February 22, 2010

Hon. Ken Salazar
Secretary of the Interior
Department of the Interior
1849 C Street, N.W., Room 7229
Washington DC 20240

Hon. Gary Locke
Secretary of Commerce
Department of Commerce
1401 Constitution Avenue Northwest
Washington, DC 20230-0002

cc:

Dr. Jane Lubchenco, Administrator
National Oceanic and Atmospheric Administration
1401 Constitution Avenue, NW, Room 5128
Washington, DC 20230

Director, U.S. Fish and Wildlife Service
U.S. Fish and Wildlife Service
1849 C Street, NW
Washington, DC 20240

Jim Lecky, Director
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NOAA Fisheries)
Office of Protected Resources
1315 East-West Highway
Silver Spring, MD 20910

Dear Secretary Locke and Secretary Salazar:

Leatherback sea turtles have been swimming the seas for 100 million years, but may go extinct in the next century due to overdevelopment and climate change. The attached petition requests the Departments of Commerce and Interior to take action to protect

the leatherbacks by designating as critical habitat beaches and nearshore waters in Puerto Rico, which is the site of some of the most important nesting beaches in U.S. jurisdiction. It is being filed on behalf of the Sierra Club, whose headquarters address is:

85 Second St., Second Floor
San Francisco, CA 94105

You can reach us by phone at (202)-548-4597.

Thank you for considering this petition, and for taking prompt action to protect the leatherback and its habitat.

Sincerely,

Craig Segall
Law Fellow
Sierra Club Environmental Law Program
408 C St. NE,
Washington, DC, 20003
(202) 548-4597

Before the Secretary of the United States Department of the Interior, the Secretary of the United States Department of Commerce, The Director of the United States Fish and Wildlife Service, the Administrator of the National Oceanic and Atmospheric Administration, and the Director of the National Marine Fisheries Service

Petition to Revise Critical Habitat for the Endangered Leatherback Sea Turtle

February 22, 2010

Sierra Club
85 Second St., Second Floor
San Francisco, CA 94105
(202)-548-4597

Petitioner.

INTRODUCTION

The Sierra Club hereby petitions the Departments of Interior and Commerce, the U.S. Fish and Wildlife Service (FWS), the National Oceanic and Atmospheric Administration, and the National Marine Fisheries Service (NMFS, also known as 'NOAA Fisheries') to revise the critical habitat of the leatherback sea turtle (*Dermochelys coriacea*), codified at 50 C.F.R. §§ 17.95 & 226.207, to include the beaches and nearby waters of the Northeast Ecological Corridor of Puerto Rico, which are among the most important leatherback nesting beaches in the U.S. Caribbean.

This petition is based upon both Section 4(b)(3)(D) of the Endangered Species Act ('ESA'), 16 U.S.C. §1533(b)(3)(D) and Section 553 of the Administrative Procedure Act ('APA'), 5 U.S.C. §553(e).

This petition is proper under the ESA. *See* 16 U.S.C. §§ 1532(15), 1533(a)(1)&(2). "[a]ny interested person" may petition to revise a critical habitat designation. 50 C.F.R. § 424.14(a) & (c); *see also* 50 C.F.R. § 424.12 (designation criteria). Under the ESA, FWS generally has jurisdiction over terrestrial species, while NFMS has jurisdiction over marine species. Sea turtles use both environments, so the two agencies have formalized their duties in a 1977 Memorandum of Understanding, with NMFS taking "sole jurisdiction over sea turtles . . . when in the marine environment" and FWS taking jurisdiction "when [the turtles are] on land."[1] This petition requests critical habitat revisions for both environments, and so is addressed to both agencies which we collectively refer to as the 'Service,' and the Departments of Commerce and Interior, which oversee them. The joint ESA regulations govern the actions of both agencies. *See generally* 50 C.F.R. 424.01 *et seq.*

Under those regulations, and the ESA itself, submission of this petition triggers definite response requirements for the Service.[2] First, the Service must "acknowledge in writing receipt of [this] petition . . . within 30 days." 50 C.F.R. § 424.14. Then, "to the maximum extent practicable," the Service must "within 90 days after receiving the petition . . . make a finding as to whether the petition presents substantial scientific or commercial information indicating that the revision may be warranted" and "promptly publish" this finding in the Federal Register. 16 U.S.C. § 1533(b)(3)(D)(i); *see also* 50 C.F.R. §

---

[1] *See* Memorandum of Understanding Defining the Roles of the U.S. Fish and Wildlife Service and the National Marine Fisheries Service in Joint Administration of the Endangered Species Act of 1973 as to Marine Turtles (July 18, 1977) (Ex 1).

[2] Both the ESA and its regulations apply these requirements without variation for species listed prior to the 1982 ESA amendments which established the revision petition timeline. Indeed, at the time of those amendments, Congress made clear that that any proposals to "designate critical habitat for a species that was determined before [the 1982 amendments to the ESA] to be endangered or threatened shall be subject to the [revision of critical habitat procedures of § 1533(b)]"). Pub. L. 97-304 § 2(b)(2) (Oct. 13, 1982).

424.14(c). FWS must also, within 12 months of receipt, "determine how it[intends to proceed" and "promptly publish" that determination in the Federal Register. 15 U.S.C. § 1533(b)(3)(D)(ii); *see also* 50 C.F.R. § 424.14(c). Because "the final determination must be made within twelve months, the only logical conclusion is that the initial [90-day] determination must be made within that time as well." *Biodiversity Legal Foundation v. Badgley*, 309 F.3d 1166, 1175 (9th Cir. 2002).

Under the APA, "an interested person [has] the right to petition for the issuance, amendment, or repeal of a rule," including a critical habitat revision. *See* 5 U.S.C. § 553(e). The Service must take "prompt action" on matters before it, and likewise must give "prompt notice" of the denial of any petition, including 'a brief statement of the ground for denial." 5 U.S.C. § 555; *see also Forest Guardians v. Babbitt*, 154 F.3d 1261, 1272 (10th Cir. 1998) (under the APA, an agency must act upon a petition within a "reasonable time").

We therefore petition the Service under both the APA and the ESA to:

(1) Make all critical habitat-related determinations regarding the leatherback on the basis of the "best scientific data available." *See* 16 U.S.C. § 1533(b)(2). These scientific data are set out below and include, but are not limited to:

(A) Nat'l Marine Fisheries Serv. & U.S. Fish and Wildlife Serv., Leatherback Sea Turtle (*Dermochelys coriacea*) 5 year review: Summary and Evaluation, 15 (2007);

(B) Hector C. Horta Abraham, *20 Years of Monitoring and Management of Leatherback Sea Turtle Nesting Population in the Northeast Coast of Puerto Rico*;

(C) Horta et al., *17 Years of Monitoring and Management of Leatherback Sea Turtle Nesting Population[s] in the Northeast Coast of Puerto Rico (1986-2002)*;

(D) DRNA, Declaracion de Impacto Ambiental Estrategica, Plan Integral de Usos de Terrenos y Manejo de la Reserva Natural Corredor Ecologico del Noreste (Sept. 2008);

(E) Graeme C. Hays et al., *Climate change and sea turtles: a 150-year reconstruction of incubation temperatures at a major marine turtle rookery*, 9 Global Change Biology 642 (2003);

(F) Lucy A. Hawkes et al., *Climate change and marine turtles*, 7 Endangered Species Research 137 (2009);

(G) NMFS, Revision of Critical Habitat for Leatherback Sea Turtles, Biological Report (Nov. 2009);

(H) J.D. Houghton et al., *Jellyfish Aggregations and Leatherback Turtle Foraging Patterns in a Temperate Coastal Environment*, 87 Ecology 1967 (2006);

(I) Loren McClenachan et al., *Conservation implications of historic sea turtle nesting beach loss*. 4 Frontiers in Ecology and the Environment 290 (2006);

(J) A. McGowan et al., *Down but not out: marine turtles of the British Virgin Islands*, 11 Animal Conservation 92 (2008);
(K) Sarti Martinez, A.L. 2000. *Dermochelys coriacea*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2;
(L) James R. Spotila, Arthur E. Dunham, Alison J. Leslie, Anthony C. Steyermark, Pamela T. Plotkin, and Frank V. Paladino, *Worldwide Population Decline of Dermochelys coriacea: Are Leatherback Turtles Going Extinct?* 2 Chelonian Conservation and Biology, Vol. 2 (1996);
(M) James R. Spotila et al., *Pacific Leatherback Turtles Faces Extinction*, 405 Nature 529, 530 (2000);
(N) C.S. Martin et al., *The status of marine turtles in Montserrat (Eastern Caribbean)*, 28 Animal Biodiversity and Conservation (2005);
(O) Michael James et al., *Canadian Waters Provide Critical Foraging Habitat for Leatherback Sea Turtles*, 133 Biological Conservation 347 (2006);
(P) Nat'l Marine Fisheries Serv. & U.S. Fish and Wildlife Serv., *Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico* 1 (1992);
(Q) Elizabeth Griffin et al., *Climate Change & Commercial Fishing: A One-Two Punch for Sea Turtles*, Oceana Report (Nov. 2007);
(R) Mark Bynoe, Caribbean Community Climate Change Center, *Living with Climatic Change in the Caribbean: The Economic Implications*, Presentation at Copenhagen (Dec. 2009);
(S) Caribbean Community Climate Change Center, *Climate Change and the Caribbean: A Regional Framework for Achieving Development Resilient to Climate Change* (2009);
(T) Meg Caldwell and Craig Segall, No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access Along the California Coast, 34 Ecology Law Quarterly 533 (2007);
(U) IPCC, *Climate Change 2007: Synthesis Report* (2007);
(V) IPCC, Summary for Policymakers, in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007);
(W) N.A. Bindoff et al., Observations: Oceanic Climate Change and Sea Level, in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* at 414 (2007);
(X) A. Fischlin et al., Ecosystems, their Properties, Goods, and Services, *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007);
(Y) K.L. Denman et al., Couplings Between Changes in the Climate System and Biogeochemistry, *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007);

(Z) R.A. Feely et al., *Evidence for Upwelling of Corrosive 'Acidified' Water onto the Continental Shelf*, 320 Science 1490 (2008);
(AA) U.S. Global Change Research Program, *Global Climate Change Impacts in the United States* (2009);
(BB) U.S. Climate Change Science Program, *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region*, Synthesis and Assessment Product 4.1 (2009);
(CC) U.S. Climate Change Science Program, *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States*, Synthesis and Assessment Product 4.3 (2008);
(DD) U.S. Fish and Wildlife Service, *Rising to the Challenge: Strategic Plan for Responding to Accelerating Climate Change* (2009);
(EE) U.S. Fish and Wildlife Service, *Appendix: 5-Year Action Plan for Implementing the Climate Change Strategic Plan* (2009);
(FF) U.S. Climate Change Science Program, *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources*, Synthesis and Assessment Product 4.4 (2008);
(GG) Lara Hansen & Jennifer Biringer et al., World Wildlife Federation, *Buying Time: A User's Manual for Building Resistance and Resilience to Climate Change in Natural Systems* (2003);
(HH) M.F.J. Taylor et al., *The Effectiveness of the Endangered Species Act: A Quantitative Analysis*, 55 BioScience 360 (2005).
(II) K.S. Van Houten & O.L. Bass, *Stormy oceans are associated with declines in sea turtle hatching*, 17 Current Biology R590 (2007).

(2) At the earliest possible time, not later than 90 days from receiving this petition, find that this petition presents substantial scientific information indicating that revision of the critical habitat determination for the leatherback, as described in this petition, may be warranted, and promptly publish that finding in the Federal Register. *See* 16 U.S.C. § 1533(b)(3)(D)(i).

(3) At the earliest possible time, not later than 12 months from receiving this petition, determine how the Service intends to proceed with the requested revision of critical habitat and publish notice of that intention in the Federal Register. *See* 16 U.S.C. § 1533(b)(3)(D)(ii).

(4) At the earliest possible time, give notice of intent to issue a regulation designating

(A) The coastline of the Northeast Ecological Corridor of Puerto Rico, running from Luquillo, Puerto Rico, to Fajardo, Puerto Rico, including the beaches known as San Miguel, Paulinas, and Convento, and extending at least .025 miles (132 feet) inland from the mean high tide line, and

(B) The waters off the coastline of the Northeast Ecological Corridor of Puerto Rico, sufficient to protect leatherbacks using the Northeast Ecological Corridor, and extending at least to the hundred fathom contour, or 9 nautical miles offshore, whichever is further, and including the existing marine extensions of the Espiritu Santo, Cabezas de San Juan, and Arreceifes de la Cordillera Nature Reserves.

as critical habitat and publish this proposed regulation in the Federal Register. *See* 16 U.S.C. § 1533(b)(5).

(5) At the earliest possible time, publish this final critical habitat regulation in the Federal Register and implement that regulation. *See* 16 U.S.C. § 1533(b)(6).

(6) At the earliest possible time, revise the Recovery Plan for the leatherback sea turtle.

(7) Issue no incidental take permits (with the exception of permits supporting pure conservation research), biological opinions, or habitat conservation plans, and take no other final agency actions, that could impact the Atlantic leatherback population or critical habitat areas identified by this petition until: a) the Service has ruled on this petition; and b) critical habitat has been revised in accordance with this petition.

DISCUSSION

I. Summary

The Sierra Club petitions to revise the existing critical habitat designation for the leatherback sea turtle (*Dermochelys coriacea*) under the Endangered Species Act (ESA) to include the beaches and nearshore waters of the Northeast Ecological Corridor of Puerto Rico, which provide vital leatherback nesting habitat. Leatherback sea turtles are critically endangered and face numerous threats to their survival. Nesting sites in Puerto Rico represent the second most significant nesting activity in the United States,[3] and the beaches of the Corridor are the most important leatherback sites on the main island of Puerto Rico. The need to identify and protect the habitat necessary for survival of the Caribbean region's sea turtles has long been recognized.[4] The coastal zone in the Corridor is particularly vulnerable to development pressure and to the growing impacts of climate change, and so warrants protection as critical habitat.

---

[3] Nat'l Marine Fisheries Serv. & U.S. Fish and Wildlife Serv., Leatherback Sea Turtle (*Dermochelys coriacea*) 5 year review: Summary and Evaluation, 15 (2007). [hereinafter 5-Year Plan] (Ex 2).

[4] Wendy Dow, Karen Eckert, Michael Palmer & Philip Kramer, *An Atlas of Sea Turtle Nesting Habitat for the Wider Caribbean Region*. (2007) The Wider Caribbean Sea Turtle Conservation Network and The Nature Conservancy. WIDECAST Technical Report No. 6 (available at http://seamap.env.duke.edu/prod/services/widecast/references/Dow_et_al_2007.pdf) (Ex 3).

In addition to being a critical nesting habitat for the leatherback sea turtle, more than 50 rare, threatened, endangered and endemic species have been documented in the Corridor. These species include the federally threatened or endangered snowy plover (*Charadrius alexandrinus*), the least tern (*Sterna antillarum*), the roseate tern (*Sterna dougalli*), the Puerto Rican boa (*Epicrates inornatus*), the Virgin Islands tree boa (*Epicrates monensis granti*), the hawksbill sea turtle (*Eretmochelys imbricata*), the West Indian manatee (*Trichechus manatus manatus*), the elkhorn coral (*Acropora palmata*), the beautiful goetzea (*Goetzea elegans*), and the tree species *Stahlia monosperma* and *Schoepfia arenaria*. Designating the proposed area as critical habitat would not only provide meaningful protection against threats the leatherback faces and will also protect a multitude of other species.

Figure 1. Leatherback Nesting in the Northeast Ecological Corridor[5]

II. Natural History and Conservation Status of the Leatherback Sea Turtle

A. Characteristics and Taxonomy

Leatherbacks are named for their slightly flexible rubber-textured carapace.[6] The leatherback is the largest living turtle and is so distinctive from other sea turtles that it is placed in a separate family, *Dermochelyidae*, which diverged from the other sea turtles

[5] Courtesy Randy Sargent Neppl.

[6] Nat'l Marine Fisheries Serv. & U.S. Fish and Wildlife Serv., *Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico* 1 (1992). [hereinafter Recovery Plan] (Ex 4).

over 150 million years ago, and of which it is the only living member.[7] All other sea turtles belong to the family *Cheloniidae* and have bony carapaces that are plated and covered with horny scutes.[8]

Not only is the leatherback the largest turtle in the world, it is also the largest living reptile: mature males and females can reach six and a half feet (2 m) long and weigh in at almost 2000 lbs.[9] In addition to their large size, the leatherback has other morphological adaptations which support its open ocean lifestyle.[10] For example, thermoregulatory adaptations such as a counter-current heat exchange system, large body size, and insulative fat layers allow the leatherback to maintain a core body temperature higher than that of the surrounding water; this enables them to tolerate colder water temperatures, which is essential for their long migratory journeys.[11]

B. Life History

Leatherbacks knit together the world's oceans and coastlines. For tens of millions of years, leatherbacks have nested on sandy beaches all over the planet.[12] They range from these tropical beaches far to the north and south, further than any other marine reptile, into the sub-Arctic and sub-Antarctic.[13] Gliding in the currents, they seek out cnidarians – jellyfish – whose sometimes dense aggregations provide their primary food source.[14] They dive deep for food, and have been documented at 1300 meters beneath the surface.[15] And, in time, they return to their beaches to reproduce.

Reproductive females emerge from the ocean to dig nests out of the sand.[16] In the Caribbean, nesting season begins in late February or early March and continues into July.[17] The females dig between 5 to 7 nests per year, laying 100 eggs or more in each nest.[18] The eggs incubate for 55-75 days.[19] During that time, the temperature of the beach determines the sex of the infant turtles: above roughly 29.5 degrees Celsius, more and more females are produced, with males predominating at lower

---

[7] Id.
[8] Id.
[9] *See* Nat'l Marine Fisheries Serv., Office of Protected Resources, *available at* http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm.
[10] Id.
[11] Id.
[12] Recovery Plan at 6.
[13] Five-Year Plan at 26; *see also* Michael James et al., *Canadian Waters Provide Critical Foraging Habitat for Leatherback Sea Turtles*, 133 Biological Conservation 347 (2006) (concluding that "Canadian waters support one of the highest summer and fall densities of leatherbacks in the North Atlantic") (Ex 5).
[14] Recovery Plan at 6-7; J.D. Houghton et al., *Jellyfish Aggregations and Leatherback Turtle Foraging Patterns in a Temperate Coastal Environment*, 87 Ecology 1967 (2006) (Ex 6).
[15] Recovery Plan at 7.
[16] Recovery Plan at 7-9.
[17] *Id.* at 8.
[18] *Id.*
[19] *Id.*

temperatures.[20] Males also proceed to the nesting beach region from high latitude foraging areas, as revealed by satellite tracking, and mating and reproduction occurs in areas adjacent to nesting beaches where they intercept females. Males and females continue to forage in reproductive habitats, and females also appear to utilize nearshore waters as refugia and resting areas in between nesting bouts.

Eventually, the eggs hatch, and the hatchlings burrow out and head for the ocean.[21] There, they will seek out tropical waters, to grow, feed, and mature, dispersing widely.[22] Sexually mature in their teens to mid twenties,[23] they will eventually return to nesting beaches and continue this cycle, which has gone on for tens of millions of years.

C. Distribution

This cycle takes place around the world, in the Indian, Pacific, and Atlantic Oceans, but has been disrupted by human interference. The Indian population is not well studied, but there is evidence of declines, at least on South African beaches.[24] The Pacific population, once enormous, has, as the Service acknowledges, "collapsed," in part as the result of years of poaching, damage to nesting beaches, and fishing-related mortality.[25] On Costa Rican nesting beaches, for instance, 1,504 females nested in 1988; only 188 were nesting in 2000.[26] Likewise, tens of thousands of turtles nested in Mexico in the 1980s but only 120 turtles appeared nationwide in 2003.[27] In the western Pacific, the situation is similarly grim.[28]

Conditions in the Atlantic and Caribbean are relatively more stable, but still have seen declines.[29] Most Atlantic leatherbacks nest in Suriname and French Guiana in South America, Trinidad in the Caribbean, and in Gabon in Africa.[30] Nesting at these sites thus far appears superficially healthy,[31] but genetic analysis suggests that even the very large population in French Guiana and Suriname is vulnerable to eventual extinction.[32] And, in fact, one recent long-term study documents substantial declines in sea turtle

---

[20] *Id.*
[21] *Id.*
[22] Five-Year Plan at 27-28.
[23] NMFS, Revision of Critical Habitat for Leatherback Sea Turtles, Biological Report at 7 (Nov. 2009) (hereinafter 'Revision Biological Report') (Ex 7).
[24] Five-Year Plan at 11-12, 22.
[25] *Id.* at 12-14, 22-23, 39.
[26] *Id.* at 12.
[27] *Id.* at 13.
[28] *Id.* at 13-14.
[29] *See* James R. Spotila, Arthur E. Dunham, Alison J. Leslie, Anthony C. Steyermark, Pamela T. Plotkin, and Frank V. Paladino, Worldwide Population Decline of Dermochelys coriacea: Are Leatherback Turtles Going Extinct? 2 Chelonian Conservation and Biology, Vol. 2 (1996) *available at* http://www.leatherback.org/ldc/pg/popdec.htm (Ex 8).
[30] Five-Year Plan at 15-17.
[31] *Id.*
[32] *Id.* at 25.

populations over the last few centuries (although it did not specifically look at leatherback populations). The authors view this decline as a good reason to protect small and mid-sized nesting beaches as well, writing:

> Populations of endangered Caribbean sea turtles are far more depleted than realized because current conservation assessments do not reflect historic nesting data. We used historical sources to analyze changes in the numbers of nesting populations and population sizes for green and hawksbill turtles on all known nesting beaches in the Caribbean over the past millennium. We present the first maps of historic nesting populations, which provide the basis for an objective measure of changes in distribution and abundance. Our results indicate that 20% of historic nesting sites have been lost entirely and 50% of the remaining nesting sites have been reduced to dangerously low populations. Recent conservation efforts have resulted in large population increases at several nesting sites, but loss of widespread nesting throughout the Caribbean and reductions in the Caribbean-wide population since human hunting began indicate that Caribbean turtles are far from recovered. Focusing attention on a small number of nesting populations is a risk-prone strategy; conservation programs should instead broaden their scope to protect both large and small nesting populations throughout the Caribbean.[33]

The United States contains at least three significant leatherback nesting areas: Sandy Point on St. Croix in the U.S. Virgin Islands, which hosted 1,008 nests in 2001, Brava and Resaca Beaches on Puerto Rico's island of Culebra, and the beaches around Fajardo and Luquillo in the Northeast Ecological Corridor of Puerto Rico. The Puerto Rican beaches cumulatively hosted a minimum of 469-882 nests each year between 2000 and 2005.[34] We discuss the extraordinary leatherback populations of the Corridor in detail below.

It is important to immediately emphasize the U.S. beaches do not just bolster the Atlantic leatherbacks' basic population numbers. They also provide critical genetic diversity that helps the species survive. As the Service has emphasized:

> The observed low genetic diversity in leatherbacks and the potential vulnerability of even large populations like French Guiana and Suriname emphasize the need for conservation measures even when populations are stable or increasing. Unique haplotypes contained in breeding assemblages such as St. Croix account for a

---

[33] Loren McClenachan et al., *Conservation implications of historic sea turtle nesting beach loss.* 4 Frontiers in Ecology and the Environment 290 (2006) (discussing "large-scale reductions in population numbers" over the centuries for Caribbean sea turtles and the importance to focus on the "small, widespread nesting populations still remaining") (Ex 9).

[34] Five-Year Plan at 15.

significant part of the global diversity and are important to conserve and maintain genetic diversity for the species as a whole.[35]

Encouragingly, conservation efforts designed to protect mid-sized nesting beaches, like those in Puerto Rico, have met success in small parts of the Caribbean, including Montserrat and the British Virgin Islands.[36] Although these successes are not alone sufficient to swiftly restore turtle populations to the huge numbers they once sustained, they are a step in the right direction.

D. Conservation Status

It is shocking that a species that has survived for over 100 million years may fail due to a few years of human abuse, but it is possible. Leatherbacks have suffered a catastrophic decline in their worldwide population.[37] In 1982, it was estimated that that the world population consisted of 115,000 adult females.[38] In 1996, the total estimation of the adult female leatherback population had plunged to 20,000-30,000.[39] In less than 15 years, the global population was reduced by nearly 80%.[40] In the Pacific Ocean, populations have declined at all major nesting beaches,[41] and if current trends continue, the pacific Leatherbacks are predicted to be extinct in just a few short decades.[42] The Atlantic leatherbacks could follow if their habitat is not protected.

i. Threats to Leatherbacks

Threats take many forms. At sea, leatherbacks can become entangled in fishing lines in pelagic or artisan fisheries, caught on the hooks of fishing boats or, despite the use of turtle excluder devices, in nets.[43] At Sandy Point, in the U.S. Virgin Islands, which is the only protected critical habitat for leatherbacks, females have been reported to "exhibit various degrees of rope or cable cuts on their shoulders and front flippers" from such

---

[35] *Id.*; *see also* NOAA Technical Memorandum NMFS-NWFSC-42, *Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units* (2000) (discussing the critical importance of maintaining many geographically distinct breeding populations to maintain a species' genetic diversity). (Ex 47)

[36] *See* C.S Martin et al., *The status of marine turtles in Montserrat (Eastern Caribbean)*, 28 Animal Biodiversity and Conservation (2005) (Ex 46); A. McGowan et al., *Down but not out: marine turtles of the British Virgin Islands*, 11 Animal Conservation 92 (2008) (Ex 10).

[37] Sarti Martinez, A.L. 2000. *Dermochelys coriacea*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2. *available at* www.iucnredlist.org. (Ex 11)

[38] *Id.*

[39] *Id.*

[40] *Id.*

[41] Pacific Fishery Management Council and NMFS. Management of the drift gillnet fishery exempted fishing permit and/or regulatory amendment: Draft Environmental Assessment, Regulatory Impact Review & Regulatory Flexibility Analysis 67 (2006).

[42] James R. Spotila et al., Pacific Leatherback Turtles Faces Extinction, 405 NATURE 529, 530 (2000) (Ex 12).

[43] Recovery Plan at 14-16.

encounters.[44] Turtles also mistake marine debris, like plastic bags, for their jellyfish prey, ingesting them and clogging their throats and stomachs.[45]

On land, the nesting beaches, too, have become increasingly inhospitable. As the Service explains:

> Considering that coastal development and beach armoring is detrimental to leatherback nesting behavior, human population expansion is reason for major concern. This is underscored by the fact that over the next few decades the human population is expected to grow by more than 3 billion people (about 50%). By the year 2025, the United Nations Educational, Scientific and Cultural Organization forecasts that population growth and migration will result in a situation in which 75% of the world human population will live within 60 km of the sea. Such a migration will change a coastal landscape that, in many areas, is already suffering from human impacts. The problems associated with development in these zones will progressively become a greater challenge for conservation efforts, particularly in the developing world where wildlife conservation is often secondary to other national needs.[46]

These human impacts are diverse. Some are obvious: poaching and egg theft continue to threaten turtles around the world, contributing to "catastrophic declines" in some areas.[47] Any human presence on nesting beaches can "result in lowered hatching emergence success rates" by compacting sand above nests, disturbing hatchlings, and discouraging nesting females from laying eggs at all.[48] Beach off-road vehicle driving crushes and destroys nest sites and leaves tire tracks that can trap hatchlings.[49] Other threats are a bit more subtle: for instance, left-over beach furniture, like lounge chairs and umbrellas, confuses and entraps turtles.[50]

Artificial lighting is a particularly potent threat. Hatchlings and nesting leatherbacks tend to follow the brightest direction; light closest to the horizon plays the greatest role in determining orientation in their way back to the sea.[51, 52] Under natural conditions, many nesting beaches have a relatively simple topography with an open stretch of sand backed by trees and vegetation. This gives a brightness difference between the open

---

[44] *Id.*
[45] *Id.* at 15.
[46] Five-Year Plan at 33.
[47] Five-Year Plan at 34.
[48] Recovery Plan at 13.
[49] *Id.* at 14.
[50] *Id.* at 13.
[51] Salmon, M. And J. Wyneken. 1990. Do swimming loggerhead sea turtles (*Caretta caretta* L.) use light cues for offshore orientation? Mar. Behav. Physiol. 17: 233-246.
[52] Verheijen, F. J. and J. T. Wildschut. 1973. The photic orientation of hatchling sea turtle during water finding behaviour. Netherlands J. Sea Res. 7: 53-67.

seaward horizon and the darker tree line and landmass. [53] In addition, water reflects more moonlight and starlight than land, enabling the hatchlings to find the sea when it cannot initially be seen. [54, 55] As such, artificial lights from coastal development can cause hatchlings and nesting leatherbacks disoriented or to strike out in the wrong direction; adult females will avoid lighted beaches all together.[56] Intense lights can draw hatchings back out of the surf and onto roads or parking lots, where they are crushed and killed.[57] In short, "[c]umulatively, along the heavily developed beaches of the southeastern continental United States and Puerto Rico, the negative effects of artificial lights may be profound."[58]

Beach armoring is also a major problem. "Armoring" is the practice of protecting beachfront developments from erosion with engineered walls, rock piles, groins, and jetties.[59] These changes can block sea turtles from nesting beaches or scatter debris across nesting sites; worse, can cause the beaches to disappear entirely. If a beach is retreating before storm surge or a rising sea, it will ordinarily simply move inland. But if the land behind the beach has been armored, the beach has nowhere to go, and will simply erode away.[60]

These threats are substantial: they have already caused major global declines. And, as our understanding of behavior and utilization of nesting and reproductive areas, as well as adjacent ocean habitats is still maturing, we may not yet know of some threats. New electronic tagging studies are revealing greater complexity in habitat utilization and behavior, suggesting that human activities in these areas could potentially impact turtles in previously unexpected ways. Unfortunately, global climate change is rapidly making the situation even more challenging, as we next discuss.

ii. Leatherbacks, Climate Change, and Ocean Acidification

The Nobel-Prize-winning Intergovernmental Panel on Climate Change ('IPCC'), made up of thousands of scientists working together all around the world, has been sounding ever more urgent warnings about accelerating global warming. The IPCC's most recent reports paint a grim picture of a world of rising seas and stronger storms. Leatherbacks will struggle to survive in this new world, especially because the same gases that are

---

[53] Mrosovsky, N. 1970. The influence of the sun's position and elevated cues on the orientation of hatchling sea turtles. Anim. Behav. 18: 648-651.

[54] *Id.*

[55] Lohmann, K. J. and C. M. F. Lohmann. 1996. Orientation and open-sea navigation in sea turtles. J. Exper. Biol. 199: 73-81.

[56] *Id.* at 12-13.

[57] *Id.*

[58] *Id.* at 13.

[59] *Id.* at 10-11.

[60] *See id.* at 10-11; *see generally* Meg Caldwell and Craig Segall, No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access Along the California Coast, 34 Ecology Law Quarterly 533 (2007) (Ex 13).

heating the planet are also acidifying the oceans, killing coral reefs and undermining the aquatic food chain.

a. Climate Change Impacts

The IPCC has determined that:

• "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global sea level."[61]

• "For the next two decades a warming of about 0.2 °C per decade is projected [by a wide range of greenhouse gas emission scenarios]. . . . Continued [greenhouse gas] emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century."[62] The IPCC projects upper-end warming by the end of the century at 6.4 °C.

• "Mountain glaciers and snow cover have declined on average in both hemispheres. Widespread decreases in glaciers and ice caps have contributed to sea level rise. . . . [L]osses from the ice sheets of Greenland and Antarctica have very likely contributed to sea level rise over 1993 to 2003."[63]

• "Global sea level rose at an average rate of 1.8 mm per year over 1961 to 2003. The rate was faster over 1993 to 2003: about 3.1 mm per year. . . . The total 20th-century rise is estimated to be .17 m."[64]

• Depending on how quickly emissions are controlled, the IPCC estimates global average sea level rise of between roughly 0.20 and 0.59 m by the end of the century.[65]

• "Anthropogenic warming and sea level rise would continue for centuries due to the time scales associated with climate processes and feedbacks, even if [greenhouse gas] concentrations were to be stabilised."[66]

---

[61] IPCC, *Climate Change 2007: Synthesis Report* at 30 (2007) ('*IPCC Synthesis*') (attached as Ex. 14).
[62] *Id.* at 45.
[63] IPCC, Summary for Policymakers, in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* ('*IPCC Summary for Policymakers*') at 5 (2007) (attached as Ex. 15).
[64] *Id.* at 5-6.
[65] *Id.* at 13.
[66] *IPCC Synthesis* at 46.

• "[I]t is likely that future tropical cyclones (typhoons and hurricanes) will become more intense, with larger peak wind speeds and more heavy precipitation associated with ongoing increases of tropical sea surface temperatures."[67]

• The combination of stronger storms and rising seas will amplify each others' effects, as storm surge drives high seas even higher. "Extreme sea levels occur mainly in the form of storm surges generated by tropical or extra tropical cyclones," and these extreme events appear to be increasing.[68]

Ocean acidification accompanies these grim events. The scientific evidence erases any doubt that ocean acidification has occurred as a direct result of increased carbon dioxide emissions from fossil fuels.[69] In fact, because the oceans have a significant absorptive capacity, atmospheric concentrations of carbon dioxide are much lower than they would otherwise be.[70]

The resulting acidification of oceans is adversely affecting various forms of wildlife.[71] To date, surface ocean pH has decreased by 0.1 units and is predicted to decline by an additional 0.3 to 0.4 units by 2100.[72] This occurrence is unprecedented and "may lead to ocean pH levels within a few centuries that have not been observed for a few hundred million years."[73] Recent evidence suggests that anthropogenic undersaturation of carbonate -- a direct result of increasing ocean acidification --is already spreading to lower latitudes and higher reaches of the ocean water column, which is much faster than predicted in earlier studies.[74]

This projected increase in ocean acidification will undoubtedly threaten a wide variety of aquatic life. Oceanic species which form calcium carbonate shells, and the many species which eat them, are badly threatened. As the Senate Commerce Committee recently heard in testimony, for instance, tiny aquatic pteropods, "an important food

---

[67] *IPCC Summary for Policymakers* at 15.

[68] N.A. Bindoff et al., Observations: Oceanic Climate Change and Sea Level, in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* at 414 (2007) (Ex 16).

[69] *Id.* at 31.

[70] *Id.* at 31.

[71] *Id.* at 57.

[72] A. Fischlin et al., Ecosystems, their Properties, Goods, and Services, *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007) (Ex 17).

[73] K.L. Denman et al., Couplings Between Changes in the Climate System and Biogeochemistry, *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007) (Ex 18).

[74] R.A. Feely et al., *Evidence for Upwelling of Corrosive 'Acidified' Water onto the Continental Shelf*, 320 Science 1490-92 (2008) (Ex 19).

source for salmon and many other fish" simply dissolve in acidified ocean water.[75] Some fisheries are already suffering: There is growing suspicion, in this regard, that oyster growers in Washington State, who have seen four years of reproductive failure, are losing their catch to acidification.[76] As the seas increasingly become inhospitable to life, ocean acidification will become an ever greater threat.

The U.S. Global Change Research Program ('GCRP') confirms that these changes are occurring in the United States and that they may, in some instances, be even more severe than the IPCC predicts. Predicting warming of between 2° and 11.5 °F by the end of the century,[77] the GCRP documents rising seas, stronger storms, and increasingly extreme floods and droughts.[78] Gathering the most recent data, the GCRP explains that the IPCC's sea level rise estimates were quite conservative, writing:

> More recent research has attempted to quantify the potential contribution to sea-level rise from the accelerated flow of ice sheets to the sea or to estimate future sea level based on its observed relationship to temperature. The resulting estimates exceed those of the IPCC, and the average estimates under higher emissions scenarios are for sea-level rise between 3 and 4 feet [that is, over 1 m, or roughly double the IPCC's high-end projection] by the end of this century.[79]

All of these changes have the potential to devastate species and ecosystems. The IPCC, for instance, predicts that even modest warming of between 1.5 -2.5 °C would place "[a]pproximately 20 to 30% of [the] plant and animal species" which it has studied "at increased risk of extinction"; higher temperatures would cause "major changes in ecosystem structure and function, species' ecological interactions and shifts in species' geographical ranges, with predominantly negative consequences for biodiversity and ecosystem goods and services."[80]

U.S. government researchers have similarly found that "[c]limate variability and change have many impacts on terrestrial and marine ecosystems."[81] Dramatic changes in

---

[75] Testimony of Brad Warren, Sustainable Fisheries Partnership, before the U.S. Senate Committee on Commerce, Science, and Transportation, hearing on *The Blue Economy: The Role of the Oceans in our Nation's Future* (June 9, 2009) (Ex 20).

[76] *See id.*

[77] U.S. Global Change Research Program, *Global Climate Change Impacts in the United States* ('*Global Climate Change Impacts in the United States*') at 24 (2009) (Ex 21).

[78] *See, e.g., id.* at 19-26, 27-40.

[79] *Id.* at 25. *See also* U.S. Climate Change Science Program, *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region*, Synthesis and Assessment Product 4.1 at 2 (2009) (Observing that "[r]ecent studies suggest the potential for a meter or more of global sea-level rise by the year 2100, and possibly several meters within the next several centuries.") (Ex 22)

[80] *IPCC Synthesis* at 48.

[81] U.S. Climate Change Science Program, *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States*, Synthesis and Assessment Product 4.3 ('*Effects of Climate Change on Biodiversity*') at 18 (2008) (Ex 23).

habitat quantity and quality will threaten many species.[82] Existing stresses will also become harder to bear as new climate pressures ramp up.[83]

These stresses, again, include strong storms, which can erode away nesting beaches. Rising seas will intensify the effects of strengthening hurricanes, as the GCRP explains:

> As sea level rises, coastal shorelines will retreat. Wetlands will be inundated and eroded away, and low-lying areas including some communities will be inundated more frequently – some permanently – by the advancing sea. . . . The salinity of estuaries, coastal wetlands, and tidal rivers is likely to increase in the southeastern coastal zone, thereby altering coastal ecosystems and displacing them further inland if no barriers exist. . . . Compared to the present coastal situation, for which vulnerability is quite high, an increase in hurricane intensity will further affect low-lying coastal ecosystems and coastal communities along the Gulf and South Atlantic coastal margin. An increase in intensity is very likely to increase inland and coastal flooding, coastal erosion rates, wind damage to coastal forests, and wetland loss.[84]

This increase in hurricane intensity is already occurring:

> The destructive potential of Atlantic hurricanes has increased since 1970, correlated with an increase in sea surface temperature. . . . An increase in average summer wave heights along the U.S. Atlantic coastline since 1975 has been attributed to a progressive increase in hurricane power. The intensity of Atlantic hurricanes is likely to increase during this century with higher peak wind speeds, rainfall intensity, and storm surge height and strength.[85]

The Caribbean Community Climate Change Center expects these impacts to be "devastating,"[86] writing:

> [Climate change] is expected to result in more hostile regional climate change and rising sea levels. Rising sea levels, together with the associated coastal erosion and salt water intrusion, an escalation in the frequency and intensity of tropical storms and hurricanes, and disruptions in rainfall and fresh-water supply threaten the very existence of the CARICOM countries.

Between 1995 and 2000, "the region experienced the highest recorded level of hurricane activity," losing billions of dollars of housing and infrastructure.[87]

---

[82] *Id.* at 159-74.
[83] *Id.* at 184.
[84] *Id.* at 114-15.
[85] *Global Climate Change Impacts in the United States* at 112.
[86] Caribbean Community Climate Change Center, *Climate Change and the Caribbean: A Regional Framework for Achieving Development Resilient to Climate Change* (2009) at iii (Ex 24)

The GCRP, too, forecasts an especially dire future for Caribbean ecosystems:

> Marine and coastal ecosystems of the islands are particularly vulnerable to the impacts of climate change. Sea-level rise, increasing water temperatures, rising storm intensity, coastal inundation and flooding from extreme events, beach erosion, ocean acidification, increased incidences of coral disease, and increased invasions by non-native species are among the threats that endanger the ecosystems that provide safety, sustenance, economic viability, and cultural and traditional values to island communities.[88]

These impacts include major marine resource damage, as "[s]ea-level rise can erode beaches, and along with increasing water temperatures, can destroy or degrade natural resources such as mangroves and coral reef ecosystems that attract tourists."[89]

The upshot is that climate change is creating an increasingly inhospitable environment, and is especially likely to do harm to species dependent on coastal resources.

b. Climate Change and Leatherbacks

Global warming has the potential to destabilize the already endangered leatherback population. The International Conservation Union ('IUCN') describes the challenges as follows:

> • Higher sand temperatures during egg incubation lead to disproportionately higher numbers of female turtles. Increasing sand temperatures caused by climate change could threaten the stability of Leatherback populations in the future.
>
> • Rising sea levels and increased storm activity may wash away turtle nests and decrease turtle nesting habitat.
>
> • Leatherbacks are listed as Critically Endangered on the IUCN's Red List and already face a number of threats, including accidental capture by fisheries, coastal development and mistaken consumption of plastic debris.
>
> • Leatherback Turtles highlight the impacts of increasing air and sea temperatures, rising sea levels and changing ocean currents. These

[87] *Id.* at ii., 6-9; *see also* Mark Bynoe, Caribbean Community Climate Change Center, *Living with Climatic Change in the Caribbean: The Economic Implications*, Presentation at Copenhagen (Dec. 2009) (Ex 25).
[88] *See Global Climate Change Impacts in the United States* at 145-48.
[89] *Id.* at 148.

> changes are likely to affect all marine turtles and many other marine species.[90]

The IUCN recommends protecting suitable beaches to ensure that the leatherback does not go extinct, cautioning that "[c]oastal developments and pressures from humans have already rendered many possible sites unsuitable, and increasing sea wall development and beach erosion are likely to further reduce beach availability."[91] As one recent study explains:

> Predicted increases in sea level have the potential to compromise availability of nesting beaches, particularly on low-lying narrow coastal and island beaches and where coastal development prevents landward migration of beaches – also known as coastal squeeze. . . . Compounding the threat of sea level rise is the likelihood of an increase in fortification of coastal areas to protect human settlements (using, e.g., sea walls, groynes, and other hard sea defences). Such 'shoreline' protection is already in widespread use (for example, in the Caribbean). It effectively reduces total sandy beach availability and leads to a disproportionate loss of dry upper inter-tidal beach area and, in some cases, entire beaches.[92]

In fact, recent studies are already documenting beach losses associated with stronger storms of the sort climate change causes. A nine year study of nesting loggerhead and green sea turtles in Dry Tortugas National Park showed a steady rise in storm intensity linked to falling hatching success and a stark increase in flooded nests:

Figure 2: Nesting Success with Stormy Seas[93]

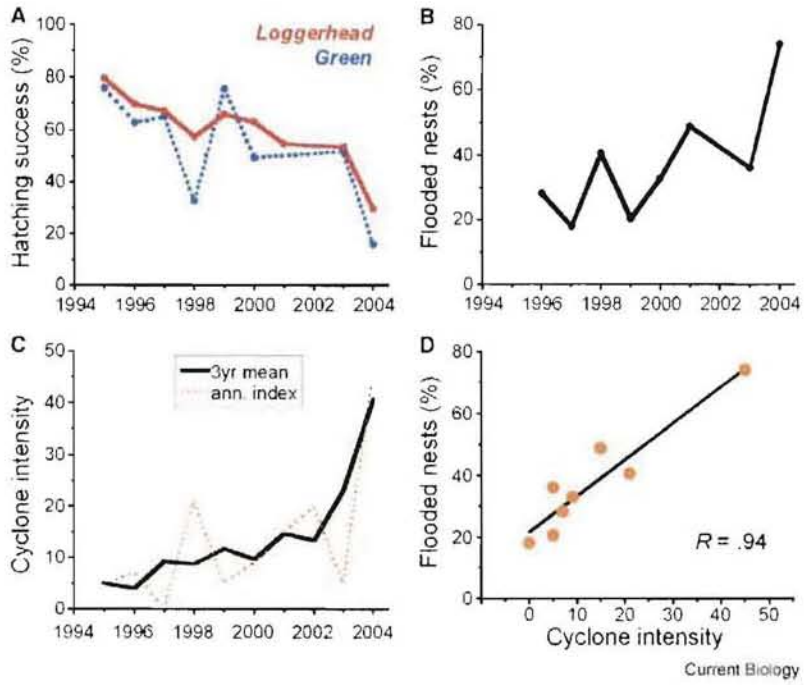
---

[90] IUCN Red List Species Survival Commission, Leatherback Turtles and Climate Change: Turtle-y Exposed to Climate Change, 12 (2009) *available at* http://cmsdata.iucn.org/downloads/species_and_climate_change.pdf(Ex 26); *see also* Graeme C. Hays et al., *Climate change and sea turtles: a 150-year reconstruction of incubation temperatures at a major marine turtle rookery*, 9 Global Change Biology 642 (2003) (documenting rising san temperatures at nesting beaches) (Ex 27).

[91] Id. at 14.

[92] Lucy A. Hawkes et al., *Climate change and marine turtles*, 7 Endangered Species Research 137, 139 (2009) (Ex 28).

[93] From K.S. Van Houten & O.L. Bass, *Stormy oceans are associated with declines in sea turtle hatching*, 17 Current Biology R590 (2007) (Ex 29).



The authors of that study wrote:

> [O]ur results suggest that tropical cyclones are a significant factor in the observed turtle hatching declines. This raises concern given the link between warming sea surfaces and tropical cyclones. Theory alone predicts global warming may amplify the potential power of tropical cyclones. Recent historical models confirm this link and suggest that warming seas likely increase the frequency, duration and destructive power of tropical cyclones; particularly in the Atlantic Ocean. The potential prospects of earlier, more numerous, and more powerful storms pose an additional and significant threat to loggerhead and green sea turtles nesting in southwest Florida, and perhaps beyond. This may be especially true for turtle rookeries like those at [the Dry Tortugas] where nesting beaches are exposed to high surf and storm surges that accompany strong storms.[94]

Leatherbacks prefer precisely such "exposed" beaches – including the beaches of Puerto Rico's Northeast Ecological Corridor – and so may be quite vulnerable to this threat. Indeed, beach erosion is already a problem, even leaving aside climate change. As the Recovery Plan, which was published in 1996, records:

> Leatherbacks prefer open access beaches presumably to avoid damage to their soft plastron and flippers. However, beaches with little shoreline protection tend to be very dynamic, often displaying severe beach erosion during seasonal changes in wind and wave direction. Eggs that are laid in beach areas that erode before

[94] *Id.* at R591.

> hatching are lost. In the U.S. Caribbean, most leatherback nesting beaches are relative[ly] stable with little egg lose due to erosion, but on Sandy Point, approximately 40 to 60 percent of all eggs laid each year would be lost without human intervention. Many nests laid on Manchenil beach, St. Croix, are lost to wave inundation. Many nests laid on Buck Island, St. Croix, Mona Island, and the north coast of Puerto Rico are lost to early winter swells. Given the current low number of leatherbacks nesting in the United States[,] this egg loss could be a significant threat to the recovery of leatherbacks that nest in the United States.[95]

Conditions will also change at sea. While warmer waters further north may allow leatherbacks to expand their range, they are also likely to alter the timing and distribution of jellyfish blooms, an important leatherback food source.[96] Changes in ocean productivity affect migration patterns and acquisition of food and energy stores for the highly migratory leatherback, and ultimately impacts reproductive potential.

The Service discussed climate change in its recent five-year review of the leatherbacks, acknowledging that "[a]n anthropogenic factor that may affect leatherback habitat and biology is global warming."[97] It explained that the leatherbacks might be able to expand their range or switch nesting beaches (if new beaches were available), but conceded that ultimately how climate changes in the Atlantic "will affect leatherback distribution and foraging behavior is difficult to predict."[98]

At a minimum, then, climate change is unlikely to produce definite benefits for the leatherbacks and nearly certain to damage or destroy nesting beaches – and, in particular, beaches which have been developed or armored. Coupled with the other threats that leatherbacks already face, it seriously jeopardizes the species.[99]

E. Legal Protection under the Endangered Species Act

The leatherback turtle was first listed as endangered in 1970 but, despite a worldwide decline in leatherback populations and nesting beaches, the FWS and NMFS have only designated a single beach as critical habitat. *See* 35 Fed. Reg. 8491, 8495 (June 2, 1970); 50 C.F.R. § 17.11, 50 C.F.R. § 224.101. [100]

---

[95] Recovery Plan at 10; *see also* Gilliam Cambers, *Caribbean beaches changes and climate change adaptation*, 12 Aquatic Ecosystem Health & Management 168 (2009) (concluding that climate-linked hurricanes in the region mean "it is likely that the beach erosion trend will continue and increase") (Ex 30); Gilliam Cambers, Paper prepared for Commonwealth Association of Planners Regional Conference, *Impact of Climate Change on the Beaches of the Caribbean* (June 2007) (Ex 31).

[96] *See id.* at 144.

[97] Five-Year Plan at 33.

[98] *Id.* at 33-34.

[99] *See, e.g.*, Elizabeth Griffin et al., *Climate Change & Commercial Fishing: A One-Two Punch for Sea Turtles*, Oceana Report (Nov. 2007) (Ex 32).

[100] *See*; *see also* Nat'l Marine Fisheries Serv., Office of Protected Resources, *available at* http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm.

That beach is Sandy Point, on St. Croix in the U.S. Virgin Islands. FWS and NMFS designated the terrestrial and aquatic portions of the beach separately. The process began in the summer of 1977 when the FWS "became aware of a newly discovered nesting aggregation of leatherback sea turtles" at Sandy Point. 43 Fed. Reg. 12,050, 12,050 (Mar. 23, 1978). Relying entirely on "observations on St. Croix during the month of June" which documented the presence of "76 to 79 leatherback nests," it proposed to designate a strip of the beach 0.8 miles long and 0.1 miles wide as critical habitat. *Id.* at 12,050-51.

Local government officials recommended doubling the width of the protected beach, and added that 86 leatherbacks "actually nested on Sandy Point in 1977," including in some areas not covered by the original proposed designation. 43 Fed. Reg. 43,688, 43,688 (Sept. 26, 1978). In response, FWS expanded the area as suggested. It explained that habitat warranted designation because "the beaches in this rulemaking provide sites for the incubation of eggs and are known to provide proper sand size, moisture, and temperature conditions for successful development and hatching." *Id.* at 43,689. It therefore designated as critical habitat:

> A strip of land 0.2 mile wide (from mean high tide inland) at Sandy Point Beach on the western end of the island of St. Croix beginning at the southwest cape to the south and running 1.2 miles northwest and then northeast along the western and northern shoreline, and from the southwest cape 0.7 mile east along the southern shoreline.

50 C.F.R. § 17.95.

This designation left marine areas adjacent to the beach unprotected, so in 1979, NMFS also acted. It observed that "the survival and recovery of the leatherback depends on the maintenance of suitable and undisturbed nesting beaches and protection of waters adjacent to those beaches." 44 Fed Reg. 17,710, 17,710 (Mar. 23, 1979). Making clear that the "70 leatherback nests" on Sandy Point constituted "a major beach under U.S. jurisdiction used for nesting by the endangered leatherback," *id.*, it left little doubt that critical habitat designation was warranted, writing:

> Since the area . . . is used by the leatherback for courting and mating activities and provides an access to and from an important nesting beach, the NFMS believes the area is essential for the conservation of the leatherback sea turtle and requires special management protection. As such, these waters qualify for designation as critical habitat under the Endangered Species Act as amended.

Id. Thus, the Service designated as critical habitat:

> The waters adjacent to Sandy Point, St. Croix, U.S. Virgin Islands, up to and inclusive of the waters from the hundred fathom curve shoreward to the level of mean high tide with boundaries at 17°42'12'' North and 64°50'00'' West.

See id.; *see also* 50 C.F.R. 226.207.

At that time, Defenders of Wildlife, a nonprofit environmental group, "recommended that NMFS identify other areas under U.S. jurisdiction that may be essential to the conservation of the species and designate those areas as critical habitat." 44 Fed. Reg. at 17,711. Unfortunately, even though important nesting beaches were later discovered in Puerto Rico – beaches that, as we discuss below, have nesting populations larger than Sandy Point had when it was designated – no further critical habitat has now been designated for 31 years. During that time, of course, leatherback populations have crashed.

Indeed, only in the last few months has NMFS begun moving again – but not in the Caribbean. In January 2010, it proposed to designate 46,100 square miles off the west coast as critical habitat for the Pacific leatherback. *See* 75 Fed. Reg. 319 (Jan. 5, 2010). Although this designation, if made final, would have significant conservation benefits, it protects no nesting beaches.

III. The Northeast Ecological Corridor & the Leatherback

Perhaps the most significant nesting beaches in U.S. territory without federal protection lie in the Northeast Ecological Corridor of Puerto Rico. Extensive nesting data, collected over decades, demonstrates that the beaches of the Corridor are centrally important to the U.S. Caribbean leatherback population, and should be designated as critical habitat.

The Corridor lies between the towns of Luquillo and Fajardo on the north coast of Puerto Rico. Formally, it lies between latitudes 18°20'50'' N and 18°22'51'' N and longitudes 65°38'12''W and 65°42'49'' W. Its 2,970 acres have been recognized by Federal and Commonwealth resource management agencies, as well as by U.S. based and local conservation organizations for its extraordinary natural value. [101] The Corridor includes forests, wetlands, beaches, coral communities, and bioluminescent lagoons. It also harbors most of the coastal wetland types found in Puerto Rico, such as coral, seagrass beds, freshwater marshes, mangroves forests and bloodwood swamps, among others. Laguna Aguas Prietas, a bioluminescent lagoon is within the Corridor itself, and Laguna Grande is located immediately east of the Corridor. A structurally sound mangrove forest is situated on the estuary of the Río Juan Martín. Combined with the

[101] These include, among other, the US Forest Service El Yunque National Forest, the US Forest International Institute of Tropical Forestry, the USFWS, the Puerto Rico Department of Natural and Environmental Resources, the Puerto Rico Conservation Trust, the National Wildlife Federation, Environmental Defense Fund, the Surfrider Foundation, Waterkeeper Alliance, and the Sierra Club.

San Juan Headlands Nature Reserve ("El Faro")and El Yunque National Forest, the only protected national tropical rainforest in the United States, to the southwest, the Corridor provides a "bridge" where all of Puerto Rico's ecological life zones are found within a continuous area.

Figure 3: The Northeast Ecological Corridor in Relation to El Yunque[102]

Figure 4. The Northeast Ecological Corridor of Puerto Rico[103]

[102] From DRNA, Declaracion de Impacto Ambiental Estrategica, Plan Integral de Usos de Terrenos y Manejo de la Reserva Natural Corredor Ecologico del Noreste (Sept. 2008) (hereinafter 'Plan Integral') (Ex 33).

[103] Plan Integral.

Figure 5: A View Over the Northeast Ecological Corridor[104]

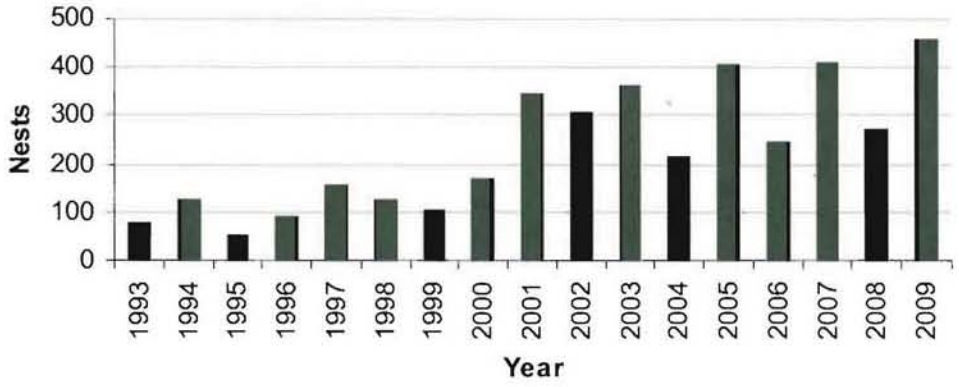
From east to west, the beaches of the Corridor are known as San Miguel (or 'Fincas San Miguel'), Paulinas, and Convento, and correspond to the properties marked on the map in Figure 2. The Corridor conserves optimum leatherback sea turtle nesting conditions:

[104] Courtesy Randy Sargent Neppl.

it is characterized by long and wide sandy beaches, with dense back dune vegetation, free of any obstacles or human made barriers, including almost no light pollution, and it is free from human or predatory disturbances during night hours. [105] As a result, it is home to a remarkably large leatherback population.

Since 1986, nesting activities in Puerto Rico have been cataloged by the Department of Natural and Environmental Resources showing a near-constant rise in nesting activity.[106] The Department's data show, first, that nests on the Corridor beaches have become steadily more common over the last two decades.

Chart 1: Nests on Northeast Ecological Corridor Beaches (1993-2009)



Nesting has increased on all three of the Corridor beaches, as Charts 2 and 3 demonstrate:

[105] USFWS Statement of Commonwealth of Puerto Rico House of Representative Resolution's Number 2723 and 2089, on the potential impacts of residential-tourist projects proposed in the Northeast Ecological Corridor. March 8, 2002.

[106] Where not otherwise cited, data on the leatherback nesting on the Corridor beaches is drawn from the Puerto Rico Department of Natural and Environmental Resources' monitoring, which has been coordinated by Hector C. Horta Abraham. Mr. Horta has presented this data in abstracts and posters, including Horta Abraham et al., *17 Years of Monitoring and Management of Leatherback Sea Turtle Nesting Population[s] in the Northeast Coast of Puerto Rico (1986-2002)* (Ex 34) and Hector C. Horta Abraham, *20 Years of Monitoring and Management of Leatherback Sea Turtle Nesting Population in the Northeast Coast of Puerto Rico*, Puerto Rico Department of Natural and Environmental Resources (Ex 35).

Chart 2: Nests on Each Northeast Ecological Corridor Beache (1993-2009)

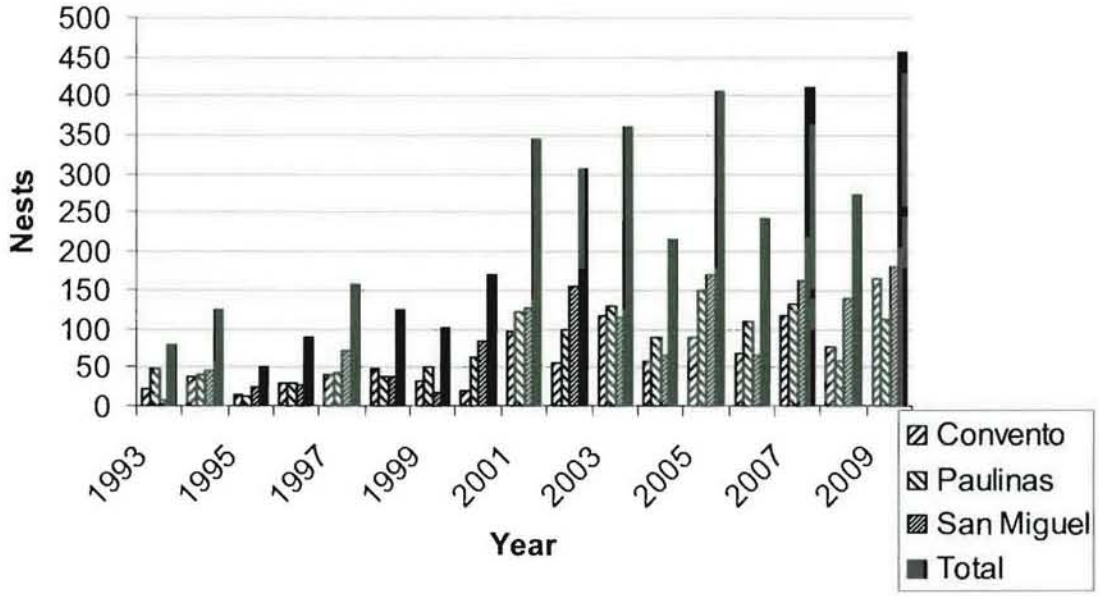
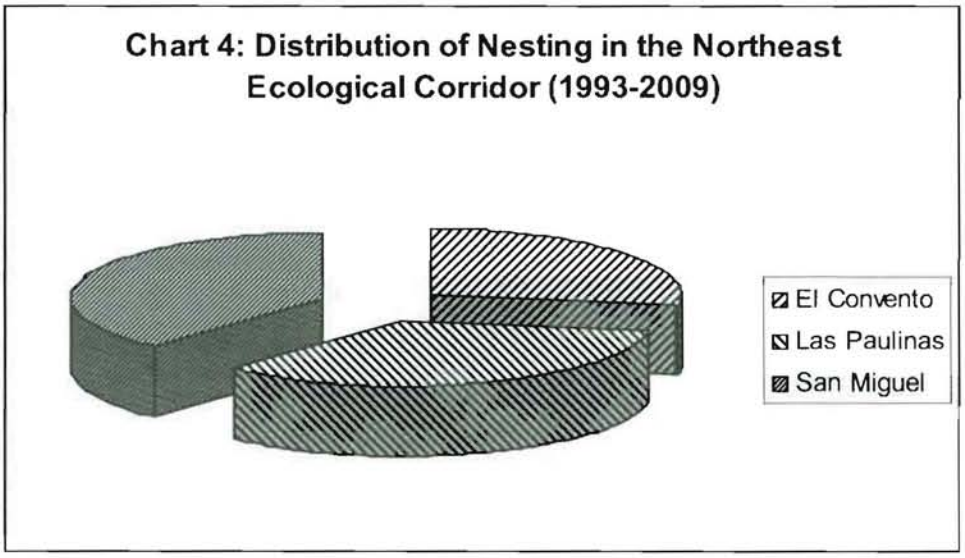


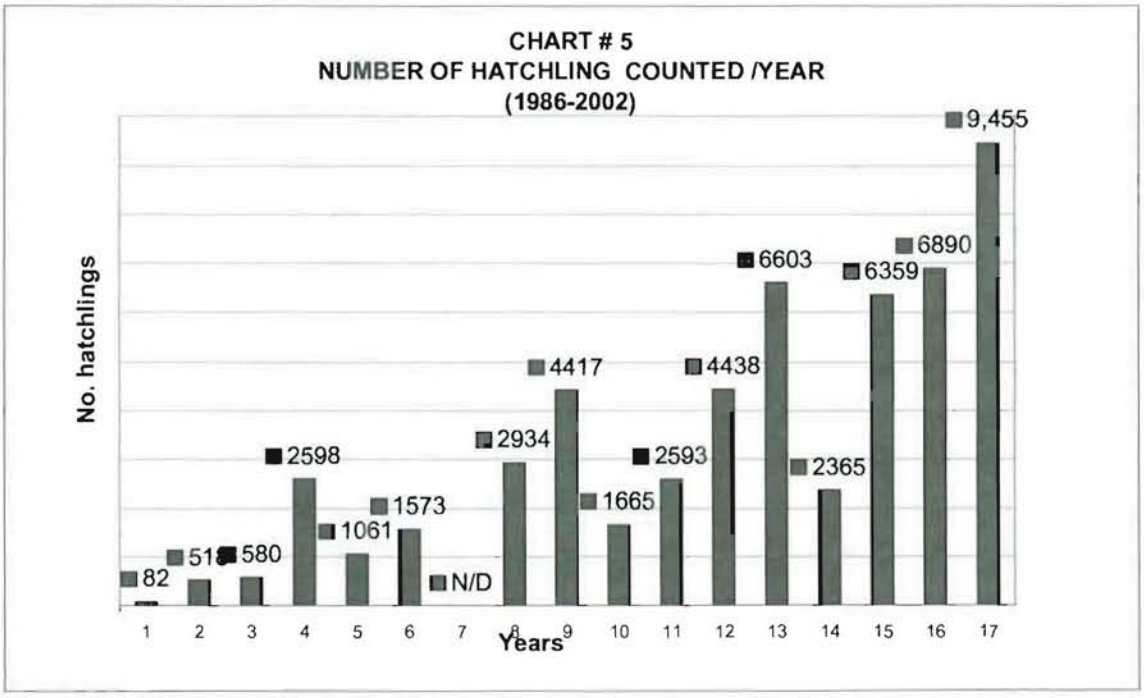
Chart 3: Nesting Activity on the Corridor Beaches

Year	Beach			Total per Year
	El Convento	Las Paulinas	San Miguel	
1993	23	48	8	79
1994	38	40	46	124
1995	14	12	25	51
1996	31	31	28	90
1997	41	44	72	157
1998	47	39	39	125
1999	32	51	19	102
2000	21	64	85	170
2001	97	121	128	346
2002	55	98	154	307
2003	116	130	114	360
2004	58	90	67	215
2005	89	149	169	407
2006	69	110	65	244
2007	117	132	162	411
2008	75	59	139	273
2009	164	111	181	456
Total	**1,087**	**1,329**	**1,501**	**3,917**

Although usage patterns between the three beaches vary on any given year, all three beaches have seen roughly equal use over time, as Chart 4 shows:



And, with all of these nests, come thousands of hatchlings, as earlier DRNA data, included in Chart 5, demonstrates. This last chart covers data from northeastern Puerto Rico beaches near the Corridor, as well as in the Corridor itself. But, as the Corridor beaches are the center of the population, it demonstrates the substantial contribution they make to hatching success.



Indeed, careful tracking of nesting leatherbacks has demonstrated that the Corridor beaches contribute significantly to other populations. From 1998-2003, the Puerto Rico Department of Natural and Environmental Resources (referred to as 'DRNA' after its name in Spanish), in conjunction with the Large Pelagic Research Lab, studied the home range and inter-nesting habits of adult nesting female leatherbacks. The result suggested that nesting habitat in the Corridor has a very close relationship with other Caribbean nesting sites, specifically those on Culebra Island (currently protected as part of Culebra National Wildlife Refuge).[107]

The critical importance of the Corridor has not gone unnoticed. In 2006, for instance, the International Sea Turtle Society passed a resolution "endors[ing] the [Corridor's] conservation as a nature reserve" because the Corridor is "one of the Caribbean's last great unprotected areas, containing one of the most important nesting grounds for the leatherback sea turtle in areas under the United States[']jurisdiction."[108] The Corridor, the Society determined, contains "the only beach left in Puerto Rico under a natural condition able to sustain a large leatherback nesting population."[109] The Corridor beaches are "considered an index beach for leatherback sea turtles, and the population that nests there belongs to the same that nests at Brava and Resaca beaches on the island of Culebra, Puerto Rico, and Sandy Point, U.S. Virgin Islands." These sites "harbor the largest nesting populations of leatherback sea turtles in the United States Atlantic region."[110]

Puerto Rico's DRNA likewise recognizes the importance of the Corridor's beaches. In a management plan for the region, DRNA describes it as "one of the most important leatherback nesting areas in Puerto Rico and in the jurisdiction of the United States," noting that from 1993 to 2007, 3,188 nests have been recorded, for an average of 213 nests annually.[111] DRNA describes the leatherback sea turtle – el tinglar in Spanish – as "possibly the most emblematic organism to utilize the Corridor's ecosystem."[112]

The U.S. Department of Fish & Wildlife Service has also regularly commented on the importance of protecting this habitat, especially since it has determined that the Corridor is the only area left in Puerto Rico with the potential of sustaining a substantial leatherback nesting population since the remaining sites are small, fragmented, dispersed and developed, thus maintain limited nesting activity.[113] Since "the long term protection of Caribbean leatherback populations is vital to ensure the continued

---

[107] Id.

[108] International Sea Turtle Society, *Resolution: Designation of Puerto Rico's Northeast Ecological Corridor as a Nature Reserve* (Apr. 7, 2006) (Ex 36).

[109] *Id.*

[110] *Id.*

[111] Plan Integral at 90.

[112] *Id.* at 122.

[113] USFWS comments to 2nd Preliminary Environmental Impact Statement for the San Miguel Resort, submitted to the Commonwealth of Puerto Rico Environmental Quality Board. January 30, 2002.

existence of the species", the FWS has for the more than 15 years, consistently recommended the designation of the NEC as a nature reserve or as a Commonwealth forest unit. [114] The FWS has unambiguously recognized the importance of the Corridor, writing:

> The beachfront of this area comprises approximately 8.5 kilometers of continuous pristine sandy beach associated with forested coastal beach berm and vegetated sand dunes. The beach has been identified by the Service and the Puerto Rico Department of Natural Resources (Department) as the most important leatherback nesting beach on mainland Puerto Rico because it harbors the greatest number of leatherback nests per year. The number of nests documented by Mr. Hector Horta and his staff from the Department during the leatherback nesting season of 2001 (March to August), reached 346 nests. In addition to being a record number of nests, this is only 100 nests less than the Culebra beaches which are considered the most important leatherback beaches of Puerto Rico. In addition to this significant number of nests, the Convento-La Paulina-San Miguel beach area is the only pristine nesting habitat for the species extensive enough to allow for future recovery of the species in Puerto Rico.[115]

When referring to the proposed development of the area, the FWS stated: "since 1997, the Service has been providing technical assistance . . . on the protection and long term conservation of endangered sea turtles and their nesting habitat in El Convento/Las Paulinas beach and wetland habitats within this project area. We have encouraged the Commonwealth of Puerto Rico to protect in perpetuity the Commonwealth owned Convento and Paulina properties, and we continue doing so."[116] Likewise, the recent *Draft Puerto Rico Coastal and Estuarine Land Conservation Plan* stated "[r]etaining longer segments of undisturbed shoreline is essential to support long-term habitat viability and protect native coastal wildlife such as seabirds, migratory shorebirds, and leatherback and hawksbill sea turtles."[117]

---

[114] *See* USFWS letter to the PR Tourism Company, regarding the PR Northeastern Coast Conceptual Development Plan (Dec. 28, 1994); USFWS letter submitted to the Commonwealth of Puerto Rico Environmental Quality Board, with comments to the Preliminary Environmental Impact Statement for the San Miguel Resort. (Apr. 20, 1999) (Ex 48); USFWS letter submitted to the Commonwealth of Puerto Rico Planning Board, with comments to the siting consultation for the Dos Mares Resort. (Oct. 12, 2001) (Ex 49); USFWS letter submitted to the Commonwealth of Puerto Rico Tourism Company on the San Miguel Resort. (Nov. 13, 2001) (Ex 50); USFWS letter to the Commonwealth of Puerto Rico Planning Board, with comments to the Environmental Impact Statement of the Dos Mares Resort. (May 28, 2002) (Ex 51); USFWS letter to the Commonwealth of Puerto Rico Planning Board, with comments to the Final Environmental Impact Statement of the Dos Mares Resort. (July 19, 2004) (Ex 52); USFWS Letter to the Commonwealth of Puerto Rico Environmental Quality Board (Jan. 30, 2002) (Ex 53); USFWS Letter to the Department of Natural and Environmental Resources (Nov. 13, 2008) (Ex 54).

[115] Nov, 13, 2001 USFWS letter (emphasis added).

[116] July 19, 2004 USFWS letter.

[117] CELCP at 6.

As part of the Recovery Plan for the Leatherback Sea Turtle prepared in 1992, the FWS recommended that "key nesting beaches in . . . Puerto Rico in particular should be identified and appropriate measures taken to protect them. . . . Long term protection should be accomplished through acquisition or conservation easements."[118]

The Federal government has already committed substantial economic resources and efforts to achieve this goal through the protection of the NEC's leatherback nesting population, among other ecological resources by means of successful grant applications for the FWS' Recovery Land Acquisition Grant Program, the National Coastal Wetlands Grant Program, the North American Wetlands Conservation Grant Program and the National Oceanic and Atmospheric Administration's Coastal & Estuarine Land Conservation Program.

These remarkable features of the Corridor led then-Governor Anibal Acevedo Vila to declare the Corridor a nature reserve by executive order in 2007.[119] Unfortunately, the current governor, Luis Fortuño, has recently rescinded this order, leaving swaths of the Corridor, which contains large areas of private land, open to development.[120] This threat is significant, as Figures 4 and 5 demonstrate. Two large resorts – the San Miguel Four Seasons and the Dos Mares J.W. Marriott, would occupy the majority of the land in the Corridor and vastly change the character of the undeveloped beaches of the Corridor. The heavy human use, artificial light and noise, run-off, and pollution of these resorts would permanently and unavoidably damage the leatherback nesting beaches.

The FWS recognizes that "[t]he absence of beachfront development and its associated lighting, [and] the presence of native coastal shrub and forest . . . are factors contributing to successful nesting on these beaches," and has observed that other nesting beaches "support significantly fewer nesting activities," likely because "these beaches have development projects and heavy use associated with them."[121] As a result, it has repeatedly expressed deep concern about development pressure in northeastern Puerto Rico, writing:

> Over the years, the Service has seen a general push for development along the entire northeast portion of Puerto Rico. There are numerous proposals for hotel/golf course developments in various stages of review from Loiza to Fajardo. None of the environmental documents that we have reviewed address the issue of cumulative impacts. Each project is apparently being reviewed in isolation. . . . From Punta Maldonado in Loiza to Cabeza Chiquita in Fajardo, there are approximately 39.5 kilometers of sand beach. Existing beachfront development was identified within more than 50 percent of this area. We understand that this

---

[118] Recovery Plan at 21.
[119] Puerto Rico Executive Order 2007-37 (Ex 37).
[120] *See* Puerto Rico Executive Order 2009-042 (Ex 38).
[121] USFWS Letter of Oct. 12, 2001.

analysis is conservative since the information is not up to date. Therefore, based on our analysis, no existing development projects are located on approximately 20 kilometers of beach. Most of these areas support optimal nesting habitat for the leatherback sea turtle . . .Continued approval by the [Puerto Rico] Planning Board of beachfront development projects without planning and design considerations to protect these species and their habitat will result in the loss of all optimal nesting habitat for endangered sea turtles in the northeastern region of Puerto Rico and the rest of the island. The loss of important nesting habitat may jeopardize the continued survival and recovery of the species.[122]

Figure 6: Private Land Holdings in the Northeast Ecological Corridor[123]

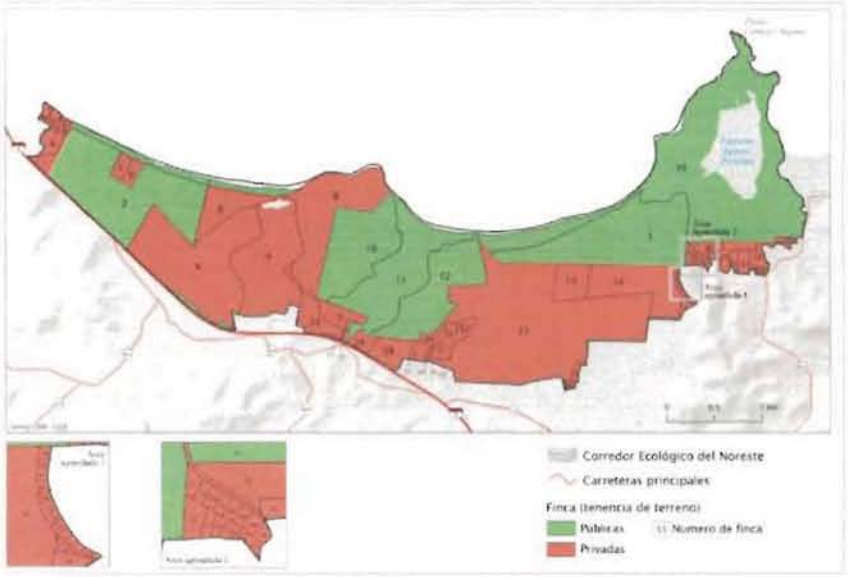
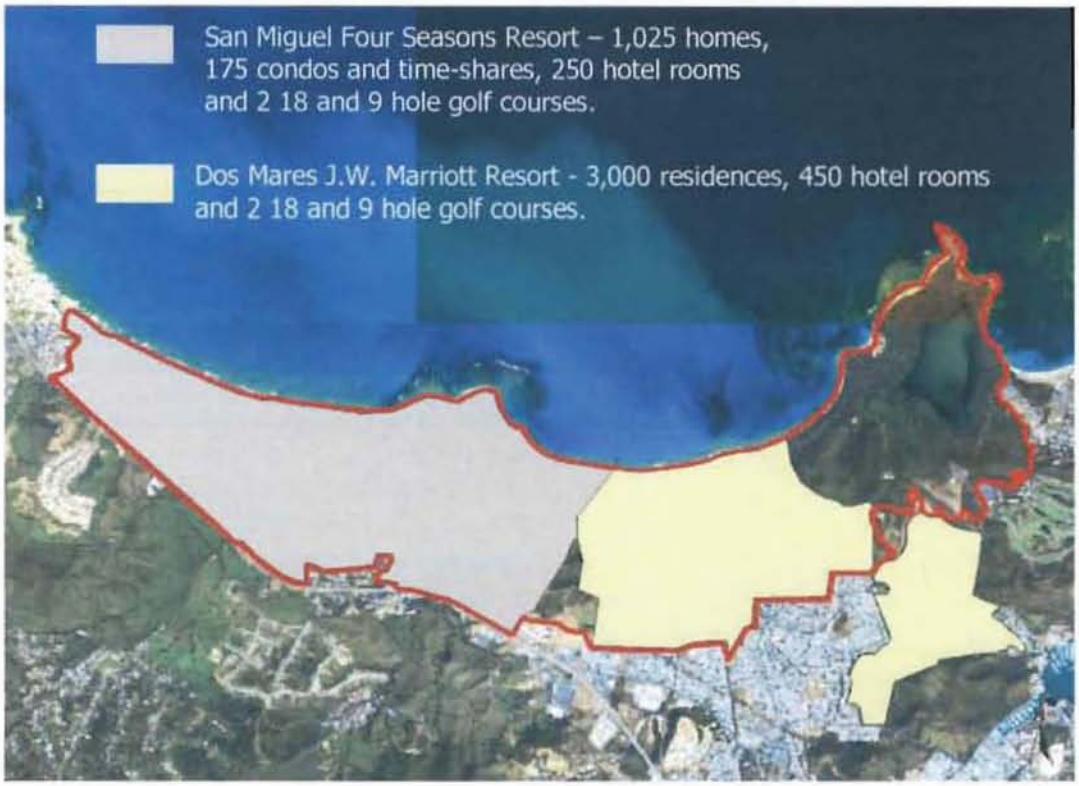


Figure 7: Proposed Resort Developments in the Northeast Ecological Corridor[124]

[122] *Id.* at 2-3.
[123] Plan Integral
[124] From Sierra Club Puerto Rico Presentation, relying upon development plans and the Plan Integral.



Climate change accelerates the development threat. As we discussed above, shoreline armoring often accompanies coastal development. If armoring accompanies development in the Corridor, the leatherback beaches will have nowhere to go as the sea continues to rise. The Corridor, as Figures 7 and 8 demonstrate, is low-lying, and already quite susceptible to flooding from hurricanes. As storms grow stronger, and more frequent, floods will become more severe.

Figure 8: Relief Map of the Northeast Ecological Corridor[125]

[125] Plan Integral.

Figure 9: Hurricane Flooding Potential in the Northeast Ecological Corridor[126]

The bottom line is simple. Puerto Rico's Northeast Ecological Corridor's San Miguel, Paulinas, and Convento beaches are among the most important leatherback nesting beaches in the United States. They are easily as important as Sandy Point, and the evidence for protecting them is very strong. Those beaches are under threat from development and climate change, as is the species as a whole. If they are not protected,

[126] Plan Integral.

the American leatherback population will suffer a serious blow, and the Caribbean population as a whole will both suffer a likely population loss and see the genetic diversity it needs to survive and recover diminished. The FWS puts it well:

> Worldwide, the leatherback sea turtle populations have declined dramatically. The leatherbacks of the Caribbean are among the few populations that are increasing, however, they are represented by a very small group of individuals. The long term protection of these populations is vital to ensure the continued existence of the species.[127]

IV. Requested Critical Habitat Revision

The best available science and applicable law support taking action to protect the leatherback sea turtles nesting habitat from further degradation. Designating the beaches and coastal waters of the Corridor as critical habitat is the right next step.

Critical habitat is defined as the areas occupied by a species "on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection." 16 U.S.C. § 1532(5)(A)(i). By regulation, the Service has clarified that it will look specifically to the "principal biological or physical constituent elements within the defined area that are essential to the conservation of the species," including such features as "nesting grounds, spawning sites," and physical features, like particular "soil types." 50 C.F.R. §424.12(b). The Service works especially to protect "[s]pace for individual and population growth," "[s]ites for breeding, reproduction, [and] rearing of offspring." *Id.*

The Northeast Ecological Corridor, including its coastal waters, amply meets these requirements. It is, obviously, a centrally important space for "individual and population growth," because it is also a site for "breeding, reproduction, [and] rearing of offspring." As two decades of data demonstrate, it is a "nesting ground" or "reproduction [site]" which includes the sandy beaches and open access to the ocean that constitute the "soil type" and "physical constituent elements" that leatherbacks need to survive. Further, the near-shore coastal waters provide room for turtles to mate and to access the beaches, and for hatchlings and adults to leave the beaches after nesting. If these waters are disturbed, reproductive success is likely to decline. And, as we have demonstrated at length above, these nesting beaches and coastal waters require special management consideration and, emphatically, protection, as they are otherwise vulnerable to development, disturbance, and degradation – and may be disrupted by even such an apparently minimal action as leaving external lights on near them during breeding season. At present, the Corridor has no permanent structures which could cause such disruptions, save for a beach house used by the island's governor. Were that situation to change, the unique value of the Corridor would be significantly impaired.

---

[127] USFWS Letter of Oct. 12, 2001 at 3.

Moreover, while Puerto Rico has taken some conservation measures in the past, the protected status of this region remains in doubt, as it is subject to shifting political winds. Major resort development has been proposed in the past and could well be on the horizon again without special management and protection from the Service. [128]

Indeed, the evidence supporting designating the Corridor as leatherback critical habitat is far stronger than the evidence the Service relied on for the Sandy Point designation. There, as we discussed above, the Service had data from a year of breeding, showing that about 70 nests were present. Those nests were sufficient to lead both FWS and NMFS to conclude Sandy Point was "a major beach under U.S. jurisdiction used for nesting by the endangered leatherback," and must be designated as critical habitat. that 44 Fed Reg. at 17,710. Here, twenty years of observations document hundreds of nests a year, and nearly 4,000 nests over the last twenty years. It would be entirely inconsistent with past practice – and with the Endangered Species Act – to decline to protect these beaches as critical habitat.

Notably, designating the Corridor beaches and offshore waters as critical habitat would also serve important economic development goals. *Cf.* 16 U.S.C. § 1533(b)(2) (allowing the Service to consider "the economic impact" and "any other relevant impact" of "specifying a particular area as critical habitat"). The Corridor is uniquely suited for profitable eco-tourism ventures, both because of its turtle beaches and its rich terrestrial ecosystems, which link El Yunque National Forest's rainforest to the sea. Already, the town of Luquillo hosts the annual "Festival del Tinglar," or 'Leatherback Festival," in its main square every year.[129] Numerous organizations lead education tours into the Corridor, as well.[130] Students and other interested groups also travel to Puerto Rico to assist in leatherback monitoring.[131]

Such locally-driven economic development is a major benefit of Corridor conservation. Among the core criticisms of traditional mega-resort driven tourism in the Caribbean, in contrast, has been that the large off-island companies that own most of these resorts channel profits away from local economies. As a result, "the multiplier effect on the rest of the Caribbean economy [from such developments] is significantly reduced."[132] Locally-owned, environmentally sensitive development is far more likely to produce

---

[128] Between 1998 and 2007, the San Miguel Resort and the Dos Mares Resort projects, consisting of nearly 4,500 residential and tourist units, three 18 holes golf course, were proposed for the NEC. No permits, however, have yet been granted to these projects.

[129] Plan Integral at 145.

[130] *Id.* at 146.

[131] *Id.* at 144-45.

[132] James Goodwin, *Sustainable Tourism Development in the Caribbean Island Nation States*, 5 Mich. J. of Public Affairs, Chapter 6 at 6 (2008) (Ex 49).

lasting economic growth, and provide residents with high quality jobs, than the mass market beach tourism that might otherwise take place in the corridor.[133]

Protecting the Corridor is also consistent with the government's commitment to respond to climate change. The Department of the Interior recognizes that climate change's "dramatic effects" require it to "take the lead in protecting our country's water, land, fish, and wildlife." Secretarial Order No. 3289 § 1. It has committed to "landscape-level" planning to respond to the crisis. *Id.* § 3(c). The Fish and Wildlife Service likewise views the "climate crisis as one of enormous consequence and challenge for fish and wildlife conservation," which, "if unabated will cause abrupt ecosystem changes and widespread species extinctions."[134] It acknowledges that it has "the opportunity and the responsibility to help tip the balance in favor of aggressive action" to safeguard the nation's biodiversity.[135] Among other goals, it is committed to "ensure that climate change is addressed in existing on-the-ground projects to promote habitat connectivity among protected areas."[136]

These goals are consistent with core scientific climate adaptation principles. These principles boil down to two basic priorities: (1) protect existing habitat and (2) give species room to move. As the U.S. Climate Chance Science Program (a component of the GCRP) puts it, adaptation relies, on the one hand, upon "protecting key ecosystem features," and "reducing anthropogenic stressors" – such as "pollution [and] fragmentation" – "that "hinder the ability of species or ecosystems to withstand climatic events."[137] The Program also makes clear the importance of providing "[r]efugia" – "areas that are less affected by climate change . . . as destinations for climate-sensitive migrants," and the need to ensure that "there will be areas that survive and provide a source for recovery."[138]

These principles warrant protection of the Corridor beaches and offshore waters. These beaches and coastal waters are the "key ecosystem features" the leatherbacks need to survive and "reducing anthropogenic stressors" on the species will enhance its ability to weather climate-related disruptions. Because the beaches are vulnerable to flooding

---

[133] *See id.* at 11-13.

[134] U.S. Fish and Wildlife Service, *Rising to the Challenge: Strategic Plan for Responding to Accelerating Climate Change* (2009) ('*Rising to the Challenge*') at 4, 6 (Ex 40).

[135] *Id.* at 17; *see also* U.S. Fish and Wildlife Service, *Appendix: 5-Year Action Plan for Implementing the Climate Change Strategic Plan* (2009) ('*5-Year Action Plan*') at 5-6 (committing to conduct climate habitat and population vulnerability assessments for endangered species and to incorporate climate change in decisionmaking) (Ex 41).

[136] *5-Year Action Plan* at 8.

[137] U.S. Climate Change Science Program, *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources*, Synthesis and Assessment Product 4.4 at 2, 9.1-9.25 (2008) (Ex 42)

[138] *Id.* at 2. *See also* Lara Hansen & Jennifer Biringer et al., World Wildlife Federation, *Buying Time: A User's Manual for Building Resistance and Resilience to Climate Change in Natural Systems* (2003) at 11-12 (emphasizing the need to "protect adequate and appropriate space" and to "limit all non-climate stresses") (Ex 43).

from rising seas and stronger hurricanes, protecting them from other stressors and discouraging resort development and the shoreline armoring that could accompany it is particularly important. At bottom, climate change makes it all the more important to protect the few nesting beaches that the leatherbacks have left, along with the waters the turtles use to access them.

Critical habitat protection provides this sort of protection, as the Congressional Research Service has repeatedly documented. These benefits include providing important guidance to landowners, ensuring detailed consultation before federal agencies act, providing important information for habitat conservation planning, and driving the preparation of recovery plans.[139] Without critical habitat, conservation planners lack the detailed spatial conservation information they require to prepare effective, scientifically rigorous plans.[140, 141] These advantages are not theoretical: A recent peer-reviewed study of 1,095 listed species demonstrates that "species with critical habitat for two or more years were less than half as likely to be declining [early on], and more than twice as likely to be improving [later on], as species without critical habitat."[142]

We therefore petition the Service and the Department of Interior to revise the critical habitat designation of the leatherback sea turtle to include:

(1) The coastline of the Northeast Ecological Corridor of Puerto Rico, running from Luquillo, Puerto Rico, to Fajardo, Puerto Rico, including the beaches known as San Miguel, Paulinas, and Convento, and extending at least .025 miles (132 feet) inland from the mean high tide line.

(2) The waters off the coastline of the Northeast Ecological Corridor of Puerto Rico, sufficient to protect leatherbacks using the Northeast Ecological Corridor, and extending at least to the hundred fathom contour, or 9 nautical miles offshore, whichever is further, and including the existing marine extensions of the Espiritu Santo, Cabezas de San Juan, and Arreceifes de la Cordillera Nature Reserves.

---

[139] *See, e.g.*, Pamela Baldwin, CRS Report for Congress, *Designation of Critical Habitat under the Endangered Species Act* at 3-5 (Apr. 11, 2005) (Ex 44).

[140] *Cf. id.*; *see also* 74 Fed. Reg. 8,616, 8,624 (Feb. 25, 2009) (Lynx critical habitat listing, in which the Service explains that "critical habitat designation identifies land on which are found the physical and biological features essential to the conservation of the species," which "is important to guide management and provide for the recovery of the species," and to "educate the public and State and local governments regarding the potential conservation value of certain areas").

[141] Of course, such plans do not and cannot substitute for critical habitat designation itself, and the mere intent to prepare a habitat conservation plan certainly does not do so. *See* 74 Fed. Reg. at 8,627 (declining to waive critical habitat designation for an area where a plan was being developed but had not been finalized).

[142] M.F.J. Taylor et al., *The Effectiveness of the Endangered Species Act: A Quantitative Analysis*, 55 BioScience 360, 362 (2005) (Ex 45).

V. The Recovery Plan and Other Agency Actions

Despite the substantial climate-related threats we have documented, the leatherback turtle Recovery Plan does not acknowledge the climate crisis or the impacts of climate change on the leatherback or its habitat. It also does not present alternatives for addressing climate change, nor any acknowledgment that sea level rise, strong storms, and shifts in oceanic currents and acidity that leatherbacks will face. While the Plan rightly emphasizes protecting nesting habitat in Puerto Rico,[143] it does not acknowledge the full importance of the Corridor beaches, reporting that "nowhere does the species occur in large numbers" on the "main island of Puerto Rico," and suggesting that Paulinas beach, for instance, hosts "10 or fewer nests."[144] As a result, the Recovery Plan does not focus sufficiently on what we now know to be major conservation opportunities on the main island of Puerto Rico.

The Plan must take these factors into account if it is to accurately describe the "site-specific management actions" which are "necessary to achieve" its goals, as the very sites at issue are rapidly changing in ways which imperil the leatherback population. *See* 16 U.S.C. § 1533(f). Without an accurate Recovery Plan, the Service may not recognize opportunities to protect the leatherbacks. We therefore petition the Service and the Department to revise the Recovery Plan at the earliest possible time in order to: a) recognize the necessity of designating and or revising critical habitat to ensure recovery of the species; and b) take climate impacts into account in the Recovery Plan.

In addition, the Sierra Club hereby petitions the Service to issue no Atlantic leatherback-related incidental take permit (save for permits supporting pure conservation research), *see* 16 U.S.C. § 1539, issue no Atlantic leatherback-related habitat conservation plan, *see id.*, issue no Atlantic leatherback-related biological opinion, *see* 16 U.S.C. § 1536, and take no other final agency action which could affect the Atlantic population of the leatherbacks or their habitat until this petition is ruled on, and without taking climate change fully into account. Without a prior ruling on this petition any such actions by FWS would be being taken without fully considering the best scientific data available, which is provided with this petition.

Because critical habitat designation is a critical first step in understanding and mitigating these impacts, we further petition the Departments of Interior and Commerce, and NMFS and FWS, to take none of the above actions unless and until critical habitat has been designated in accordance with this petition.

VI. Conclusion

---

[143] *See, e.g.*, Recovery Plan at 19 (expressing concern that "Coastal development has already destroyed or degraded many miles of nesting habitat in . . . Puerto Rico" and stating that this threat must be " effectively combated.").

[144] *Id.* at 3.

Despite a global collapse in their population, leatherback sea turtles continue to breed on the beaches of the Northeast Ecological Corridor of Puerto Rico. Development pressures and climate change imperil this important population and the beaches where they nest. The FWS and NMFS have a duty to "seek to conserve endangered species . . . [and] utilize their authorities in furtherance of the [ESA]," *see* 16 U.S.C. § 1531(c)(1), and must "carry[ ] out programs for the conservation of endangered species," *see* 16 U.S.C. § 1536(a)(1). 'Conservation' means "to use . . . all methods and procedures which are necessary to bring an endangered species . . . to the point at which the measures provided pursuant to [the ESA] are no longer necessary." 16 U.S.C. § 1532(3). That necessary action here is clear: The agencies should take action to protect the leatherbacks by revising the critical habitat for this species to include the beaches and coastal waters of the Corridor, and taking the other actions requested in this petition.

On behalf of the Sierra Club,

Eric Huber
Senior Staff Attorney
Sierra Club Environmental Law Program
1650 38th St. Ste. 102W
Boulder, CO 80301
(303) 449-5595

Craig Segall
Law Fellow
Sierra Club Environmental Law Program
408 C St. NE,
Washington, DC, 20003
(202) 548-4597

Ashley Krupski
Law Fellow
Sierra Club Environmental Law Program
95 Second St., Second Floor
San Francisco, CA, 94105
(415) 977-5763