SWOT report

Volume I

The State of the World's Sea Turtles

Burning Issues in Conservation…

leatherback sea turtles of the world

significance of genetic stocks | changes consumers can make
partnering with fishers | and more…

Baby green turtle. © DAVID DOUBILET / UNDERSEA IMAGES, INC.

The sea turtle conservation movement numbers in the thousands of concerned people from all walks of life and the far corners of the planet. We are organized, powerful, and committed. It is time for us to wield our power and step up our cause a notch—to act globally, strategically, and with shared purpose...

Welcome to the first *SWoT Report.* It has been in the making for more than two years, since the idea for a State of the World's Sea Turtles (SWoT) initiative was born among a handful of people seeking to add global momentum to the many local, national, and regional sea turtle conservation tasks under way throughout the world. We felt it was time to generate greater synergy and take full advantage of the tools that have grown to serve us so well over the past quarter century—tools such as the Annual Sea Turtle Symposium, now in its 26th year; the *Marine Turtle Newsletter,* which has served our community for even longer; the IUCN Marine Turtle Specialist Group, active since 1966; Seaturtle.org sees more than 20 million internet hits per year; a professional peer-reviewed journal, *Chelonian Conservation Biology*, that communicates our scientific findings; and most importantly, a far-flung band of researchers, conservationists, and enthusiasts from local communities, clubs, universities, research facilities, government agencies, tourism operations, nonprofit organizations, and volunteer groups the world over, numbering many thousands of people.

The time is ripe to focus these vast and valuable resources on a global vision to prevent the extinction of sea turtles and the degradation of their habitats. Many excellent local- and regional-scale data sets and sea turtle conservation programs exist. We aim to weave these successes and the data they generate into a broader whole, to begin looking at sea turtle conservation from a planet-wide perspective. Our intent is to pursue not just a single snapshot of the status of the world's sea turtles, but a permanent, annually updated tool for monitoring our success and setting priorities for conservation work worldwide.

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The vision is taking form in three ways. First is the effort to develop an up-to-the-moment, dynamic, global-scale, and geo-referenced **database** on sea turtles, covering all the species and all their life stages. This is a tall order by any measure. You will learn about our progress toward this audacious goal in our feature article titled, "The Challenge of Collective Conservation," on pages 16–17. Second is the development of a **network of people** who generate and interact with the data, forever improving them, and using them to guide conservation. This network is our "SWoT Team," now approaching 160 volunteers whose names appear on page 37 of this report, and whose time, energy, and ingenuity are manifest on every page herein. And last, a broad **communications strategy**—with the *SWoT Report* as its centerpiece—puts this SWoT data and our messages of conservation into the minds and hands of people the world over.

All threats to the sea and sea turtles come from people. Hence, conservation strategies must focus on changing human behaviors, and indeed, awareness is growing. Much like pandas and tigers have drawn interest to rainforest conservation, sea turtles can focus needed attention on ocean conservation issues. They are charismatic flagships for communicating the broad and often complex concepts of marine conservation to the public. Sea turtles embody the sea's mystery and majesty.

We could not have made it as far as we have on this remarkable journey without the help of our generous donors, including Dirk Aguilar, Barbara Bauer, Conservation International, Duke University's Marine Geospatial Ecology Laboratory, Mary Estrin, Hornthal Family Foundation, Don Goodman, International Sea Turtle Society, IUCN/SSC Marine Turtle Specialist Group, IUCN Species Programme, Maria Semple and George Meyer, Barbara and Donald Niemann, Offield Family Foundation, Mills Family Fund, Moore Family Foundation, Panaphil Foundation, Nancy Ritter, and Kevin Thomas. Thank you for sharing in our vision. And special recognition and appreciation are extended to Lisa M. Bailey, Ben Best, Dana Coelho, Michael Coyne, Karen and Scott Eckert, Pat Halpin, Emily Howgate, Brian J. Hutchinson, María Fernanda Pérez, Colette Wabnitz, and our SWoT Scientific and Editorial Advisory Boards for contributing your expertise, hard work, and dedication to making this first *SWoT Report* a reality.

We hope you, too, will join our growing SWoT Team as we pursue our pledge of permitting "no sea turtle extinctions on our watch."

Roderic B. Mast

SWoT Report

Roderic B. Mast *Editor*

Lisa M. Bailey *Writer/Editor*

Brian J. Hutchinson *Writer/Editor*

Miya Su Rowe / Rowe Design House *Design*

State of the World's Sea Turtles
1919 M Street, NW, Suite 600
Washington, DC 20036
USA
+1-202-912-1000
www.SeaTurtleStatus.org

For changes of address, or to request a copy of the latest issue of *SWoT Report*, please call us toll-free within the U.S.A. at 800-406-2306, or at +1-202-912-1000 from outside the U.S.A. If you have comments or questions, please e-mail us at editor@SeaTurtleStatus.org.

FRONT COVER: En route to the sea, a newly hatched leatherback crawls past a sand dollar. © STEVE WINTER / NATIONAL GEOGRAPHIC / GETTY IMAGES; AT LEFT: Olive Ridley tracks line the beach where this female, along with hundreds of others, has just nested. © RODERIC B. MAST; AT RIGHT: A researcher gathers leatherback eggs in Pacific Mexico. © RODERIC B. MAST

SWoT Report

The State of the World's Sea Turtles

The State of the World's Sea Turtles

Policy and Economics

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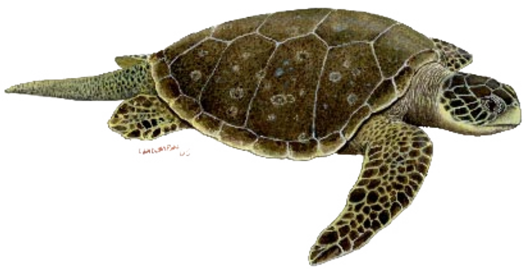
Habitat

An Introduction to Sea Turtles

Seven distinct species of sea turtles grace our oceans today; they constitute a single radiation that was distinct from all other turtles at least 110 million years ago. During that radiation, sea turtles split into two main subgroups, which still exist today: the unique family *Dermochelyidae*, which consists of a single species, the leatherback; and the six species of hard-shelled sea turtle, in the family *Cheloniidae*.

The Family *Cheloniidae* (hard-shelled turtles)



Green

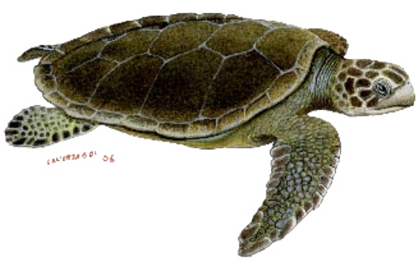
Chelonia mydas—Endangered

The most widespread of the seven species, the green sea turtle earns its name from the color of its body fat, called calipee, which is the main ingredient in green turtle soup and was once highly sought after in Europe. Although now illegal to trade in many areas of the world, the green sea turtle and its eggs continue to be consumed by many coastal peoples. In the Eastern Pacific, there is a morphologically distinct subpopulation of this species, often called the black turtle and considered by some to be a separate species.

Hawksbill

Eretmochelys imbricata—Critically Endangered

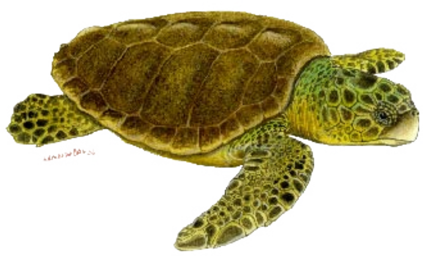
Named for its sharp, pointed beak, the hawksbill's Latin name refers to the overlapping arrangement of scutes on its shell. These turtles are omnivorous, feeding on both invertebrates and algae. In much of the Caribbean, they feed primarily on reef sponges, invertebrate organisms whose bodies contain indigestible glass spicules. Hawksbills have beautiful, translucent shells that have been used in tortoiseshell jewelry for centuries—a form of consumption that has contributed to their sharp population declines in the past century.



Flatback

Natator depressus—Data Deficient (Status Unknown)

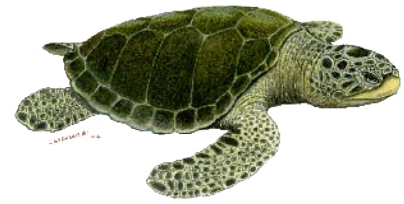
The flatback is the least studied of the sea turtles and has one of the smallest geographic ranges. Flatbacks stay within a relatively small area around northern Australia, southern Indonesia, and southern Papua New Guinea.



Loggerhead

Caretta caretta—Endangered

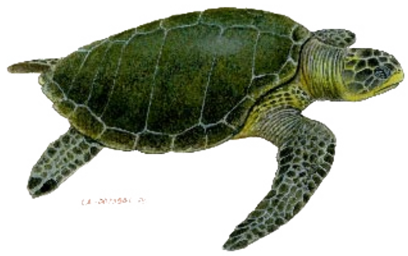
Loggerheads are named for their large heads, with jaws powerful enough to crush an adult queen conch. Like most sea turtles, loggerheads are famed for their vast migrations; for instance, loggerheads that mate and nest in Japan regularly cross the Pacific to feed in Mexican waters. Likewise, loggerheads that nest on beaches in the southeastern United States spend a portion of their lives in the northeastern Atlantic Ocean, sometimes even venturing into the Mediterranean Sea.



Kemp's Ridley

Lepidochelys kempii—Critically Endangered

The Kemp's Ridley is the smallest of the sea turtles and has a very restricted range, nesting only along the Caribbean shores of northeastern Mexico, and more recently in Texas, USA. Fifty years ago the Kemp's Ridley was almost extinct; this species now shows signs of recovery, although much work remains before it can be considered "out of the red."



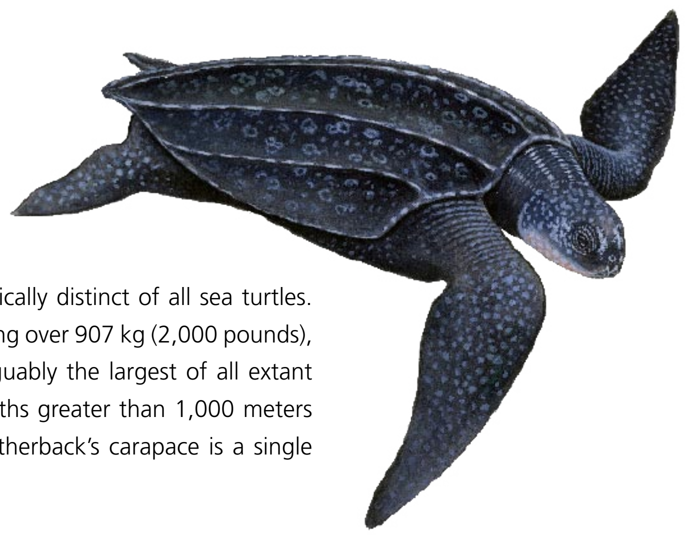
Olive Ridley

Lepidochelys olivacea—Endangered

Olive Ridleys are the most abundant of the sea turtles. At their largest nesting rookery in Escobilla, Mexico, anywhere between 730,000 and 1,120,000 nests are laid each year. Like Kemp's Ridleys, these turtles nest synchronously en masse in a phenomenon known as the *arribada*, Spanish for "arrival." During these spectacles of nature, thousands of turtles can come ashore to nest simultaneously, using a "safety in numbers" strategy for reproduction.

Family *Dermochelyidae* (leathery turtles)

diverged from Cheloniids 100 mya to 150 mya



Leatherback

Dermochelys coriacea—Critically Endangered

The leatherback is the sole species in its scientific family and the most physically distinct of all sea turtles. Sometimes reaching over two meters in length (six and a half feet) and weighing over 907 kg (2,000 pounds), it is the largest of all Chelonians (land, sea, and freshwater turtles) and arguably the largest of all extant reptiles. Leatherbacks swim the greatest distances and regularly dive to depths greater than 1,000 meters (3,281 feet), feeding primarily on jellyfish and other ocean drifters. The leatherback's carapace is a single piece with five distinct ridges and a rubbery feel.

Their Greatest Challenge in 100 Million Years: Facing the Hazards of Humankind

Sea turtles were born of the Cretaceous period and survived the extinction of the dinosaurs by 65 million years. Now they face the greatest peril of their 110-million-year existence: us. The progressively diminishing number of sea turtles on Earth is a direct result of human actions.

In the recent "Burning Issues Assessment" undertaken by the Marine Turtle Specialist Group of the World Conservation Union-IUCN, human behaviors that threaten sea turtles were identified, categorized, and prioritized. These hazards are defined as specific pressures that will result in declines in numbers, instigate local extinctions, and prevent the recovery of sea turtle populations.

Burning Issues Assessment—Hazards to Sea Turtles

Fisheries Impacts. Sea turtles virtually everywhere are impacted by fisheries—especially by longlines, gill nets, and trawls. Bycatch mortality, habitat destruction, and food web changes are the most severe of these impacts.

Coastal Development. Sea turtle habitats are degraded and destroyed by coastal development. This includes both shoreline and seafloor alterations such as nesting beach degradation, seafloor dredging, vessel traffic, construction, and alteration of vegetation.

Direct Take. Throughout the world, people kill sea turtles and consume their eggs for food and for products such as oil, leather, and shell.

Pollution and Pathogens. Marine pollution—plastics, discarded fishing gear, petroleum by products, and other debris—directly impact sea turtles through ingestion and entanglement. Light pollution disrupts nesting behavior and hatchling orientation, leading to hatchling mortality. Chemical pollutants can weaken sea turtles' immune systems, making them susceptible to pathogens.

Global Warming. Global warming may impact natural sex ratios of hatchlings; escalate the frequency of extreme weather events; increase the likelihood of disease outbreaks among sea turtles; and result in loss of nesting beaches, destruction of coral reefs, and other alterations critical to sea turtle habitats and basic oceanographic processes.

The hazards are numerous, yet the mitigation of each one is possible and depends on human behavior—often simple changes to the actions we take. Ultimately, the fate of the world's sea turtles depends on us.

© STERLING ZUMBRUNN / CONSERVATION INTERNATIONAL

"Protecting the **habitat** of sea turtles is equivalent to protecting the habitats of thousands of species—whales, sharks, seabirds, sea flora, even humans…"

—**Dr. Sylvia Earle**, Executive Director, Global Marine Division, Conservation International

Hope on the Horizon— Three Success Stories in the Making

Conservation by Cooperation in the Eastern Pacific

Dedication. Passion. Love of nature. Some say such words are overly sentimental. Some say that deep personal relationships get in the way of one's goals, that it is hard to maintain one's status as a respectable scientist and also be an effective advocate for the ocean, and that to restore nature is only a matter of dollars and enforcement.

Some wholeheartedly disagree. If we are to repair what is broken in nature, to replace its still-beating heart, it will take a revolution full of passionate celebration and commitment to each other.

On the Baja California peninsula, in the towns along its shores, you'll find the heart of that ocean revolution. The Grupo Tortuguero is a prime example of a community of people coming together to do what they feel is right, regardless of economics and short-term personal benefits. The killing of sea turtles for food had always been a boon for the fisher people of northwest Mexico, and the laws designed to control turtle hunting were seldom (if ever) enforced. Yet many people have made a conscious choice to change their behavior and to band together to preserve their natural heritage, celebrating the ocean and its potential for abundance.

Rodrigo Rangel, Grupo Tortuguero Coordinator, releases a black turtle in Bahia Magdalena, Baja California Sur, in March 2003.
© W. J. NICHOLS

In 1999, a group of fishers, coastal residents, scientists and conservationists in Baja California united to form the Grupo Tortuguero (www.grupotortuguero.org). Their objective was and is to use on-the-ground action to address the main threats to sea turtles in this region of the world—poaching for eggs and meat, and incidental capture in fishing nets, by trawls, and on longlines—and to recover the populations of the five species in the Eastern Pacific.

The Grupo Tortuguero now represents more than 25 coastal communities and a dozen sea turtle monitoring projects. Activities include nesting beach and in-water monitoring, biannual meetings, sea turtle festivals, publications, distribution of educational materials, and maintenance of connectivity between the various approaches to sea turtle conservation in the region. Perhaps its most important victory has been its continual reminder to concerned individuals that they are not alone—that we can all work together as part of a creative, evolving, and thriving conservation movement.

Wallace J. Nichols, Ph.D. *is Director of Conservation Science at ProPeninsula, Co-Director of Ocean Revolution, a Research Associate at the California Academy of Science, and Vice Co-Chair of the IUCN Marine Turtle Specialist Group, North East Pacific Region (j@oceanrevolution.org). He really likes turtles.*

The Return of the Kemp's Ridley to Texas Shores

By the 1970s, due to decades of over-hunting and collecting, the Kemp's Ridley was suffering the closest brush with extinction that any sea turtle species had endured; the species narrowly sidestepped this disaster. An ambitious and risky conservation experiment spearheaded by a joint Mexico-U.S. team from 1978 to the present has not only stopped the killing but also helped to reestablish historic nesting grounds for the species in Texas.

Kemp's Ridleys nest primarily on one small stretch of beach in northeastern Mexico near the small town of Rancho Nuevo, and while historical records indicate that their nesting once extended north along Texas' Gulf of Mexico coast, only about one Kemp's Ridley nest was found every three years on Texas shores from the late 1940s through the mid-1990s. Experts felt that it was critical to expand the Kemp's Ridley's once-extensive nesting range in order to reduce the risk of losing the entire global population to a natural or human-caused disaster at Rancho Nuevo.

On the basis of the best available science of the day, scientists carefully gathered eggs from nesting turtles in Mexico, buried them in Texas sand (flown in from North Padre Island, Texas), then gingerly transported them by aircraft back to Padre Island National Seashore on North Padre, where incubation was completed and the hatchling turtles were allowed to scurry down the beach and into the shallows. After a few moments of imprinting on their new natal shores, the hatchlings were

A Kemp's Ridley hatchling. © THANE WIBBELS

then scooped up and flown to holding pens in Galveston, Texas, where they were hand-reared for a year. These "head-started" turtles, now too large for most predators, were released into the Gulf of Mexico with fingers crossed and hopes that they would find their way back to Texas shores after reaching adulthood.

Sure enough, they have returned, and they may have brought others with them. More research is needed to determine whether the wild turtles have followed the head-started turtles back to Texas, or whether the turtles nesting in Texas are simply a result of the increased population at Rancho Nuevo. The number of Texas nests has increased throughout the past decade, and a record 51 were recorded during 2005. About 55 percent of Kemp's Ridley nests found in the U.S.A. are at Padre Island National Seashore, but nesting is also increasing on other Texas beaches. Kemp's Ridleys nesting in Texas today are a mixture of returnees from the experimental imprinting and head-starting projects and turtles from wild stock. As the Kemp's Ridley population continues to recover and more turtles and their offspring reach maturity, all signs indicate that the number of nesting Kemp's Ridleys in Texas will continue to grow.

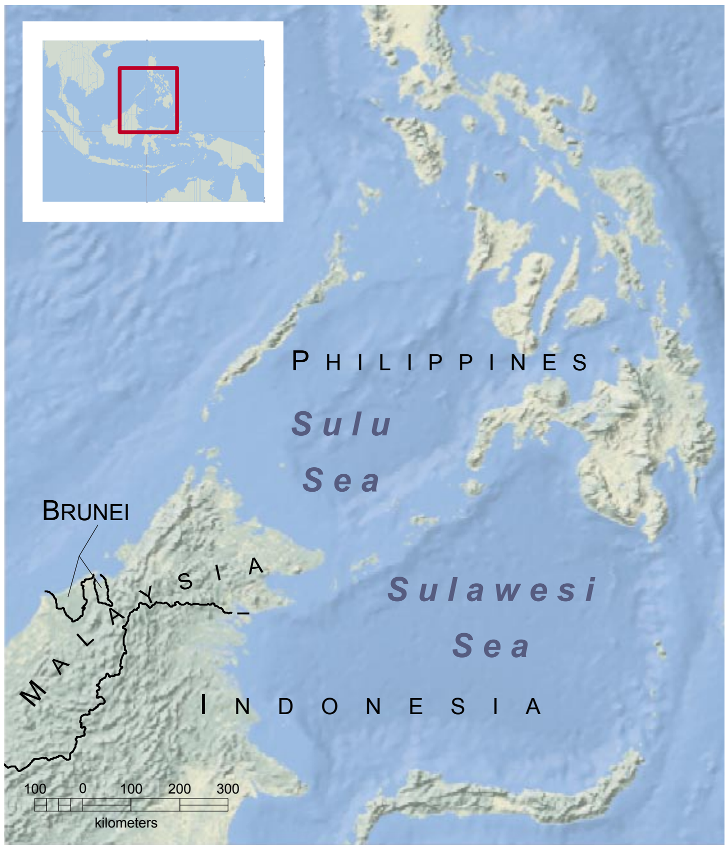
While recovery is still far from absolute, thanks to the visionary and bold actions of that bi-national team of conservationists and scientists, Kemp's Ridleys are slowly, albeit steadily, on the rise.

***Donna J. Shaver** is Chief of the Division of Sea Turtle Science and Recovery at the Padre Island National Seashore.*

***Roderic B. Mast** is Vice President of Conservation International in Washington, DC, and Co-Chair of the IUCN Marine Turtle Specialist Group.*

Sulu-Sulawesi Seascape— A New Precedent in Marine Conservation

Protected area strategies that have been time-tested and have proven successful for terrestrial organisms are not necessarily conducive to the conservation of wide-ranging, migratory species like sea turtles. Whereas a fence can be built around the entire global distribution of an endangered plant or amphibian on land, such is not the case with a sea turtle that may nest on beaches in Japan, feed along the coast of Mexico, and range the entire Pacific basin in between. Modern knowledge of ocean processes has provided overwhelming evidence of the importance of large-scale strategies for marine conservation. In recent years, a new wave of attention to conservation designs that address entire seascapes has taken hold and become a necessary and urgent component of global efforts to conserve marine biodiversity and wide-ranging animals like sea turtles. The Sulu-Sulawesi Seascape is one of the first efforts to create such a large marine management regime, and sea turtles have been a critical consideration in its design.



The Sulu-Sulawesi Seascape. © CONSERVATION INTERNATIONAL

This seascape encompasses the entire Sulu and Sulawesi Seas, an area of 1 million square kilometers, spanning parts of Indonesia, Malaysia, and the Philippines. This vast marine region, often referred to as the "coral triangle," is the global epicenter of diversity for corals and other important marine taxa; moreover, it is home to five species of nesting, foraging, and migrating sea turtles. And the Sulu-Sulawesi Seascape supports the livelihoods of approximately 35 million people from at least 50 cultural groups whose lives are tied to the fishing, tourism, and international shipping industries.

In February 2004, during the Convention on Biological Diversity's Seventh Meeting of the Conference of the Parties in Kuala Lumpur, Malaysia, the three governments of this region agreed upon an intergovernmental management plan for the Sulu and Sulawesi Seas. The agreement's long-term conservation strategy is both comprehensive and specific, taking into account the region's complete range of social and biological considerations.

These plans call for a Tri-National Sea Turtle Conservation Program and the management of a large marine corridor that encompasses known feeding grounds for leatherbacks and loggerheads and that protects the largest aggregations of green and hawksbill turtles in the Association of Southeast Asian Nations (ASEAN) region, with more than 10,000 nesting turtles per year.

To support the implementation of the Sulu-Sulawesi Seascape conservation plan, Conservation International announced in June 2005 a grant of roughly US$3 million per year for three years. This new initiative represents a tremendous step forward for marine conservation.

***Romeo Trono** is the Country Executive Director of Conservation International's Philippines Program and a member of the IUCN Marine Turtle Specialist Group.*

To help prevent the theft of eggs, armed federal agents patrol Mexico's Escobilla Beach during the olive Ridley nesting period. © ADRIANA ZEHBRAUSKAS / THE NEW YORK TIMES

Simple, Yet Effective: Protection at the Nesting Beach

What is the simplest way to destroy a sea turtle nesting population? The answer is easy: by over-exploiting its females or their eggs at the nesting beach.

And the most effective way to rehabilitate that over-exploited sea turtle population? This should also be a simple solution: protect its nesting females, along with their eggs and hatchlings, at the beach.

The Republic of Seychelles, comprising some 130 islands in the western Indian Ocean, had a long history of sea turtle exploitation going back three centuries, which led to a serious decline in all the country's sea turtle populations. Responding to that decline, the government of Seychelles took action almost four decades ago that made the nation a global pioneer in sea turtle conservation, setting aside several islands as nature reserves in the 1970s. Meanwhile, however, exploitation continued at varying degrees at most of the other islands in the republic—until 1994, when national legislation was implemented to protect all sea turtles in the country.

Because many of these nesting sites have been repeatedly surveyed since 1981, Seychelles provides a unique natural laboratory in which to compare the success of a variety of management regimes at nesting beaches. Analysis of data collected for nesting hawksbills in the inner islands of Seychelles between 1981 and 2003 demonstrates that, overall, the number of female hawksbills nesting in the inner islands declined by approximately 24 percent—from an estimated 820 annual nesters in the early 1980s, to some 625 in the early 2000s.

However, correlation was found between the level of protection at different sites and the rise or decline of turtle populations. For the two islands that had been well protected since the early 1970s, nesting hawksbills increased by approximately 490 percent. At seven islands that had received intermediate levels of protection between 1979 and 2002, turtle populations declined by approximately 21 percent. And the remaining 13 islands whose turtles received no protection prior to 1994 declined by approximately 59 percent. These data provide clear evidence: protection at the beach is an effective conservation scheme for nesting turtles.

For green turtles at Tortuguero in Costa Rica, in the Archie Carr Refuge in Florida, on the beaches of Hawaii, and at Aldabra atoll in Seychelles, nesting beach protection has produced similar positive results—showing significant increases in numbers of nesting females during the past three to four decades. Likewise, leatherback turtles nesting at protected beaches in St. Croix, U.S. Virgin Islands, are on the rise.

As always, while nesting beach protection is a critical component of any sea turtle conservation program, it is sometimes not enough. "In-water" issues, such as accidental capture in fisheries and intense levels of harvest at sea, must also be addressed—protecting the sea turtles in their ocean environment granting them opportunities to find their way safely onto protected nesting beaches.

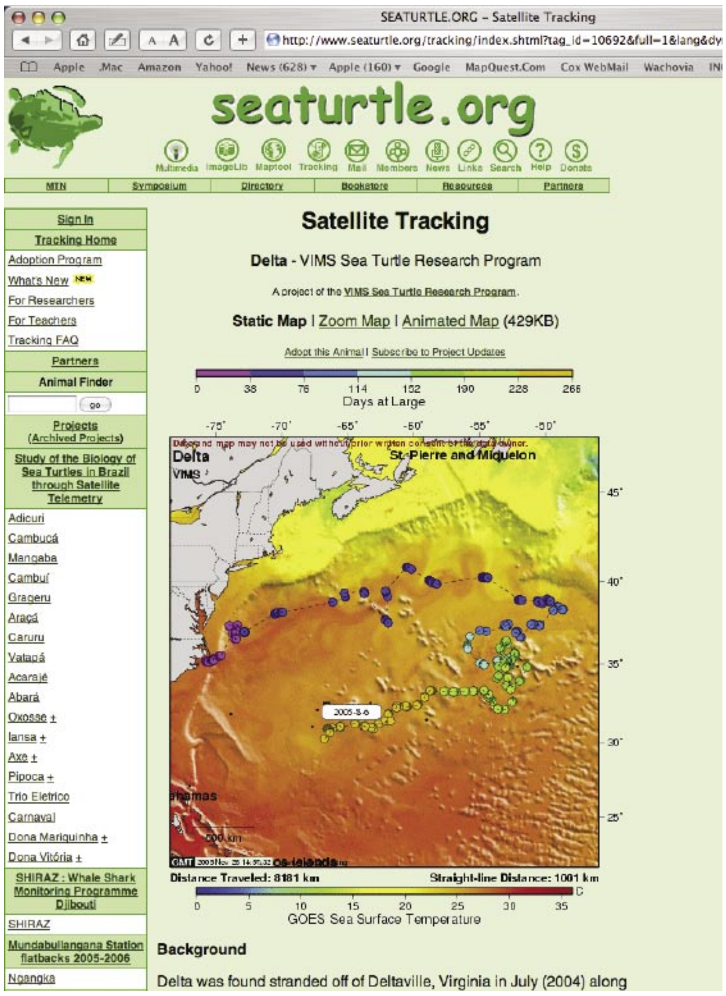
Jeanne A. Mortimer *is a scientist at the Island Conservation Society of Seychelles, and a member of the IUCN Marine Turtle Specialist Group.*

Setting a Trend with Turtle Tracks: Satellite Tracking on the Web

Until quite recently, very little was known of sea turtles' lives in the sea, where females spend the vast majority of their lives and males their entire post-hatchling existence. Countless studies of that miniscule fraction of a female turtle's lifespan spent at nesting beaches have left us with a relatively advanced level of understanding about the reproductive behavior of adult females, a fair idea of how eggs become hatchlings, and a reasonable comprehension of how hatchlings behave. But once they hit the open ocean, baby sea turtles more or less disappear. We never see the adult males again (except occasionally while scuba diving or in a market), and the period of time when a turtle grows from hatchling to young adult is, to this day, referred to as the "lost year," a term coined by pioneering sea turtle researcher Archie Carr in the late 1950s.

But modern technology is changing all of that, helping us to unravel many of the critical natural history mysteries of sea turtles—the understanding of which will vastly aid our efforts to conserve them. Today, we can place tracking devices on turtles and follow them via satellite, and even monitor the temperature of the water, the depths to which they dive, and a variety of other variables.

As the science and art of wildlife tracking garners growing interest from the general public, increasingly more studies using advanced electronic tags and satellite telemetry have found their way onto the Internet, offering anyone a glimpse into the daily lives of sea turtles with nearly real-time updates of their movements in the sea. This type of easily accessed, up-to-the-minute data reporting allows scientists to conduct their research rapidly and from anywhere in the world, and it offers unprecedented opportunities for collaboration among multiple scientists. Resource managers can see what tagged animals are doing, determine how the turtles' movements fit into conservation strategies, and use the information to instantly make changes on the ground to their own management actions. Focused outreach and education using these technologies offers a multiplicity of new avenues for public engagement.



In this example from SEATURTLE.ORG, a loggerhead off the east coast of the U.S. is tracked on a map shaded with GEBCO one-minute bathymetry and showing U.S. National Oceanic and Atmospheric Administration's Geostationary Orbiting Environmental Satellite (GOES) sea surface temperature. © SEATURTLE.ORG AND VIRGINIA INSTITUTE OF MARINE SCIENCE

Researchers in Florida, USA, equip this loggerhead turtle with a satellite tag. © 2001 WOLCOTT HENRY

In 2003, SEATURTLE.ORG launched the Satellite Tracking and Analysis Tool (STAT) at www.seaturtle.org/tracking to help scientists manage satellite telemetry data and maximize the potential of these relatively expensive data for the study and conservation of sea turtles. The most valuable aspect of STAT is its ability to automatically retrieve, parse, and store telemetry data from the Argos Satellite network. A suite of summary maps, tables, and graphs updated each day, allowing investigators to easily check each of their subject animals. STAT also provides an array of mapping, filtering, and export functions to facilitate data analysis, as well as access to bathymetry, sea surface temperature, chlorophyll, sea surface height, and ocean surface currents—thus allowing researchers an exciting new way to see sea turtles' movements in the context of their local environment.

Tracking animals by satellite clearly offers a unique perspective into the lives of the animals we are working to study and conserve, helping scientists, managers, and conservationists obtain maximum value from their efforts and reach the widest audience possible.

Michael Coyne *is a research scientist with the Marine Geospatial Ecology Lab at Duke University and Director of SEATURTLE.ORG.*

Building our Knowledge *of the* Leatherback Stock Structure

The key to any successful business is understanding the nature and nuances of its clientele. Similarly, as sea turtle conservationists, we must know who our "clients" are as intimately as possible in order to be successful in our mission. The current taxonomy of the world's sea turtles describes only seven species, yet just as there are a multitude of human races within the species *Homo sapiens,* we find that each species of sea turtle comprises numerous populations or stocks. For the leatherback turtle, the sole surviving species of its family, we are beginning to understand the stock composition as a result of recent research

Leatherback hatchlings make their way from nest to sea. © SUZANNE LIVINGSTONE / UNIVERSITY OF GLASGOW

Most people think of sea turtle populations in terms of the nesting beaches where adult females lay their eggs. Indeed, global population estimates for sea turtles are most commonly determined and monitored by counting the number of females or of nests laid, and from these beach data we see that some populations have declined dramatically, while others are stable or increasing. Conservation efforts, however, cannot focus on nesting beaches alone; nor can mere nesting beach data provide us with a full understanding of turtle populations, since they tell us nothing about younger life stages or about male turtles. Furthermore, while it is now generally accepted that sea turtles return to their natal beaches to breed, the precision of this natal homing behavior varies between different species, populations, geographic areas, and probably even individuals. It is also important to understand the linkages between the various habitats where leatherbacks are found and the nesting beaches where these turtles originate and return to reproduce—not only to have a more holistic understanding of their life histories, but also potential impacts of human-induced and to assess the natural threats on different populations.

These complexities of sea turtles' life histories complicate the task of drawing precise boundary lines around each stock. And although current means of studying stock structure are limited on their own—such as molecular genetics, tagging, and satellite telemetry—limitations can be overcome when these tools are employed together.

As seen in the figures on page 11, leatherback turtles in the Pacific appear to be of two main, distinct genetic stocks: an eastern Pacific stock made up of nesting aggregations (rookeries) in Mexico, Costa Rica, and other parts of central America; and a western Pacific stock made up of rookeries in Papua, Indonesia; Papua New Guinea; and the Solomon Islands. A possible third Indo-Pacific stock in Malaysia may also exist—a stock that now may be almost extinct. Genetic results, coupled with tag-recapture and satellite telemetry data, thus far suggest that leatherbacks that breed in the western Pacific feed and grow in the northern Pacific, while animals from the eastern Pacific stocks generally forage in the southern hemisphere, including the waters off Peru and Chile. However, this pattern is not exclusive, since animals of western Pacific stock origin have been found off Chile and in other

This figure shows the known genetic stocks for leatherback sea turtles. Solid colors indicate the location of major rookeries for known distinct genetic stocks, while the hatched colors mark rookeries for which the genetic stock is not yet fully defined or its boundaries unclear. One distinct stock, in Malaysia, may no longer exist, and the genetic structure of rookeries in the Indian Ocean remains unknown. © CONSERVATION INTERNATIONAL AND ROWE DESIGN HOUSE

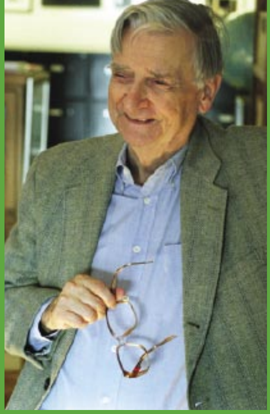
areas of southeast Asia and the southern Pacific and while less common, some leatherbacks of eastern Pacific stock origin are found in the northern Pacific.

In the Atlantic, the nesting assemblages in French Guiana, Suriname, and Trinidad have been identified as one distinct genetic stock based on mtDNA and nuclear data. This is also consistent with tagging data. Costa Rica (Tortuguero and Gandoca beaches) appears to constitute a distinct stock, although it is unclear where the boundary between Costa Rica and the Guiana/Trinidad stock falls, since rookeries in between (Venezuela, Panama, and Colombia) have not yet been surveyed. This boundary may be somewhat difficult to delineate, since there is likely to be dispersal, from Costa Rica on the one side and from the Guianas on the other, into an area of overlap. A northern Caribbean stock has also been identified from genetic data from St. Croix, although the boundary is also unclear.

West Africa (the eastern Atlantic) appears to be distinct based on data from Gabon, as is the South Africa rookery in Natal. Tagging and genetic studies so far show that leatherbacks found in the waters of the North Atlantic are part of the western Atlantic genetic stocks, while some preliminary tag returns show that leatherbacks from West Africa forage off the Atlantic coast of South America. South African leatherbacks have been tracked from nesting beaches in Natal, around the Cape of Good Hope, into the South Atlantic. The stock structure of Indian Ocean rookeries is unknown, although it is likely that the rookeries identified in Sri Lanka and the Nicobar Islands are part of a distinct Indian Ocean stock.

Research using tagging, telemetry, and genetics will continue to shed light on the complexities of stock assessments for all seven species of sea turtles worldwide. This intimate understanding of the structure of turtle stocks and of which key habitats are important to their continued existence is critical to our efforts to prevent extinctions of these endangered species.

__Dr. Peter Dutton__ is the leader of the Marine Turtle Research Program at NOAA's National Marine Fisheries Service Southwest Fisheries Science Center, and serves as Chair of the Genetics Task Force of the IUCN Marine Turtle Specialist Group. He uses genetics and satellite telemetry as tools to study the evolution, life history, migration, and habitat use of sea turtles.



© ROSE LINCOLN / HARVARD NEWS OFFICE

"As we begin to understand **the state of the world's sea turtles**, new priorities arise, global strategies form, and fresh hope swells for the survival of these incredible creatures…"

—**Edward O. Wilson**, Pellegrino University Research Professor Emeritus, Harvard University

Experts Define the Burning Issues in Sea Turtle Conservation

A generation ago, a small group of conservationists recommended to the administrators of the brand new U.S. Endangered Species Act that certain marine turtles be listed as endangered. Despite very little data, the leatherback, Kemp's Ridley, and hawksbill became the first sea turtles to be listed. Loggerheads, olive Ridleys and green turtles were added a few years later, after threats to sue the U.S. government over their exclusion were heeded. The flatback was included also, even though it is the least impacted of all the sea turtles, as there was a danger of fraudulent mislabeling of flatback products in trade. These early actions set in motion an incredible global cascade of events to prevent the extinction of sea turtles, and a small worldwide network of sea turtle protectors and scientists expanded to the multitude that we see today.

Resting green turtle near Sipadan Island, Sulawesi Sea, Sabah, Malaysia. © NICHOLAS PILCHER

Urgency and limited resources have driven conservationists to be increasingly strategic in their focus, and setting priorities is critical for any effort, whether directed at a species, an ecosystem, or the Biosphere as a whole. One way to do this is to look at the risk of extinction. IUCN, through its *Red List of Threatened Species*, provides a global overview of plants and animals at risk of extinction. IUCN's criteria are generalized to be useful for all types of organisms; hence they pose certain difficulties when applied to widely ranging, long-generation creatures such as sea turtles. The *Red List* criteria, for instance, call for analyzing "ten years or three generations, whichever is longer" of abundance data, which for sea turtles can mean over a century of data in some cases, and such long-term data sets are hard to find. Nonetheless, *Red List* assessments are an extremely valuable tool for sea turtle conservation, and IUCN continues to take its Red-Listing role seriously. All seven species of sea turtles are now on the *Red List* as either Endangered or Critically Endangered, with the exception of the flatback turtle (listed as Data Deficient); these species assessments are intended to be updated every five years.

But global-scale data are just a start. Peter Dutton's article on pages 10–11 demonstrates that there are several stocks of leatherback turtles around the world, some of which are vastly more at risk than others. Leatherbacks in the American Pacific have witnessed a vertiginous decline in recent years, whereas some Caribbean stocks are actually on the rise. The global Red Listing of the leatherback as Critically Endangered is warranted since the mean global change in status is negative, but conservation efforts are clearly more urgently needed in the Pacific.

Endeavoring to go a step further than the *Red List*, an initiative called the Burning Issues Assessment has been undertaken by members of IUCN's Marine Turtle Specialist Group (MTSG). The MTSG is a group of more than 300 experts from more than 70 countries that work to ensure a vision of *"marine turtles fulfilling their ecological roles on a healthy Planet where all peoples value and celebrate their continued survival."* A select group of these sea turtle experts, hailing from several countries and representing knowledge of all the world's major sea turtle stocks, gathered in Washington, DC, in August 2005 for this assessment.

There are several components to the Burning Issues Assessment, including the "Hazards to Sea Turtles" (p. 5), as well as lists of critical research needs and conservation tools. However, its centerpiece is the list of "The Top Ten Burning Issues in Global Sea Turtle Conservation."

The Top Ten Burning Issues in Global Sea Turtle Conservation

Leatherbacks in the Pacific

Current Status: Major populations in Mexico, Costa Rica, and Malaysia have declined more than 90 percent in less than 20 years.

Olive Ridleys in Orissa, India

Current Status: A minimum of 10,000 adults has been killed each year for the past 10 years.

Kemp's Ridleys throughout their range (Caribbean, Gulf of Mexico, and Atlantic)

Current Status: Kemp's Ridleys' small population size has declined more than 95 percent in less than 50 years, and they live within a limited range.

Loggerheads in the Pacific

Current Status: Nesting in the Pacific (principally Japan and Australia) has declined by more than 90 percent over the past 25 years.

Green turtles in the Mediterranean

Current Status: In the major rookeries, located in Turkey, populations have declined by 60–90 percent in 17 years.

All sea turtles in Southeast Asia

Current Status: Hawksbills, green turtles, and olive Ridleys have all suffered substantial declines in nesting in this region.

Loggerheads in the Atlantic

Current Status: At the major rookery at Archie Carr Refuge in Florida, U.S.A., nesting has declined by more than 50 percent in the past five years.

Hawksbill and green turtles in the Caribbean

Current Status: Green turtles have declined by more than 95 percent in the past 400 years. The loss of a number of rookeries has significantly reduced genetic diversity of green, and current take of adult green turtles is greater than 11,000 per year in Nicaragua. Hawksbill nesting has declined by more than 60 percent at the largest rookery, located in Mexico, in the past five years.

Green and leatherbacks in the Eastern Atlantic (and their southwest Atlantic foraging grounds)

Current Status: Globally significant nesting and foraging populations are virtually unstudied and threatened by substantial take because of extreme local poverty. Leatherbacks from Atlantic African nesting beaches also face great pressure from fisheries off the coasts of Brazil, Argentina, and Uruguay.

Hawksbills in the Indian Ocean

Current Status: Trade statistics going back more than 100 years indicate massive declines of up to 95 percent in hawksbill populations, specifically in Madagascar, Seychelles, and Sri Lanka.

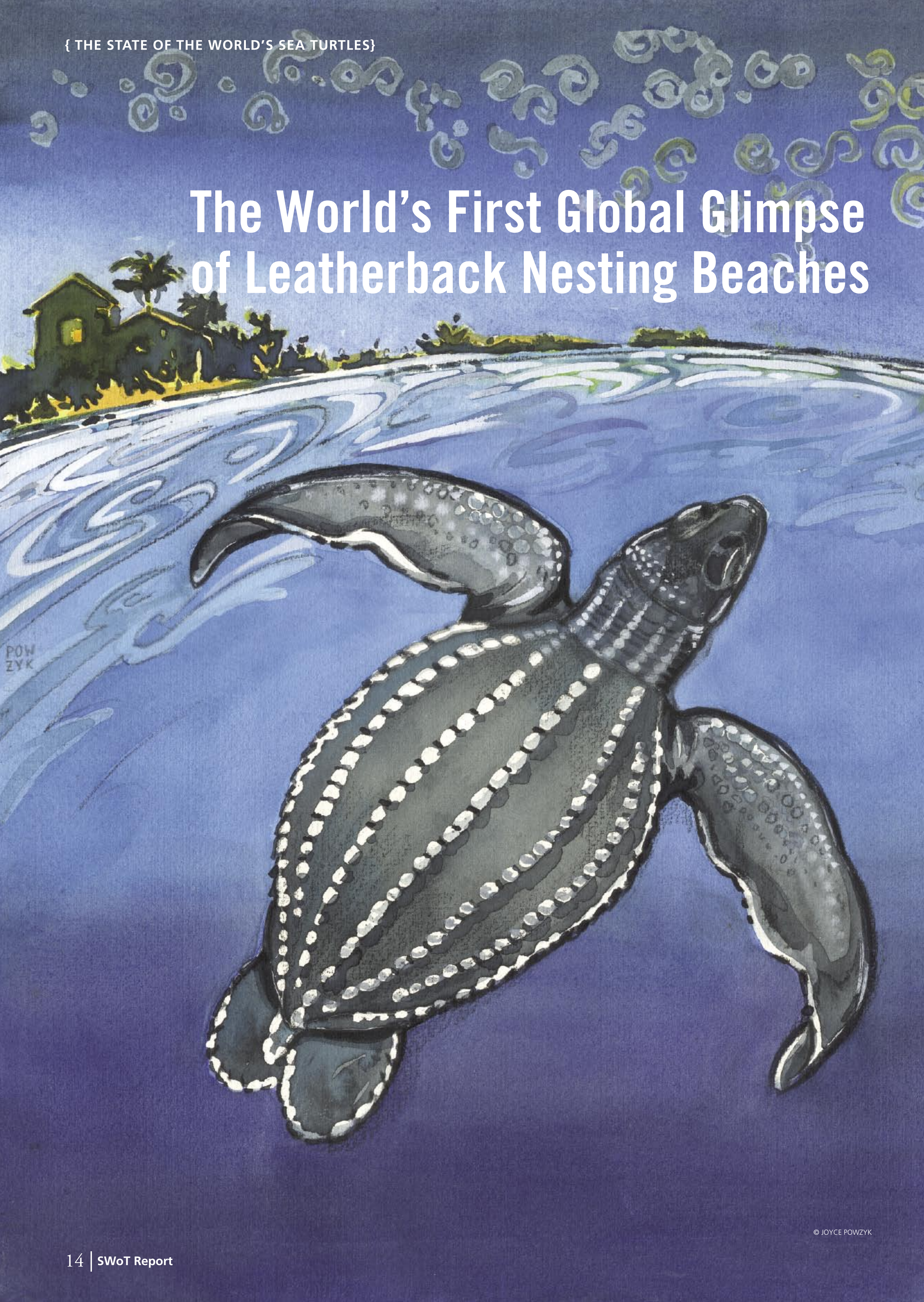
The Top Ten draws attention to some of the sea turtle populations that are most in need of urgent conservation attention, considering one or more of the following criteria: recent precipitous declines, small population size, high degree of threat, or irreplaceability. The Top Ten list is reviewed annually to its timeliness, and it attempts to include all the major regions where sea turtles live, using best-available data and expert opinion as its principle resources. It is a compelling tool to assist the global sea turtle research and conservation community with media outreach, communications, and public education. It will serve as an internal compass for our movement, to ensure that we are focusing our attention on those species, regions, research, and conservation needs that are of the most grave and urgent concern to ensuring the survival of sea turtles. Moreover, it serves as a guide to influence governments, local peoples, and donor agencies of all sorts. It is at this national and local level that good management and enforcement of sea turtle protection are most critical and most effective.

All conservation efforts for sea turtles are worthy ones, yet what the Burning Issues Assessment and its Top Ten list provides is one snapshot of the world today and a reminder that while we must work toward conserving sea turtles and their habitats everywhere on Earth, there are certain sites and populations that are in need of immediate attention. We must ensure that extinction does not occur on our watch, and the Burning Issues Assessment will help us to keep that promise.

Roderic B. Mast *is Vice President of Conservation International in Washington, DC and Co-Chair of the IUCN Marine Turtle Specialist Group.*

Peter C. H. Pritchard *is Director of the Chelonian Research Institute and has studied sea turtles around the world for the past 40 years, including two decades of notable turtle conservation on the coasts of Guyana. He has been named a* Time Magazine *"Hero of the Planet" and "Floridian of the Year" for his conservation efforts.*

The World's First Global Glimpse of Leatherback Nesting Beaches



Leatherback hatchlings head to sea. © SUZANNE LIVINGSTONE / UNIVERSITY OF GLASGOW

Every night, come rain or a shining moon, hundreds of field biologists, conservationists, and volunteers around the world don their flashlights and head to the beach, pacing the shoreline all night long to document the lives of sea turtles and to protect their nests and nesting habitats. Separated by thousands of miles and often living in remote areas, speaking different languages and facing unique challenges, the people involved in these projects are worlds away from one another. Yet all share a common vision: a world with healthy oceans and coasts in which sea turtles continue to live and to thrive. And now they have come together in the State of the World's Sea Turtles (SWoT) initiative, calling themselves the "SWoT Team," and taking a collective step forward to make that vision a reality.

Over the past two years, researchers around the world have contributed their time, energy, and scientific data to SWoT, in an effort to map the leatherback nesting beaches of the world with the best available information from the last complete nesting season in 2004—results of which are displayed on the maps on pages 18–19, and in the citations at the end of this publication.

Our modern age is one of information and technology in which traditional barriers to information access have all but disappeared. Hundreds of satellites orbit the earth, relaying and collecting information. A researcher on the Amazon River sends emails to colleagues in Tokyo on a handheld cellular phone. Remote rovers explore the surface of Mars and instantly send data back home. Nevertheless, the biological data necessary for effective conservation planning often remain scattered and inaccessible. Slowly, this is changing.

In the case of sea turtles, a plethora of useful data exist at the local, national, and in some cases regional level; yet previously there have been no up-to-date global-scale presentations of these data. This has been an enormous disadvantage for conservation planners, government bodies, and the sea turtle conservation movement itself, as we attempt to seek direction for our actions in the context of the big picture. On a global level, there is an urgent need to know the status of all sea turtles—all populations and all life stages—so that we can effectively prioritize our actions.

The truth is that no matter what we do, we cannot protect every sea turtle, every nesting beach, every foraging ground, or every migratory pathway. So as we seek to prevent extinctions, where do we invest our time and money for greatest impact?

Global data such as that presented by SWoT in the first worldwide mapping of leatherback sea turtle nesting data on pages 18–19, will help us to set our global priorities and to answer that question thoroughly and thoughtfully.

***Roderic B. Mast** and **Brian J. Hutchinson** are two of the founding members of SWoT. Rod is Co-Chair of the IUCN Marine Turtle Specialist Group (MTSG) and Vice President of Conservation International (CI). Brian is Program Officer of the MTSG and Coordinator of CI's Sea Turtle Flagship Program.*

The Challenge of Collective Conservation: An Insight into Gathering Global Data

© FRANS LANTING

Sea turtles are global creatures, and the leatherback especially so, as its nesting distribution circles the globe (see map, pages 18–19). And when they are not reproducing, leatherbacks swim thousands of miles and cross entire ocean basins. One of the greatest challenges we face in conserving leatherbacks is seeing the big picture and taking local actions that can have global significance in preventing extinction.

A leatherback nests by day. © JOHN CHEVALIER

The SWoT Team has committed to this challenge by bettering this big picture, our global view of leatherbacks. Our first step has been to compile information on leatherback nesting. Over the past two years, the SWoT Team has documented 203 leatherback nesting sites in 46 countries. Nesting data from the last complete nesting season in 2004 were contributed from 89 of these sites, and the remaining 114 either did not participate or do not have beach monitoring programs.

Effectively creating this global picture has required carefully dealing with critical data deficiencies and incompatibilities. First, there are likely many leatherback nesting sites that have not been discovered, and even among the sites that we know exist, many have incomplete or no data on their turtles. Moreover, there is a good deal of incompatibility among data sets. With information from nearly 100 sources and so many different areas of the world, we are faced with the tremendous challenge of creating uniformity among these diverse data sets. For example, some beach projects count the number of females, or the number of nests per season, while others count the number of crawls per season. Perhaps even more complicated, data are collected under a wide range of monitoring efforts. Some projects monitor 100 percent of the nesting beach during the nesting season or even all year, whereas other projects may have no regular beach monitoring; data might be collected only three mornings a week on only a portion of the beach, or during a one-day aerial survey along the coastline of an entire country. The result is that one beach may appear to have more nesting turtles than another, when in reality this is due to differences in monitoring effort.

Measures of monitoring effort are typically not well documented, and as such we are unable to evaluate the relative monitoring effort at each beach. Thus we cannot extrapolate full-season nesting values at beaches with partial coverage. Therefore, caution must be exercised when comparing the relative nesting between sites displayed in the SWoT map.

A leatherback nest is excavated after the hatchlings have emerged to assess the success rate of the nest. © MATTHEW GODFREY

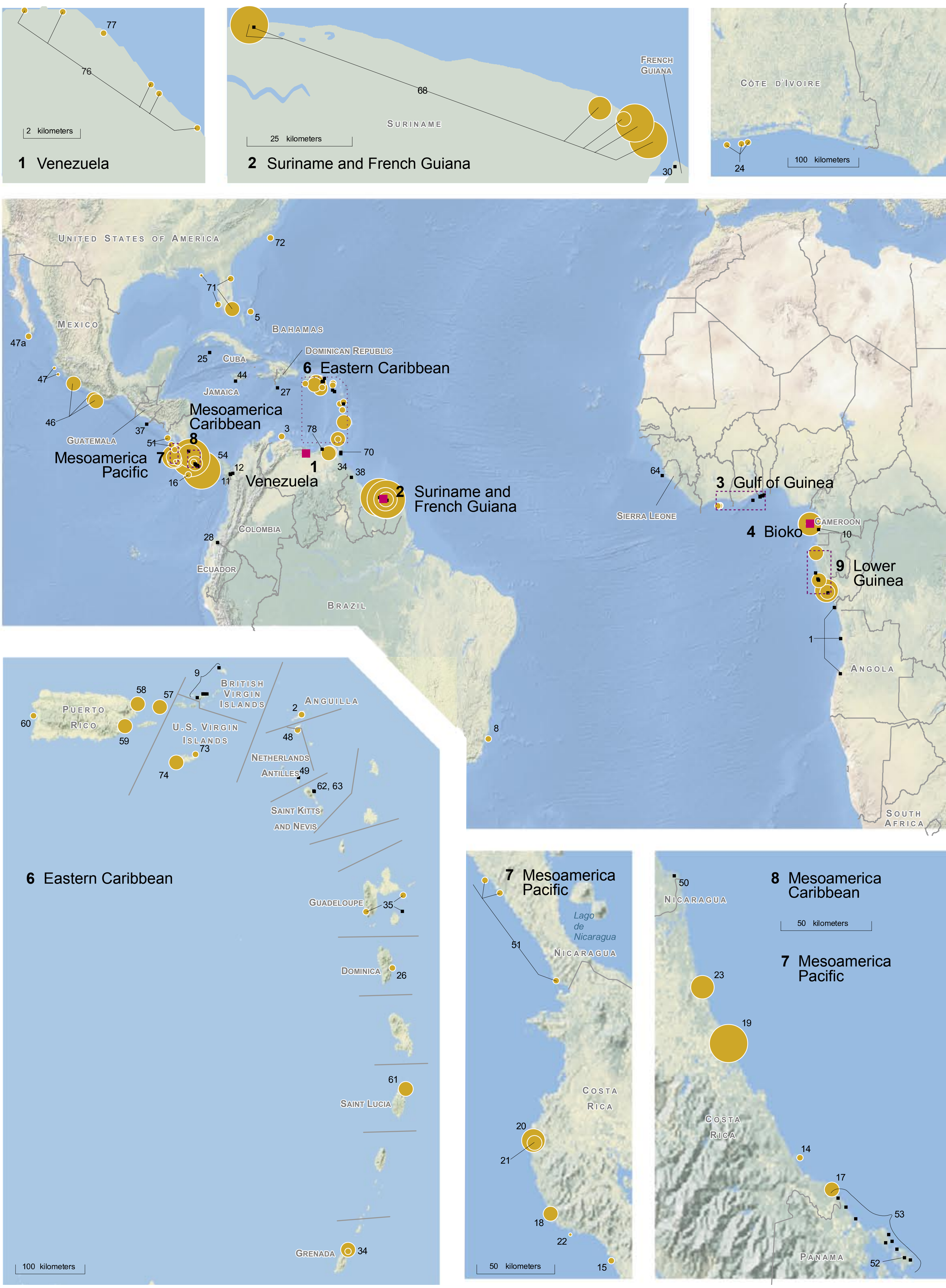
Although we have made every attempt to address these issues and present the most accurate picture possible, some notable assumptions were required in presenting these data. For the central map (pp. 18–19) we show the number of leatherback females nesting annually at all possible beaches. Because the number of nesting females is not available from every beach, for certain beaches we have estimated by dividing the recorded number of nests by a conversion value. It is important to note, therefore, that many of the points on the map are based on estimates and not actual numbers.

We have separated nesting populations into two categories: those with their main foraging grounds in the Northern Hemisphere, and those with their main foraging grounds in the Southern Hemisphere. For each of these categories, we have selected a single clutch frequency value (average nests per female per year) to estimate the number of females nesting annually for rookeries within that category. These average clutch frequencies are taken from the best-studied nesting rookeries in each group. For the Northern Hemisphere foragers, this rookery is at Sandy Point, St. Croix, U.S. Virgin Islands, and the average number of nests laid per female in 2004 was 4.64—the observed clutch frequency (Alexander et al. 2004). For the Southern Hemisphere foragers, it is Playa Grande, Costa Rica, where the estimated clutch frequency in 2003–2004 was 7.24 (Paladino & Spotila, pers. comm.).

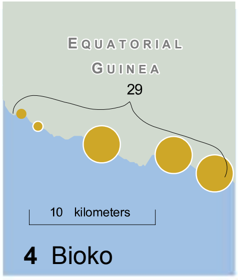
This map and database is an initial step in a long and evolving process. Recognizing the limitations and imperfections of this first step, we are committed to improving and refining this work over time. As we move into the future, the SWoT network will continue to grow, and we will update the SWoT database and find new ways to use these data for conservation action and to improve our understanding of the status of the world's sea turtles.

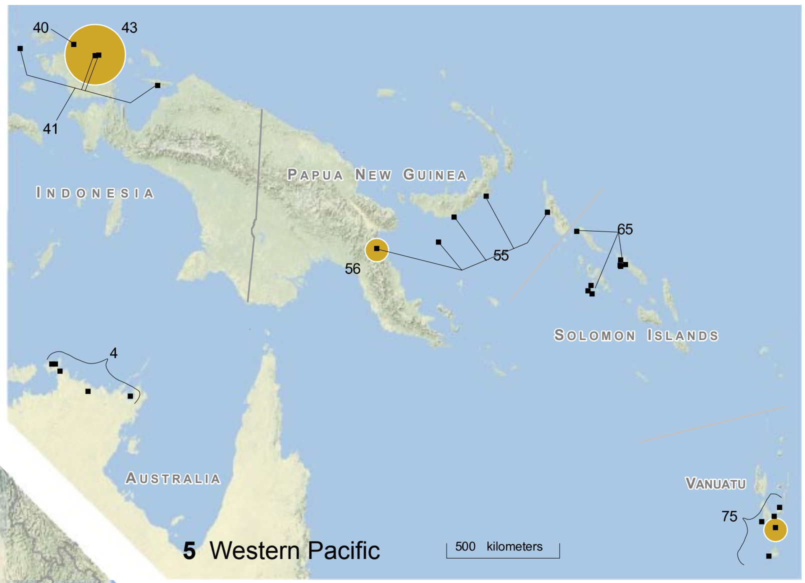
*This article is written by **Brian J. Hutchinson** and **María Fernanda Pérez**, on behalf of the SWoT Team. Brian is Program Officer of the IUCN Marine Turtle Specialist Group and Coordinator of Conservation International's Sea Turtle Flagship Program. María is SWoT Data Coordinator. For a full list of SWoT Team members, see page 37.*

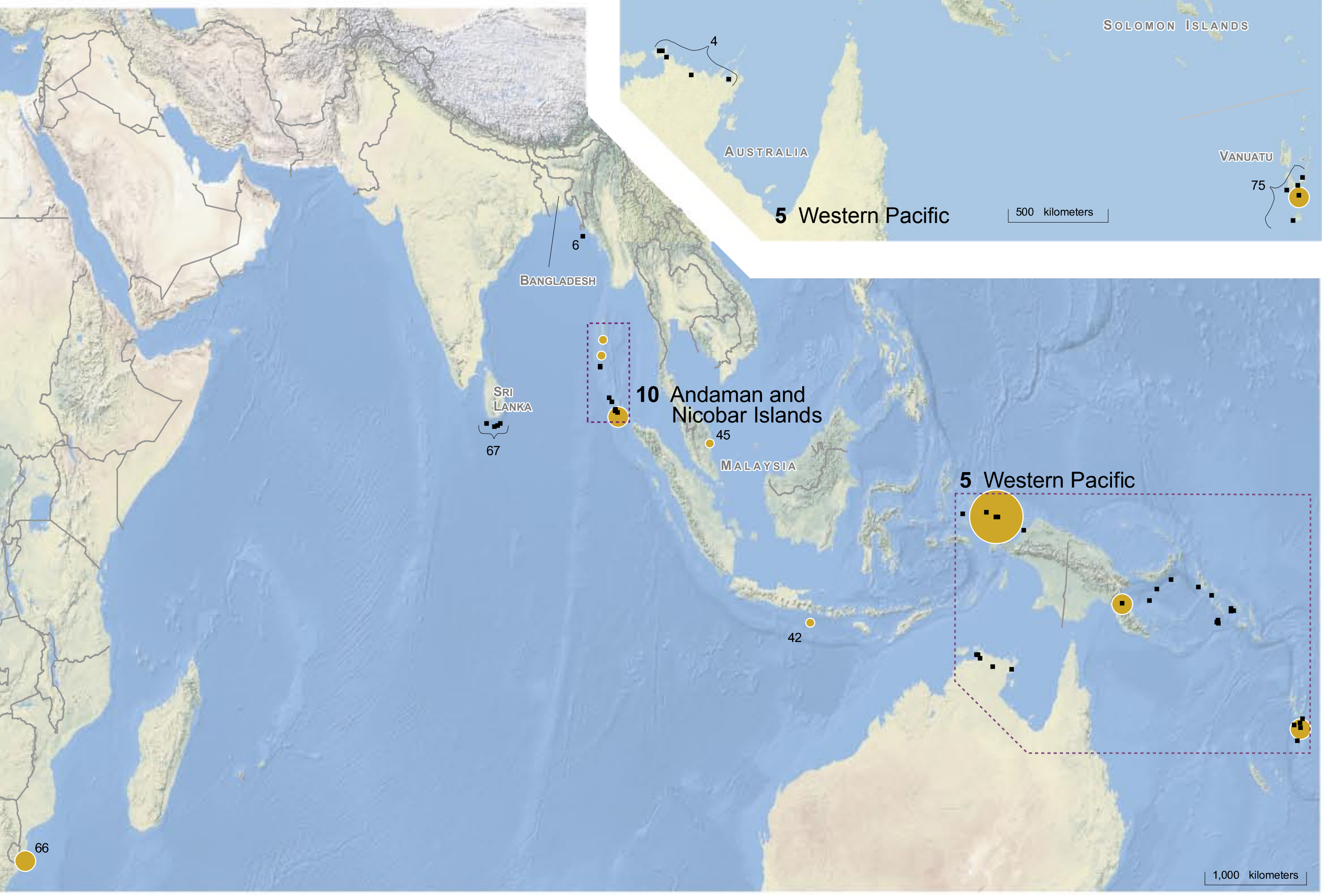
Worldwide Leatherback Nesting Sites

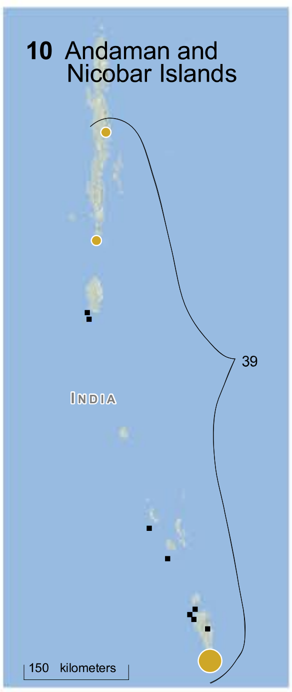


Every data point on these maps represents the original work of a data provider and the institutions he or she represents. The original data and their sources are listed in the citations on pages 30-36, and data points on the maps below are numbered to correspond with their source and citation. All data must be credited to the original source.









Leatherback Nesting Beaches

estimated nesting females (2004)

- *up to* 650
- 250
- 100
- 25
- 0
- no data (2004)

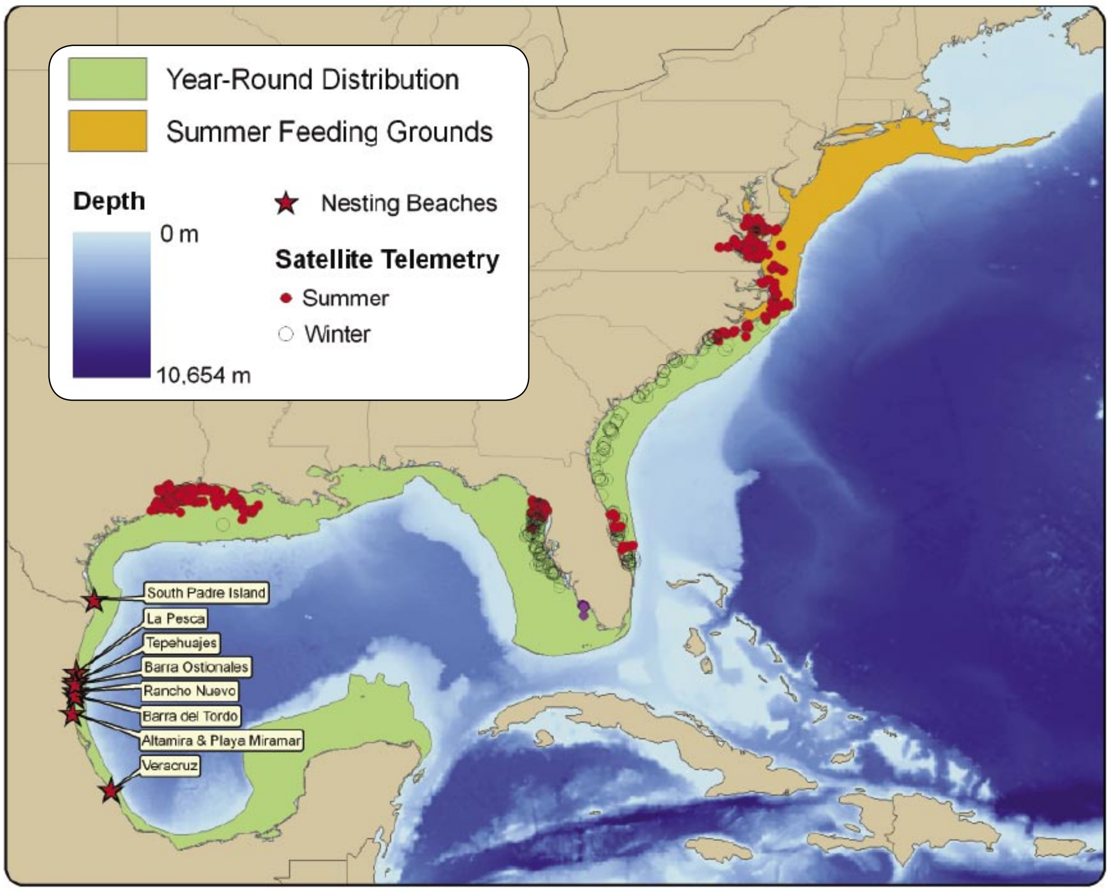
inset maps: extent / location only

projection: Eckert IV

data: Digital Chart of the World (DCW)
Natural Earth, Tom Patterson, US National Park Service
The SWoT Team
see pages 30-36
VMap0, National Geospatial Intelligence Agency

extensive input provided by: Michael Coyne

Plotting Kemp's Ridleys, Plotting the Future of Sea Turtle Conservation

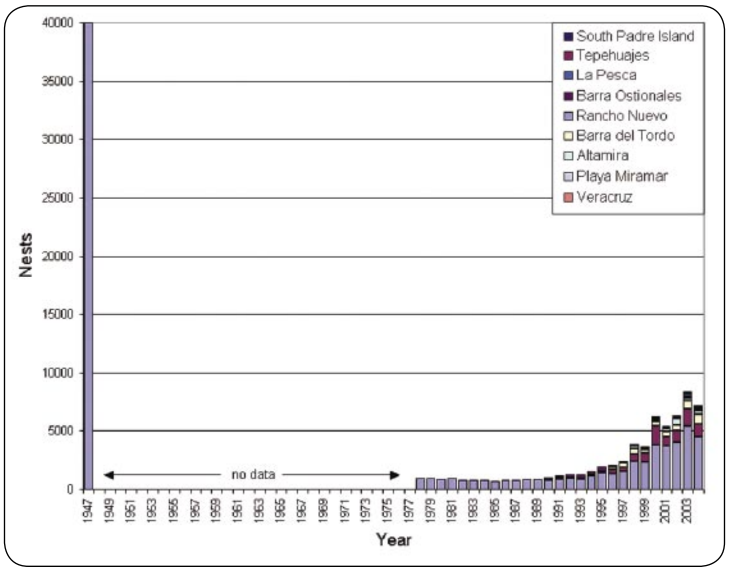


In 1947, Andres Herrera documented an estimated 40,000 Kemp's Ridley females nesting simultaneously in a *single day* at Rancho Nuevo, Mexico, in a now famous home movie of the turtles' *arribada*, their mass synchronized nesting spectacular. Fourteen years later, American biologist Henry Hildebrand showed the video at a scientific conference, and scientists were shocked to witness this spectacular phenomenon. But by then, the Kemp's Ridleys had already ceased to come ashore by the tens of thousands; their numbers were reduced to approximately 6,000 animals in an entire year.

The Mexican government began protecting this species in 1966, and over time these efforts have expanded incrementally, redoubling with the establishment of the rigorous bi-national research and conservation program between the U.S. and Mexican governments in 1978 that continues today (see "Return of the Kemp's Ridley", pp. 6–7).

Created using GIS software and data from satellite tracking devices, radio telemetry, and the Internet, the map above combines 28 years of information that portray the present understanding of the species' reproductive and migratory habits. From 1978 to 1990, the nesting population at Rancho Nuevo was in a state of continual decline. During this period, there was a peak of 954 nests in 1979 and a lull as low as 702 nests in 1985. It wasn't until the late 1980s that the population began to stabilize and then grow, as reflected in nest counts. From the early 1990s through today, the numbers have been on the rise, reaching a peak of 10,099 nests in 2005.

This map is much more than a chart of sea turtle data. It is a union of past and present and, simultaneously, an emblem of the future—a chronicle of the recent history of a very unique and Critically Endangered species. As we collaborate to pursue our common goals in sea turtle research and conservation, we can replicate this result for all species. Today, the type of collaboration that has begun to bring back the Kemp's Ridley from the brink of extinction is extraordinary, but tomorrow it will be the norm.



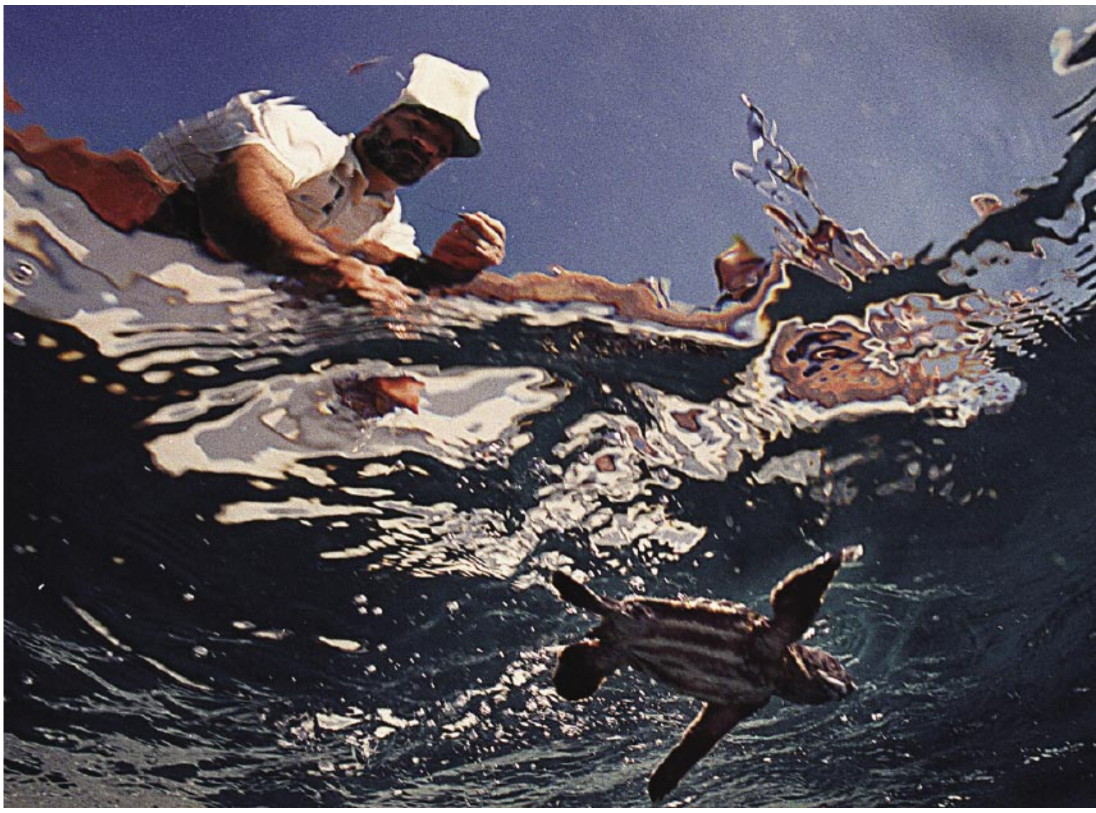
A Kemp's Ridley sea turtle on a nesting beach. © THANE WIBBELS

__Jaime Peña__ is a conservation biologist for the Gladys Porter Zoo in Brownsville, Texas, U.S.A. He began his work with the Kemp's Ridley sea turtle in 1994.

Map created by __Michael S. Coyne__ (Duke University), with satellite and radio telemetry data provided by Jeffrey R. Schmid and Wayne N. Witzell (NOAA's National Marine Fisheries Service Southeast Fisheries Science Center, and Conservancy of Southwest Florida); Erin E. Seney and Andre M. Landry, Jr. (Texas A&M University at Galveston); and Kate L. Mansfield and John A. Musick (Virginia Institute of Marine Science, The College of William and Mary); and nesting data provided by Jaime Peña (Gladys Porter Zoo) and Donna Shaver (U.S. National Park Service).

Leatherbacks Help to Map the Pacific

Hoping to gain an organism's-eye view of the aquatic world, scientists from various institutions have joined together under the Tagging of Pacific Pelagics (TOPP) research project to tag more than 1,800 specimens of 21 large marine species, including tunas, seabirds, sharks, whales, sea lions, and sea turtles. As these animals move about the Pacific, the high-tech tags they carry gather information that is instantly transmitted to onshore labs. Those data become part of a global-scale project called the Census of Marine Life, an international endeavor to determine what lives, has lived, and will live in the world's oceans.

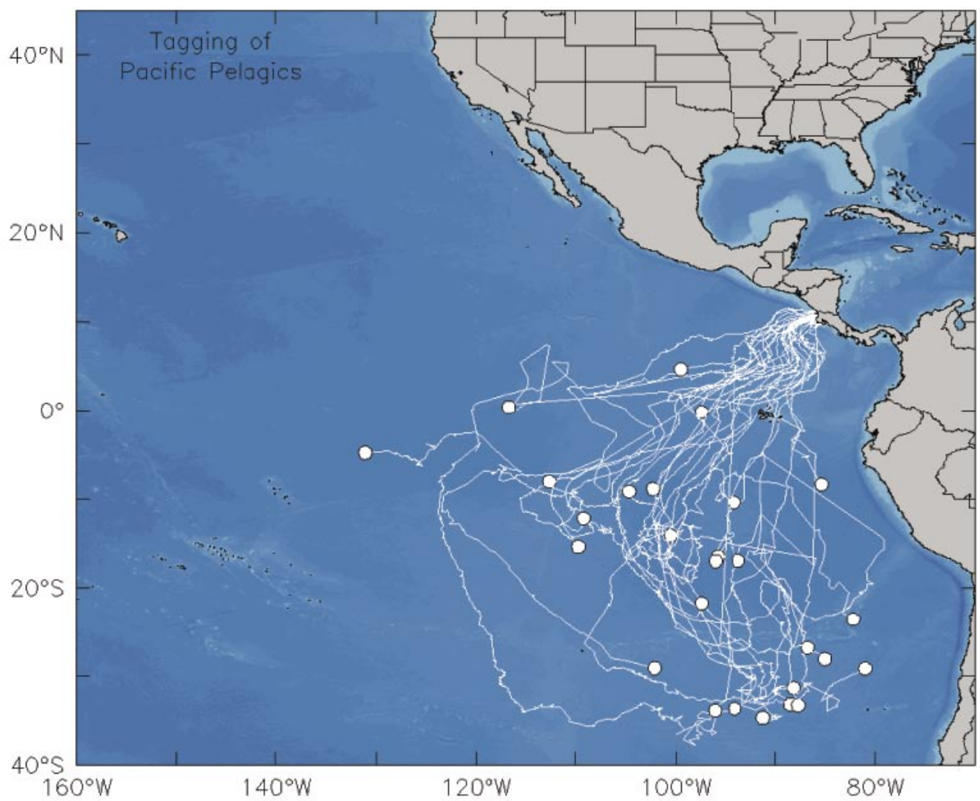


A baby leatherback is tracked using a small radio-tracking device. © 2004 GENE BEDNAREK / WWW.SOUTHLIGHT.COM

Given that leatherbacks spend nearly all of their long lives at sea, understanding their feeding and migration routes is critical to our ability to mitigate the human-induced threats that endanger them. Since 2001, TOPP researchers have been attaching satellite transmitting backpacks to leatherbacks with unique tags that not only track the turtles' movements as they feed and migrate but also record the depths of their dives and collect oceanographic information such as temperature at varying depths and locations—data that are otherwise very costly to obtain. Since 2004, more than 50 leatherbacks have been tagged at their nesting beaches by different research groups at Playa Grande, Costa Rica, and from foraging grounds in California's Monterey Bay.

Pioneers in the fascinating new field of satellite tracking, TOPP scientists and their collaborators are gaining an understanding of how the open-ocean ecosystems work. By learning where animals travel and what factors control these migrations, they will provide information that is critical to shaping responsible ocean policies.

The ***Tagging of Pacific Pelagics*** *(TOPP) program is an international, multidisciplinary research project that utilizes electronic tags to study migration patterns of large open-ocean animals and to understand the factors that control these movements. Jointly run by Stanford University, University of California Santa Cruz, U.S. National Oceanic and Atmospheric Administration's Pacific Fisheries Ecosystems Lab, and the Monterey Bay Aquarium, the TOPP program is part of the global Census of Marine Life, a ten-year initiative to assess and explain the diversity, distribution, and abundance of marine life in the oceans—past, present, and future.* www.toppcensus.org.



By use of satellite transmitters, researchers have tracked 50 leatherbacks' movements around the Pacific Ocean.
© TAGGING OF PACIFIC PELAGICS (TOPP)

© COSTA RICAN MINISTRY OF ENVIRONMENT AND ENERGY (MINAE – MINISTERIO DEL AMBIENTE Y ENERGÍA)

"The ocean cannot survive on the efforts of individual conservation projects alone. **Policy and economics** play a vital role, and states must work together—with each other, and with their citizens—to address the issues that afflict our waters."

—**Carlos Manuel Rodríguez**, Minister of Environment and Energy, Costa Rica

Costa Rica: Sea Turtles Forge the Policy Path of Marine Conservation

In 2004, a remarkable series of events took place in Costa Rica that has helped to dramatically improve the state of marine and terrestrial protection throughout the country and throughout the Central American region. The International Sea Turtle Society's 24th Annual Sea Turtle Symposium was held in Costa Rica that year, and the turnout was outstanding, not only in its typical 1,000-strong attendance but also in the international and *local* attention it brought to the plight of sea turtles—particularly the Pacific leatherback—along Costa Rica's coastlines. This attention, in turn, enhanced thousands of Costa Ricans' consciousness of their own interrelationships with marine life.

Las Baulas National Park, Costa Rica. © STEPHEN NASH / CONSERVATION INTERNATIONAL

Within two months of the Symposium's conclusion, President Abel Pacheco had summoned a meeting of top officials from the Costa Rican Fishing Institute (INCOPESCA), marine conservationists and the country's minister of environment and energy, Carlos Manuel Rodríguez, to end many years of uncertainty about which governmental body should administer marine conservation in Costa Rica. The verdict was quite clearly in favor of the environment, with the Ministry of Environment and Energy granted jurisdiction of management, conservation, and restoration of all marine and coastal-marine habitats and species therein; INCOPESCA was thereafter restricted to issues pertaining to fishing: permits and regulations, techniques, and statistical analysis of the industry.

Within another two months, President Pacheco publicly announced his intention to protect a full 25 percent of Costa Rica's Exclusive Economic Zone (EEZ) within marine protected areas—a monumental achievement for marine conservation worldwide.

With the help of Costa Ricans' heightening interest in sea turtles and marine conservation, and support from international NGOs, the government has made rapid progress in protecting Las Baulas National Park (Marine Section), the most important remaining nesting ground of the eastern Pacific leatherback expanding its marine area, and vigorously consolidating the park's terrestrial areas.

And the list of the country's successful environmental policy-making goes on. Costa Rica continues to strengthen its conservation practices and set the example for its neighbors; the teamwork among conservationists, government officials, local media, and citizens in this country is a shining example for the rest of the world.

***Clara Padilla** heads the Costa Rican office of The Leatherback Trust and sits on the Board of Directors for the International Sea Turtle Society. She has been active in conservation activities and marine issues for more than 20 years.*

***Mario A. Boza** serves as a Board Member of The Leatherback Trust. Since acting as the first director of Costa Rica's National Park Service, he has worked for the past 35 years in protected areas and related issues in Costa Rica, Central America, and Argentina.*

Understanding the Incentive

How One Community Conserves Turtle, Reef, and Forest

Picture this: a small coastal community—a bay fringed by rainforest abounding with biodiversity set amid one of the richest marine habitats in the world. As with many communities in the region, logging and destructive fishing offer a ready source of income for local villagers. Yet within a few short years, the flush of cash is gone. Its forests and reefs degraded, its culture shaken, the village finds itself worse off than before.

Now imagine this: a nearby community with the same rich natural resources as its logging and fishing neighbors. But in this community, cash and other benefits derive from an altogether different source: the conservation of nature. Villagers here have been trained in wildlife protection and sustainable farming practice. In exchange for concrete benefits from conservation, they have formally agreed to protect their terrestrial and marine resources, to fore go industrial logging, destructive fishing and all non-traditional resource extraction. Years down the road, the community's environs still appear pristine, forests intact, reefs alive with fish and corals, and people still follow a lifestyle of their own choosing.

Gathering community support for conservation projects on the island of Malaita in the Solomon Islands, cetacean biologist Benjamin Kahn speaks to community members of Fanalei Village about local marine life. © DAVID WACHENFELD / TRIGGERFISH IMAGES

This is not an imagined scenario. Conservation incentive agreements of this sort are taking hold in Papua New Guinea (PNG) and a variety of other places around the world.

In 1996, the community of Lababia, PNG, established the 47,000-hectare Kamiali Wildlife Management Area (WMA), a legally gazetted conservation zone, managed in accordance with a clear set of guidelines developed by the local community. In Kamiali, these guidelines ban industrial logging and fishing and allow for hunting only by traditional methods. In addition, the community has now entered into an agreement to ban the harvest or sale of leatherback turtle eggs. In exchange, the community receives an annual cash payment of about US$2,500, the going market rate for their unharvested eggs. Kamiali is one of PNG's largest leatherback rookeries, and its protection was a founding motivation for establishing the WMA.

Village scene from a conservation area in the Solomon Islands © EMRE TURAK

Mirroring its turtle conservation payments, over the years the community has received a steady stream of benefits from the outside world in exchange for its commitment to conserve Kamiali's forests and reefs. These include a small guest lodge and training center; access to dinghies with coolers to transport fish to the nearest market (a two-hour commute), a small portable sawmill to provide lumber for construction, improvements in local schools, and a water distribution system, among others.

The conservation result? Kamiali now stands out as the only area of protected reef and forest along this entire coastline. A globally important sea turtle population is recovering from years of over-harvest. And other communities with valuable forests and reefs are now keen to replicate the Kamiali approach in adjacent areas. None of this, of course, has come without challenges along the way, but our hope and expectation is strong that in the years ahead Kamiali's success will be replicated in many vital areas around the world.

Richard Rice, Ph.D., *is Chief Economist at Conservation International. He is presently pioneering in the design and implementation of conservation incentive agreements, an approach to conservation that involves annual compensation for the acquisition of development rights in priority habitats.*

Fishing Technology Gears Up for Turtle Conservation

Story after story tells that bycatch in pelagic and coastal fisheries may be one of the greatest threats to sea turtles in the open ocean, where they spend a great portion of their lives. A variety of current research is testing new approaches to fishing to reduce that threat.

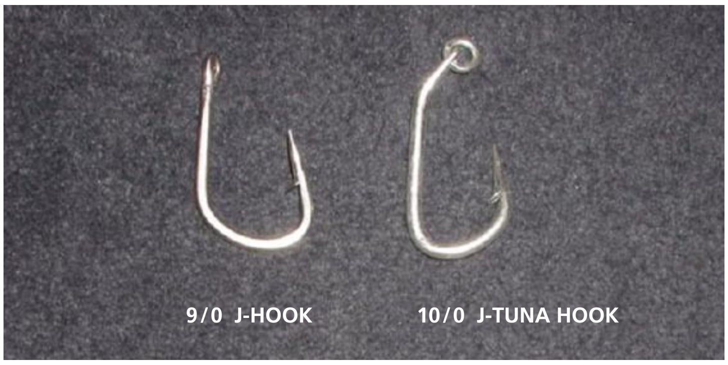
Perhaps the most promising results thus far relate to changes in longline fishing gear, such as altering the type of fishhook. Certain hook types appear to greatly reduce the capture and entanglement of sea turtles. To date, experiments have shown that using large circular hooks effectively reduces sea turtle bycatch rates, compared to using the more commonly used small J-shaped hooks. Use of circle hooks also reduces the proportion of turtles that swallow the hook, which typically results in internal damage and possibly death to the turtle. Experiments have shown that in addition to the positive implications for turtles derived from the use of large circle hooks, there is little or no reduction in the capture of the target fish species. Recent studies in Brazil even show that the number of target species may increase with use of these hooks. As such, the replacement of small J-hooks with large circle hooks presents a win-win scenario for the fishing industry and sea turtles and a viable alternative in some fleets.

Other strategies that may also prove effective in reducing turtle mortality from commercial fisheries include setting gear below depths where turtles are abundant, using fish instead of squid for bait, single-hooking fish bait, reducing gear soak time, retrieving gear during the daytime, and closing certain fisheries to avoid bycatch hotspots.

Scientists are also examining the sensory cues that attract sea turtles and fish to pelagic longline fishing gear, with the ultimate goal of developing modified gear to attract fish but not turtles. Current findings indicate that both fish and turtles are primarily attracted to fishing gear by visual cues and that there are differences in the color sensitivities between fish and sea turtles. On the basis of these findings, researchers are now experimenting with flashing light sticks, as well as other similar modifications, that are attached to longline gear and attract fish but not turtles.

This X ray of a juvenile green turtle reveals J-hooks caught in its throat. © 2002 CHRIS JOHNSON / WWW.FLORIDALEATHERBACKS.COM

All fisheries are different, based on a wide array of factors including the target species, the depth of the gear, and day-vs.-night setting; hence it is unlikely that one mitigation method would be effective at reducing turtle bycatch across the board. As such, field tests must be undertaken throughout the world and under as many different conditions as possible to determine the best combination of solutions for each scenario to ultimately result in minimizing the incidental capture of unwanted and often highly endangered species such as sea turtles.

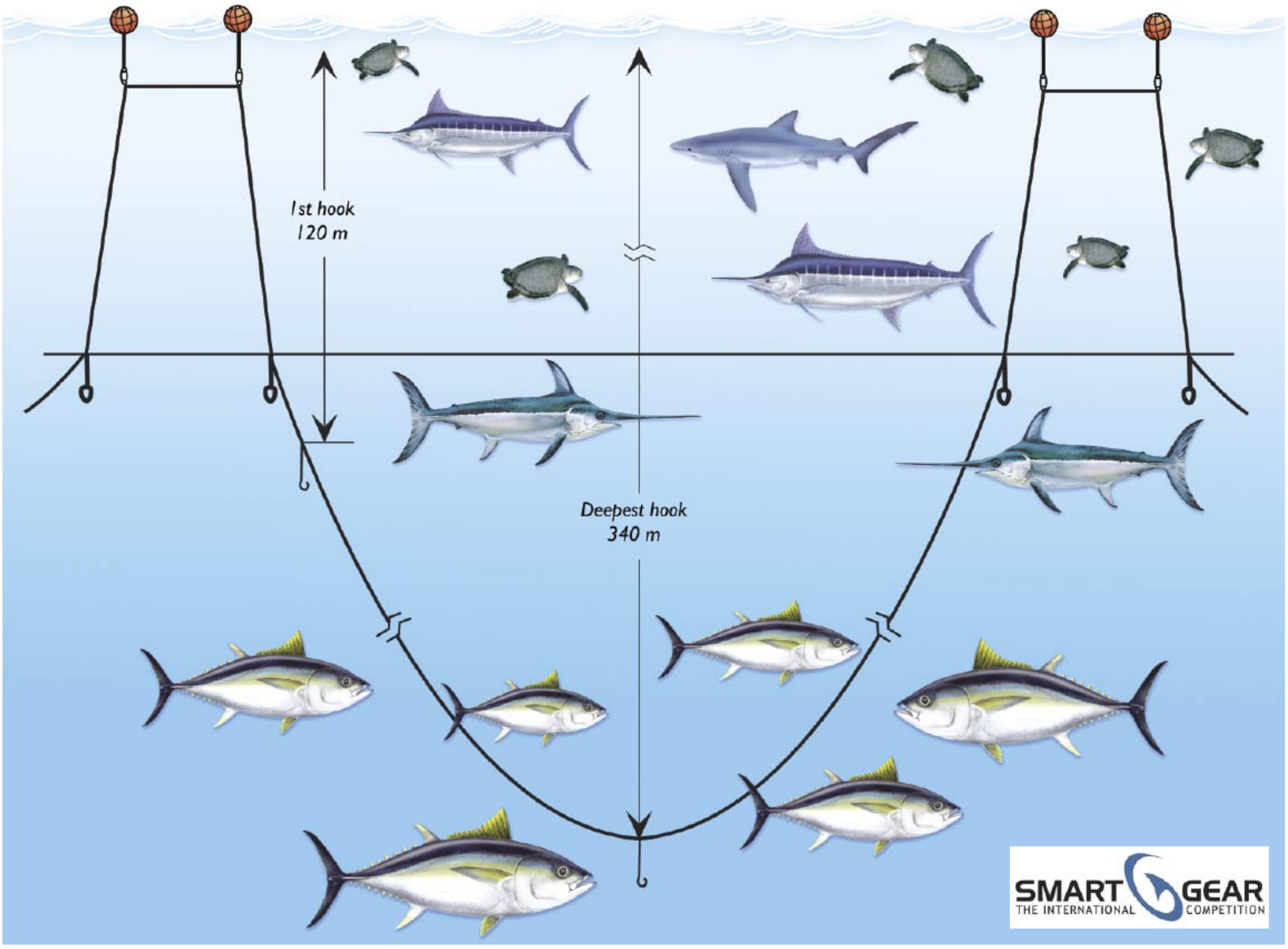


Using circular hooks rather than J-hooks on fishing lines has proven to reduce sea turtle fatality without significantly affecting capture of target fish species. ©NATIONAL MARINE FISHERIES SERVICE

Yonat Swimmer *is a fisheries research biologist working with NOAA's National Marine Fisheries Service's Fisheries Pacific Islands Fisheries Science Center. Her research focuses on means to reduce sea turtle interaction in fisheries, with respect to both understanding measures that attract turtles and fish to fishing gear, and conducting field trials to identify a mitigation method that reduces rates of turtle bycatch.*

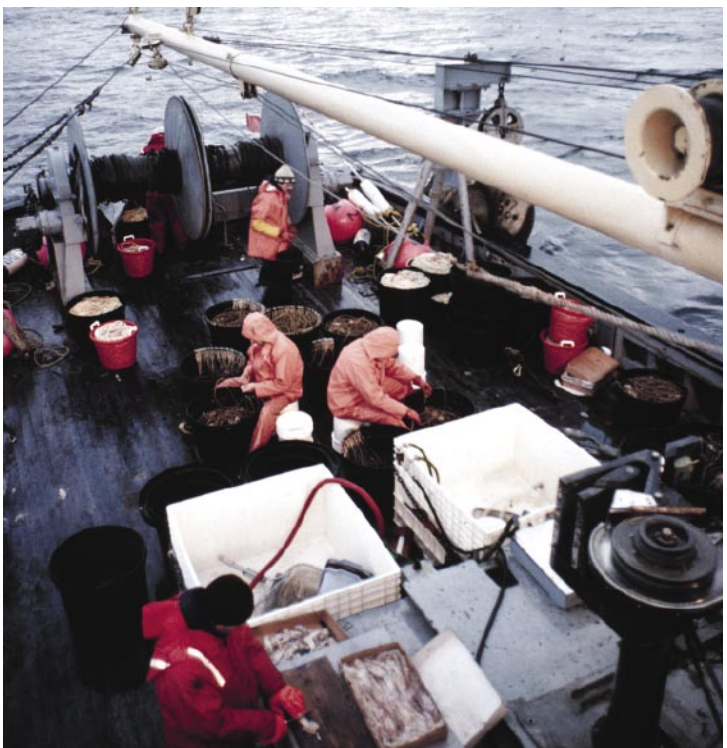
Eric Gilman *is the Fisheries Bycatch Program Director of the Blue Ocean Institute. His research focuses on identifying effective and commercially viable strategies to minimize fisheries bycatch.*

New Deep-Set Longline Is Smart Gear



Artist's rendition of one deep-set basket sh; target species
below the line at 100 meters include bigeye tuna and day swimming broadbill swordfish. All baited hooks are below the 100-meter line. © YOUNGMI CHOI

In April 2005, World Wildlife Fund (WWF) awarded New Caledonia fisherman and scientist Steve Beverly the grand prize of US$25,000 in the first-of-its-kind International Smart Gear Competition. Participants from around the world submitted more than 50 entries for innovations to help reduce bycatch and make our oceans safer for sea turtles, whales, dolphins, birds, and other nontarget species caught accidentally in fishing gear. Look for details about the 2006 Smart Gear Competition at www.smartgear.org.

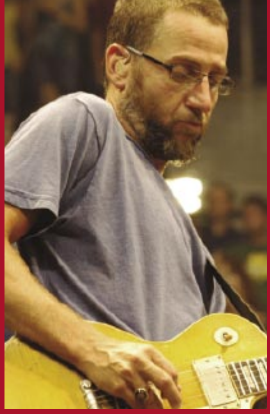


Beverly's idea helps longline fishermen target tuna and swordfish without catching sea turtles by setting longlines deep. While most boats fishing for tuna already set their lines deep, normal setting practices still leave a good portion of the baited hooks in shallow water where they are likely to snare a swimming sea turtle.

Normally, the main line is suspended between two floats and sags in a curve with the baited hooks floating at a variety of depths ranging from very near the surface and within sea turtle range down to 300 meters or more.

In Beverly's design the main line is weighted with lead weights and released or "set" in such a way that the section of main line, that holds 40 to 60 baited hooks goes down to and remains below 100 meters, which is safely out of sea turtle range yet within target species range. Successful testing of this idea has been carried out by three tuna vessels fishing Pacific waters, which caught 42 percent more tuna using Beverly's gear.

Sablefish longline operations set lines 3/4 mile long with hooks every 15 to 20 feet.
© NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / DEPARTMENT OF COMMERCE

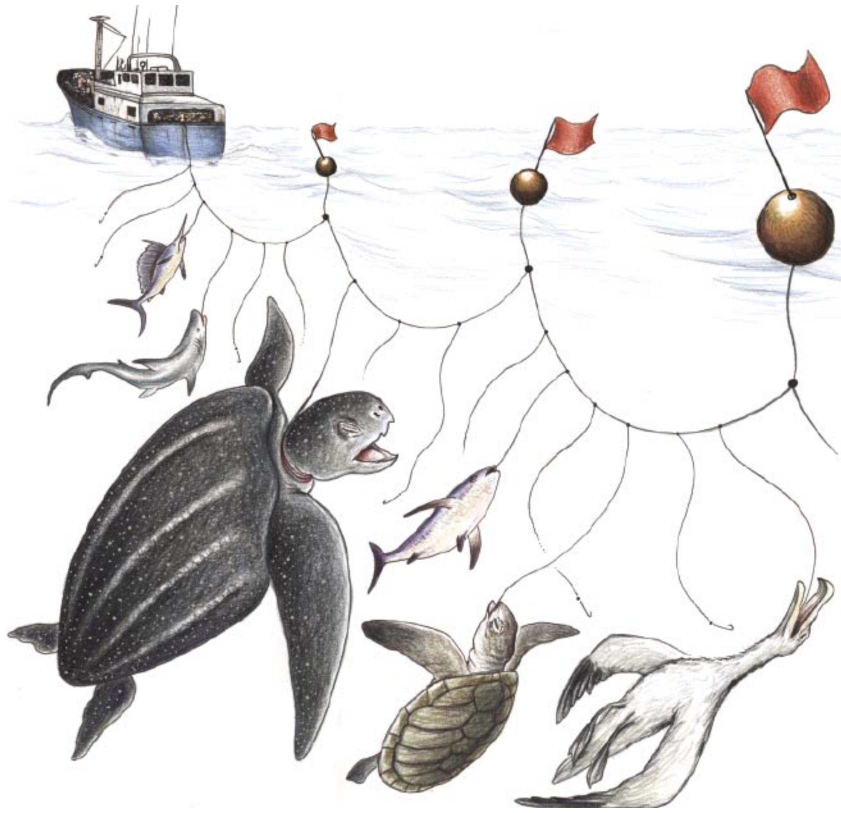


© KERENSA WIGHT

"The first step in changing human behavior is raising **awareness** of the issues—to local communities, global audiences, major industries and niche markets."

—**Stone Gossard**, Performer & Songwriter, Pearl Jam

Seafood Diet for a Small Planet



The billions of hooks set on longlines throughout the world's oceans each year injure and kill millions of animals other than the fishers' targeted fish species. Sea turtles, sharks, albatross and other seabirds, and dolphins, seals and other marine mammals are among the victims of longline fishing. © STEPHEN NASH / CONSERVATION INTERNATIONAL

Human innovation has proven that we have the ability to harvest the ocean's bounty at a much faster rate than it can replenish itself. The ocean's fish and wildlife resources appear to be losing the battle of sustainability and spiraling downward on a path toward depletion. Many of the top predator fish, like swordfish, marlin, and some species of sharks and tuna, have been vastly overfished, and stocks are diminished to the lowest levels in history. The number of sea turtles captured by industrial fishing is staggering—estimated at 250,000 per year, mostly from industrial high seas longlining, though 100,000 turtles per year are estimated caught in shrimp trawls in Central American waters alone. So what can we, as individuals, do about it?

1. **Eat Less Seafood.** As a species whose population continues to grow, we need to reduce our overall fish consumption even as we switch between seafood choices. Moreover, the seafood we purchase and consume (or not) makes a difference, either encouraging or discouraging harmful fishing practices. To help make responsible seafood choices, we can follow sustainable seafood guidelines such as those found in Seafood Watch's sustainable seafood wallet cards (www.seafoodwatch.org); these provide specific recommendations for how to steer clear of the more depleted or endangered species and focus consumption instead on alternatives that are less detrimental to our oceans—and the welfare of sea turtles.
2. **Eat Lower on the Seafood Chain.** Twenty years ago, Frances Moore Lappe's *Diet for a Small Planet* was published, selling 3 million copies and inviting an entire generation to consider the ecological, social, and personal significance that our food consumption habits have every time we sit down to a meal or shop at the supermarket. Its take-home message was that we could improve our own health and the health of our environment by eating more grains and less meat (i.e., lower on the food chain). The message is the same with seafood, especially considering that the fishing techniques that are used to capture top ocean predators—swordfish, shark, tuna, and others—are also responsible for incidentally killing countless other marine animals, including sea turtles.
3. **Avoid Trawled and Farm-Raised Shrimp.** While shrimp may not be high on the food chain, it is high on the list of seafood to avoid. Most shrimp are caught by trawling, a technology that is deadly to sea turtles and a host of other marine life. Turtle excluder devices have mitigated the problem when they are properly used, but their proper use may be more the exception than the rule. Much farm-raised shrimp has been associated with the destruction of mangrove ecosystems, a critical nursery-ground for many marine species. More sustainable, trap-caught shrimp can be found in local seafood markets and in natural food stores.
4. **Demand Action from Government.** Our government representatives need to hear from us that we must better regulate industrial fishing in order to make it sustainable for target species, as well as sea turtles and other victims of bycatch. By informing your local and national officials of your concern, you can help to encourage sustainable ocean management.

***Todd Steiner**, Executive Director of Turtle Island Restoration Network, is a wildlife biologist and environmental activist working to create healthy ocean ecosystems and protect endangered salmon and their watersheds.*

Fishers for bait fish. © WOLCOTT HENRY 2001

Increasing Fishers' Awareness Leads to Decrease in Turtle Bycatch

Fishers themselves are at the front line of the fisheries bycatch battle. Increasing their awareness has already been demonstrated to have noteworthy positive results when it comes to reducing bycatch of sea turtles. The government and the fishing industry of Ecuador undertook a major Fishermen's Education Effort starting in 2003 by joining forces with the Inter-American Tropical Tuna Commission (IATTC), the U.S. National Oceanic and Atmospheric Administration (NOAA), WWF, The Ocean Conservancy, and Ecuadorian fishworker cooperatives and environmental groups. The program focuses on deriving solutions that will allow fishers to continue to earn a living from the ocean, while simultaneously protecting the marine environment for the long term. The program consists of four major components:

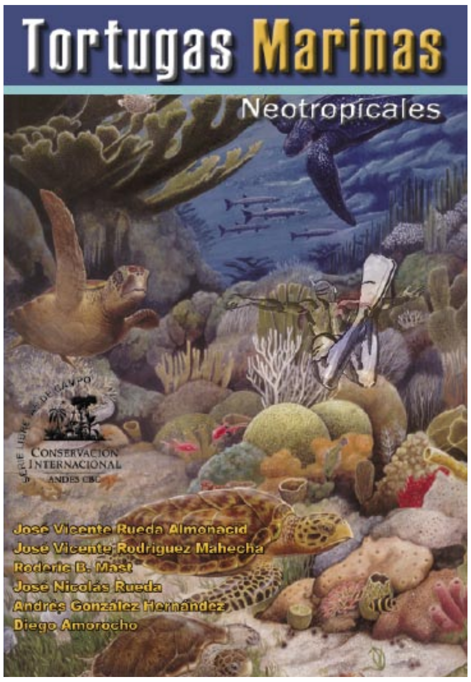
1. Replacement of J-hooks with circle hooks and testing of their efficacy in reducing sea turtle mortality
2. Provision of tools and training to fishers in techniques for releasing sea turtles
3. An observer program to document the results
4. A continuous communications and outreach program to the fishing community to explain the problem and the proposed solutions, to garner their feedback, and to evaluate the performance of the effort and the gear

Over 70 observer trips were completed during the 2003–2004 Ecuadorian tuna-fishing season. The results showed a significant reduction in the hooking rates of sea turtles through the introduction of circle hooks, as well as a significant decline in the types of hooking that lead to higher post-hooking mortality. It is estimated that the combined effects of both those factors could lead to reductions in overall mortality of 70 percent to 90 percent. Attitude changes among fishers, resulting from the outreach program, are expected to generate even further reduction in sea turtle mortality.

The demise of leatherbacks and of other species of sea turtles in the American Pacific in the past two decades has become one of the most critical global issues in sea turtle conservation, and fisheries have doubtless been a major contributing factor in the declines. Demonstrating that fishers can be a positive force in helping to reverse these downward trends, this successful pilot effort has now grown to other American Pacific countries, including Colombia, Costa Rica, El Salvador, Guatemala, Mexico, Panama, and Peru with potential for replication in other regions of the world.

Drift nets are a critical hazard that can cause death by drowning to sea turtles and other marine life. © ERIC LEONG

Born in Argentina, ***Martin Hall*** *earned his Ph.D. from the School of Fisheries at the University of Washington. He has been working on bycatch issues as the Principal Scientist at the Inter-American Tropical Tuna Commission since 1984.*



Cover image of the new *Marine Turtle Pocket Field Guide*

Plans for Miniature Field Guides Are Anything but Small

What is small enough to fit into a shirt pocket yet substantial enough to engage local communities across an entire continent in efforts to conserve nature and save species? Perhaps the new *Pocket Field Guide Series (Libretas de Campo)*, a collection of miniature field guides for the general public, can do just that. And the first *Pocket Field Guide* off the press—now making its way into the hands of coastal peoples around Latin America—is all about marine turtles.

Following the *Marine Turtle Pocket Field Guide* will be others focusing on a variety of flagship species groups such as parrots, guans, aquatic mammals, and even harlequin frogs and other lesser-known creatures. One hundred thousand copies of each *Pocket Field Guide* will be distributed throughout Latin America.

Each guide is divided into three parts. It begins with a comic-strip storyline involving a likeable, astute boy named Joaquín who travels to a different region of South America in each book, playing the role of investigator and environmental educator. The second part of the book is the field guide portion itself, with details on species identification, distribution, natural history, and conservation status. The final pages, titled "Noah's Ark," are designed to engage the user as a field scientist; forms are provided for listing species observed and for notes on "when," "where," and "how." Thanks to collaborative arrangements with postal systems across the continent, these notes can then be returned by mail free of charge, or they may be e-mailed, to become part of a growing online "Noah's Ark" database. For more information on this project and for electronic versions of the *Pocket Field Guide*, visit www.arcadenoeandes.org.

***José Vicente Rodríguez** is Unit Director of Biodiversity Science for Conservation International's Andean region and Vice Co-Chair for the IUCN Marine Turtle Specialist Group, South East Pacific Region.*

Baring the Truth for Turtles

Throughout Latin America and the world, aphrodisiacal properties are attributed to sea turtle products, especially turtle eggs. Such beliefs represent an enormous hazard, as they fuel egg harvest and illegal trade in sea turtle products.

To combat this, the famous Argentine model Dorismar donated her time and celebrity status to a creative new campaign to say, "My man doesn't need turtle eggs…because he knows they do not make him more potent." Launched in June 2005 by nonprofit groups WiLDCOAST (California, USA) and *Fondo de Educación Ambiental* (Environmental Education Fund, Mexico), the campaign is appearing on billboards, at bus stops, on television, in magazines throughout Mexico and the U.S.A., at North American concerts of famed Mexican band *Los Tigres del Norte*, and in all Mexican markets where the illegal trade takes place.

The advertisements have fueled public debate that has gained the attention of readers everywhere—including those of the *New York Times*, the *London Times*, Associated Press, and Reuters and of 103 other newspapers and magazines in eight languages and more than 130 global websites.

Private Tourism Takes Marine Conservation to the Public

A baby hawksbill takes it inaugural swim off a beach in front of a villa at the Banyan Tree Maldives Vabbinfaru.
© BANYAN TREE

At Banyan Tree Hotels and Resorts, every aspect of day-to-day operation is designed to help protect and preserve the planet. But this group of eco-properties has gone above and beyond its operations to develop a comprehensive marine conservation and education program—with a special emphasis on sea turtles at its Maldives and Seychelles resorts.

At the Banyan Tree Maldives Vabbinfaru and Angsana Ihuru resorts, a team of full-time marine biologists is hard at work building coral reefs, researching black-tip reef sharks *(Carcharhinus melanopterus)*, and monitoring sea turtles. The resorts' Marine Lab hosts semi-weekly marine biology classes for Banyan Tree guests, who are also invited to participate in nesting and monitoring studies of the hawksbill and green sea turtles that visit the resorts' shores.

Recognizing the importance of educating the local community on the value of marine conservation, Banyan Tree biologists conduct regular classes for local school children, giving them hands-on experiences at the Marine Lab and in sea turtle conservation activities. Reaching even beyond the local communities, an easy-to-read, illustrated children's book is distributed throughout the Maldives. It is a narrative told by a young green sea turtle about his history in the Banyan Tree Green Sea Turtle Head-Start Program, a program and facility currently in redevelopment after the December 2004 tsunami.

A sister resort, the Banyan Tree Seychelles, has joined hands with the Marine Conservation Society of Seychelles to implement a Turtle Nesting and Beach Dynamics Observation Program, a three-year study to monitor the impact of sand movement, hotel development, and resort activities on hawksbill nesting behavior, with a view toward developing beach management practices that minimize negative impacts and learning how to increase the number of successful hawksbill hatches.

Resort guests are encouraged to participate in this program as well, and support has been rallied from the local community with such creative outreach activities as a hawksbill drawing competition for children and a World Environment Day march in the country's capital, Victoria, to raise public support for turtle conservation in Seychelles.

Conservationists Say "Cheers" to this Company's Idea

Business executives may think it unfeasible for their companies to assist sea turtle or other wildlife conservation. But when creative, conservation-concerned minds went to work at the Portland Brewing Company in Portland, Oregon, U.S.A., the brewery came up with an innovative idea: a beer that generates funds and raises awareness for sea turtle conservation.

Sold throughout Hawaii, U.S.A., where locals and tourists recognize *honu* as the Hawaiian name for sea turtle, the brewery's Honu Beer has been a smash success since its introduction to the market in January 2004. A generous portion of each sale goes directly to the World Turtle Trust, a nonprofit organization based in Honolulu that aids sea turtle conservation and education projects across the globe.

© HONU BEER

SWoT Data Contributors

Guidelines for Data Use and Citation

The leatherback nesting data below correspond directly to this report's feature map (pp. 18–19), organized alphabetically by country and beach name. Every record with a point on the map is numbered to correspond with that point. These data have come from a wide variety of sources, and in many cases have not been previously published. Data may be used freely but must be cited to the original source as indicated in the "Data Source" field of each record. Only original data are reported here, not the converted values that were used to create the feature map. For more information on data conversions, see the article on page 17.

In the following records, nesting data are reported from the last complete nesting season in 2004 from all available beaches. For those beaches from which recent data were not available, the most recently available data are reported.

Important Notes on Data

Great effort has been made to provide sufficient information with each data record to allow the quality and source of the record to be fairly evaluated. While every attempt has been made to ensure the accuracy of these data, absolute accuracy cannot be guaranteed.

Definitions of Terms

Nesting activities. A count of the number of times leatherbacks were documented coming ashore during the monitoring period. This includes crawls and false crawls.

Nests. A count of the number of nests laid by leatherback females during the monitoring period. Not all nests contain eggs.

Nesting females. A count of observed nesting female leatherbacks during the monitoring period.

Tagged females. A number of nesting females tagged by researchers during the nesting season.

Crawl. A female leatherback's emergence onto the beach to nest. These counts may or may not include false crawls.

False crawl. An emergence onto the beach by a female leatherback that does not result in a nest.

Estimated nesting females. An estimate of the number of leatherback females nesting in a season. Methods of estimation vary.

Monitoring effort. The level of effort used to monitor nesting on a given beach.

Year. The year in which a given nesting season ended (e.g., data collected between late 2003 and early 2004 are listed as year 2004).

ANGOLA
Data Record 1

Data Source: Ron, T. 2006. Leatherback nesting in Angola: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beaches: Beaches along the coast of the Cabinda Province in the North to Baia Farta, Benguela Province in the south.
Comments: Several preliminary beach surveys and interviews with fishers in 2002 confirmed leatherback nesting on several beaches along the Angolan coast. Information is still very limited, yet there is good reason to believe that leatherback nesting may occur on most or all suitable beaches along the Angolan coast, with a southern distribution limit somewhere between Baia Farta and Equimina in Benguela Province.
SWoT Team Contact: Tamar Ron

ANGUILLA
Data Record 2

Data Source: Gumbs, J. 2006. Leatherback nesting in Anguilla: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beaches: Barnes Bay, Captain's Bay, Maunday's Bay, Rendezvous Bay, and Shoal Bay East
Year: 2004
Count: 1-10 estimated nesting females per beach per year
Comments: Leatherbacks are known to nest on these five beaches. There is no current monitoring, and estimations are based on past data.
SWoT Team Contact: James Gumbs

ARUBA
Data Record 3

Data Source: Turtugaraba. 2006. Leatherback nesting data from Eagle Beach, Dos Playa, and Boca Grandi, Aruba, 2004. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beaches: Eagle Beach, Dos Playa, and Boca Grandi
Year: 2004
Count: 6 nesting females, 37 nests
Monitoring Effort: 100%
SWoT Team Contact: Edith Van Der Wal

AUSTRALIA

Data Source: Limpus, C. J. 2006. Leatherback nesting in Australia: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Comments: The previously reliable nesting (at low density, 1–3 females per year in the late 1970s) for *Dermochelys coriacea* in Australia was on the southeast Queensland beaches of Wreck Rock and adjacent Rules Beach (fronting the Coral Sea, Pacific Ocean). Nesting numbers have declined on these and all other eastern Australian beaches, and not a single beaching of nesting *D. coriacea* has been recorded since February 1996.
SWoT Team Contact: Col Limpus

Data Record 4

Data Sources: 1) Limpus, C. J., and R. Chatto. 2004. Marine Turtles. In *Description of Key Species Groups in the Northern Planning Area*. National Oceans Office. Hobart, Australia; 2) Limpus, C. J. 2006. Leatherback nesting in Australia: Personal communication. In *The State of the World's Sea Turtles Report,* vol. 1 (2006).
Nesting Beaches: Beaches of Coburg Peninsula in Northern Arnhem Land
Comments: These beaches appear to have annual, low-density leatherback nesting. No rigorous surveys have been conducted in this area, and nesting density remains unquantified.
SWoT Team Contact: Col Limpus

BAHAMAS
Data Record 5

Data Source: De Ruyck, C. 2006. Leatherback nesting in the Bahamas. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Long Beach, Abaco Island
Year: 2004
Count: 2 nests
Comments: Data were collected during a six-day site visit (August 25–31, 2004), and there is no regular monitoring of this beach. The nest count should be considered a minimum.
SWoT Team Contact: Christopher De Ruyck

BANGLADESH
Data Record 6

Data Source: Islam, M. Z. 2002. Marine turtle nesting at St. Martin's Island, Bangladesh. *Marine Turtle Newsletter* 96: 19–22.
Nesting Beach: Shill Banyar Gula, St. Martin Island, Cox's Bazar District
Comments: In 2001, one leatherback nest was recorded at this beach. This is the only recent record of leatherback nesting in Bangladesh.
SWoT Team Contact: M. Zahirul Islam

BENIN
Data Record 7

Data Source: Dossou-Bodjrenou, J. S., and A. Tehou. 2002. The status of efforts to protect Atlantic sea turtles in Benin (West Africa). In *Proceedings of the Twentieth Annual Symposium on Sea Turtle Biology and Conservation: NOAA Technical Memorandum NMFS-SEFSC-477*, compilers A. Mosier, A. Foley, and B. Brost, 108–110. Miami: National Marine Fisheries Service.
Comments: Recent surveys have confirmed that leatherback nesting regularly occurs in many areas along the coast of Benin. Initial surveys (Dossou-Bodjrenou & Tehou 2002) suggest that the major nesting sites are at Hilla-Condji, Grand-Popo, Djegbadji, Togbin, and Sèmè.

BRAZIL
Data Record 8

Data Source: Projeto Tamar. 2006. Leatherback nesting in Brazil. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beaches: Comboios, Povoação, Pontal, Guriri (Espirito Santo Province)
Beach Length: 200 km
Year: 2004
Count: 68 nests
SWoT Team Contact: Maria A. Marcovaldi and Paolo Barata

BRITISH VIRGIN ISLANDS
Data Record 9

Data Source: Gore, S., Pickering, A., and G. Frett. 2006. Leatherback nesting in the British Virgin Isles. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).

Nesting Beach: Josiah's Bay, Tortola Island
Year: 2004
Count: 6 crawls

Nesting Beach: Lambert, Tortola Island
Year: 2004
Count: 11 crawls

Nesting Beach: Long Bay-Belmont, Tortola Island
Year: 2004
Count: 2 crawls

Nesting Beach: Rogues Bay, Tortola Island
Year: 2004
Count: 6 crawls

Nesting Beach: Trunk Bay, Tortola Island
Year: 2004
Count: 13 crawls
Comments: Counts include false crawls. 2004 data were not available from North Shore, Anegada, and Long Bay, Beef Island. In 2003, there were 2 crawls and 1 crawl recorded at these beaches, respectively.
SWoT Team Contact: Shannon Gore

CAMEROON

Data Record 10

Data Source: Angoni, H. 2004. Suivi et Conservation des Tortues Marines Dans l'U.T.O. Campo—Ma'an. Rapport Technique.
Nesting Beach: Beaches between Campo and Kribi, South Province
Comments: Leatherback nesting was documented on these beaches in 2004. Exact nest numbers were not available.

COLOMBIA

Data Record 11

Data Source: Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andréis (INVEMAR), and Ministerio del Medio Ambiente (MMA). 2003. *Distribución de playas de anidación actual y zonas de avistamiento en el caribe colombiano de las tortugas caguama (Caretta caretta), verde (Chelonia mydas), carey (Eretmochelys imbricata) y canal (Dermochelys coriacea).* Proyecto tortugas marinas del caribe colombiano.
Nesting Beach: Playa Acandíes, Playa Chilingos, Punta Arenas
Comments: Nesting data from 2004 data were not available. The most recent available data are from 2002, when roughly 10–100 leatherback females are estimated to have nested on each of the above beaches. This rough estimate is based on conversations with local residents.
SWoT Team Contact: Claudia Ceballos

Data Record 12

Data Source: Páez, V. 2006. Leatherback nesting in Colombia. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Playona
Beach Length: 12 km
Comments: Nesting data from 2004 were not available. In 2003, 178 nests were recorded here. Seventy percent of the nests are found in the first 1.2 kilometers of beach, and only 3 kilometers of the beach are monitored.
SWoT Team Contact: Vivian Páez

CONGO

Data Record 13

Data Source: 1) Sounguet, G. P., and C. Mbina. 2003. Turtle conservation in Gabon and Republic of Congo. In *Proceedings of the Twenty-Second Annual Symposium on Sea Turtle Biology and Conservation: NOAA Technical Memorandum NMFS-SEF-SC-503*, compiler J. A. Seminoff, 162. Miami: National Marine Fisheries Service; 2) Verhage, B., and E. B. Moundjim. 2005. Three years of marine turtle monitoring in the Gamba Complex of Protected Areas, Gabon, Central Africa, 2002–2005.
Nesting Beach: Conkouati National Park, Region de Kouilou
Comments: The nesting beach in Conkouati National Park is more than 30 km long and is contiguous with Mayumba in Gabon.

COSTA RICA

Data Source: Troëng, S., Chacón, D., and B. Dick. 2004. Possible decline in leatherback turtle *Dermochelys coriacea* nesting along Caribbean Central America. Oryx: 38(4): 395-403.
Comments: Recent aerial surveys (Troëng, et al. 2004) have found that leatherbacks nest on beaches along most of the Caribbean coast between southern Nicaragua and northern Panama (this includes all of Costa Rica). Only a few of these beaches have regular monitoring projects, and actual annual nesting numbers are unknown. Troëng et al. (2004) estimate that there are between 5,759 and 12,893 leatherback nests deposited per year on beaches between the San Juan River at the southern extent of Nicaragua and Chiriquí Beach in northern Panama. This includes the beaches of Tortuguero, Pacuare, and Gandoca in Costa Rica, and Chiriquí in Panama, at which regular monitoring efforts are currently established.

COURTESY OF THE LEATHERBACK TRUST

> "Sea turtles are wonderful creatures and an important natural and economic resource; global collaboration is undoubtedly key to their effective conservation. The survival of these species will depend upon the way humans respond to the threats that we have globally inflicted upon them."
>
> *—Rotney Piedra and Elizabeth Vélez, Las Baulas National Marine Park, Costa Rica*

Data Record 14

Data Source: Chacón, D., and J. M. Carvajal. 2004. Informe de la Anidación de Tortuga Baula *(Dermochelys coriacea)*, en el Parque Nacional Cahuita, Limón, Costa Rica. Temporada 2004. Proyecto para la conservación de Tortugas Marinas del Caribe Sur, Talamanca, Costa Rica.
Nesting Beach: Cahuita National Park, Limón Province
Year: 2004
Count: 14 nesting females
SWoT Team Contact: Didiher Chacón

Data Record 15

Data Source: Arauz, R., Pyle, A., and J. A. Serna. 2004. Conservation of leatherback sea turtles, *Dermochelys coriacea*, and monitoring of sea turtle nesting activity in Playa Caletas and Playa Pencal, Costa Rica from July 15, 2003 to April 15, 2004. PRETOMA, Costa Rica.
Nesting Beach: Caletas, Nicoya Peninsula
Beach Length: 5 km
Year: 2004
Count: 24 nests, 8 false crawls, 11 unconfirmed nesting activities
Monitoring Effort: Nightly patrols from July 15, 2003 to February 29, 2004
SWoT Team Contact: Randall Arauz and Andy Pyle

Data Record 16

Data Source: Silverman, R. 2006. Leatherback nesting on the Osa Peninsula, Costa Rica. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Carate/Río Oro, Osa Peninsula, Puntarenas Province
Year: 2004
Count: 13 nests, 2 nesting females
Monitoring Effort: Morning surveys and nightly patrols 75% of the time since June 2003
SWoT Team Contact: Rachel Silverman

Data Record 17

Data Source: Chacón, D., and J. M. Hancock. 2004. Anidación de la tortuga baula *Dermochelys coriacea* en Playa Gandoca, Talamanca, Costa Rica. Programa de Conservación de Tortugas Marinas del Caribe Sur, Talamanca, Costa Rica. Temporada 2004.
Nesting Beach: Gandoca (Gandoca-Manzanillo National Wildlife Refuge)
Beach Length: 11 km
Year: 2004
Count: 98 nesting females, 262 nests
Monitoring Effort: 150 survey days annually, from March to July
SWoT Team Contact: Didiher Chacón

Data Record 18

Data Source: Cháves, G., Morera, R., and J.R. Aviles. 2006. Leatherback nesting in the Ostional National Wildlife Refuge, Costa Rica. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Ostional and Nosara, Refugio Nacional de Vida Silvestre Ostional
Beach Length: 7 km
Year: 2004
Count: 59 nests
Monitoring Effort: 75-100%
SWoT Team Contact: Gerardo Cháves

Data Record 19

Data Source: Gutiérrez, I. A., and M. López. 2006. Leatherback nesting in Pacuare, Costa Rica. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Pacuare
Beach Length: 6 km
Year: 2004
Count: 264 tagged females, 550 nests, and 832 nesting activities
SWoT Team Contact: Iñaki Abella Gutiérrez

Data Record 20

Data Source: The Leatherback Trust. Las Baulas Conservation Project – Archive 2003-2004 Field Report. www.leatherback.org/pages/project/report/report0304.htm.
Nesting Beach: Playa Grande, Parque Nacional Marino Las Baulas, Guanacaste
Beach Length: 3.7 km
Year: 2004
Count: 159 nesting females
SWoT Team Contact: Jim Spotila and Frank Paladino

Data Record 21

Data Source: Piedra, R., and E. Vélez. 2004. Reporte de actividades de investigación y protección de la tortuga baula (*Dermochelys coriacea)* temporada de anidación 2003-2004 Playa Langosta. Unpublished manuscript, Proyecto de Conservación en Tortugas Marinas—Tortuga Baula, Parque Nacional Marino Las Baulas, Guanacaste, Costa Rica.
Nesting Beach: Playa Langosta, Parque Nacional Marino Las Baulas, Guanacaste
Beach Length: 1.3 km
Year: 2004
Count: 44 nesting females
Monitoring Effort: 100%
SWoT Team Contact: Rotney Piedra Chacón and Elizabeth Vélez Carballo

Data Record 22

Data Source: Arauz, R., López, E., Gaos, A., Yañez, I., Reyes, W., and S. Bejarano. 2004. Sea turtle conservation and research using coastal community organizations as the cornerstone of support. PRETOMA, Costa Rica.
Nesting Beach: San Miguel, Guanacaste
Comments: Leatherback nesting has not been documented at San Miguel since 2001. Previous leatherback nesting records include: 1 false crawl in 2001; 1 nest and 2 false crawls in 2000; and 2 nests in 1999.

Data Record 23

Data Source: Troëng, S., Harrison, E., and D. Evans. Forthcoming. Leatherback nesting trend and threats at Tortuguero, Costa Rica. *Chelonian Conservation and Biology.*
Nesting Beach: Tortuguero, Limón Province
Beach Length: 35.2 km
Year: 2004
Count: 503 nests
SWoT Team Contact: Sebastian Troëng

CÔTE D'IVOIRE

Data Record 24

Data Source: Gómez, J. 2006. Leatherback nesting in Côte d'Ivoire. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Abréby
Beach Length: 17 km
Year: 2004
Count: 2 nests

Nesting Beach: Addah
Beach Length: 19 km
Year: 2004
Count: 5 nests

Nesting Beach: Jacqueville
Beach Length: 26 km
Year: 2004
Count: 13 nests

Nesting Beach: Noumouzou
Beach Length: 19 km
Year: 2004
Count: 5 nests
Monitoring Effort: Surveyed from November 1, 2003 to January 31, 2004
SWoT Team Contact: José Gomez

COURTESY OF KETUT PUTRA

"Because sea turtles use such a wide range of habitats in their lifecycles—from beaches to seagrass beds, coral reefs, the ocean deeps, and beyond—we can use data collected on these species to help design marine and coastal conservation areas. In Indonesia, the turtle is part of our culture, and I am proud to have my turtle research used toward this purpose. In the coming years, SWoT will enable us to accomplish this not only in our own regions but on a global scale."

—Ketut Putra, Conservation International, Indonesia

CUBA
Data Record 25

Data Source: Moncada, F. 2006. Leatherback nesting in Cuba: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Cayo Campo, Arquipielago de los Canarreos
Comments: This is the only confirmed nesting site for leatherbacks in Cuba. In 2004, leatherback hatchlings were found on Cayo Campo, and on other occasions large tracks have been observed. The level of nesting is unknown because of lack of monitoring, but it is likely to be small or occasional. Leatherbacks sporadically nest in other areas of Cuba, though these are not considered regular nesting beaches for the species.
SWoT Team Contact: Felix Moncada

DOMINICA
Data Record 26

Data Source: 1) Byrne, R., and K. Eckert. 2004. *2003 Annual Report: Rosalie Sea Turtle Initiative (RoSTI).* Roseau, Dominica, West Indies: Prepared by WIDECAST for the Ministry of Agriculture and the Environment (Forestry, Wildlife and Parks Division); 2) Byrne, R. 2006. Leatherback nesting in Dominica. In *The State of the World's Sea Turtles Report,* vol. 1 (2006).
Nesting Beaches: Rosalie-Coffee and La Plaine-Bout Sable
Beach Length: 4 km
Year: 2004
Count: 22 tagged females, 40 nesting activities
Monitoring Effort: Surveys conducted from March 1 to October 1
Comments: Nearly 100% of nesting females were killed each year from 1998 to 2001 (19 to 27 females). On Marigot, Londonderry, Woodford Hill, Cabana, and Wesley beaches, females are still being killed.
SWoT Team Contact: Rowan Byrne

DOMINICAN REPUBLIC
Data Record 27

Data Source: 1) Dominici, G. 1996. Monitoreo de anidamiento de tortuga tinglar *(Dermochelys coriacea)* en playas del Parque Nacional Jaragua. In *Memorias del Segundo Congreso de la Biodiversidad Caribeña*. Santo Domingo, Republica Dominicana, Jan. 14–16, 1996; 2) León, Y. 2006. Leatherback nesting in the Dominican Republic: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beaches: Mosquea, San Luis, and Inglesa
Beach Length: 13 km
Comments: These beaches are not currently monitored but are known to host nesting leatherbacks (Y. Leon, pers. comm.). The most recent data are from 1995, when 24 crawls were documented (Dominici 1996).
SWoT Team Contact: Yolanda León

ECUADOR
Data Record 28

Data Source: Barragán, M. J. 2006. Leatherback nesting in Ecuador: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: San Lorenzo, Esmeraldas
Comments: There is one recent record of leatherback nesting in Ecuador, from San Lorenzo, Esmeraldas, in December 2000. This is considered an occasional nesting site that does not host a regular nesting population. Leatherback strandings are also recorded occasionally along the Ecuadorian coastline.
SWoT Team Contact: María José Barragán

EQUATORIAL GUINEA
Data Record 29

Data Source: Hearn, G. W., Rader, H., and J. L. Bradsby. 2006. Leatherback nesting in Bioko Island, Equatorial Guinea. In *The State of the World's Sea Turtles Report,* vol. 1 (2006).
Nesting Beach: "Beach A," Bioko Island
Beach Length: 1.78 km
Year: 2004
Count: 134 nests
Monitoring Effort: 199 survey days between September 2003 and May 2004

Nesting Beach: "Beach B," Bioko Island
Beach Length: 3 km
Year: 2004
Count: 157 nests
Monitoring Effort: 194 survey days between September 2003 and May 2004

Nesting Beach: "Beach C," Bioko Island
Beach Length: 3.34 km
Year: 2004
Count: 804 nests
Monitoring Effort: 223 survey days between September 2003 and May 2004

Nesting Beach: "Beach D," Bioko Island
Beach Length: 3.41 km
Year: 2004
Count: 748 nests
Monitoring Effort: 194 survey days between September 2003 and May 2004

Nesting Beach: "Beach E," Bioko Island
Beach Length: 4.10 km
Year: 2004
Count: 1,105 nests
Monitoring Effort: 198 survey days between September 2003 and May 2004
SWoT Team Contact: Gail Hearn

FRENCH GUIANA
Data Record 30

Data Source: Rivalan, P. 2004. La dynamique des populations de tortues luths de Guyane Français : Recherche des facteures impliques et applicatin a la mise en place de stratégies de conservation. PhD diss, Université de Paris XI Orsay.
Nesting Beach: Awa:la – Ya:lima:po
Beach Length: 3.6 km
Comments: Nesting data from the 2004 season were not available. The last available datum is 4,448 leatherback nests in 2003 (Rivalan 2004).

GABON
Data Record 31

Data Source: 1) Sounguet, G. P., Mbina, C., and A. Formia. 2004. Sea turtle research and conservation in Gabon by Aventures Sans Frontières, an organizational profile. *Marine Turtle Newsletter* 105:19–21; 2) Sounguet, G. P. 2006. Leatherback nesting in Gabon. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Bame, Mayumba National Park
Beach Length: 3.6 km
Year: 2004
Count: 1,648 nests, 32 false crawls
Monitoring Effort: Daily surveys from November 3, 2003 to February 27, 2004

Nesting Beach: Iguela, Loango National Park
Beach Length: 35 km
Comments: Leatherback nesting is known to occur here, though in lesser numbers than at Bame and Pongara (Sounguet, Mbina, & Formia 2004). Recent data were not available.

Nesting Beach: Nyafessa, Mayumba National Park
Beach Length: 10 km
Year: 2004
Count: 626 nests, 26 false crawls
Monitoring Effort: Daily surveys from November 3, 2003 to February 27, 2004

Nesting Beach: Pongara, Pongara National Park
Beach Length: 5 km
Year: 2004
Count: 17 false crawls, 258 nests.
Monitoring Effort: Daily surveys from November 17, 2003 to February 20, 2004
SWoT Team Contact: Guy-Philippe Sounguet

Data Record 32

Data Source: Verhage, B., and E. B. Moundjim. 2005. Three years of marine turtle monitoring in the Gamba Complex of Protected Areas, Gabon, Central Africa, 2002–2005.

Nesting Beach: Pont Dick, Gamba Complex
Beach Length: 5.75 km
Year: 2004
Count: 61 tagged females, 203 nests, 10 false crawls

Nesting Beach: Coastline roughly between Sette Cama and Gamba
Beach Length: 40 km
Comments: Verhage and Moundjim (2005) report that leatherback nesting was observed on several beaches along the coast in the Gamba Complex region. The Point Petrace area had higher observed nesting density than Sette Cama.

GHANA
Data Record 33

Data Source: 1) Adjei, R., Boakye, G., and S. Adu. 2001. Organisational profile: Ghana Wildlife Society. *Marine Turtle Newsletter* 93: 11–12; 2) Beyer, K., Ekau, W., and J. Blay. 2002. Sea turtle nesting and the effect of predation on the hatching success of the olive Ridley *(Lepidochelys olivacea)* on Old Ningo Beach, Ghana, West Africa. In *Proceedings of the Twentieth Annual Symposium on Sea Turtle Biology and Conservation: NOAA Technical Memorandum NMFS-SEFSC-477*, compilers A. Mosier, A. Foley, and B. Brost, 108-110. Miami: National Marine Fisheries Service.
Comments: Leatherbacks are known to nest along the coast of Ghana, though recent nesting data were not available. Low level leatherback nesting was observed during monitoring at Old Ningo Beach between September 2001 and February 2002 (Beyer, Ekau, & Blay 2002) and is likely to occur in other areas of the coast.

GRENADA
Data Record 34

Data Source: King, R. S., and C. B. Lloyd. 2006. Leatherback nesting in Grenada: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Bathway
Beach Length: 0.35 km
Year: 2004
Count: More than 100 nests

Nesting Beach: Levera
Beach length: 0.7 km
Year: 2004
Count: Between 200 and 600 nests
Monitoring Effort: Monitoring is conducted between March 1 and July 31 each year at both of the above beaches.
Comments: Exact nest numbers were not available for publication.
SWoT Team Contact: R. S. King and C. B. Lloyd, Ocean Spirits.

"In Jamursba Medi, we have significantly reduced poaching on sea turtle nesting beaches through an agreement with the community, and we have been active in the development of effectively managed marine protected areas in Indonesia. SWoT will benefit our conservation efforts by allowing us to evaluate our results not only at local and regional levels but also in a global context."

—Creusa "Tetha" Hitipeuw, WWF Indonesia

COURTESY OF RICHARD RICE

GUADELOUPE

Data Record 35

Data Source: Delcroix, E., DeProft, P., Saint-Auret, A., Dumont, R., and F. Guiougou. 2006. Leatherback nesting in Guadeloupe. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Cluny (Basse-Terre)
Beach Length: 0.7 km
Year: 2004
Count: 7 nests
Monitoring Effort: 20 survey days from April 1 to July 31, 2004

Nesting Beach: Grande-Anse (Les Saintes)
Beach Length: 0.9 km
Comments: Nesting data from 2004 were not available. In 2003, 4 leatherback nests were recorded during 80 survey days between April 1 and October 30.

Nesting Beach: Petite-Terre
Beach Length: 2.5 km
Year: 2004
Count: 1 nest
Monitoring Effort: 120 survey days from February 1 to November 30, 2004
SWoT Team Contact: Eric Delcroix

GUATEMALA

Data Record 36

Data Source: Muccio, C., ARCAS. 2006. Leatherback nesting in the Hawaii area of Guatemala. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beaches: El Cebollito, Hawaii, Las Mañanitas, El Rosario, and El Dormido (Monterrico - Hawaii)
Beach Length: 16 km
Comments: Nesting data from 2004 were not available. In 2003, 13 leatherback crawls were documented during daily crawl counts on 8 kilometers of beach between October 1 and December 31. Nesting continues in January but was not monitored.
SWoT Team Contact: Colum Muccio

Data Record 37

Data Source: Pérez, J., Gómez, R., Estrada, C., Bran, A., and C. Alfaro. 2006. Leatherback nesting in Guatemala: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beaches: Taxisco Beaches, Santa Rosa
Beach Length: 32 km
Comments: Nesting data from 2004 were not available. In 2003, 12 crawls and 2 nesting females were recorded during 11 days of monitoring between November 16 and December 31.
SWoT Team Contact: Jaime Pérez

GUYANA

Data Record 38

Data Source: Pritchard, P. C. H. 2006. Leatherback nesting in Guyana: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beaches: Luri, Almond, and Tiger Beaches (in the Northwest)
Year: 2004
Count: 552 nesting activities
Comments: Nesting was concentrated and monitored primarily on Luri Beach, as well as some on Almond Beach, and occasional spot checks on Tiger beach. Nesting counts should be considered a minimum, as monitoring is conducted at only a portion of the much larger nesting area (90 km long). Beaches shift annually, and each year monitoring is conducted on the areas that have the highest density nesting.
SWoT Team Contact: Peter Pritchard

INDIA

Data Record 39

Data Sources: 1) Andrews, H. V., Krishnan, S., and P. Biswas. 2002. Leatherback nesting in the Andaman & Nicobar Islands. *Kachhapa* 6: 15–18; 2) Andrews, H. V., and A. Tripathy. 2004. Tracing the migrations of Indian marine turtles towards an integrated and collaborative conservation programme: Andaman and Nicobar Archipelago, India. An Interim Report to the Convention on the Conservation of Migratory Species of Wild Animals and United Nations Environment Programme. Tamil Nadu, India: Madras Crocodile Bank Trust; 3) Andrews, H. V., Krishnan, S., and P. Biswas. Forthcoming. Distribution and status of marine turtles in the Andaman and Nicobar Islands. In *Marine Turtles of the Indian Subcontinent*, ed. K. Shanker and B. C. Choudhury, 33–57. Hyderabad, India: Universities Press.

Nicobar Island Group

Nesting Beach: Galathea Beach, southeast Great Nicobar Island
Year: 2004
Count: 574 nests, 1,030 nesting activities
Comments: Data are from Andrews and Tripathy (2004). Nesting began in late September 2003 and ended by the third week of April 2004. Many beaches in the Andaman and Nicobar Islands, including Galathea, were destroyed by the tsunami of December 2004 (K. Shanker, pers. comm.).

Nesting Beach: Beaches straddling the Alexandria and Dagmar Rivers on the west coast of Great Nicobar Island
Comments: Nesting data from 2004 were not available. This is a high-intensity leatherback nesting area: 1,228 nests were recorded in 2001 (Andrews, Krishnan, & Biswas 2002). Additional sparse leatherback nesting occurs on the west coast of Great Nicobar Island at Renhong, Rokoret, and Pulo Kunji (Andrews, Krishnan, & Biswas, Forthcoming).

COURTESY OF JOSÉ URTEAGA

"Sea turtles are a vital element of the socio-economic, cultural, and biological environment of numerous diverse communities. Mitigating the impact of human activities on sea turtle populations is paramount to turtles' survival, and effective conservation and understanding of these migratory species requires the combined efforts of many stakeholders throughout their geographic range."

—José Urteaga (center), Fauna & Flora International, Nicaragua

Nesting Beach: Beaches on the west coast of Teressa Island and West Bay and the northeastern coast of Katchal Island in the Middle Nicobar group
Comments: Nesting data from 2004 were not available from these sites, though they are known leatherback nesting beaches (Andrews, Krishnan, & Biswas 2002; Andrews, Krishnan, & Biswas, Forthcoming).

Nesting Beach: Beaches on Little Nicobar Island
Comments: The beaches on Little Nicobar Island are important leatherback nesting sites. These are mainly along the west coast of the island and include a beach north of Pulo Kiyang hamlet, two beaches south of Dahaya hamlet, Pulo Baha beach and the beach where Akupa hamlet is situated (Andrews, Krishnan, & Biswas, Forthcoming).

Andaman Island Group

Nesting Beach: Cuthbert Bay beach, Middle Andaman Island
Year: 2004
Count: 15 nests, 23 nesting activities
Comments: Data are from Andrews and Tripathy (2004).

Nesting Beach: Jahaji Beach, Rutland Island
Year: 2004
Count: 12 nests, 13 nesting activities
Comments: Data are from Andrews and Tripathy (2004). Nesting began in November 2003 and ended in February 2004.

Nesting Beach: Beaches of Little Andaman Island
Comments: Leatherback nesting has been confirmed at four beaches on Little Andaman Island, with high-intensity nesting occurring at South Bay and West Bay beaches, and sporadic nesting on two beaches on the northwestern side (Andrews, Krishnan, & Biswas 2002).
SWoT Team Contact: Harry Andrews and Kartik Shanker

INDONESIA

Data Record 40

Data Source: Hitipeuw, C., WWF Indonesia. 2006. Leatherback nesting in Papua, Indonesia: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Jamursba-Medi, Papua
Beach Length: 18 km
Comments: Nesting data from 2004 were not available. In 2003, 3601 leatherback nests were recorded by WWF Indonesia between March 1 and November 30
SWoT Team Contact: Creusa "Tetha" Hitipeuw

Data Record 41

Data Source: 1) Kinan, I., ed. 2005. *Proceedings of the Second Western Pacific Sea Turtle Cooperative Research and Management Workshop. Volume I: West Pacific Leatherback and Southwest Pacific Hawksbill Sea Turtles. 17–21 May 2004, Honolulu, HI.* Honolulu, HI, USA: Western Pacific Regional Fishery Management Council.; 2) Dutton, P.H., Hitipeuw, C., Zein, M., Petro, G., Pita, J., Rei, V., Ambio, L., Kisakao, K., Sengo, J., Bakarbessy, J., Mackay, K., Benson, S., Suganuma, H., Kinan, I., and C. Fahy. Forthcoming. Status and genetic structure of nesting stocks of leatherback turtles *(Dermochelys coriacea)* in the western Pacific. *Chelonian Conservation and Biology.*

Nesting Beach: Mubrani-Kaironi, Papua
Beach Length: 20 km
Comments: Identified by local residents as a leatherback nesting site with approximately 20–25 nesting females per year (Dutton et al. Forthcoming).

Nesting Beach: Raja Ampat Islands, Papua
Comments: No recent nesting data are available from the beaches in this island group. Leatherbacks are known to nest here, and it is estimated that more than 20 nests are deposited here each year (Kinan 2005; Dutton et al. Forthcoming).

Nesting Beach: Sidey-Wibain, Papua
Beach Length: 18
Comments: Identified by local residents as a leatherback nesting site with approximately 20-25 nesting females per year (Dutton et al. Forthcoming).

Nesting Beach: Yapen Island, Papua
Beach Length: 5 km
Comments: No recent nesting data are available from this site. Leatherbacks are known to nest here and it is estimated that more than 20 nests are deposited here each year (Kinan 2005; Dutton et al. Forthcoming).

Data Record 42

Data Source: 1) Anonymous. 2004. Laporan Tahunan TN Alas Purwo. *Annual Report of Alas Purwo National Park.* Banyuwangi, East Java, Indonesia: Alas Purwo National Park Office, Department of Forestry; 2) Putra, K. S. 2006. Leatherback nesting in Indonesia: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Ngagelan, Alas Purwo National Park, Banyuwangi Regency, East Java
Beach Length: 18.5 km
Year: 2004
Count: 14 nests
Monitoring Effort: Beaches are monitored all year.
SWoT Team Contact: Ketut Sarjana Putra

Data Record 43

Data Source: Thebu, J., and C. T. Hitipeuw. 2005. Leatherback conservation at Warmon beach, Papua-Indonesia: November 2003-October 2004. In Kinan 2005, 19-23.
Nesting Beach: Warmon, Papua
Beach Length: 4 km
Year: 2004
Count: 2,881 nests
Monitoring Effort: Daily and nightly beach patrols between November 2003 and September 2004
S**WoT Team Contact:** Creusa "Tetha" Hitipeuw

JAMAICA

Data Record 44

Data source: Donaldson, A., and R. Kerr. 2006. Leatherback nesting in Jamaica: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Comments: There have been very few reports of leatherback nesting in Jamaica: ten since 1851. The last three reports of leatherback nesting were near Rose Hall in St. James Parish.
SWoT Team Contact: Andrea Donaldson and Rhema Kerr

MALAYSIA

Data Record 45

Data Source: Turtle and Marine Ecosystem Center (TUMEC), Fisheries Department of Malaysia. 2006. Leatherback nesting in Malaysia. In *The State of the World's Sea Turtles Report,* vol. 1 (2006).
Nesting Beaches: Dungun beaches, Terengganu
Beach Length: 20 km
Year: 2004
Count: 5 nests
Monitoring Effort: Monitoring from May to September every year

Comments: Data are from several beaches located within the Rantau Abang Reserve in Terrenganu.
SWoT Team Contact: Eng-Heng Chan

MEXICO

Data Record 46

Data Source: 1) Barragán, A., Tavera, A., Ocampo, E., and A. Escudero. 2004. Informe final de investigación de las actividades de conservación desarrolladas en la playa de Cahuitán durante la temporada 2003–2004. In Sarti M., L., Barragán R., A. R., and J. A. Juárez C., 2004; 2) Gómez G., L., and L. Sarti. 2004. Protección y conservación de la tortuga laúd *(Dermochelys coriacea)* en Barra de la Cruz, Oaxaca, temporada 2003-2004: Informe final. CI-México, Kutzari, Asociación para el Estudio y Conservación de las Tortugas Marinas, A.C. In Sarti M., L., Barragán R., A. R., and J. A. Juárez C., 2004; 3) Huerta, P., and C. Machuca. 2004. Informe final de investigación de las actividades de conservación desarrolladas en la playa de Mexiquillo durante la temporada 2003–2004. In Sarti M., L., Barragán R., A. R., and J. A. Juárez C., 2004; 4) Sarti, L. 2004. *Situación actual de la tortuga laúd Dermochelys coriacea en el Pacífico Mexicano y medidas para su recuperación y conservación.* Publicación patrocinada por el WWF. Mexico: Secretaría del Medio Ambiente y Recursos Naturales; 5) Sarti M., L., Barragán R., A. R., and J. A. Juárez C, compilers. 2004. *Conservación y evaluación de la población de tortuga laúd Dermochelys coriacea en el Pacífico Mexicano, temporada de anidación 2003-2004.* DGVS-SEMARNAT-Kutzari, Asociación para el Estudio y Conservación de las Tortugas Marinas A. C; 6) Vargas S., F., Vasconcelos, D., Ángeles, M. A., and M. Licea. 2004. Informe final de investigación de las actividades de conservación desarrollados en la Playa de Tierra Colorada durante la temporada 2003-2004. In Sarti M., L., Barragán R., A. R., and J. A. Juárez C., 2004.
Nesting Beaches: Barra de la Cruz, Oaxaca; Cahuitán, Oaxaca; Playa Mexiquillo, Michoacán; and Tierra Colorada, Guerrero
Comments: These are the largest leatherback nesting areas in Pacific Mexico and among the largest in the American Pacific. Recent data could not be published at this time. However, the map in this report displays 2004 data and can be used to approximate the relative importance of these nesting sites. Data for mapping were obtained from their respective sources, which are listed above.
SWoT Team Contact: Laura Sarti

Data Record 47

Data Source: Trejos, J. A., and E. Carretero. 2006. Leatherback nesting in Mexico. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Playa del Coco, Bahia Navidad, Municipio de Cihuatlan, Jalisco
Beach Length: 12 km
Year: 2004
Count: 0 nests
Comments: In 2003, beach monitoring effort was approximately 30% and 60 nests were recorded, of which all but 16 were poached.

Nesting Beach: Santuario Playón de Mismaloya, Campamento La Gloria, Jalisco
Beach length: 28 km
Year: 2004
Count: 0 nests
Monitoring Effort: Beach was patrolled three times per day from June to January.
Comments: In 2003, 45 leatherback nests were documented, of which all but 14 were poached.
SWoT Team Contact: José Antonio Trejo Robles

Data Record 47a

Data Source: González, E., and R. Pinal. 2004. *Informe final del programa de investigación y protección de la tortuga marina, y educación ambiental en el estado de Baja California Sur.* Temporada 2003-2004: ASUPMATOMA, A.C.
Nesting Beach: Beaches between Todos Santos and Agua Blanca, Baja California Sur
Beach Length: 46 km
Year: 2004
Count: 16 nests, 29 crawls, 3 nesting females
Monitoring Effort: 30 kilometers of beach patrolled three times per night from early November to mid-February, with some additional monitoring until March.
SWoT Team Contact: Elizabeth González

NETHERLANDS ANTILLES

Data Record 48

Data Source: Caballero, A. 2006. Leatherback nesting in St. Maarten, Netherlands Antilles: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Guana and Simpson Bay, St. Maarten
Year: 2004
Count: 7 nesting females

COURTESY OF RONEL NEL

Monitoring Effort: There is no regular beach monitoring, and females are generally reported by tourists or volunteers.
SWoT Team Contact: Andy Caballero

Data Record 49

Data Source: Le scao, R., and N. Esteban. 2003. *2003 Annual Report: St. Eustatius Sea Turtle Monitoring Programme.* Prepared for St. Eustatius National Parks Foundation (STENAPA).
Nesting Beaches: Beaches from Zeelandia to Smith's Gut, St. Eustatius
Beach Length: 1 km
Comments: Nesting data from 2004 were not available. In 2003, 10 leatherback nests were documented during regular beach monitoring from April 14 to May 2 and from June 23 to August 23.
SWoT Team Contact: Rozenn Le scao

NICARAGUA

Data Record 50

Data Source: 1) Chacón-Chaverrí, D. 2004. Synopsis of the leatherback turtle *(Dermochelys coriacea).* Document INF-16-04, Inter-American Convention for the Protection and Conservation of Sea Turtles; 2) Lagueux, C., and C. Campbell. 2006. Leatherback nesting in Nicaragua: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Playa Cocal
Comments: This beach is located on the Caribbean coast near the Costa Rican border and receives approximately 100-150 leatherback nests per year (Chacón-Cheverri 2004). It is considered the only leatherback nesting site in Caribbean Nicaragua.
SWoT Team Contact: Cynthia Lagueux and Cathi Campbell

Data Record 51

Data Source: Urteaga, J. R. 2004. *Conservación de tortugas tora, Dermochelys coriacea, en el Refugio de Vida Silvestre Río Escalante–Chacocente: Temporada 2003–2004, informe anual.* Nicaragua: Fauna and Flora International.
Nesting Beach: Beach between Río Acayo and el Mogote, Rio Escalante–Chacocente Wildlife Refuge
Beach length: 3.2 km
Year: 2004
Count: 74 nests 3 false crawls
Survey effort: Daily monitoring for 151 days from October 2003 to March 2004

Nesting Beach: Tecomapa, Carazo
Year: 2004
Count: 11 nests
Comments: Leatherback nests were reported by local residents.

Nesting Beach: Playa La Flor, Rivas
Year: 2004
Count: 3 nests
Comments: Leatherback nests were reported by local residents.

Nesting Beach: Playa El Coco
Year: 2004
Count: 3 nests
Comments: Leatherback nests were reported by local residents.
Data Source: G. Cáceres, personal communication, in Urteaga 2004.
Nesting Beach: Isla Juan Venado, León
Year: 2004
Count: 29 nests
SWoT Team Contact: José Urteaga

PANAMA

Data Record 52

Data Source: Ordoñez, C. 2006. Leatherback nesting in Panama: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Beaches on Bastimentos Island, Comarca San Blas

"I believe that no one who has the opportunity to study sea turtles can walk away from these amazing creatures. They grab your attention, draw you in, and pull you through a window into natural history in a way that few other living beings can do. The further we are pulled through that window, the better we comprehend their significance to entire ecosystems and the process of evolution as a whole."
—Dr. Ronel Nel,
Ezemvelo KwaZulu-Natal Wildlife, South Africa

Comments: Nesting data from 2004 were not available from this beach. In 2003, 236 leatherback nests were recorded during daily surveys from March 1 to July 31.
SWoT Team Contact: Cristina Ordoñez

Data Record 53

Data Source: Troëng, S., Chacón, D., and B. Dick. 2004. Possible decline in leatherback turtle *Dermochelys coriacea* nesting along Caribbean Central America. *Oryx:* 38(4): 395-403.
Nesting Beaches: Bluff, Colon Island, Flores, Larga (Colon Island), Primera, San San (Bastimentos Island), Sixaola River to San San, and Soropta
Comments: During recent aerial surveys by Troeng et al. (2004) evidence of leatherback nesting was documented on all of these beaches along the Caribbean coast of Panama. For more information see data record from the same source, listed under Costa Rica.

Data Record 54

Data Source: Ordoñez, C., Troëng, S., Meylan, A., Meylan, P., and A. Ruiz. Forthcoming. Chiriquí Beach, Panama, the most important leatherback nesting beach in Central America. *Chelonian Conservation and Biology.*
Nesting Beach: Chiriquí, Bocas del Toro Province
Beach Length: 24 km
Year: 2004
Count: 3,083 nests
Monitoring Effort: Daily beach monitoring between June 1 and November 30, 2004

PAPUA NEW GUINEA

Data Record 55

Data Source: 1) Kinan, I., ed. 2005. *Proceedings of the Second Western Pacific Sea Turtle Cooperative Research and Management Workshop. Volume I: West Pacific Leatherback and Southwest Pacific Hawksbill Sea Turtles.* 17–21 May 2004, Honolulu, HI. Honolulu, HI, USA: Western Pacific Regional Fishery Management Council.; 2) Dutton, P.H., Hitipeuw, C., Zein, M., Petro, G., Pita, J., Rei, V., Ambio, L., Kisakao, K., Sengo, J., Bakarbessy, J., Mackay, K., Benson, S., Suganuma, H., Kinan, I., and C. Fahy. Forthcoming. Status and genetic structure of nesting stocks of leatherback turtles *(Dermochelys coriacea)* in the western Pacific. *Chelonian Conservation and Biology.*

Nesting Beach: Bouganville
Beach Length: 5 km
Comments: There is no monitoring at this site and recent data were not available. However, locals confirm that leatherback nesting currently occurs here. The last available data are from 1990, when 10 leatherback nests were documented (Dutton et al. Forthcoming).

Nesting Beach: Fulleborn
Beach Length: 7.5 km
Comments: There is no monitoring at this site and recent data were not available. Dutton et al. (Forthcoming) documented a minimum of 26 leatherback nests during a one-day aerial survey in 2004.

Nesting Beach: Korapun
Beach Length: 3.25 km
Comments: There is no monitoring at this site and recent data were not available. Dutton et al. (Forthcoming) documented a minimum of 14 leatherback nests during a one-day aerial survey in 2004.

Nesting Beach: Maus Buang, Huon Peninsula (between Buan and Buasi Rivers)
Beach Length: 5.5 km
Comments: There is no monitoring at this site and recent data were not available. Dutton et al. (Forthcoming) documented a minimum of 104 leatherback crawls during a one-day aerial survey in 2004.
Nesting Beach: Salus

Beach Length: 4.57 km
Comments: There is no monitoring at this site, and recent data were not available. Dutton et al. (Forthcoming) documented a minimum of 19 leatherback nests during a one-day aerial survey in 2004.
SWoT Team Contact: Peter Dutton

Data Record 56

Data Source: Kisokau, K. M., and L. Ambio. 2005. The community-based conservation and monitoring of leatherback turtles *(Dermochelys coriacea)* at Kamiali Wlidlife Management Area, Morobe Province, Papua New Guinea. In Kinan, 2005, 51-58.
Nesting Beach: Kamiali Wildlife Management Area, Lababia village, Morobe Province
Beach Length: 11 km
Year: 2004
Count: 71 nesting females
Monitoring Effort: The nesting beach is approximately 11 kilometers long, and only 2 kilometers are monitored. Nightly surveys were conducted between November 2003 and February 2004.
SWoT Team Contact: Rodney J. Galama

PUERTO RICO

Data Record 57

Data Source: Puerto Rico Department of Natural and Environmental Resources (DNER). 2004. Internal report. Status of marine turtle nesting beach productivity in Puerto Rico. 3 pp.
Nesting Beach: Culebra
Beach Length: 15 km
Year: 2004
Count: 100-400 estimated nests
Monitoring Effort: Daily nest counts and occasional night patrols

Data Record 58

Data Source: Horta, H. 2004. Internal report to DNER. Leatherback nesting surveys, 2004. Puerto Rico Natural Resources Department (DRNA).
Nesting Beach: Fajardo
Beach Length: 22 km
Year: 2004
Count: 100-400 estimated nests
Monitoring Effort: Daily nest counts and occasional night patrols

Data Record 59

Data Source: Montero, L. 2004. Internal report to DNER. Leatherback nesting at Humacao, 2004. DNER.
Nesting Beach: Humacao
Beach Length: 15 km
Year: 2004
Count: 30-200 estimated nests
Monitoring Effort: Daily nest counts and occasional night patrols

Data Record 60

Data Source: Justiniano, M. 2004. Internal report to DNER. Leatherback nesting surveys. 2004. DRNA.
Nesting Beach: Mayaguez
Beach Length: 40 km
Year: 2004
Count: 10-30 nests
Monitoring Effort: Daily nests counts and occasional night patrols.
SWoT Team Contact: Carlos Díez and Hector Horta

SAINT LUCIA

Data Record 61

Data Source: St. Lucia Department of Fisheries. 2006. Preliminary sea turtle figures for Grande Anse Beach, Saint Lucia. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Grande Anse Beach
Beach Length: 1.3 km
Year: 2004
Count: 53 nesting activities, 31 nesting females
SWoT Team Contact: Dawn Pierre-Nathoniel

SAINT KITTS

Data Record 62

Data Source: Stewart, K., St. Kitts Sea Turtle Monitoring Network. 2006. Leatherback nesting in St. Kitts. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Beaches from Cayon to Keys
Beach Length: 8 km
Year: 2004
Count: 141 crawls
Monitoring Effort: Three kilometers are monitored three mornings per week from March to September.
SWoT Team Contact: Kimberly Stewart

Data Record 63

Data Source: Svendson, B., and K. Stewart, St. Kitts Sea Turtle Monitoring Network. 2006. Leatherback nesting in St. Kitts. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: North Friars
Beach Length: 0.6 km
Year: 2004
Count: 13 crawls
Monitoring Effort: Six hundred meters of beach are monitored three mornings per week and every night from March to September.
SWoT Team Contact: Barry Svendson and Kimberly Stewart

SIERRA LEONE

Data Record 64

Data Source: Aruna, E. 2006. Leatherback nesting in Sierra Leone: Personal communication. In T*he State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Hamilton Beach, Western Area
Beach Length: 1.36 km
Comments: No monitoring is currently taking place on this beach, yet leatherbacks are known to nest here and are often captured and killed by locals and sand-miners while nesting (E. Aruna, pers. comm.).
SWoT Team Contact: Edward Aruna

SOLOMON ISLANDS

Data Record 65

Data Source: 1) Kinan, I., ed. 2005. *Proceedings of the Second Western Pacific Sea Turtle Cooperative Research and Management Workshop. Volume I: West Pacific Leatherback and Southwest Pacific Hawksbill Sea Turtles. 17-21 May 2004, Honolulu, HI.* Honolulu, HI, USA: Western Pacific Regional Fishery Management Council.; 2) Dutton, P.H., Hitipeuw, C., Zein, M., Petro, G., Pita, J., Rei, V., Ambio, L., Kisakao, K., Sengo, J., Bakarbessy, J., Mackay, K., Benson, S., Suganuma, H., Kinan, I., and C. Fahy. Forthcoming. Status and genetic structure of nesting stocks of leatherback turtles *(Dermochelys coriacea)* in the western Pacific. *Chelonian Conservation and Biology.*
Nesting Beach: Baniata, Rendova Island, Western Province
Beach Length: 2-3 km
Comments: This is the longest nesting beach in the Solomon Islands. Leatherback nesting is monitored by local villagers who reported 65 crawls in the last complete season as of May 2004.

Nesting Beach: Havila, Rendova Island, Western Province
Beach Length: 2-3 km
Comments: Leatherback nesting is monitored by local villagers who reported 38 crawls in the last complete season as of May 2004.

Nesting Beach: Katova Bay, Santa Isabel Island (East Coast)
Comments: There is currently no monitoring at this beach. The most recent available reports (from 1980 and 1989) indicate that approximately 20-30 leatherback nests were deposited here each year.
Nesting Beach: Lilika, Santa Isabel Island
Comments: There is currently no monitoring at this beach, and nesting intensity is thought to be around 150 nests per year.

Nesting Beach: Litogahira, Santa Isabel Island
Beach Length: 1.5 km
Comments: There has been minimal incomplete monitoring at this beach and leatherback nesting is thought to exceed 150 nests per year.

Nesting Beach: Quero, Tetapara Island, Western Province
Beach length: 2 km
Comments: Leatherback nesting is monitored by rangers, who reported 20 nests in the last complete season as of May 2004.

Nesting Beach: Rakata Bay, Santa Isabel Island
Comments: There is currently no monitoring at this beach. The most recent available reports (from 1980 and 1989) indicate that approximately more than 20 leatherback nests were deposited here each year.

Nesting Beach: Salona, Santa Isabel Island
Comments: There is currently no monitoring at this beach, though nesting intensity is thought to be around 150 nests per year.

Nesting Beach: Sasakalo, Santa Isabel Island
Beach Length: Approx. 1 km.
Comments: The most recent available data are from 2001 when 27 nesting leatherbacks were tagged at this beach. Nesting intensity is thought to be greater than 150 nests per year this beach.

Nesting Beach: Vachu River, Choiseul Island
Beach length: 2 km
Comments: There is currently no monitoring at this beach. The most recent available reports (from 1980, 1989 and 1990) indicate that approximately 50 leatherback nests are deposited here each year.

SOUTH AFRICA

Data Record 66

Data Source: Nel, R. 2006. Leatherback nesting in South Africa: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Northern KwaZulu-Natal, Maputaland (in the Greater St. Lucia Wetland Park)
Beach Length: 200 km
Year: 2004
Count: 112 nests, 49 tagged females
Monitoring Effort: Fifty-six kilometers of the beach were consistently monitored during nightly patrols throughout the nesting season (October 15, 2003, to March 15, 2004).
Comments: The main nesting beaches are in the 56 km between Mabibi and Ponto do Ouro. Since the 1983-84 season an additional 93 kilometers of beach are patrolled, but irregularly. The data presented here are for the 56 kilometers survey area.
SWoT Team Contact: Ronel Nel

SRI LANKA

Data Record 67

Data Source: 1) Ekanayake, E. M. L., Kapurusinghe, T., Saman, M. M., and M. G. C. Premakumara. 2002a. Estimation of the number of leatherback *(Dermochelys coriacea)* nesting at the Godavaya turtle rookery in southern Sri Lanka during the nesting season in the year 2001. *Kachhapa* 6: 13-14; 2) Ekanayake E. M. L., Ranawana, K. B., Kapurusinghe, T., Premakumara, M. G. C., and M. M. Saman. 2002b. Marine turtle conservation in Rekawa turtle rookery In southern Sri Lanka. *Ceylon Journal of Science (Biological Science)* 30: 79-88; 3) The Turtle Conservation Project. Turtle nesting beaches in Sri Lanka. www.tcpsrilanka.org/download/Map.pdf.
Nesting Beaches: Benthota, Bundala National Park, Godavaya, and Rekawa
Comments: Leatherbacks are known to nest on many beaches throughout the southern coast of Sri Lanka. The most recent available data are from the beaches of Godavaya and Rekawa. In 2001, there were 70 leatherback nests recorded at Godavaya during 32 survey days between March 21and November 30 (Ekanayake et al. 2002a). In 2000, 12 nests were documented at Rekawa during 205 survey days between January 1 and July 23 (Ekanayake et al. 2002b). Although current data were unavailable, current nesting was also confirmed at Bundala National Park, where regular monitoring is conducted by Park authorities (Lakshman, pers comm.)

SURINAME

Data Record 68

Data Source: Hilterman, M. L., and E. Goverse. 2005. Annual Report on the 2004 Leatherback Turtle Research and Monitoring Project in Suriname. World Wildlife Fund – Guianas Forests and Environmental Conservation Project (WWF-GFECP) Technical Report of the Netherlands Committee for IUCN (NC-IUCN), Amsterdam, the Netherlands.
Nesting Beach: Babunsanti, Galibi Nature Reserve
Beach Length: 6 km
Year: 2004
Count: >2,300 estimated nests
Comments: See comments at the end of this record.

COURTESY OF KIMBERLY STEWART

"SWoT provides a unique, exciting opportunity for small conservation programs such as St. Kitts Sea Turtle Network to have a global impact. Humans have ravaged sea turtles' oceans and nesting beaches, and only through worldwide cooperation can we rectify this situation."

—Kimberly Stewart, St. Kitts Sea Turtle Network, St. Kitts

Nesting Beach: Diana Beach
Comments: Nesting data from this beach were not available for the 2004 season. However, Hilterman and Goverse (2005) report that this beach has minor green turtle, leatherback, and olive Ridley nesting.

Nesting Beach: Kolukumbo/Marie
Beach Length: 9 km
Year: 2004
Count: >850 estimated nests
Comments: These are combined data for Kolukumbo and Marie beaches. During the 2004 season, these beaches were only visited two or three times at the beginning and end of the nesting season, not during the peak, so their real status in 2004 is unknown.

Nesting Beach: Matapica
Beach Length: 9 km
Year: 2004
Count: >3,000 estimated nests
Comments: See comments at the end of this record.

Nesting Beach: Samsambo
Beach Length: 8 km
Year: 2004
Count: >450 estimated nests
Comments: Because this beach was monitored by STINASU for only a short period at the beginning of the season, the real status of this beach in 2004 is unknown.

Nesting Beach: Thomas-Eilanti
Beach Length: 9 km
Year: 2004
Count: >2,300 estimated nests
Comments: Nest numbers for the beaches listed above should be considered minimum values based on rough estimates. These estimates are based on PIT tag data (number of new tags + old tags + observed missed nestings per night; false crawls excluded) and rough estimates for beaches / sections that were very irregularly or not at all monitored (Hilterman & Goverse 2005).
SWoT Team Contact: Maartje Hilterman and Edo Goverse

TOGO

Data Record 69

Data Source: Segniagbeto, G. H. 2006. Leatherback nesting in Togo: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beaches: Agbodrafo, Prefecture d'Aneho; Gbétsogbé, Prefecture de Lome; Kodjoviakope, Prefecture de Lome; Kotokoucondji, Prefecture de Lome; N'Lessi; and Palm Beach
Comments: The most recent available nesting data are from 2003, when the following numbers of nesting females were documented during patrols by eco-guards: Agbodrafo, 19; Gbétsogbé, 1; Kodjoviakope, 4; Kotokoucondli, 1; N'Lessi, 7; Palm Beach, 1.
SWoT Team Contact: Gabriel H. Segniagbeto

TRINIDAD AND TOBAGO

Data Record 70

Data Source: Chacón-Chaverrí, D. 2004. Synopsis of the leatherback turtle *(Dermochelys coriacea)*. Document INF-16-04, Inter-American Convention for the Protection and Conservation of Sea Turtles.
Nesting Beach: Grand Riviere, Trinidad (North coast)
Nesting Beach: Matura, Trinidad (East coast)
Comments: Trinidad and Tobago host significant leatherback nesting populations at these two principal beaches. The number of females nesting annually is estimated between 800 and 1,000. Data from 2004 were not available.

UNITED STATES OF AMERICA

Data Record 71

Data Source: Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Marine Turtle Program. Leatherback Nesting in Florida. http://research.myfwc.com/features/view_article.asp?id=2479.
Nesting Beach: Beaches of Northeast Florida
Year: 2004
Count: 4 nests
Beach Length: 222.8 km patrolled
Comments: Nesting data are combined from five counties in Northeast Florida: Volusia, Flagler, St. Johns, Duval, and Nassau.

Nesting Beach: Beaches of Northwest Florida
Year: 2004
Count: 0 nests
Beach Length: 219 km patrolled
Comments: Nesting data are combined from seven counties in Northwest Florida: Escambia, Santa Rosa, Okaloosa, Walton, Bay, Franklin, and Gulf.

Nesting Beach: Beaches of Southeast Florida
Year: 2004
Count: 466 nests
Beach Length: 347.8 km patrolled
Comments: Nesting data are combined from seven counties in Southeast Florida: Miami Dade, Broward, Palm Beach, Martin, St. Lucie, Indian River, and Brevard.

Nesting Beach: Beaches of Southwest Florida
Year: 2004
Count: 3 nests
Beach Length: 106.3 km patrolled
Comments: Nesting data are combined from eight counties in Southwest Florida: Hillsborough, Pinellas, Manatee, Sarasota, Charlotte, Lee, Collier, and Monroe.
SWoT Team Contact: Blair Witherington

Data Record 72

Data Source: Godfrey, M., North Carolina Wildlife Resources Commission. 2006. Leatherback nesting in North Carolina: Personal communication. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Cape Lookout National Seashore, North Carolina
Year: 2004
Count: 4 nests
SWoT Team Contact: Matthew Godfrey
Data Sources: 1) Frick, M. G., Williams, K. L., and D. C. Veljacic. 2002. A record of the northernmost verified leatherback sea turtle nesting event on the East coast of the USA. *Marine Turtle Newsletter* 97: 12-13.; 2) Rabón, D., Johnson, S. A., Boettcher, R., Dodd, M., Lyons, M., Murphy, S., Ramsey, S., Roff, S., and K. Stewart. 2003. Confirmed leatherback *(Dermochelys coriacea)* turtle nests from North Carolina, with a summary of leatherback nesting activities north of Florida. *Marine Turtle Newsletter* 101: 4-8.
Comments: Though irregular and scattered, leatherback nesting has been documented (North of Florida) on the East coast of the U.S. In Georgia in 2001, there were 2 nests recorded on Cumberland Island, and 1 nesting female on Wassau Island (Frick, Williams, and Veljacic 2002). In 2002, 3 leatherback nests were recorded in North Carolina at Cape Hatteras National Seashore, as well as 1 nesting female at Cape Island, South Carolina in 2001, and 1 nesting female in 2000 at Huntington Beach State Park, South Carolina (Rabón et al. 2003).

UNITED STATES VIRGIN ISLANDS

Data Record 73

Data Source: Buck Island Sea Turtle Research Program, National Park Service. 2006. Leatherback nesting at Buck Island Reef National Monument, St. Croix, U.S. Virgin Islands. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Buck Island Reef National Monument, St. Croix
Beach Length: 1.5 km
Year: 2004
Count: 9 nests, 3 suspected nests, 1 false crawl
Monitoring Effort: Nesting activity is documented during daily beach walks by the park staff all year.
SWoT Team Contact: Kimberly Woody and Zandy Hillis-Starr

Data Record 74

Data Source: Alexander, J., Garret, K., Conrad, J., and W. Coles. 2004. *Tagging and Nesting Research on Leatherback Sea Turtles (Dermochelys coriacea) on Sandy Point, St. Croix, U.S. Virgin Islands, 2004.* Annual Report to Fish and Wildlife Service.
Nesting Beach: Sandy Point, St. Croix
Beach Length: 3 km
Year: 2004
Count: 100 nesting females, 444 nests, 705 nesting activities
SWoT Team Contact: William Coles

VANUATU

Data Record 75

Data Source: 1) Kinan, I., ed. 2005. *Proceedings of the Second Western Pacific Sea Turtle Cooperative Research and Management Workshop. Volume I: West Pacific Leatherback and Southwest Pacific Hawksbill Sea Turtles. 17-21 May 2004, Honolulu, HI.* Honolulu, HI, USA: Western Pacific Regional Fishery Management Council; 2) Petro, G., Hickey, F., and K. Mackay. 2005. Leatherback Turtles in Vanuatu. In Kinan, 2005, 73-77.; 3) Petro, G., Hickey, F. R., and K. Mackay. Forthcoming. Leatherback turtles in Vanuatu. *Chelonian Conservation and Biology.*
Nesting Beach: Big Bay, Epi Island (Northeast coast)
Comments: Epi Island appears to receive the largest number of leatherback nests in Vanuatu and has two nesting areas. The Southwest coast probably has 20-30 nesting females annually. A smaller number appear to nest on the East coast around Big Bay (Kinan 2005; Petro, Hickey, & Mackay 2005).

Nesting Beach: Southern Pentecost Island
Comments: In 2000, one nesting leatherback from the south of the island was reported eaten.

Nesting Beach: Beaches on Malakula Island
Comments: A few nests are reported from a number of beaches right around the island. Five leatherbacks have been reported eaten or killed here in the past seven years. Malakula appears to receive the greatest number of nests after Epi Island.

Nesting Beach: Mele Bay, Efate Island
Comments: Reports of leatherback nesting (two in 1997–98, three in 1999–2000, and one in 2003) are mainly confined to the black sand area of Mele Bay, north of Port Vila. There has also been one confirmed report from Teouma, south of Port Vila.

Nesting Beach: Southern Ambrym Island
Comments: In January 2003 one nesting female was tagged in the area of Port Vato. There are a number of potential nesting beaches along the western side of the island from Lalinda to Maranata, though they have not been well surveyed. The northern beaches in the Ranon area are also occasionally said to receive nesting leatherbacks.

Nesting Beach: Votlo, Epi Island (Southeast coast)
Beach Length: 4 km
Year: 2004
Count: 31 nests, 5 false crawls
Comments: Monitoring between November 2003 and February 2004
SWoT Team Contact: Kenneth Mackay

VENEZUELA

Data Record 76

Data Source: PROVITA. 2006. Leatherback nesting in Venezuela. In *The State of the World's Sea Turtles Report*, vol. 1 (2006).
Nesting Beach: Beaches of the Costa Barloventena, Miranda State
Year: 2004
Count: 20 nests
Survey effort: 150 survey days from March to August
Comments: These data are combined from eight beaches along this stretch of coast. These are (with their respective number of nests in 2004): Boca Aricagua (2), Chirere (2), El Banquito (8), Los Pilones (1), Maspana (3), Playa Grande (2), Portugués (1) and Sale (1). The primary nesting beach is El Banquito. Two
additional beaches, La Trinidad and Las Majaguitas, each received 1 nest in 2003.
SWoT Team Contact: Alfredo Arteaga

Data Record 77

Data Source: Hernández, R., Buitrago, J., and H. Guada. 2006. Leatherback nesting in Venezuela: Personal communication. In *The State of the World's Sea Turtles Report,* vol. 1 (2006).
Nesting Beach: Playa Parguito, Isla Margarita
Beach length: 1.6 km
Comments: Recent nesting data were not available. In 2001, there were an estimated 30-46 nesting females, according to surveys from March 1 to September 30.
SWoT Team Contact: Ricardo Hernández

Data Record 78

Data Source: 1) Guada, H. J., ed. 2004. Status of the Leatherback Turtle in Venezuela: National Analysis. CICTMAR-WIDECAST; 2) Rondón, M. A., Hernández, R. S., and H. J. Guada. 2004. Research and conservation of sea turtles in the Paria Peninsula, Venezuela: Results of the 2003 nesting season. Poster presented in the 24th Annual Sea Turtle Symposium, San José, Costa Rica.
Nesting Beach: Cipara, Peninsula de Paria, Sucre State
Beach length: 1.6 km
Year: 2004
Count: 117 nests, 50 tagged females

Nesting Beach: El Banquito, Miranda State
Beach length: 1.6 km
Year: 2004
Count: 29 nests

Nesting Beach: Querepare, Peninsula de Paria, Sucre State
Beach length: 1.24 km
Year: 2004
Count: 101 nests, 37 tagged females
SWoT Team Contact: Hedelvy Guada

The SWoT Team

A Partnership With a Common Vision

SWoT is a partnership of Duke University's Marine Geospatial Ecology Laboratory, Conservation International (CI), the International Sea Turtle Society, the IUCN Marine Turtle Specialist Group and a growing network of dedicated conservationists and data providers from 46 countries.

This powerful network of partners, collectively known as the "SWoT Team," has volunteered to annually describe the status of the world's seven sea turtle species, the threats they face and the wide range of efforts to conserve them. A talented group of scientists has agreed to serve voluntarily on a Scientific Advisory Board to ensure that SWoT meets the highest possible standard of scientific accuracy and transparency; similarly, a group of accomplished editors has volunteered to assure the strength of the *SWoT Report's* content as part of an Editorial Advisory Board.

The SWoT Team is dedicated to its collective vision—a permanent global network of specialists working to accelerate the conservation of sea turtles and their habitats, pooling and synthesizing data, and openly sharing the information to audiences who can make a difference. We hope to serve as an example of the collective power of true collaboration for conservation.

Inaugural SWoT Team members

Harry Andrews
Randall Arauz
ARCAS
Alfredo Arteaga
Edward Aruna
Asociación ANAI
Aventures Sans Frontières
Lisa M. Bailey
Paulo Barata
María José Barragán
Ben Best
Federico Bolaños
Mario A. Boza
Joaquín Buitrago
Rowan Byrne
Andy Caballero
Caribbean Conservation Corporation
Claudia Ceballos
Didiher Chacón
Eng-Heng Chan
Simon Chan
Gerardo Cháves
Dana Coelho
William Coles
Conservation International
Sergio Cordón
Michael Coyne
Larry Crowder
Kimberly Davis
Christopher De Ruyck
Defenders of Wildlife
Eric Delcroix
Belinda Dick
Carlos Diez
Andrea Donaldson
Duke University
Peter Dutton
Karen Eckert
Scott Eckert
Lalith Ekanayake
Debra Fischman
Flora and Fauna International
Florida Fish and Wildlife Conservation Commission
Gaverson Frett
Rodney Galama
Eric Gilman
Marc Girondot
Matthew Godfrey
José Gómez
Elizabeth González
Shannon Gore
Edo Goverse
Grupo Tortuguero de las Californias
Hedelvy Guada
James Gumbs
Iñaki A. Gutiérrez
Martin Hall
Patrick Halpin
Joana Hancock
Mervin Hastings
Gail Hearn
Ricardo Hernández
Francis Hickey
Zandy Hillis-Starr
Maartje Hilterman
C. Tetha Hitipeuw
Hector Horta
George Hughes
Brian J. Hutchinson
M. Zahirul Islam
Thushan Kapurusinghe
Rhema Kerr
Irene Kinan
Becky King
Kellee Koenig
Cynthia Lagueux
M. Lakshman
Rozenn Le scao
Yolanda León
Colin Limpus
Stephen Lindsay
Carl Lloyd
Ken Mackay
Maria A. Marcovaldi
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Stefanie Ouellette
Clara Padilla
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Jaime Pérez
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Arlington Pickering
Rotney Piedra
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Jeffrey Polovina
PRETOMA
Peter Pritchard
Projeto Tamar
PROVITA
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Andy Pyle
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Anders Rhodin
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José Vicente Rodríguez
Tamar Ron
Laura Sarti
Seaturtle.org
Gabriel Segniagbeto
Jeffrey Seminoff
Kartik Shanker
Donna Shaver
Debbie Sherman
George Shillinger
Rachel Silverman
Robert Solano
Guy-Philippe Sounguet
Jim Spotila
Todd Steiner
Kimberly Stewart
St. Kitts Sea Turtle Monitoring Network
Barry Svendson
Yonat Swimmer
Tagging of Pacific Pelagics
The Leatherback Trust
Kim Thurlow
Manjula Tiwari
Jose Antonio Trejos R.
Sebastian Troëng
Romeo Trono
TUMEC, Fisheries Department of Malaysia
Turtle Conservation Project – Sri Lanka
Turtugaraba
José Urteaga
Edith van der Wal
Richard van der Wal
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State of the World's Sea Turtles
1919 M Street, NW, Suite 600
Washington, DC 20036
USA

www.SeaTurtleStatus.org