SWOT report

Volume XVIII

The State of the World's Sea Turtles

INSIDE:

REGIONAL MANAGEMENT UNITS

THERMAL DRONES

DECOLONIZING CONSERVATION

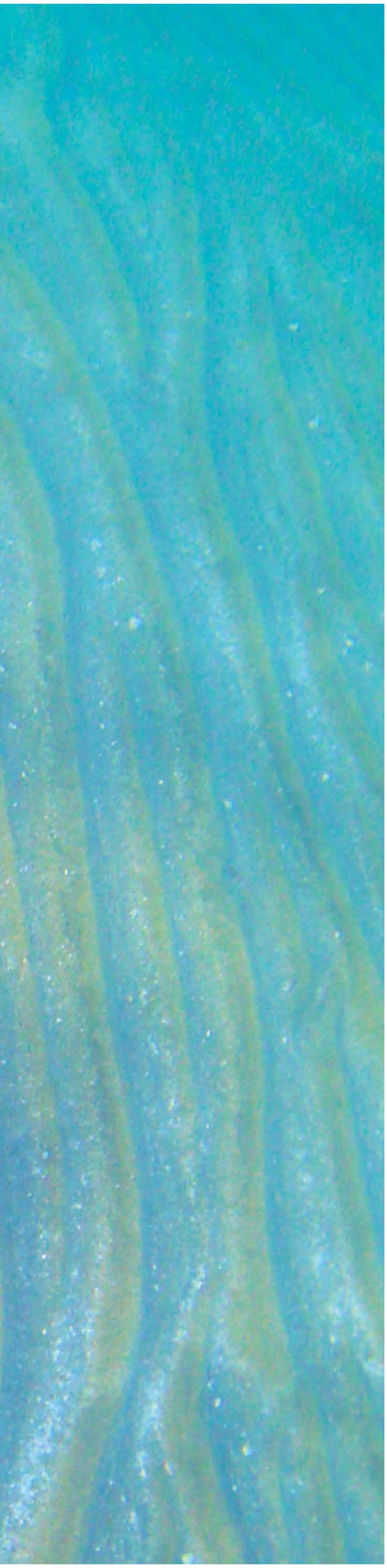
AND MORE ...

SPECIAL FEATURE

LEATHERBACKS *of the* WORLD

A green turtle hatchling swims in sargassum off the coast of Jupiter, Florida, U.S.A. © Jeff Biege Photography; **FRONT COVER:** A leatherback turtle in the Kei Islands, Maluku, Indonesia. Photographer Jason Isley leads annual trips to the islands; if you are interested in joining, please email jason@scubazoo.com for information. © Jason Isley / Scubazoo

A green turtle swims over the seafloor in Florida, U.S.A. © Ben J. Hicks / benjhicks.com



Editor’s Note

Considering the Sea Turtle Umwelt

Coined by Jakob von Uexküll in 1909, the word *umwelt* derives from the German word for *environment*, but more specifically it means the unique perceptual world of any living thing, be it an amoeba, tree, bug, bird, human, or sea turtle. The human umwelt is our sensory window to the world around us, and we often mistakenly believe that our perception is reality. Yet we cannot experience the countless colors beyond our visible spectra, the sounds above and below our audible range, or the array of scents and tastes that are unknown to us, not to mention electric fields; magnetic forces; and tiny variations in temperature, pressure, vibration, and air and ocean currents that we are simply unable to detect. Humans are sensually blind to many of the stimuli that Earth has to offer.

Science has historically seen other species through the anthropomorphic lens of the human umwelt. So it is no surprise that most data on sea turtles come from observations of nesting females and hatchlings in places that are easily accessed by human eyes. Yet, to be good conservationists of turtles and their environments, we need to adopt a sort of “turtle empathy,” place ourselves in their flippers, and ask (as we do in the FAQ on p. 38) how their umwelt may diverge from ours. Sea turtle lives take place in nearly every ocean biome, from coasts to the open sea, and from the surface to perpetual darkness. As such, their sensory reception is drastically different from that of humans, and we ought to understand it better if we are to properly buffer turtles and their habitats from the hazards of man.

To be sure, our community is chipping away at this understanding, and technology is helping. Seeing a nesting beach from the air by night—not with human eyes, but using a heat-sensing aerial drone (see article pp. 6–9)—can reveal new truths. By synthesizing hundreds of leatherback telemetry tracks from dozens of researchers, even a new map projection (see p. 27) can challenge us to visualize global leatherback movements in an ocean-centric perspective for the first time.

Also lying outside the sea turtle umwelt are the innumerable boundaries that humans have drawn on Earth, ranging from national borders to exclusive economic zones, marine protected areas, and even the vast unbounded high seas of the world, frontiers that are entirely imperceptible to turtles. In this issue (pp. 12–15), we present the latest versions of regional management units, an ongoing effort to see the planet from a sea turtle perspective that uses the biogeographic limits that matter most to them.

Imagine if you could be a sea turtle for long enough to see, hear, feel, magneto-sense, and receive all the stimuli that drive their behaviors, determine their geography, and define their niches in the global biosphere. Now consider how humanity encroaches on that sea turtle umwelt with stimuli like artificial light, low-frequency noise, warming and acidifying seas containing manmade compounds, and more. We hope that the articles in this volume of *SWOT Report* will help you to indulge your imagination, consider new perspectives, think inside the sea turtle umwelt, and seek new ways to better understand and conserve the oceans.

Roderic B. Mast
Chief Editor

meet the turtles

The seven sea turtle species that grace our oceans belong to an evolutionary lineage that dates back at least 110 million years. Sea turtles fall into two main subgroups: (a) the unique family *Dermochelyidae*, which consists of a single species, the leatherback, and (b) the family *Cheloniidae*, which comprises the six species of hard-shelled sea turtles.

Kemp's ridley
Lepidochelys kempii
CR

Olive ridley
Lepidochelys olivacea
VU

Hawksbill
Eretmochelys imbricata
CR

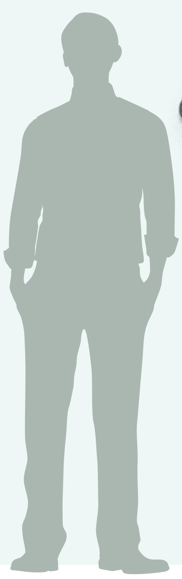
Flatback
Natator depressus
DD

Loggerhead
Caretta caretta
VU

Green
Chelonia mydas
EN

IUCN RED LIST STATUS:

- CR Critically Endangered
- EN Endangered
- VU Vulnerable
- DD Data Deficient



Leatherback
Dermochelys coriacea
VU

Visit **www.SeaTurtleStatus.org** to learn more about all seven sea turtle species!

ILLUSTRATIONS: © Dawn Witherington

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VOLUME XVIII

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SWOT
The State of the World's Sea Turtles

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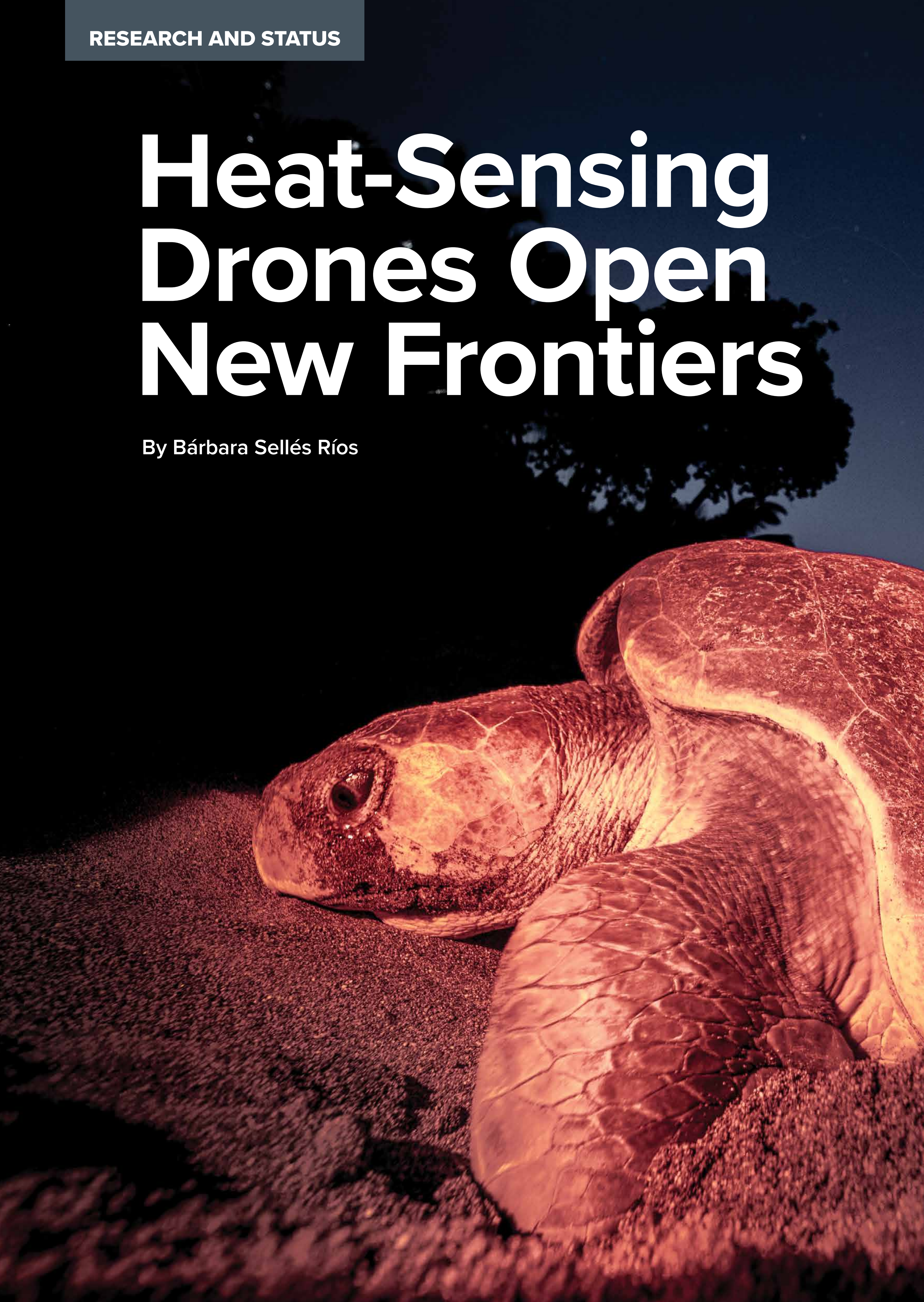
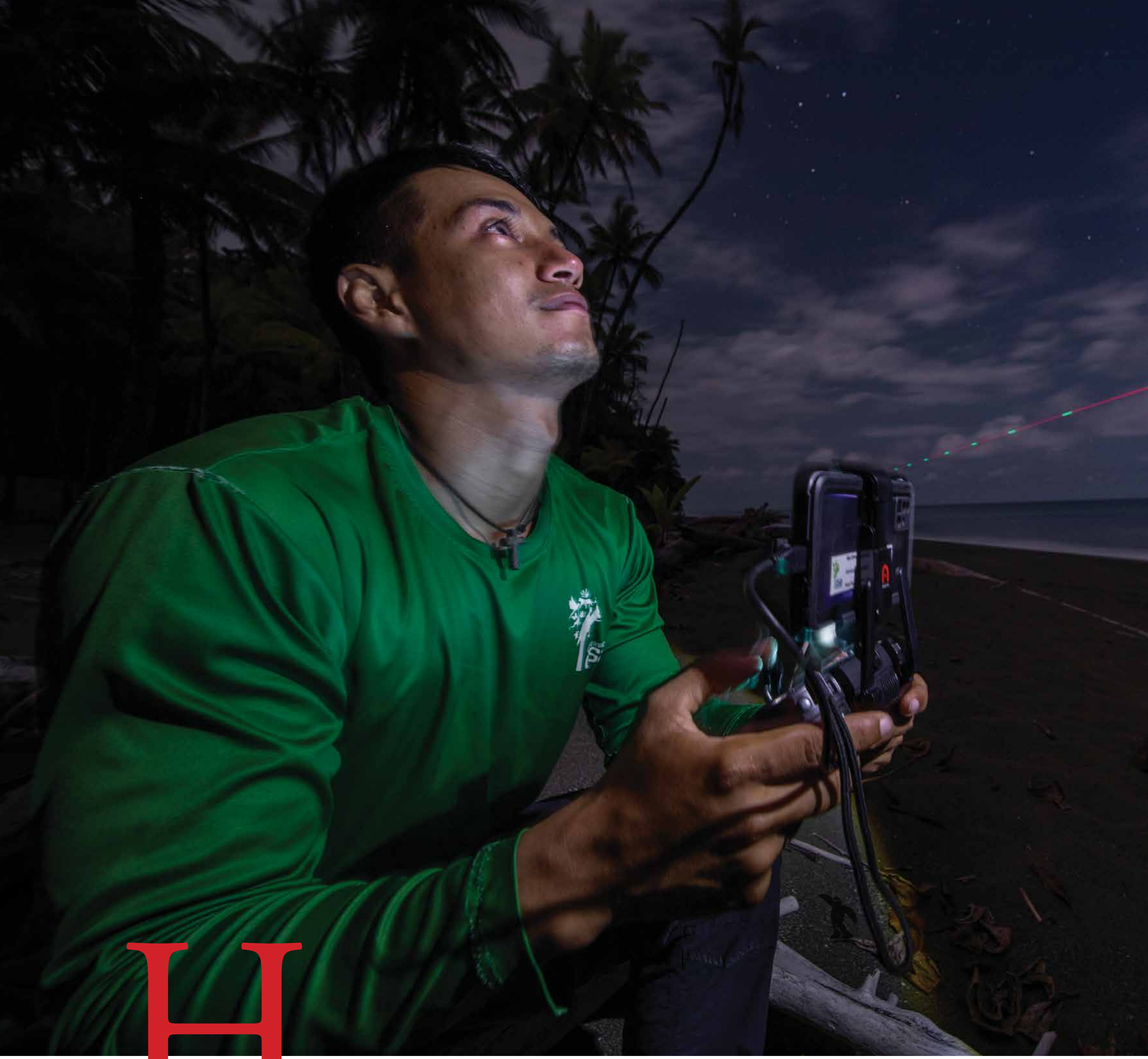
Find Mr. Leatherback! How many times can you spot Mr. Leatherback's distinctive silhouette in this issue of *SWOT Report*? Check the SWOT website at www.SeaTurtleStatus.org for the correct answer!

THIS PAGE: © Tui De Roy / Roving Tortoise Photos

Heat-Sensing Drones Open New Frontiers

By Bárbara Sellés Ríos

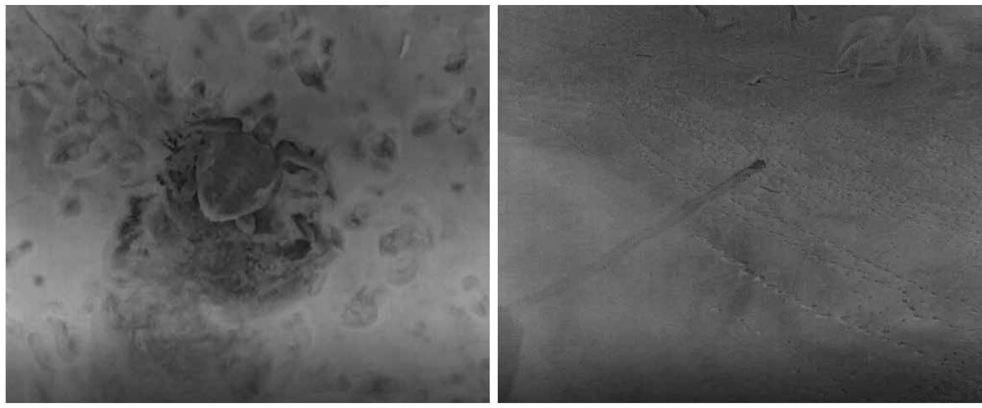




Hundreds of sea turtle projects monitor more than 3,200 nesting beaches globally, with volunteers walking for countless long hours on sometimes dangerous beaches alongside drug traffickers, poachers, native and feral animals, and other hazards. The fast growth of drone technology holds great promise for easing the challenges of such work while allowing for greater accuracy in species identification, for monitoring of mass nesting events, for studies of adult sex ratios nearshore, for pinpointing of tagged individuals, and more.

Drones equipped with thermal infrared sensors (TIR) have more recently expanded the scope of such work by augmenting daylight visual observations with the ability to view nighttime temperature signatures of animals and their surrounding environments. Nocturnal testing of TIR-equipped drones in Mexico and Cabo Verde has proved useful in detecting human and feral animal presence on nesting beaches. Moreover, at one site in Cabo Verde such tools helped to significantly reduce rates of poaching (see *SWOT Report*, vol. XVII, p. 8).

Informed by such initial studies, researchers at Piro Beach (Osa Peninsula, Costa Rica) began nocturnal drone surveys in 2021 and verified that the drones could effectively spot sea turtles and tracks; differentiate between adult olive ridley and green turtles; and see hatchlings and wildlife



... comparative studies between foot and drone patrols showed that the thermal drones detected 20 percent more nesting activity than did human patrollers.

Certified drone pilot and local community member, Johan Ortiz García, flies a drone outfitted with thermal infrared sensors over Piro Beach, Costa Rica. © Andy Whitworth; **INSETS:** Images captured using the drone's thermal infrared sensors show (left) an olive ridley returning to the sea, captured at a height of 4 meters, and (right) an olive ridley emerging from the sea with its track visible behind it. © Osa Conservation; **PREVIOUS SPREAD:** The lights from a passing drone can be seen patrolling the beach while an olive ridley nests under the cover of darkness on Piro Beach, Costa Rica. © Andy Whitworth

(raccoon, coati, wildcats, birds, and bats), as well as humans, on the beach at night. Using an Autel Robotics drone (EVO II Dual 8K and Autel Explorer App), a team of two biologists observed TIR images in real time and tested different camera gimbal angles (90, 45, 35, and 18 degrees), heights (from 80 to 4 meters), and visualization modes ("black hot," "white hot," and "hottest") to determine optimal camera settings for sea turtle work.

The team concluded that to best identify turtles and ensure greatest coverage of the full width of the beach at Piro, the optimal camera angle was 35–45 degrees downward from horizontal at a height of 50 meters above the ground. At that altitude, the drone was inaudible because of the overpowering sound of waves, though its positioning lights were still visible. Nonetheless, even when the drone was flown as low as 4 meters above a turtle engaged in nest covering and camouflaging, the animal appeared to be unperturbed; though at such a low altitude, the drone landing lights turn on automatically, which could deter more light-sensitive species or individuals.

Regarding the thermal camera visualization mode, no significant difference was noted between the "white hot" and "black hot" modes, though the latter was judged better for detecting fine-scale features. Further comparative studies between foot and drone patrols showed that the thermal drones detected 20 percent more nesting activity (sea turtles and tracks) than did human patrollers. Drones were also better at spotting other potential predator animals and humans, including three potential poachers seen by the drone that the foot patrols missed altogether.

Despite the promising results, we should consider some challenges and limitations before investing in a shift to aerial surveys using thermal drones. Some tracks and turtles at Piro Beach were hard to identify and easy to confuse with other marks on the sand, such as those made by wave action. And sea turtles were often difficult to tell apart from logs, debris, and other beach features. Also, though each video lasted 21–25 minutes, the video analysis typically required an added 45 minutes to prevent double-counting of tracks and other potential errors, though this is a challenge that could be addressed through a higher resolution TIR camera and by georeferencing tracks with artificial intelligence as they are counted. Because sand and sea turtle temperatures need to be significantly different to ensure proper thermal detection, further testing on beaches of varying sand color and heat retention are needed so we can understand the beach types where thermal drone work can be most effective.

Other factors to consider are the possible negative impacts of moonlight or artificial lights, which other projects have suggested contribute to a reduction in animal detection using TIR drones. Finally, the cost of this technology may be a barrier; the drone used in this study cost around US$10,000, though other models—such as the DJI Mavic 3 Enterprise Thermal camera—also hold great promise, yet at a lower price. Therefore, the authors recommend testing a variety of models for their cost-effectiveness and potential light and sound effects on nesting sea turtles before embarking on a long-term thermal drone monitoring effort.

TIR drones, human beach patrols, and effective local law enforcement present a powerful and complementary set of tools to combat important threats on sea turtle beaches while also supporting monitoring and research goals. ●

Minimum Data Standards Perform to the Maximum

By Marc Girondot, Roderic Mast, and Brian Hutchinson

An aerial view shows a large number of turtle tracks covering a nesting beach. SWOT's *Minimum Data Standards for Nesting Beach Monitoring* provides guidance for effective nesting beach monitoring under a wide range of circumstances. © Tui De Roy / Roving Tortoise Photos

Having concluded that globally standardized nesting beach data would be critical to any efforts to monitor worldwide trends in sea turtle populations, the State of the World's Sea Turtles (SWOT) Program conducted a study and published a 28-page booklet titled *Minimum Data Standards for Sea Turtle Nesting Beach Monitoring, Version 1.0,* or the *MDS Handbook*, in 2011. The *MDS Handbook* describes a methodology that was synthesized by the SWOT Scientific Advisory Board and numerous volunteers, who surveyed and described best practices for monitoring sea turtle nesting populations under varying beach monitoring conditions. With support from the National Fish and Wildlife Foundation, the booklet was printed in English, French, and Spanish, and thousands of copies were made available for free to sea turtle projects internationally. Ultimately, the booklet was also produced in a number of other languages, including Turkish and Bengali, with the help of SWOT partners.

Now, more than a decade after the *MDS Handbook*'s release, it is interesting to look at how those standards have been used by researchers around the world. An initial literature analysis found no less than 10 peer-reviewed articles that cited the MDS methodology.

To begin, we should note that many methods can be used to estimate population size in sea turtles, as explained in the *MDS Handbook*:

> Counting nesting females and their nesting activities is an important part of generating abundance estimates and assessing trends, but this information alone is insufficient for understanding the underlying, complex processes that drive population status and trends. The reasons for this insufficiency are clear, considering that nesting females account for only a portion of overall population structure and for probably no more than 1 percent of the total population abundance. Therefore, trends in nesting activity may not be reflective of trends in the entire population. Furthermore, a trend in nesting activity may be due to changes in the processes that drive reproduction, rather than a reflection of the actual number of mature females in a population.

Despite those limitations, monitoring female turtles on nesting beaches remains the preferred methodology in most regions, because it is the most practical and easily accessible proxy for elucidating population trends.

The MDS methodology asks researchers to consider (1) how many beaches they should monitor within a given territory and (2) how much they should monitor during a season in order to make viable population estimates for a given beach. Finally, the *MDS Handbook* provides a statistical methodology for analyzing the collected data.

There are two main strategies for determining how many beaches should be monitored. The first strategy is to define index sites of limited extent where researchers can conduct intense beach monitoring and extrapolate trends to determine the population of a broader territory. In doing so, researchers assume that a few monitored index beaches reflect the whole dynamic at the scale of the territory. This approach has great advantages when monitoring large areas is not feasible, but risk is also involved, as the disappearance of an index beach because of geomorphological, climatic, or anthropogenic causes could mean the loss of valuable time series data for an entire region.

The second strategy in the MDS methodology recommends that all beaches within a territory be monitored over the duration of a nesting season to help define the beginning, end, and peaks of the nesting season. This approach allows for the elaboration of a formula that, once established, can then be populated in subsequent years with data gathered at more random points during a season.

The Minimum Data Standards methodology has now been tested at many sites and in virtually all ocean basins, and it has been widely referenced in published studies.

The MDS methodology has now been tested at many sites and in virtually all ocean basins, and it has been widely referenced in published studies. The Wider Caribbean Sea Turtle Conservation Network has advocated for the use of MDS in the Caribbean, as have researchers working with hawksbill nesting and conservation in the eastern Pacific and researchers on the central African Atlantic coast.

The MDS methodology was also cited in publications about the nesting range expansion of loggerhead turtles in the Mediterranean, about the discovery in Angola of the Atlantic's largest olive ridley nesting population, about validating trends in olive ridley nesting in Guatemala, about the identification of secondary nesting beaches for leatherback turtles on the Pacific coast of Costa Rica, and about the largest South Pacific green turtle rookery in New Caledonia's Forgotten Islands. These are just some of the practical applications of MDS that appear in published literature. Although MDS 1.0 has served the sea turtle conservation community admirably since its release in 2011, there is always room for improvement, and there may one day be an MDS 2.0 that addresses gaps in the methodology. For instance, an intra-seasonal model of nesting phenology may help fill missing data for monitored periods during a nesting season, and a new method for the spatial and temporal aggregation of nesting seasons could also make for a natural extension of the SWOT MDS recommendations. Meanwhile, we encourage anyone interested to read the short *MDS Handbook*, which is available at www.seaturtlestatus.org/minimum-data-standards, as you define or review your nest monitoring program's methodology and goals. ●

A New Coat of Paint for Sea Turtle RMUs

By Bryan P. Wallace, Roderic Mast, Zach Posnik, Brendan Hurley, Lucy Meyer, Hannah Brenner, Andrew DiMatteo, Sara Maxwell, Isabel Rodriguez, Ashleigh Bandimere, Brian Hutchinson, and Paolo Casale

Because they range over vast oceans, countless ecological niches, and multiple political jurisdictions during their decades-long lifespans, sea turtles present an array of challenges for monitoring, assessment, and conservation. A fundamental first step in devising management strategies is to understand the units for assessment, which for sea turtles makes most sense at a scale that is finer than species, yet broader than nesting sites, and which includes biological and demographic processes that span time and space. Such subpopulations are called regional management units (RMUs), a framework that has been in use for more than a decade.

An olive ridley turtle swims in the Pacific Ocean off the coast of Costa Rica.
© Doug Perinne

Why Are RMUs Useful?

Imagine you work for a grant-giving authority whose priority is to save sea turtles from extinction globally. Where to begin? Granted, you only have seven sea turtle species to worry about, unlike a fish (about 34,800 species) or bird (about 10,000 species) conservationist, or someone concerned with saving mollusks (maybe 50,000 to 200,000 species)—yikes! So you're feeling lucky. But still, if you were the person tasked with doing this on a limited budget just a little over a decade ago, you would have had very few tools to help you choose where to invest in projects. You likely would have started by checking the IUCN Red List of Threatened Species global assessments for sea turtles.

For instance, let's consider just one of the seven species, the leatherback: The Red List would have told you that the species was "Critically Endangered throughout its range." And knowing that the leatherback is found in every major ocean basin on Earth and is arguably the most widely ranging animal on the planet, you'd still have been hard-pressed to choose where to make strategic grant investments to prevent its extinction. Would you target nesting beaches, foraging areas, or migratory routes? Would you prioritize hatchlings, subadults, or adults? Males or females? And which of the many ocean basins that are home to leatherbacks would you have chosen?

This was the situation back in 2003, when the IUCN Marine Turtle Specialist Group (MTSG) decided to launch a series of Burning Issues (BI) Workshops to help set global priorities that would assist sea turtle conservationists in making such difficult choices. By the time Burning Issues Workshop #6 (BI-6) rolled around in 2009, the group had determined to develop a framework to organize marine turtles globally into units above the level of nesting populations, but below the level of species. Thus, RMUs integrate biogeographical information from multiple scales and tools, including nesting sites, genetic stocks, satellite telemetry, and geographic distributions based on long-term monitoring research.

The first assessment of RMUs was published in 2010, and it has been used widely by the sea turtle community ever since to identify data gaps, assess high diversity areas for multiple species and genetic stocks, evaluate relative impacts of threats, and generally improve our understanding of the conservation status of marine turtles worldwide. RMUs also provide valuable guidance to marine spatial planning initiatives such as the creation of marine protected areas, as well as monitoring, protection, and data gap analysis. Designed from the outset to be dynamic and to evolve over time as our understanding of sea turtle biogeography improves, the RMU tools—including maps and supporting metadata—were made publicly available through the SWOT database in an online application for comments, improvements, downloads, and analyses.

By 2019, given the many improvements in our understanding of sea turtles during the decade since BI-6, the MTSG felt it was time to refresh the concept and framework, and to reconsider RMU boundaries. Thus, RMU 2.0 was under way. Burning Issues Workshop #7 (BI-7) was scheduled to take place at the renowned Monaco Oceanographic Museum in June 2020, but the gathering had to be postponed because of the COVID-19 pandemic. It was subsequently moved online in a series of virtual meetings that were conducted between 2019 and 2022 by small, thematically focused expert teams of MTSG volunteers from around the world.

How Was RMU 2.0 Developed?

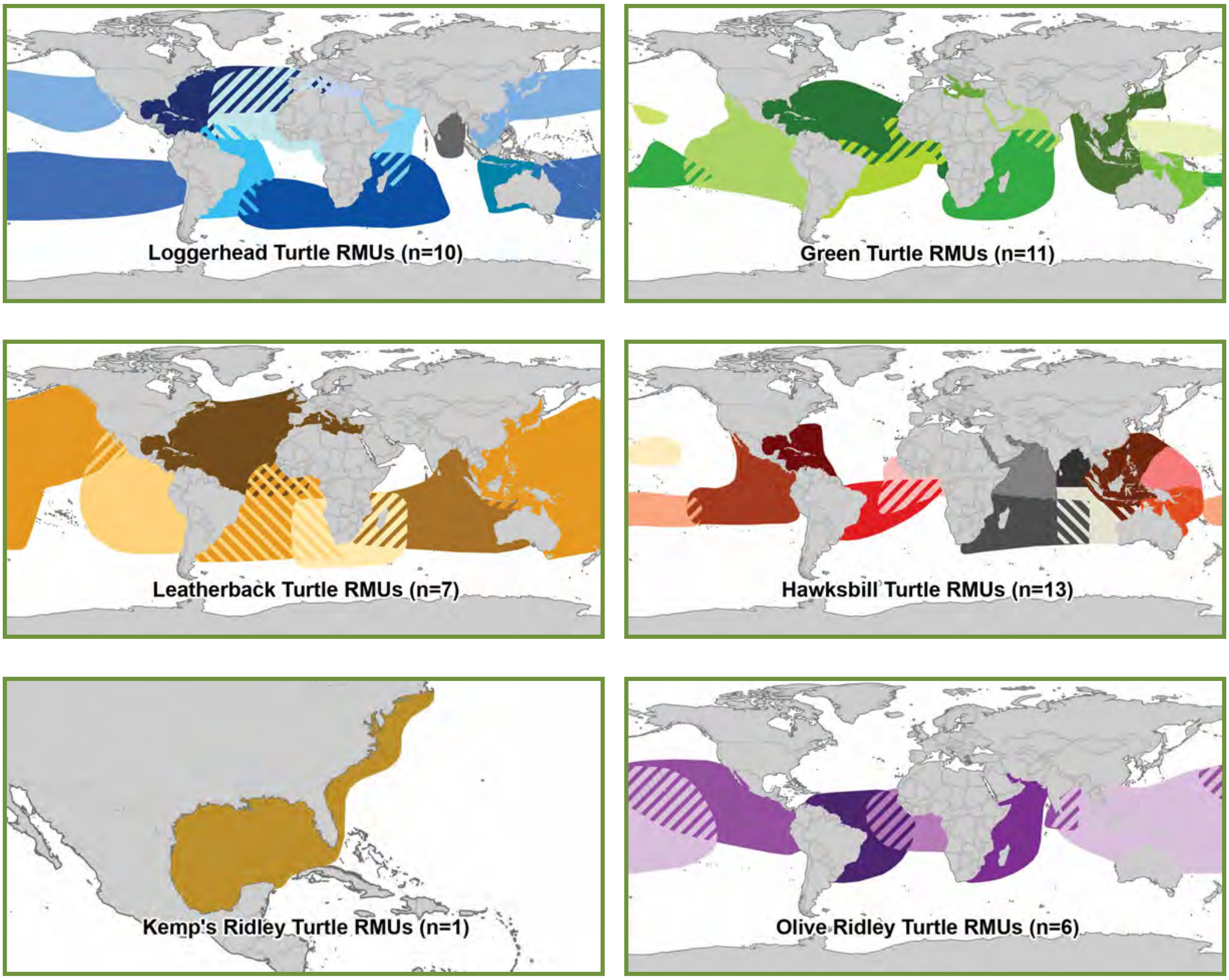
The RMU 2.0 redefinition process began with scientists amassing decades of published and unpublished data, reference articles, and reports, as well as focused literature searches and entirely new compiled data platforms, including the following:

- The State of the World's Sea Turtles (SWOT) database of sea turtle biogeography—which contains more than 760,000 data records—and SWOT's existing national, regional, and global scale maps of biogeography for all sea turtle species.
- An overview of published data about sea turtle biogeography published through 2019 and used in the first RMU definition process.
- The MTSG's regional reports, compiled through an ongoing process launched in 2016 that aspires to produce a set of regularly updated and comprehensive lists of literature pertaining to sea turtle biology, biogeography, and conservation.
- A database of 500 pertinent publications since 2009 that focus specifically on sea turtle telemetry, genetics, threats, and population status.
- A powerful geospatial data management platform that includes nearly 1,000 georeferenced maps from published papers and the updated Geographic Information System shapefiles for RMUs that are based on the most current sea turtle telemetry data, SWOT resources, and more.

RMU 2.0 Definition Process

The results of that exhaustive literature review were presented to hundreds of expert reviewers—many of whom were also involved in the first RMU assessment—in a way that would facilitate robust, inclusive, and thoughtful consideration of all new information.

Despite the broad uptake of RMUs, valid questions were raised about whether RMUs had been defined clearly enough in 2010 to avoid confusion with other types of conservation unit



Forty-eight regional management units (RMUs) for six sea turtle species were recently updated by the IUCN Species Survival Commission (SSC) Marine Turtle Specialist Group and Oceanic Society. From the original RMU analysis published in 2010, 11 of these have remained unchanged, 2 have been removed (the flatback was not included in this analysis), and the rest were modified on the basis of new data. RMUs may overlap (lined areas) but are anchored to nesting sites where females share a common genetic lineage and the best-known in-water distributions for those subpopulations. Putative RMUs (dark gray) were created as placeholders in cases where in-water distributions are poorly known.

frameworks, such as genetically defined management units or evolutionarily significant units. As such, before reviewers embarked on the time-intensive process of updating RMUs, an online discussion ensued to revisit the definition of RMUs and to provide guidance for the update process. The new and improved RMU definition that resulted is as follows:

- Regional management units are assemblages of marine turtles from the same species that share areas critical to life history requirements. Their overlapping geographic distributions expose these turtles to similar environmental and anthropogenic factors, placing them on similar demographic trajectories. These spatially explicit marine turtle RMUs, which include all life history stages, are similar to IUCN "subpopulations" because they are directly below the level of global species and can encompass finer-scale population structuring (e.g., unique genetic stock management units).
- In practice, RMUs provide a globally applicable assessment framework that (1) can account for influences of environmental and anthropogenic factors on geographically widespread, complex marine turtle assemblages and (2) allow for conservation and management priorities to be designed for appropriate geographic scales.

With this guidance in place, an inclusive virtual review process to update RMUs ensued in several stages:

- In early 2019 (in preparation for the Monaco Workshop that was ultimately canceled), a BI-7 Workshop team was formed of about 50 volunteer experts with broad regional and thematic expertise.
- All 300 or so MTSG members were invited to participate in online surveys in March 2019 to review and validate the criteria for RMUs and to gather feedback about the strengths of, weaknesses of, and opportunities for improvements to the methods used in the first RMU definition process.
- From November 2020 to June 2021, MTSG members and others convened online to fine-tune the online platform that would be used to revise and finalize all sea turtle RMUs.
- Following two formal one-month review periods in March and August 2022, the platform was launched in August 2022, and the system remained open for comments throughout the year.

Behold, RMU 2.0

The new RMUs reflect a significant expansion of our understanding of marine turtle biogeography and provide added clarity about the RMU concept and its potential applications. A total of 48 RMUs and 166 genetic stocks of six sea turtle species globally (all except the flatback) are presented in the maps on p. 14, and the supporting files have been made open-access to empower research and conservation initiatives around the world. Flatback turtles nest only in Australia and have a relatively restricted geographic range; thus, the MTSG decided not to redefine flatback RMUs because of potential confusion with the existing seven management units officially recognized for the species that are already the focus of ongoing management efforts in Australia.

A male loggerhead turtle swims off the coast of Zakynthos island in Greece.
© Kostas Papafitsoros

How RMUs Affect Conservation

Since their introduction in 2010, RMUs have provided a framework for evaluating threats and conservation status in numerous published overviews and in countless research projects relating to conservation status and priorities for marine turtles. RMUs have even provided a conceptual model for conservation planning among specialists working on other taxonomic groups. Originally developed to help the MTSG address perennial challenges when performing Red List assessments, RMUs now provide a basis for subpopulation-level assessments, which have been widely recognized as more appropriate for conservation because they focus on more conservation-relevant population units.

For example, RMUs have now been used to conduct finer-scale subpopulation Red List assessments for loggerheads, leatherbacks, and green turtles, which, when those assessments are coupled with improved data about regional status and threats, are strengthening efforts to set conservation priorities for those species. In addition, the next step in the MTSG BI-7 Workshop process will be to revamp the conservation priorities portfolio framework to assess population viability and threat impacts and to allow identification of conservation opportunities for all RMUs globally. As time goes on and more information becomes available, RMUs should be updated so that they stay current and useful for various conservation and research applications.

And for the ill-equipped sea turtle conservation grant-giver who was referenced earlier and was tasked with preventing sea turtle extinctions before 2010, RMUs should help give a more focused perspective about how, where, and when to assign limited conservation resources for the biggest effect. ●

Are Sea Turtles Getting Smaller?

An undergraduate intern measures a loggerhead after nesting in the Archie Carr National Wildlife Refuge, Florida, U.S.A., as part of the long-term research project led by the University of Central Florida Marine Turtle Research Group. Loggerheads and green turtles nesting in the refuge have decreased in average size since monitoring began in 1982. Image taken while conducting permitted research under FL-MTP 171 & 186. © Gustavo Stahelin

By Katrina Phillips

Research projects across the globe monitor sea turtle nesting beaches and collect information about numbers of nests and their fates over a breeding season. Many researchers also observe turtles as they lay their eggs, which offers a rare glimpse into the biology of animals that spend most of their lives at sea. In addition to tracking nest counts and hatching success, the projects have an opportunity to measure the sizes of mature female turtles.

Over time, a trend has emerged in multiple ocean basins and across species: sea turtles nesting now are smaller on average than those nesting in decades past. Although the causes and implications of smaller nesting turtles remain unclear, several long-term studies have found that smaller nesting sea turtles have indeed become more common over time, particularly within four of the seven sea turtle species:

- Loggerheads in Cabo Verde, South Africa, Turkey, and the United States
- Green turtles in Ascension Island (United Kingdom), Australia, Brazil, Seychelles, Turkey, and the United States
- Olive ridleys in Brazil and India
- Hawksbills on the Yucatán coast of Mexico

The observed size differences are a few centimeters or more among turtles that are more than half a meter in size, but those differences have potential impacts at the population scale.

Why Does Size Matter?

Smaller turtles typically lay fewer eggs per clutch than do larger turtles. If the turtles nesting now are smaller than they were historically, they may have lower potential fitness over their lifetimes. A slight decrease in the number of eggs laid per turtle might not make much difference in stable or increasing populations, but for declining populations, even a small reduction in the numbers of eggs and potential hatchlings could lead to further depletion.

The Causes Are Unclear

Locating where nesting female turtle sizes are decreasing will help researchers to identify the population-level causes that might lead to this trend. For instance, some of the sites where smaller nesting turtles are more common have also experienced recent increases in the number of nests laid per year. More small nesting females may be an indication of an influx of new recruits (new adult females joining the nesting population due to maturation or immigration) linked to population recovery. However, this is not the case at every site where smaller turtles have been observed.

Less positive possible causes for the trend could derive from a loss of larger females in the population from anthropogenic causes (overharvesting, bycatch, and so on) or from a reduction in the quality of foraging habitats, which could lead to slower growth rates among juveniles, to smaller juveniles over time, and subsequently to smaller mature animals. There may also be shifts in where nesting females migrate between nesting seasons, because some regions support larger turtles than do others. Given the broad distribution of the phenomenon worldwide, the reduction in nesting female size may also be linked to global climate change.

Ultimately, the answers are probably not one-size-fits-all, and different combinations of factors may be affecting each of the sites and populations. In addition, smaller turtles are likely nesting at many sites that have not yet been assessed or documented. As additional nesting beach projects examine the long-term datasets, the sea turtle research community will become better equipped to identify the common threads that such sites share and to learn more about what conservation measures may be needed to support the populations in the future. ●

SPECIAL FEATURE

WHAT'S HOLDING BACK the Leatherback?

By Bryan P. Wallace

We've all heard many words to describe *Dermochelys coriacea*. Superlative. Ancient. Enormous. Beautiful. I'll add another one that I think describes them well: weird. They have weird physiology: They can stay warm in frigid waters and avoid overheating in tropical waters, and they can dive more than a kilometer (3,280 feet) deep. We don't really know what they do down there. They lay weird eggs that are not even eggs—shelled albumen gobs containing no yolk that serve no apparent purpose (and we've looked for one). They have weird semi-bony shells. They grow to huge sizes, and they thermoregulate and migrate across ocean basins while eating *only jellyfish*, for goodness' sake! What if we have underestimated their weirdness when trying to assess and understand their population status?

Lots of Data, but Little Clarity

If we don't know where we are and where we've been, it's hard to know where we might be going. This is true for many things, including the status of sea turtle populations, and especially for the status of leatherback populations. Decades of effort by hundreds of researchers and volunteers on nesting beaches, in the water, and even via satellite-relayed movements and oceanographic conditions, have yielded mountains of data about sea turtles and how they live.

Yet despite all the knowledge we have gained, we're still unable to understand the leatherback population trends we see or understand why we haven't seen recovery after decades of conservation effort. In part, this paradox is rooted in a history of assessing leatherback status in ways that are fraught with inconsistencies. Flawed assumptions about how to go from a snapshot in time and space to a full global picture, which beaches to include, and more have confounded efforts to get a complete picture about how leatherbacks are doing. On multiple occasions,

AT LEFT: A Leatherback sea turtle feeds on a pyrosome off the Azores in the North Atlantic Ocean. © Brian Skerry; **PREVIOUS SPREAD:** A leatherback hatchling swims away from shore after leaving the beach. After decades of research, there are still many unanswered questions about the leatherback's conservation status. © Ben J. Hicks / benjhicks.com researchers have sounded the alarm that leatherbacks are in decline, but each time uncertainties have remained about the underlying dynamics of the situation and about what those dynamics might mean for the future.

The Challenge of Understanding the Past

Nearly 30 years ago, in 1996, Jim Spotila and coauthors asked the question "Are leatherbacks going extinct?" After they compiled data, rough estimates, and personal communications from researchers around the world, their analysis indicated that several populations were indeed declining, especially those in the Pacific Ocean, and that global leatherback abundance had declined from 115,000 to 34,500 adult females. A few years later, in 2000, the IUCN Marine Turtle Specialist Group concluded in a Red List assessment that the global leatherback population deserved critically endangered status, a listing that was again largely driven by the rapidly declining East Pacific and peninsular Malaysia populations. In fact, by the early 2000s, the once large leatherback population in Terengganu, Malaysia, was extinct. Seems pretty bad, right?

As with any trend, however, its accuracy depends on the source information. Both the Spotila et al. and Red List assessments used a baseline population estimate of 115,000 adult female leatherbacks worldwide, published in 1982 by Peter Pritchard—more than *80,000* of which were in the eastern Pacific alone. This 1982 estimate was itself an enormous increase over a much more modest population estimate by the same author in 1971 of 29,000–40,000 females globally, with approximately 8,000 in the eastern Pacific. This massive change was based on a two-day aerial survey that was of leatherback nesting in three Mexican states and was undertaken in 1980, which stimulated a vast extrapolation of existing (largely anecdotal) nesting abundance values, many of which had been conveyed to authors personally and without information about monitoring effort.

Until recently, this type of reporting—personal communications, second-hand information, and a lack of consistent monitoring or data analysis underpinning back-of-envelope calculations—was the norm. The Spotila et al. paper and the Red List assessment had simply adopted the 115,000 number because it was the best available science at the time. However, several researchers have noted that Pritchard's numbers are almost certainly overestimates for the reasons mentioned previously. Further, no estimates before or since have landed global leatherback numbers in the same order of magnitude as Pritchard's 1982 tally, even as more and more beaches have been included with improved monitoring, reporting, and collaboration over time. So does this mean that leatherbacks were *not* actually declining toward extinction globally?

Status Improves—or Does It?

Since those days, we've learned much more about leatherbacks and gained data from significant beaches in parts of the world that had been overlooked or unmonitored when the early assessments were done. In 2013, the leatherback status on the

A leatherback takes a deep breath while nesting at Grande Riviere on the northern coast of Trinidad. © Tui De Roy / Roving Tortoise Photos

Red List was updated by evaluating nesting turtle abundance data through 2010 from many of the same places included in Spotila et al.'s paper, plus many more locations. This updated Red List assessment confirmed the critically endangered status of the West and East Pacific leatherback subpopulations (also called *regional management units*, or RMUs) while highlighting that the Northwest Atlantic RMU was abundant and stable, if not increasing. Further, the Southeast Atlantic RMU appeared to be at least as abundant—though with an undetermined trend—as the Northwest Atlantic RMU. But with the apparently robust Northwest Atlantic RMU included, the global status looked better than it had two decades prior. The global Red List assessment improved from critically endangered in 2000 to vulnerable in 2013. Finally, some good news!

Some apparent improvements in status were due to differences in which rookeries were included in the various analyses. For example, Pritchard's aerial survey–based estimates of global population size did not include the large rookeries of Trinidad and Tobago in the Wider Caribbean Region nor Gabon on the West African coast, and Spotila et al.'s estimates of those rookeries were far lower than those used in the updated Red List assessment. In fact, in his first global assessment in 1971, Pritchard mentioned that only one or two leatherbacks nested nightly in northeastern Trinidad, and Spotila reported about 200 females per year in 1996, whereas now it's normal to see hundreds *per night* during the peak nesting season. Similarly, while Pritchard asserted in 1971 that "a moderate amount of nesting" probably occurred in West Africa, by 1996, Spotila reported fewer than 5,000 females per year there. But by 2010, estimates of leatherback abundance were an order of magnitude higher.

Maybe leatherbacks really had increased in several places—and globally. Even after one accounted for discrepancies among different assessments, it seemed that things might be looking up for leatherbacks in some places and that there were more leatherbacks in the world than we had previously known. Those findings also gave much-needed hope for a brighter future in places where leatherbacks had declined and not yet recovered, such as the eastern Pacific.

More Populations in Decline

Just a few years after the updated 2013 Red List assessment was published, nervous whispers that leatherbacks actually might be in *decline* in parts of the Wider Caribbean rose to a chorus of concern, prompting a regional analysis of nest abundance trends, with data through 2017 amassed by the Wider Caribbean Sea Turtle Conservation Network. This analysis showed that annual numbers of leatherback nests had dropped on almost every nesting beach examined, producing a regionwide negative trend that accelerated in the most recent decade analyzed. For example, leatherback abundance in French Guiana—considered for decades to be robust and stable—had declined from tens of thousands of nests per year in the 1990s to a few hundred per year by 2017. The Red List status for the Northwest Atlantic RMU was updated with those new data in 2019, changing the status from least concern to endangered.

To make matters worse, soon after this Northwest Atlantic status update, a new global assessment of leatherback status delivered more bad news. In a comprehensive evaluation of abundance and trends from all leatherback RMUs through the year 2020, the U.S. National Oceanic and Atmospheric Administration biological review team confirmed the dire status of the Pacific RMUs and the Northwest Atlantic RMU. The team also revealed that the Southeast Atlantic RMU—thought to be the most abundant on the planet just 10 years earlier—was actually in decline. Other RMUs (Southwest Indian Ocean, Southwest Atlantic Ocean) are relatively small and geographically restricted, making them susceptible to declines as well, if the right threats were to come along.

Leatherbacks Are Weirdly Unique and Uniquely at Risk

Today, looking back on all the status assessments since the 1970s and accounting for their associated caveats, the global leatherback population trend does indeed appear to be downward. So maybe it's time to ask the question posed by earlier researchers: Are leatherbacks going extinct? Like, for real this time?

To be clear, I consider myself an optimistic realist about sea turtle status. I tend to think that the extinction of any species—particularly at a global scale—is highly unlikely. After all, sea turtles survived the asteroid that took out most of life on Earth (including their non-avian dinosaur cousins), not to mention shifting continents and climate ups and downs over millennia. And despite everything we've thrown at them in the past few centuries—and it has been a *lot*—sea turtle populations seem to be hanging on everywhere and even bouncing back in some places. The drumbeat of good news for sea turtles appears to be getting louder, a testament to the incredible conservation efforts performed by so many people in so many places. To me, the trends underscore turtles' resilience in the face of adversity, especially with sustained help from humans. Slow and steady just might win the race after all.

But leatherbacks do not seem to show the same resilience as other sea turtle species, at least not in the past five decades. Why are they doing so poorly? When are they going to recover? *Are* they going to recover? Threats to leatherback survival have been well-documented in many places. Chief among them have been human consumption of eggs and meat and incidental mortality in fishing gear. But something else might be compounding the negative effects of high mortality and low recruitment. Something else might be holding back the leatherback.

Perhaps that something is heightened sensitivity of the species to fluctuations in the marine environments the turtles depend on to survive and thrive. Like those of all animals, leatherback populations are driven by environmental ups and downs. Research in the early 2000s showed that eastern Pacific leatherbacks encountered much less predictable, much less favorable oceanographic conditions than did their Northwest Atlantic counterparts, making them smaller and more vulnerable to threats (see *SWOT Report*, vol. IV, pp. 8–11). This change caused divergent population trajectories between the two RMUs. Might the same one-two punch of poor ocean conditions and threats now be knocking down the Northwest Atlantic and other RMUs as well? Maybe we have underestimated the unique—and uniquely weird—sensitivity of the species to environmental conditions.

Digging further into available data might provide some clues. Mark-recapture analyses of flipper tags and microchips on individual leatherbacks can reveal how long leatherbacks take to return to beaches between nesting seasons and can shed light on the probability that leatherbacks survive from one season to the next. In declining populations like Pacific Mexico, Pacific Costa Rica, and French Guiana, adult female survival rates (lower than 80 percent per year) are indeed much lower than they should be for long-lived vertebrate populations with stable trends (typically above 90 percent per year), thereby pointing to high adult mortality. However, those analyses have also revealed an interesting and often overlooked phenomenon: the surprising prevalence of so-called *transient turtles*—turtles that are tagged in one season and then never seen again.

Transients are common in animal population biology and are usually explained as individuals that are merely "passing through" a study area, rather than long-term residents. However, given robust coverage of leatherback nesting in most regions, the proportion of these one-and-done nesters is much higher than expected in multiple populations. For example, of roughly 8,000 turtles tagged across 30 years in Mexico and Costa Rica, perhaps 30 percent were tagged in one season and never seen again, and adult female survival probability was quite low—less than 80 percent per year. Similarly, in French Guiana, the high number of one-and-done turtles strongly influenced survival rates, which were also less than 80 percent per year.

Why would there be so many transients, and how might this be a clue to what is happening with leatherback populations globally? Let's assume that a turtle receiving her first tags at a long-term monitoring project is a newly reproductive adult. Given what we know about sea turtles' site fidelity, we should expect to see her again in another nesting season. So, if she does not return, it is possible that she has been unable to find the food resources she needs to remigrate and reproduce. Perhaps this just means that she needs a prolonged remigration interval to gather what she needs. Maybe some turtles are swimming around for 10 years or more trying to accumulate enough fat stores to make the return trip. In fact, this is exactly what researchers in Australia have observed in green turtles tagged on nesting beaches and recaptured in foraging areas without being resighted on beaches over prolonged periods.

Or maybe the cost of being a reproductive adult is just harder on the neophytes. It's a huge physiological shift from being a juvenile to actually "adulting," which for a leatherback requires migrating across oceans to make and lay 30 kilograms of eggs each nesting season. This shift is particularly costly if neophytes haven't honed their foraging and migration skills like older, more experienced turtles. Maybe this physiological cost is simply too high for many new adults, resulting in proportionally higher mortality in this age class compared to older remigrants.

The large number of one-and-done leatherbacks across multiple populations suggests that, in general, leatherbacks might just be more sensitive to environmental conditions than we appreciate. For example, according to tag return data, female leatherbacks in French Guiana are expected to reproduce no more than three times in their entire lives. Normal sea turtle life history assumes reproduction occurs every few years over multiple decades to compensate for high mortality of eggs, hatchlings, and juveniles. In comparison, the oddly brief reproductive lifespan of leatherbacks makes them more like salmon than sea turtles.

The possibility of environmental sensitivity becomes more intriguing when we look beyond the data from recent monitoring programs. For example, elder residents in communities of Pacific Costa Rica have recounted how, in the 1960s, very few leatherbacks were on the very beaches that by the 1980s were crawling with so many turtles that locals referred to these behemoths as "ants." Colleagues in Mexico confirmed that elders there recalled similar patterns—not many leatherbacks in the 1960s, but tons by the 1980s.

What if the historical absence (or comparatively low abundance) of rookeries we now know to be highly abundant (for instance, Trinidad and Gabon) suggests that those patterns also occurred elsewhere in the world? The smaller numbers of leatherbacks were probably not due to human threats; it seems that there simply were not many leatherbacks around at the time of the early global assessments. Perhaps presciently, Pritchard wrote in 1971 that "there is no evidence that present numbers are yet substantially reduced from primordial, equilibrium population levels." Is it possible that historical leatherback abundance has fluctuated over time, often without *human* intervention?

A Future for Leatherbacks

Despite all our data—and all our supposed knowledge of how populations work—perhaps the forces truly driving leatherback population dynamics or limiting their recovery are mainly environmental in nature. This hypothesis contends that the rapid increase in leatherback numbers in the 1970s and 1980s in the eastern Pacific (perhaps later in other regions) would have been due to long-term cycles in environmental conditions that favored leatherback growth, recruitment, survival, and reproductive output for a period.

On the flip side, when times get tough, leatherback fecundity might be significantly depressed, slowing population growth and making them less resilient to threats. Maybe this boom and bust cycle characterizes leatherback population dynamics over long time periods and perhaps more so than other sea turtle species. Of course, human-caused mortality from commercial egg harvesting and fisheries bycatch is sufficient to reduce turtle numbers on its own, regardless of environmental conditions. But if unsustainably high mortality is coupled with unfavorable environments, this is a recipe for disaster for leatherbacks.

But there is a positive side to this paradigm: With effective threat reduction and favorable environmental conditions, leatherbacks *should* recover eventually. Their numbers apparently increased on their own many decades ago, and they have contracted and expanded globally with the wax and wane of glaciers over geological time. Though there isn't much we can do to produce more reliable food sources for leatherbacks, there is a *lot* we can do to bolster resilience in leatherback populations through effective conservation efforts.

Fortunately, people are rising to the challenges by reorganizing and redoubling efforts to reduce threats that leatherback populations currently face. In the eastern Pacific, the Eastern Pacific Leatherback Conservation Network (*Red Laúd OPO* in Spanish) is coordinating and supporting members' efforts everywhere they need to happen, whether on beaches or on boats or in conference rooms. In the Wider Caribbean, a hot-off-the-press regional action plan developed by key actors across the region highlights priority actions that must be implemented to promote leatherback recovery. And a tri-national plan involving

Indonesia, Papua New Guinea, and Solomon Islands is in place to promote West Pacific leatherback conservation. There are many comparable examples in other parts of the world.

Good conservation is a long, hard slog that involves long-term collaborations among multiple stakeholders to implement the best possible interventions. And we have lots of examples of effective, long-term conservation providing positive results for sea turtles. Despite all the bad news, our conservation efforts will work in the long run—especially when Mother Nature lends her hand by providing leatherback-friendly ocean conditions. This is not the first time people have thought leatherbacks were headed toward extinction, and each time, there was more to the story. This time will be no exception.

So let's keep slogging. •

SWOT FEATURE MAPS

Welcome to Planet Leatherback

By Bryan P. Wallace, Helen Bailey, Scott R. Benson, Kara Dodge, Peter H. Dutton, Karen L. Eckert, Sabrina Fossette, Michael C. James, Milagros López-Mendilaharsu, Nathan J. Robinson, Kartik Shanker, George L. Shillinger, Adhith Swaminathan, Manjula Tiwari, and Matthew Witt

The first *SWOT Report* maps in 2006 showed the global distribution of leatherback nesting, but they did not attempt to draw lines around the species' distribution across our blue planet. So what more can nearly 20 years of additional data—including hundreds of satellite tracks and tens of thousands of nests counted—tell us? As you'll see in the

A leatherback dives in the clear waters of Maluku, Indonesia. Leatherbacks inhabit vast oceanic ranges—more so than any other turtle species—as evident in the maps on pp. 27–29. © Jason Isley / Scubazoo updated maps in the pages of this 18th volume of *SWOT Report* (pp. 27–29), the more beaches we walk and the more turtles we tag and track, the more we see that leatherbacks really are … everywhere.

In fact, instead of describing where leatherbacks are, perhaps it is more appropriate to ask where they *aren't*. We've got just the map for that: the funky, Antarctica-focused telemetry map on p. 27 provides a novel perspective of the world's one big, interconnected ocean that is centered around the one place that leatherbacks are apparently absent. The South Pole seems to be encircled in an anti-leatherback force field, successfully repelling any attempt by these otherwise intrepid explorers. Similarly, a leatherback-free zone fringes the frigid waters ringing the North Pole. Although their ability to stay warm in cold waters while chowing down on jellyfish is well known, even mighty leatherbacks cannot withstand icy polar seas.

Apart from those gaps, leatherbacks are truly circumglobal—more so than any other sea turtle species. Leatherbacks regularly travel back and forth between the tropics and subpolar latitudes, connecting distant ocean areas in a way very few species ever have in Earth's history. For example, nearly 100 leatherbacks tracked from Papua Barat, Indonesia, and the U.S. West Coast over the past couple of decades show epic trans-Pacific migrations between breeding areas in warm near-equatorial waters in the west and feeding areas in the cold, foggy California Current in the east, several thousand miles apart. Meanwhile, other turtles from this nesting population take different paths into the South China Sea, to oceanic convergence areas north of Hawaii, and even as far afield as Tasmania and New Zealand. Overall, the North Pacific Ocean in the maps on pp. 27–29 seems to feature more cells that have hosted leatherback action at some point than empty blue spaces.

In the South Atlantic, movements of leatherbacks from three different regional management units (RMUs, see pp. 12–15) connect the South American and African continents, stretching like chewing gum between what was once a single landmass in the southern hemisphere. Leatherbacks in the Northwest Atlantic are known to use the entire basin—from the Caribbean to Newfoundland to Mauritania to the Mediterranean—moving from bloom to bloom of ephemeral jellyfish prey like waterborne butterflies foraging among flower patches in the summer.

Recent data from the Indian Ocean provide a new flavor of the well-established leatherback recipe for long-distance movements connecting far-reaching corners of ocean basins. Instead of all following a shared trajectory, leatherbacks leaving nesting areas in the Andaman Islands in the northeastern Indian Ocean initially travel south and spread out in two directions—mainly southwest toward the eastern coast of Africa and southeast toward the northwestern coast of Australia and the Timor Sea—providing a near mirror image of the diverse navigations of West Pacific turtles from Indonesia, Papua New Guinea, and the Solomon Islands.

Although leatherback movement data paint with a broad brush across the blue ocean canvas, they paint thinly. Compared with other species, leatherbacks lack obvious hotspots where many of them tend to hang out. Most grid cells across the ocean have at least a few leatherback locations, but very few cells have high concentrations of location data—with a few notable exceptions near nesting beaches and places like New England, U.S.A., and Nova Scotia, Canada. Eastern Pacific leatherbacks represent this pattern well. More than 50 turtles tracked from nesting beaches in Mexico and Costa Rica over two decades showed a persistent migration stretching southwest through the Galápagos Islands before fanning out in the southeastern Pacific, their migratory corridor dissolving into the open ocean. Tracks from large juveniles and adults tagged in feeding areas off the coasts of Peru and Mexico have shown similar divergence.

Mapped telemetry data help us visualize where turtles go so that we can whittle down the vast expanse of Planet Ocean to, theoretically, more manageable areas of importance for turtles. With our surreptitiously attached our trackers, turtles themselves unwittingly disclose to us where they are in the world with each connection between transmitter and satellite. Using the rich but imperfect information we obtain through these spy games, we become *Dermochelys* detectives, trying to unravel mysteries about leatherback behaviors and hangouts we rarely—if ever—see for ourselves.

But as much as we've learned about leatherback movements and habitat use thanks to the bewildering evolution of remote tracking technology, we grudgingly recognize that these fancy tools provide only brief and biased snapshots of what turtles really do and—most importantly—why they do these things. Transmitters typically last a few months, with best-case scenarios pushing a year or slightly more; yet improvements in design and miniaturization are enabling the tracking of smaller turtles, even yearling juveniles. In addition, the majority of data shown in the maps on pp. 27–29 and described in the data citations on pp. 52–53 (which does not reflect all the global tracking data for this species) come from adult females leaving their nesting beaches in search of food in far-off waters. The movements of males, smaller juveniles, and hatchlings remain largely invisible to our lens, although genetic and oceanographic modeling tools have begun to shed some light on these missing pieces. Perhaps a more complete map that accounted for those caveats would leave no patch of open ocean between the Arctic and Antarctic untouched by a leatherback flipper.

Though leatherbacks dare to swim in waters inhospitable to their cheloniid cousins, their nesting sites are still constrained to low latitudes where favorable nest conditions exist, just like those of other sea turtles. As recently as a decade ago, the Northwest and Southeast Atlantic leatherback RMUs appeared to be abundant and stable, buoying hope for leatherbacks globally amid consistently bad news from the West and East Pacific RMUs.

Although there are fewer leatherbacks now than when we started counting, the good news is that leatherbacks are persisting almost everywhere, and our increased understanding of how they move through the oceans makes us better equipped to protect them. However, most leatherback populations are not increasing in abundance, and few are sufficiently large to withstand significant threats. So wherever we work, let's keep discovering and sharing details about where leatherbacks are and what they're doing there. If we do, the version of the leatherback map that one day appears in *SWOT Report*, volume XXXVIII, will provide an improved and hopeful view of Planet Leatherback. ●

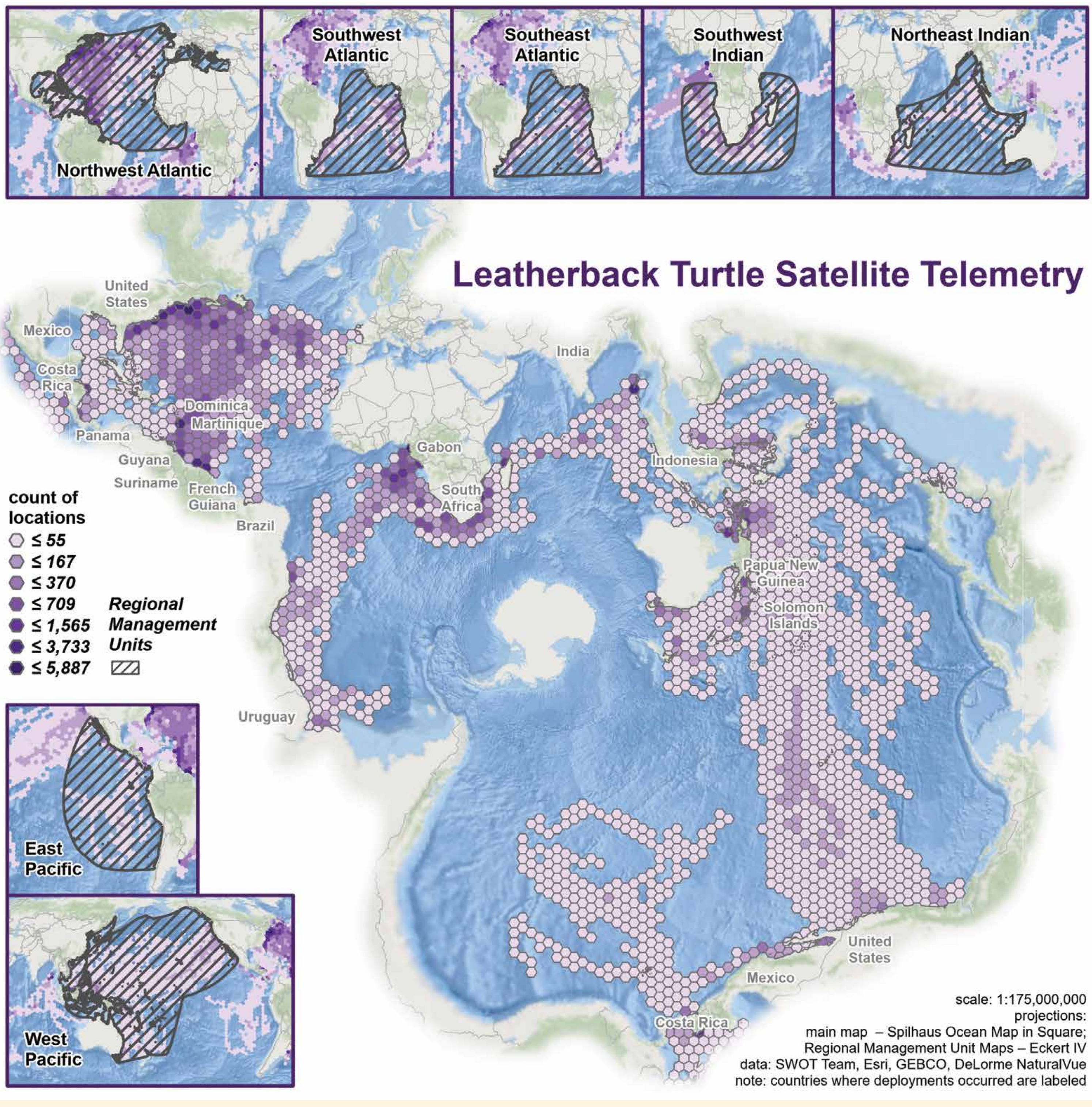
GLOBAL BIOGEOGRAPHY OF LEATHERBACK SEA TURTLES

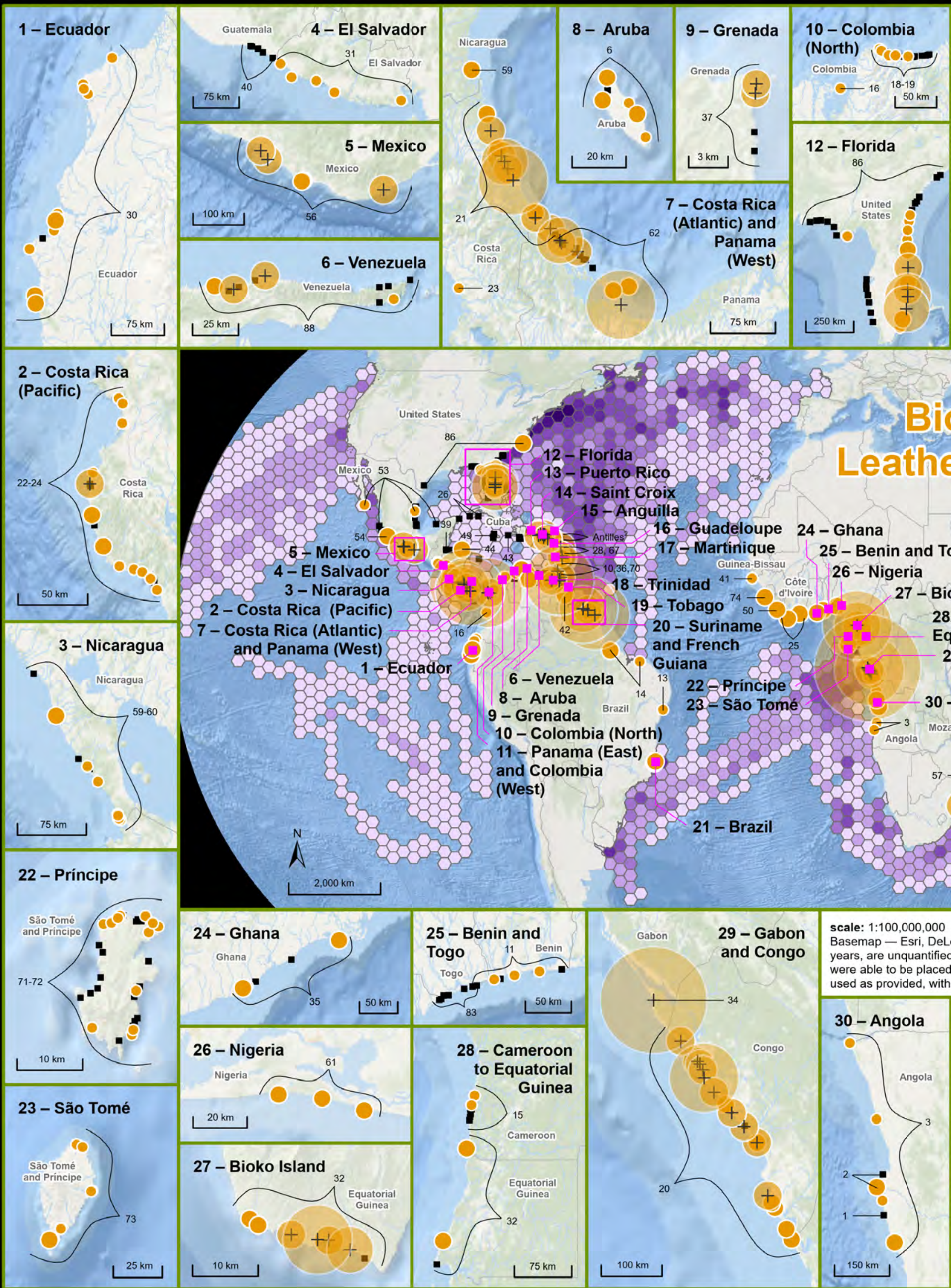
The maps below and on pp. 28–29 display available nesting and satellite telemetry data for leatherback sea turtles. The data include 988 nesting sites and 321 satellite tags, compiled through a literature review and provided directly to SWOT by data contributors worldwide. For metadata and information about data sources, see the data citations on pp. 46–53.

Nesting sites are represented by orange dots scaled according to their relative nesting abundance in the most recent year for which data are available. Black squares represent nesting sites for which data are older than 10 years, data are unquantified, or the nest count for the most recent year was given as zero. For the purposes of uniformity, all types of nesting counts (e.g., number of nesting females, number of crawls) were converted to number of clutches as needed. Conversion factors ranged from 4.1 to 6.4 clutches per female and 0.75 to 0.9 crawls per clutch.

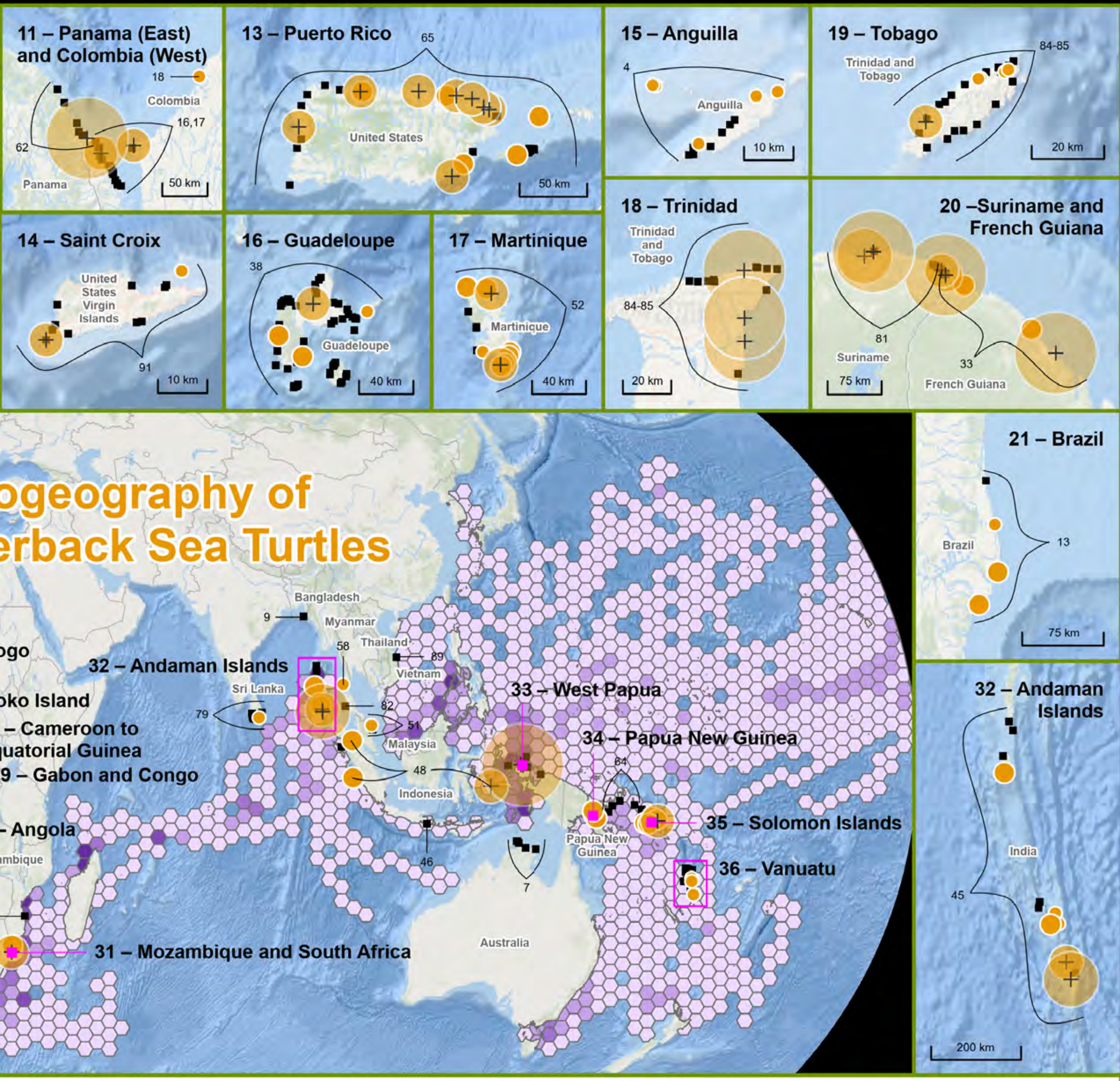
Satellite telemetry data are represented as polygons that are colored according to the number of locations within each hexagon. Darker colors represent a higher number of locations, which can indicate that a high number of tracked turtles were present in that location or that turtles spent a lot of time in that location. Telemetry data are displayed as given by the providers, with minimal processing to remove locations on land and visual outliers, and represent almost 150,000 animal locations. Some tracks are raw Argos or GPS locations, whereas others have been more extensively filtered or modeled.

We are grateful to all of the data contributors and projects that participated in this effort. For details, please see the complete data citations on pp. 46–53.

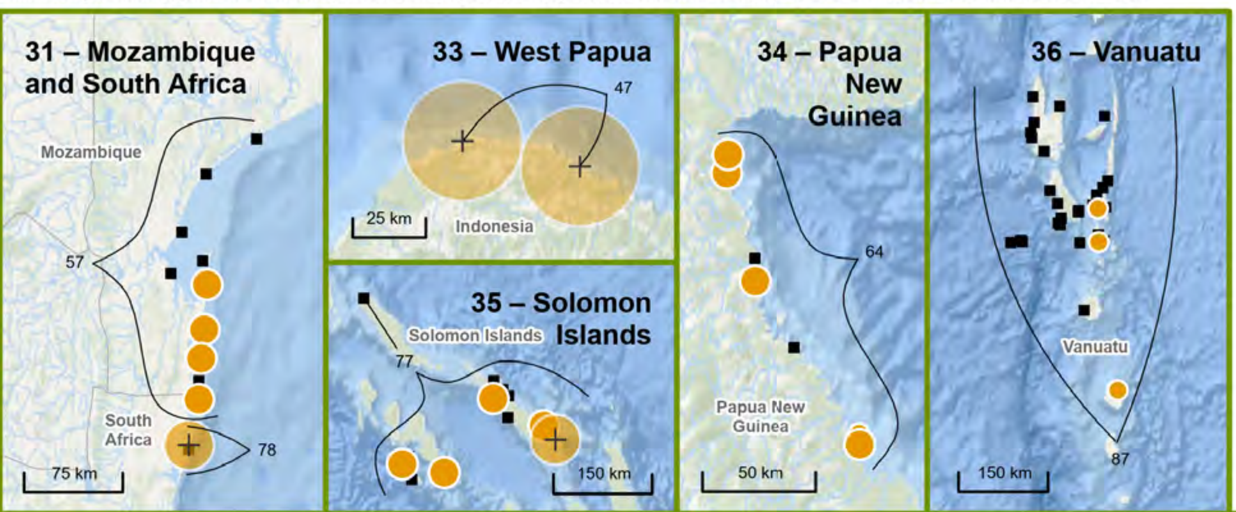




1 – Ecuador
Ecuador
30
75 km
4 – El Salvador
Guatemala
El Salvador
31
40
75 km
5 – Mexico
Mexico
56
100 km
6 – Venezuela
Venezuela
88
25 km
Nicaragua
59
21
Costa Rica
23
62
7 – Costa Rica (Atlantic) and Panama (West)
Panama
75 km
8 – Aruba
6
Aruba
20 km
9 – Grenada
Grenada
37
3 km
10 – Colombia (North)
Colombia
16
18-19
50 km
12 – Florida
86
United States
250 km
2 – Costa Rica (Pacific)
22-24
Costa Rica
50 km
3 – Nicaragua
Nicaragua
59-60
75 km
United States
86
Mexico
53
26
Cuba
39
54
49
44
43
Antilles
28, 67
10,36,70
12 – Florida
13 – Puerto Rico
14 – Saint Croix
15 – Anguilla
16 – Guadeloupe
17 – Martinique
18 – Trinidad
19 – Tobago
20 – Suriname and French Guiana
5 – Mexico
4 – El Salvador
3 – Nicaragua
2 – Costa Rica (Pacific)
7 – Costa Rica (Atlantic) and Panama (West)
1 – Ecuador
16
42
6 – Venezuela
8 – Aruba
9 – Grenada
10 – Colombia (North)
11 – Panama (East) and Colombia (West)
Brazil
13
14
21 – Brazil
Guinea-Bissau
41
Côte d'Ivoire
74
50
25
24 – Ghana
26 – Nigeria
22 – Príncipe
23 – São Tomé
3
Angola
N
2,000 km
22 – Príncipe
São Tomé and Príncipe
71-72
10 km
23 – São Tomé
São Tomé and Príncipe
73
25 km
24 – Ghana
Ghana
35
50 km
25 – Benin and Togo
Benin
Togo
11
83
50 km
26 – Nigeria
Nigeria
61
20 km
27 – Bioko Island
32
Equatorial Guinea
10 km
28 – Cameroon to Equatorial Guinea
15
Cameroon
Equatorial Guinea
32
75 km
29 – Gabon and Congo
Gabon
34
Congo
20
100 km
scale: 1:100,000,000
30 – Angola
Angola
3
2
1
150 km

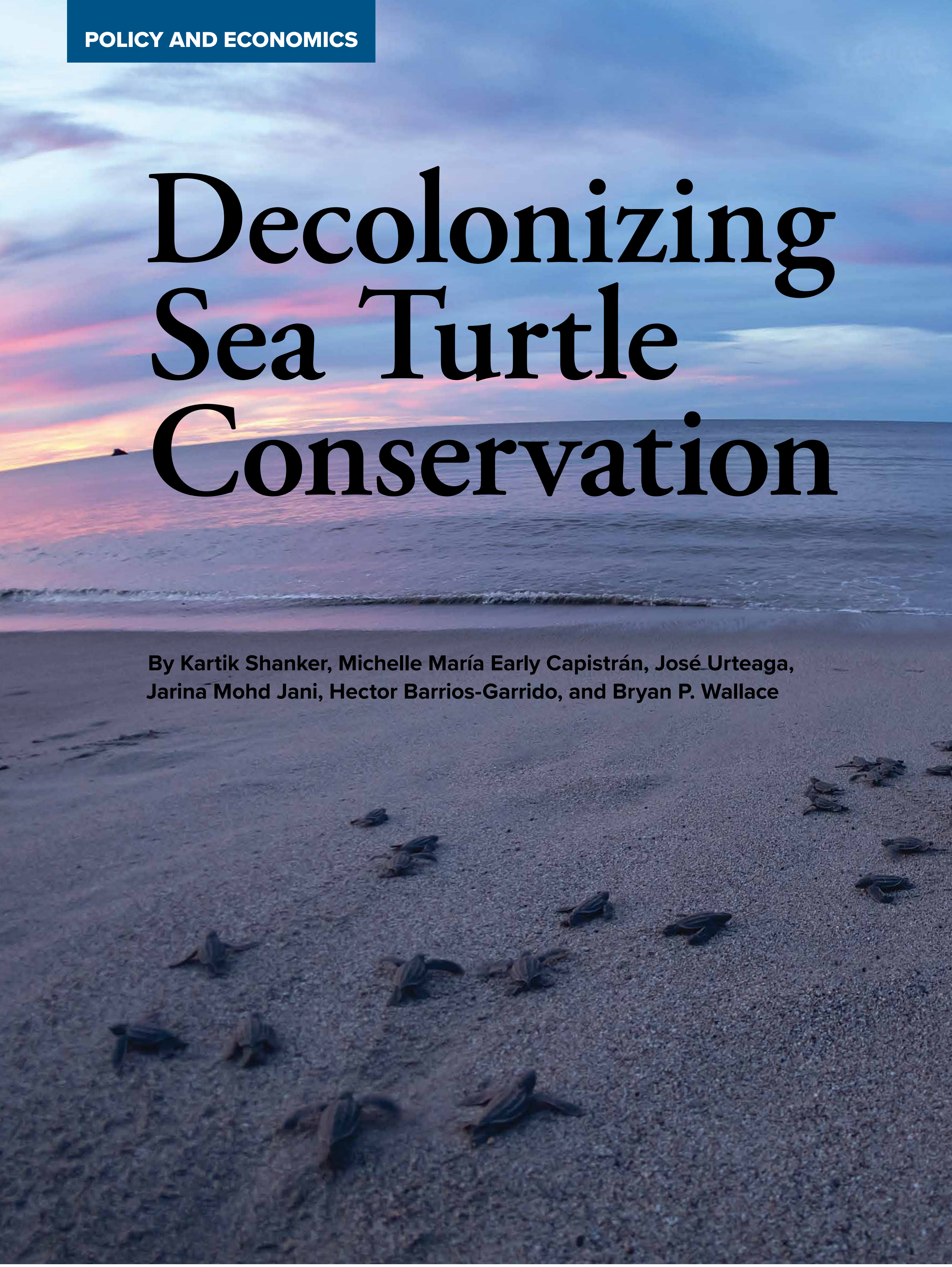


projection: Eckert IV, central meridian 30E **data:** The SWOT team and reviewed literature (see pp. 46–53 for citations); Ocean orme, GEBCO, and NaturalVue; boundary data — Esri Maps and Data 2016. **notes:** 1. Black squares denote data are older than 10 d, or count was zero. 2. Multiple records for the Lesser Antilles region: 5, 12, 66, 68–69, 75–76, 80, and 90. 3. Not all record numbers d due to space limitations but can be found in the citations at the end of the report (pp. 46–53). 4. Satellite telemetry locations were minimal processing for aesthetics. **produced in partnership with:** Oceanic Society, OBIS-SEAMAP, and the IUCN-MTSG.



Decolonizing Sea Turtle Conservation

By Kartik Shanker, Michelle María Early Capistrán, José Urteaga, Jarina Mohd Jani, Hector Barrios-Garrido, and Bryan P. Wallace



Community-led efforts from the village of Grande Riviere on Trinidad's north coast safeguard daytime hatching turtles to release them after sunset, when avian predators (vultures and frigatebirds) are absent. © Tui De Roy / Roving Tortoise Photos

Sea turtles embody all that is wise and wonderful about nature. Many of us believe that through their migrations and complex life cycles, sea turtles connect biomes, hemispheres, countries, and cultures. They pick up nutrients, transport them from marine to terrestrial realms, deposit them, and vice versa. Moreover, they connect us, the community of professional researchers; conservationists; and countless volunteer beach-walkers, crowd-talkers, and enthusiasts. So it shouldn't be surprising that we—the global sea turtle community—sometimes behave like our shelled muses. Many of us also migrate—from the places we call home to places where we work, sometimes back again, and sometimes elsewhere. We follow the turtles, connecting our homes with theirs.

But as it turns out, not all migrations are benign (see *SWOT Report*, vol. XVII, pp. 36–37). In truth, the broader patterns of migration within the sea turtle community reflect imbalances of resources, power, and agency, plus the conservation values and practices that are deeply rooted in neocolonialism as a global phenomenon.

Decolonization has become a term du jour, reflecting a wave of sentiment that we need to right the wrongs of centuries of the Global North dominating the fate of the Global South. Unfortunately for us, sea turtle conservation is no exception. As researchers and resources have moved around the world, they have done so not in symmetrical patterns, following seasons or ocean conditions like turtles, but instead they have moved along a landscape that is shaped and skewed by neocolonialist structures and practices. As a result, those movements have abetted structures and hierarchies that are inimical to our notions of a fair and equitable society.

The Lost Years

Neocolonialism, in general, involves the extraction of desired resources (including knowledge) from the colonized for the enrichment of the colonizers, who give very little, if anything, in exchange. Embedded in neocolonial behavior—overtly or covertly—is the idea that some people (the colonizers) are superior to, and more worthy and deserving than others (the colonized). This system results in the elevation and perpetuation of a dominant foreign regime, philosophy, and practice at the expense of—and often resulting in the erasure of—local counterparts. Though it might sound harsh, defining the predominant sea turtle conservation practice in those terms is not far-fetched.

The first steps toward solving a problem are acknowledging that it exists and recognizing its consequences, as difficult and painful as that process might be. So we can ask ourselves, what are the telltale signs that sea turtle conservation as we know it is a colonialist construct? Starting with a big picture view of sea turtle researcher migrations, we begin to see the contours of colonialism across the globe. Sea turtle people appear to move overwhelmingly in one direction—from the Global North to the Global South—to do their work (see maps, p. 33). This movement isn't nefarious on its face. Because sea turtles tend to live in Global South countries and waters near the equator, where else would we go to work with sea turtles?

This North-to-South pattern, however, reveals a systemic, persistent, and powerful imbalance in the prevailing philosophies and practices; in the generation and flow of new knowledge and related benefits; and in generation and flow of financial, capital, political, and human resources. As with biodiversity conservation generally, early sea turtle research was done not by people whose ancestors had lived with turtles for generations, but rather by outsiders, typically of European ancestry, who rarely lived in or engaged with local communities. Those efforts were made possible—even if unconsciously—by centuries of colonization that elevated Global North people and their values above their counterparts in the colonized Global South.

As a result, Western-centric conservation values became enshrined as best practices and standards for sea turtle research, conservation, and policy around the world, even while their proponents continued to live lifestyles that have far more negative impacts on the environment than do their southern counterparts.

This elevation of Western values means that only a particular form of research is recognized as legitimate among the global community today, because it is the only form that meets Global North standards for what is termed objectivity. In fact, social science has lifted the veil on this veneer of objectivity and emphatically revealed that prevailing conservation science is greatly influenced by a set of specific values. However, such criticisms are heartily dismissed by conservation scientists who believe in the infallibility of their methods. Meanwhile, attempts to build more-inclusive scientific approaches are dismissed or deemed too time-consuming or labor-intensive. Does this explanation sound familiar?

Maybe a concrete example will help. Let's consider the Annual Symposium on Sea Turtle Biology and Conservation. Now in its 42nd year, this gathering is considered the preeminent global meeting about sea turtle conservation and biology, sometimes drawing more than 1,000 attendees. To attend, you must first have the resources to travel, register, and stay at the symposium's location, which may cost hundreds or thousands of dollars. To present your work, you must submit an application in English, and your project must meet certain standards of science if it is to be accepted.

The main event of the symposium is several days of formal, staid presentations that are typically formatted to adhere to the Western-centric scientific method and are kept on time by diligent and sometimes intimidating moderators who must keep discussion to a minimum. Even sessions ostensibly focused on conservation consist of speaker after speaker sharing their work in highly polished presentations to an enormous ballroom of silent attendees. When those presentations include descriptions of engagement with or contributions from local communities, as they often do, the whole event becomes … poignant? Perhaps ironic? Or ridiculous?

If you speak this "language" (English being just one part of it), and if you can navigate the dynamics, the symposium is a blast—a weeklong exchange of information and experiences in which you make and strengthen professional and personal networks and identify exciting new opportunities for collaborations. If you can't speak the language, however, you're on the outside looking in—even if you were actually there.

Look at the awards of the International Sea Turtle Society (ISTS). By our unofficial count, two-thirds of recipients of ISTS Lifetime Achievement Awards have been white men from Europe or the United States; only three recipients have been from Global South countries. Winners of the ISTS Champions Award—given to individuals or organizations whose largely field-based contributions are recognized as particularly outstanding—are more frequently from Global South countries.

The principles honored by each of the awards are undoubtedly important and reflect the ISTS's values. But whether this dichotomy reflects the perceived distinction between an intellectual contribution and grunt work, as well as how those contributions should be honored, is for us all to decide. In practice, how do the dynamics of the ISTS and its awards shape the form and function of the ISTS? Perhaps over time, as the ISTS becomes more inclusive, the patterns will change.

Axes of Colonialism

Now that we see the signs of neocolonialism in our community and how it works, what are its effects? One axis to examine is the generation and use of knowledge, ostensibly in support of sea turtle conservation. Research performed using normalized, Western-centric methods has no doubt generated incredible knowledge about sea turtles and innumerable related subjects. But we must recognize that such methods produce that knowledge by perpetuating a focus on traditionally Northern values of "objectivity" and "either/or" thinking, typically at the expense of emotional, sensorial, and experiential ways of knowing that may be common in other cultures.

In many places, it is impossible to recruit local community members with significant sea turtle expertise to work for a public institution (such as a conservation department, university, or research center) because they lack required education credentials (such as a high school certification). This lack of appreciation for local ecological knowledge is one of the reasons for its erosion—a costly loss for sea turtle conservation that could be improved by sharing all ways of knowing.

Academic research largely produces graduate students and peer-reviewed papers and attracts funding to already-established researchers and their institutions, yet it typically invests little in local conservation values, initiatives, or capacity. Even within academia, some researchers have vastly greater access to resources and to prestigious institutions that enable a particular kind of research that is suited to publication in high-profile journals.

Painful as it is to accept, such research—which is typically conducted in the Global South by people from, and living, in the Global North, or by elites within the Global South—mirrors colonialist practices of extracting valuable resources and prestige-enhancing experiences without leaving much behind. If there is any doubt, let us ask who typically benefits from this research. Are host countries and communities better off for the work of the visitors? Are sea turtles better off? Or, as we must admit, has our research probably benefited us far more than anyone we met in the field, let alone the conservation of sea turtles?

Like sea turtle research, conservation priorities and actions often are defined by actors in the Global North or elites within the Global South, whose agendas are frequently imposed on local communities rather than being cocreated with them. Once

© Neil Ever Osborne

entrenched, colonial expertise and perspectives are valued more highly than, and are seen as superior to, the opinions of local or national experts.

In some countries, there is a "postcolonial legal stagnation," in which colonial policies and systems of governance that do not value local community knowledge and management practices simply continue as before, even after independence has been achieved. In many places, colonial policies are aligned with the views of the privileged and powerful people within Global South countries who could leverage the system to perpetuate it by purposely excluding others and reaping benefits to maintain the dominance of the privileged and powerful.

A second axis of colonization pertains to physical space or land. Many protected area systems in Global South countries were originally established to protect game species valued by hunters from colonial powers, while other systems were modeled on the exclusionary myth of "pristine nature." That myth led humans to be forcibly removed and kept out; examples of both types of systems abound in every continent, including Latin America, Africa, and Asia. In addition to the widespread displacement of people caused by this notion of conservation, privileged conservationists have also sought to impose their values on the world.

The dramatic opposition to human consumption of turtle eggs, meat, and other products—particularly for commercial ends—from conservationists is but one example of this concept. In such situations, local values and needs are overlooked or ignored or often outright devalued and considered inappropriate for advancing sea turtle conservation as defined by the dominant value system. The utilitarian use of environmental education—sometimes described as "behavior change"—is often aimed at urging communities to adjust to the priorities or sensibilities of those who define conservation agendas. In other words, "How do we get them to be more like us?" Many conservation organizations and academics have been complicit in such efforts to push their externally derived priorities even when the priorities do not align with local values.

A third axis of neocolonialism is how it concentrates resources to enshrine Western-centric values of sea turtle conservation in a systematic feedback loop that both creates and perpetuates inequities. Whether the resource is money, equipment, opportunities, connections, or people, there is more of it in Global North countries. Resources are typically acquired from funding agencies, foundations, and donors that are also mostly in the Global North, thus creating a kind of echo chamber that amplifies the priorities and values defined by the Global North. When those resources are not distributed in equitable ways that build local and in-country capacity where the work is happening, outcomes are rarely good for local communities.

By now we must sound like hypercritical, self-righteous preachers! And yet there may be a positive consequence of colonial-style sea turtle conservation, and with it comes great opportunity. Those of us who have benefited from neocolonialist structures, practices, and customs have powerful agency. We are in the room. We are listened to. Our recommendations matter. At individual and project levels, we can influence discussions and influence how things are done. So what should we do with this agency and platform?

The Brighter Horizon

Undoing centuries-old laws, policies, customs, resource flows, class systems, and other societal dynamics around the world will not be easy. It will require feeling for the cracks in the façade; gauging what the holes are; dismantling things brick-by-brick and section-by-section; and then replacing what's removed with new pieces that will eventually and hopefully provide a new structure and new opportunities. So how can we do this for sea turtle conservation?

First, there must be an honest acknowledgment of the foundational structure and dynamics we've described. This acknowledgment doesn't erase all the tremendous gains made in sea turtle research and conservation to date. Nor should it villainize anyone who has benefited from or perpetuated colonialist power structures, particularly anyone who has done so unwittingly. Instead, by recognizing the role of neocolonialism in sea turtle conservation, we focus on who has been left out, how and why they have been left out, and what we should do about it.

Going forward, we should focus on programs and practices that promote and grow capacity, talent, and expertise—whether it be for field research, data analysis, community development, or policy—within the Global South and remote communities. We should focus on fairer, more equitable, and more appropriate distribution of resources (such as people, training, equipment, or money) and credit for various types of valuable contributions. Such priorities could be incorporated by funders and permitting authorities and could be codified in collaboration agreements put in place before Global North visitors work in other parts of the world.

Perhaps such agreements could require that members of local communities be involved in field teams and serve as coauthors for related publications. The latter would imply a change in journal policies that, in some cases, require coauthors to have read the manuscript, despite the fact that some worthy coauthors may not even understand English—another way in which neocolonial structures prevent credit sharing.

In parallel with bolstering local capacity and in the conservation projects themselves, we must foreground the needs and values of communities where turtle conservation is taking place. Global North and South collaborations should ensure that the work, responsibilities, values, and methods better reflect local and national needs and customs—not as an afterthought retrofitted onto a research project that has been already developed, but as a central principle that determines why and how a project takes place.

We should include traditional knowledge and other ways of knowing when we frame and carry out research, and we should use models that integrate different knowledge systems into project design and implementation. Global North visitors should be required to share what they learn, analyze, and produce with Global South countries. Perhaps such requirements could be enforced as a prerequisite to obtaining funding, research permits, and access from the host country.

None of this is easy. To begin with, the priorities of those of us from privileged institutions often simply do not match the priorities of the communities that we engage with. Although members of economically disadvantaged and marginal communities may accept employment because they need the money, they may or may not really care about our scientific research of sea turtles, be it on physiology, genetics, or behavior. Balancing our own sometimes esoteric priorities with more meaningful contributions to local communities requires us to rethink the larger project of our engagement and forces us to consider what we might do, besides research, that would give something back.

Most importantly, we cannot and should not wait for national or international bodies to develop and impose the protocols. Those of us from privileged backgrounds can step up and use our voices and influence to highlight and incorporate many of these actions ourselves. We can be a platform to elevate and amplify the voices, perspectives, experiences, expertise, values, needs, and concerns of our local partners, and we can ensure that local partners are as visible in our work as we are, if not more so. But before we can use that voice effectively, we must be humble, stop talking, listen to others' voices, and actually heed what we hear.

And responsibilities do not rest just with people from the Global North. Whether in the North or South, all of us who have the privilege of dedicating our lives to the pursuit of knowledge have the responsibility to build a better future beyond the academic sphere. Those of us from the Global South with power, privilege, training, and resources need to ensure that we also give back to society. We should give due recognition to local ecological knowledge holders and should create inclusive sharing platforms where their insights and understanding can be integrated to improve conservation practices. We must assist communities in asserting ownership of the places, opportunities, and resources that are of value to visitors, thereby creating change over time. We can hold local authorities more accountable for following through on commitments, and we can prioritize enhanced training and networking in the Global South.

In the years to come, we hope to create robust spaces for meaningful, honest, and participatory dialogue and action in the sea turtle community, to dismantle our colonialist foundations, and to build a new future. Someday, perhaps, we can make our migrations between our homes and "offices" as balanced as the round-trip migrations of our sea turtle friends. We all—turtles and turtle people alike—will be better for it. •

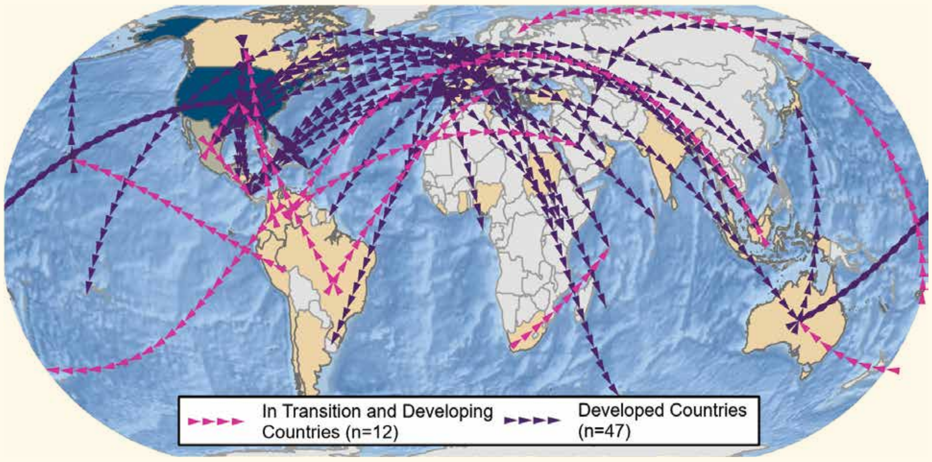
THE MIGRATIONS OF SEA TURTLE PEOPLE

We know a lot about the migrations of sea turtles around the world, but what about the migrations of sea turtle people—those of us committed to the study and conservation of sea turtles? To determine where sea turtle people go to live (top panel), attend school (middle panel), and do fieldwork (bottom panel) relative to their home countries, SWOT conducted an online survey of the sea turtle community in 2023 that received 225 responses. The survey responses are represented by lines and arrows in the maps on this page that show the directionality and magnitude of the migrations of sea turtle people relative to their home countries. Some individuals indicated more than one school, and many respondents indicated more than one field site. Each migration—even if there were several for an individual—is represented in the maps. The thicker the arrows, the higher the number of migrations along that route. The number of people who stayed in their home countries is also shown.

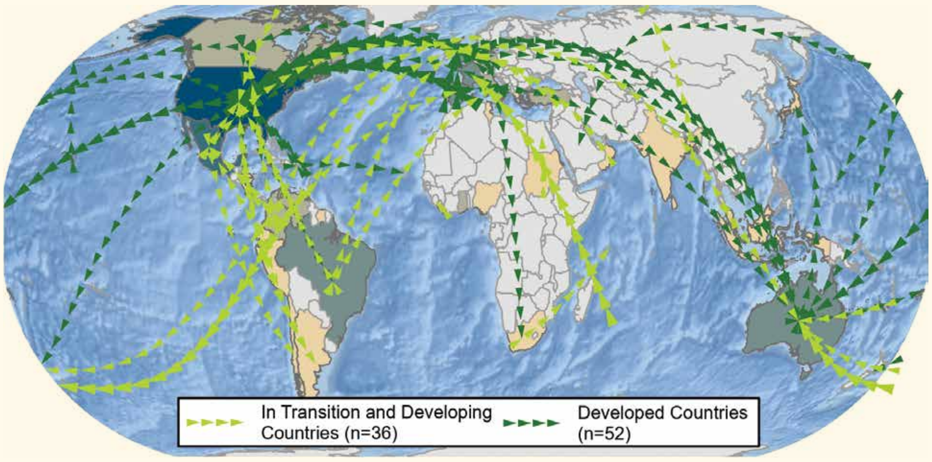
We also coded countries according to their designation as "developed" (from which we had 150 respondents), or "in transition and developing" (75 respondents) by the United Nations World Economic Situation and Projects Report (2022) to help illustrate patterns of movement between countries of differing economic status. Though the number of respondents to this survey is small relative to the total number of people in the global sea turtle community, the results show that sea turtle people's migrations follow routes forged by centuries of colonialism around the world. Specifically, people from developed countries are more likely than those from in transition and developing countries to:

- Live *outside* their home country (more than 3 times more likely)
- Have studied *outside* their home country (more han 30 percent more likely)
- Work *outside* their home country (4 times more likely)
- Have worked in more countries other than their home country (more than twice as many countries).

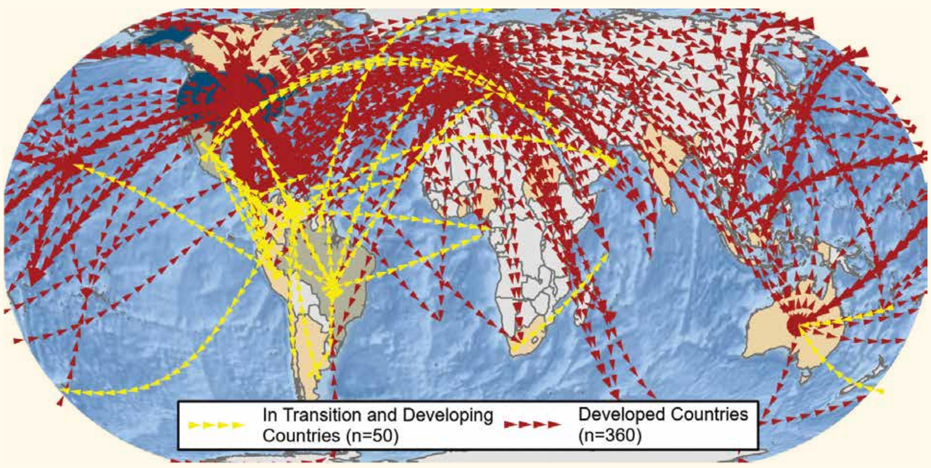
Where did you go to live?



Where did you go to school?



Where did you go to do fieldwork?



Arrow colors indicate whether the migrations originated in "in transition and developing" or "developed" countries (per World Economic Situations and Prospects 2022). Arrow size indicates the number of migrations per pathway.

As Shanker and colleagues state in the accompanying article, "the broader patterns of migration within the sea turtle community reflect imbalances of resources, power, and agency, plus the conservation values and practices that are deeply rooted in neocolonialism as a global phenomenon." Examination of these maps and the underlying data (available at seaturtlestatus.org) provoke important questions about those imbalances. For example, considering the resources required to support these global North to South migration patterns, is the sea turtle community generating the best possible return on investment in terms of research and conservation benefits that advance our collective goals? And who is benefiting most from these patterns? The answers to those questions might be painful to accept, but confronting these hard truths will make our sea turtle conservation community truly global—and one that elevates and celebrates all contributions, regardless of where you're from.

FISHERS AND TURTLES

Navigate the Same Waters

By Daniel González-Paredes, Patricio Peñalver-Duque, and Carolina Fernández-Maldonado

S.O.S Caretta—Fishers for Biodiversity

At the frontier of two major bodies of water, Spain's Iberian Peninsula protrudes southward to within 10 miles of North Africa at the Strait of Gibraltar, separating the Gulf of Cádiz (Atlantic) from the Alboran Sea (Mediterranean). Those contiguous bodies of water are key feeding areas for loggerhead turtles from two distinct subpopulations (also known as regional management units, or RMUs). And those same areas are important destinations for trawl and purse-seine fishers from the Spanish autonomous community of Andalusia. Interactions between turtles and fisheries are unavoidable; as a result of this unfortunate confluence, numerous bycaught and stranded turtles are found every year in those waters and along the region's beaches.

Fisheries bycatch is one of the greatest threats to sea turtles, and it is considered a primary driver of sea turtle population decline worldwide. Although measures to reduce bycatch have been successfully implemented in many places, large numbers of turtles continue to be caught or killed in fishing gear, which makes a solution to this problem a global imperative. In fact, conservationists and fishers worldwide are seeking solutions, and among those is S.O.S Caretta, a project that was launched by Asociación Hombre y Territorio to address the challenge of bycatch and to reduce turtle mortality in loggerhead foraging grounds on the Andalusian coast.

Fishers Become First Responders

Sea turtles that are accidentally caught by fishers are often still alive, but they may be stressed, tired, or injured to varying degrees; if released in a weakened state, such animals can die. But it has been demonstrated that administering first-aid to bycaught turtles promptly after their capture can increase their chances of survival and buy them time until they can receive proper veterinary care back in port.

Therefore, collaborating with fishers is the key to saving the lives of countless turtles. But collaboration is not always easy, and it requires building strong alliances between conservationists and fisheries to jointly develop and enforce action plans. The S.O.S Caretta project began by hosting open dialogues to discuss the priorities and concerns of all stakeholders and to create a collaborative framework for conservation action. Fishers were then taught best practices for disentangling turtles from their gear and were trained in simple actions that sustain the animals until their arrival in port.

The training also instructs fishers in how to notify rangers from the Regional Government of Andalusia (Junta de Andalucía) so they receive the rescued turtles upon arrival and can transfer the turtles to the Center for the Management of Marine Environmental Resources of Andalusia (CEGMA). At present, S.O.S Caretta provides technical support and training to fishing guilds that represent around 300 trawl and purse-seine vessels from four main Andalusian fishing ports.

LEFT: Crew members aboard the vessel *El Minero* hold the first loggerhead rescued as part of the S.O.S Caretta project. © HyT Association; **RIGHT:** Adelina, a loggerhead turtle rescued by the S.O.S Caretta project, heads back to sea with a satellite tracker on its carapace. © HyT Association

Success Breeds Enthusiasm

From the start of S.O.S Caretta in 2020, a few fishers showed a great deal of interest in the program and were among the first to rescue bycaught turtles while using their training. Each time an animal arrived at port, the whole guild would celebrate those heroes, thereby encouraging others to repeat the act. Enthusiasm spread, and in less than a year, 36 loggerhead turtles had been rescued at sea, transferred to CEGMA for rehabilitation, and then successfully released back to the wild after a favorable veterinarian health assessment. Three of those patients were also fitted with satellite tracking devices that generated novel information about habitat use and migratory patterns to and from Andalusian waters. Curiously, each of the three turtles went in different directions: Bonanza swam northwards to the North Atlantic Gyre, while Adelina traveled to the temperate waters around the Azores, and Miriam remained in the Golfo de Cadiz.

Ways to Build Awareness for the Future

S.O.S Caretta believes that long-term success with the fisheries guilds must be closely linked to increased environmental awareness. Thus, all the project actions conducted have been supported by a strong awareness campaign, which includes the implementation of educational programs at local schools that have reached more than 2,000 people, as well as public releases of recovered turtles. At the releases, fishers' families come together to affirm their deeply rooted pledge: Con el esfuerzo de todos, podemos salvar las tortugas marinas (Together, we can save sea turtles).

S.O.S Caretta's mission is to empower fishers to reduce bycatch impacts on sea turtles. For its success in this endeavor, the organization was recognized with an award from the Spanish Coast Guard for its contribution to the United Nations Sustainable Development Goal to "conserve and sustainably use the oceans, seas and marine resources for sustainable development." S.O.S Caretta represents a sizable step forward in efforts to involve fishers in marine turtle conservation and to change public perceptions of the fisheries as important players in ocean conservation.

S.O.S Caretta is grateful to the Fundación Cepsa for its support, to the numerous governmental agencies and partner organizations that have cooperated in this important work, and especially to the dozens of Andalusian fishers and their families, without whom this work would not be possible. To learn more please visit www.soscaretta.org. •

Frequently Asked Questions

A flatback turtle, endemic to Australia, rises toward the surface to breathe. Scientists continue to learn more about how sea turtles sense their environment, from what they see and smell to how they feel pain. © Doug Perrine

How Do Sea Turtles Sense Their Environment?

By Samantha Trail and Jeanette Wyneken

Sea turtles live mostly in the ocean, though they spend brief portions of their lives on nesting beaches as hatchlings or adult females. Science is beginning to understand what external stimuli are important to them in the different environments.

VISION—With relatively small eyes for their large body size, sea turtles do not initially appear to have stunning visual capabilities. Indeed, they have low visual acuity (spatial resolution), "slow" temporal resolution, and eye structures that are best suited for the kinds of bright light conditions found on the shade-free ocean surface, where they spend much of their time. When sea turtles are on land, most of their activity is at night, when sea-finding and nest site selection occur. Sea turtles do have color vision and can sense the shorter, near-UV light wavelengths emitted from the stars and moon that humans do not see. Hatchlings use those dim light cues to crawl toward the sea from the nest, and adult females respond to such cues during nest site selection.

HEARING—Sea turtles do not have an external ear, but they do possess a tympanum (eardrum), a middle ear bone (stapes), and an inner ear, within which the basilar papillae (hairlike filaments) detect sounds. In both aquatic and terrestrial environments, regardless of life stage, sea turtles are especially sensitive to low sound frequencies, with maximum sensitivity at or below 400 Hz; for perspective, humans hear sounds ranging from 20 Hz to 20,000 Hz. Why sea turtles are so sensitive to such low frequencies is unknown, but such sounds are more prevalent in underwater environments and can travel long distances, which could be advantageous. Unfortunately, sea turtles ignore continuous sounds, such as those emitted by approaching powerboats, and consequently they are often injured or killed during collisions with vessels.

CHEMORECEPTION—Smell and taste are often associated with food detection in many animals, and sea turtles are no exception. In the presence of the odors and of the chemical dimethyl sulfide (a byproduct of injured prey), sea turtles will show foraging behavior (diving, biting, an increase in swimming speed). Yet visual cues appear to be the primary way food is detected at close range, while smell may play a role in orientation toward distant foraging areas.

MAGNETORECEPTION—Cues used by sea turtles for migrating to distant goals depend, at least in part, on an ability to detect two properties of the Earth's magnetic field: strength and inclination angle (to learn more, see *SWOT Report*, vol. XVI, p. 46). Those two features combine to create a sort of GPS sense that allows emerging hatchlings to navigate to distant nursery areas and to return, as adults, to their natal nesting regions.

Science continues to search for what sea turtle sensory systems are able to detect and perceive. Lab studies have attempted to identify what their sensory receptors detect. Yet detection is not perception. For example, light wavelengths and intensities that sea turtles behaviorally respond to (perception) during sea-finding is only a small subset of what their eyes are physiologically capable of responding to in lab experiments (detection). Similarly, the neural processes that respond to noxious stimuli, such as pain (nociception), only trigger defensive behavior if the stimulus is perceived. How sea turtles feel pain remains inferred from humans' perceptions rather than understood from the turtles. •

What Are the Natural Predators of Sea Turtles?

By Michael Heithaus

When we think about threats to sea turtles, we often think only about human-related pressures. But sea turtles face a multitude of risks from natural predators throughout their life cycles.

Predation pressure on sea turtles starts before they hatch, when nests may be raided by mammals such as raccoons or foxes; several species of crabs; or countless forms of microbes, insects, mites, and more.

Hatchling turtles are at even greater risk from mammals, birds, and crabs as they cross the beach to the sea. Once they reach the water's edge, things don't get any easier. During their frenzied swim to reach deeper water, hatchlings are eaten by large bony fish, sharks, and sea birds. And when they reach deeper waters or the safety of mats of floating algae, the risks decline but don't disappear. In those habitats, too, the turtles are consumed by large bony fish and sharks, though we still cannot quantify the magnitude of this predation, nor do we know what other risks turtles may face during the posthatchling portion of their lives.

Once they have survived hatchlinghood and have large bodies and hard shells, adult sea turtles might be more immune to predators. But in Central and South America, American crocodiles and jaguars are a threat to nesting females, and in the Indo-Pacific, saltwater crocodiles prey on adult turtles both on nesting beaches and in inshore waters. At sea, large sharks are the primary threat to adult sea turtles, although killer whales may occasionally take sea turtles. Although white sharks and bull sharks have been recorded eating sea turtles—including accounts of white sharks taking adult leatherbacks—those two species rarely dine on sea turtles. But tiger sharks frequently prey on large juvenile and adult sea turtles. In fact, tiger sharks may have evolved specifically to feed on sea turtles. Tigers grow to over 4.5 meters (about 15 feet) and have broad heads that can accommodate large prey and curved, serrated teeth that cut in both directions when the sharks shake their heads, an adaptation that enables them to cut through a turtle's thick shell. Indeed, sea turtles worldwide are at risk from tiger shark predations in shallow seagrass ecosystems, coral reefs, and the open sea. In response, turtles have likely adopted behaviors, like choosing lower risk habitats (for instance, green turtles basking on shore), to reduce the hazard posed by tiger sharks.

Tiger sharks certainly play an important role in regulating turtle populations. Overfishing of sharks in the Pacific, for instance, along with diminished human take of turtles over decades, is likely one of the factors behind the rise in Hawaiian green turtle numbers in recent decades. And in the Atlantic, the disappearance of seagrasses off Bermuda may be due to reductions in tiger sharks and the consequent increase in turtles, which are major seagrass grazers. Maintaining natural predator-to-prey interactions in the oceans by conserving tiger sharks and turtles and all such symbiotic relationships is important to ensuring the overall health of ocean ecosystems. •

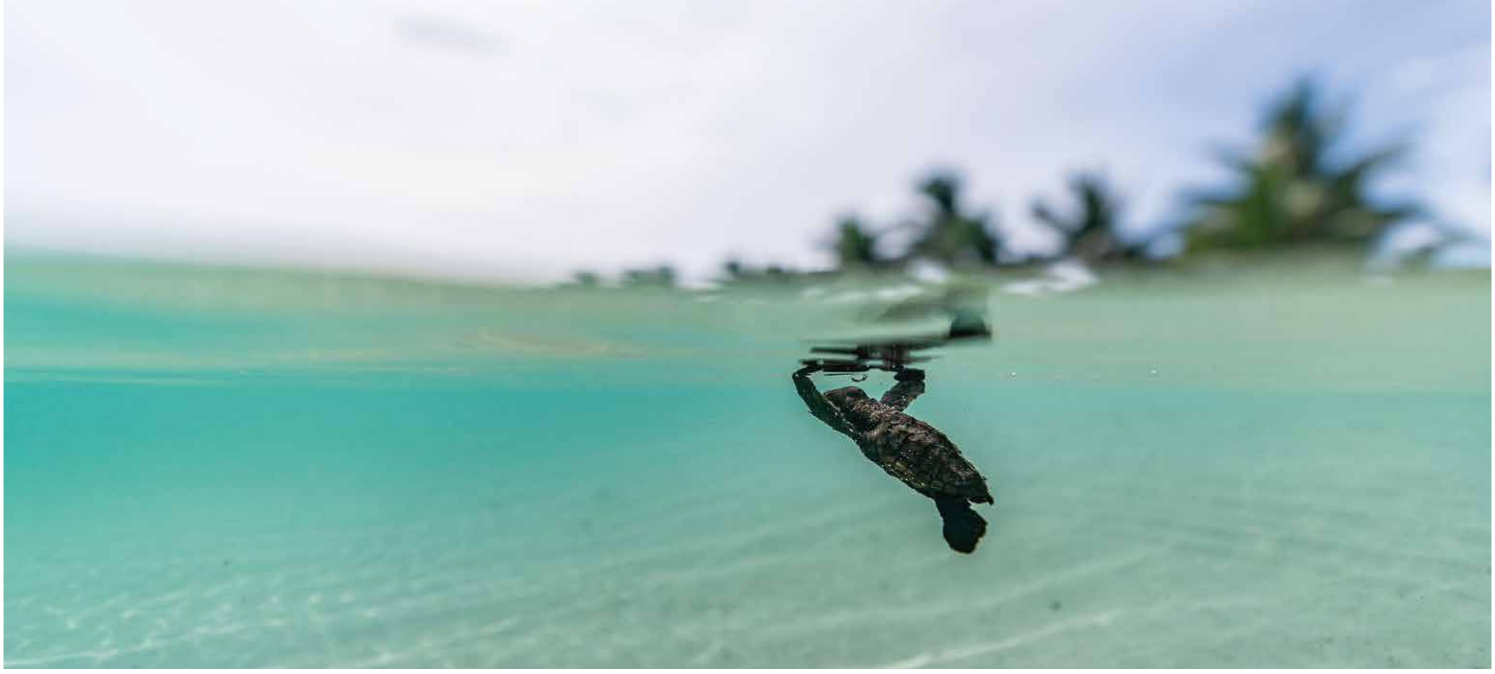
Sea turtles have many natural predators throughout their life cycles, and are especially vulnerable as hatchlings. © Jake Wilton

Acting Globally

SWOT SMALL GRANTS 2022

Since 2006, SWOT's small grants have helped field-based partners around the world to realize an array of important research and conservation goals. To date, 141 grants have been awarded to 116 applicants in more than 56 countries and territories for work addressing three key themes: (1) networking and capacity building, (2) science, and (3) education and outreach. The following are brief overviews of SWOT's 2022 grantees. Visit www.SeaTurtleStatus.org/grants for application instructions and a list of all past SWOT grantees.

TOP ROW: Environmental Awareness Group; **MIDDLE ROW:** Osa Conservation; West Africa Sea Turtle Conservation Network (WASTCON); **BOTTOM ROW:** Daniela Font



The Time + Tide Foundation

Environmental Awareness Group (EAG) in Antigua and Barbuda

EAG has been committed to preserving Antigua and Barbuda's environment and to promoting the sustainable use and management of natural resources since 1989. In 2022 and 2023, teams of researchers will continue to monitor sea turtle nesting on 10 beaches in Antigua to ensure an accurate baseline for elaborating sea turtle population trends, to document and understand threats, and to identify priority areas for conservation attention.

Osa Conservation (Costa Rica)

To combat the negative impact of plastic pollution, Osa Conservation will use plastic found during beach cleanups to create light covers that will be given to coastal hotels and restaurants, to hold workshops about proper waste management of plastics, and to train and equip local women to create and sell jewelry made from plastic bottle caps collected during beach cleanups.

Daniela Font—Argentina

By conducting outreach and structured interviews, Daniela Font will deepen ties and foster collaboration between conservationists and fishers. Her work aims to create a deeper understanding of temporal and spatial variations in sea turtle bycatch in Argentine waters. Those efforts will mitigate adverse impacts, generate data to predict and avoid bycatch, and elevate participants' awareness and willingness to adopt solutions.

West Africa Sea Turtle Conservation Network (WASTCON)—West Africa

WASTCON will mobilize experts to develop training materials that will prepare its members to conduct sea turtle fieldwork. The network will organize and host a three-day training workshop about sea turtle protection and conservation techniques for its member institutions in order to ensure the standardized use of best practices in data collection for sea turtle monitoring in the region.

Bahari Hai Conservation—Kenya

Bahari Hai Conservation works with an array of stakeholders to address complex challenges and to support an environmentally conscious community that is actively engaged in protecting the oceans. Bahari Hai Conservation will conduct capacity-building workshops with two sea turtle conservation groups on Kenya's northern coast to improve the quality and consistency of data collection, to better inform researchers, and to help them respond to top conservation priorities.

The Time + Tide Foundation—Madagascar

The Time + Tide Foundation will conduct several training sessions for community conservationists in six fishing villages on the island of Nosy Ankao and the adjacent mainland coast of Madagascar to assist conservationists in the protection of sea turtle nesting sites and to encourage them to use techniques that reduce the threats to sea turtles posed by local fishing methods.

ProOcean Marine Research, Conservation & Innovation—Venezuela

Dedicated to restoring and conserving marine and coastal biodiversity using innovative tools, research, capacity building, and stakeholder participation, ProOcean will use its SWOT grant to monitor green and hawksbill nesting and threats at the principal nesting beaches in Los Roques Archipelago National Park, Venezuela, with the long-term goal of developing strategies for permanent sea turtle protection and recovery.

AZA-SAFE GRANT RECIPIENTS

The Association of Zoos and Aquariums (AZA) and its Sea Turtle SAFE (Saving Animals from Extinction) program have partnered with SWOT since 2019 to disburse targeted grants for projects relating to the conservation of two of the top global priorities for sea turtle conservation: eastern Pacific leatherbacks and Kemp's ridleys. Following are brief overviews of the 2022 grants recipients:

TOP ROW: César Paúl Ley-Quiñónez; Adriana Lechuga Granados; **MIDDLE ROW:** César Arroyo Vega; Sea Turtle Recovery; **BOTTOM ROW:** New York Marine Rescue Center (NYMRC); Sea Turtle, Inc.

Adriana Lechuga Granados—Mexico

To better understand the population status of greens, hawksbills, olive ridleys, and leatherbacks that nest on an important yet poorly studied 5-kilometer stretch of beach in the Mexican state of Guerrero, Adriana Lechuga Granados will conduct a basic survey of monitoring and research of incubation conditions.

Sea Turtle Recovery—U.S.A.

To help Kemp's ridleys that face the threat of cold stunning in New Jersey, Sea Turtle Recovery will employ and train assistants to aid in the location and transportation of cold-stunned sea turtles to facilities where they can be rescued, resuscitated, and returned to the wild.

César Arroyo Vega—Mexico

The state of Guerrero on the Mexican Pacific coast is a priority for the protection of four species of turtles, including eastern Pacific leatherbacks. César Arroyo Vega's SWOT grant will be used to strengthen training programs, information sharing, and networking among Guerrero's turtle conservationists and researchers.

César Paúl Ley-Quiñónez—Mexico

To facilitate the effective, long-term monitoring of sea turtle health and the presence and severity of potentially dangerous diseases in the Kemp's ridley population, César Paúl Ley-Quiñónez will use his SWOT grant to conduct research to develop baseline blood biochemical reference values for the species.

Campamento Tortuguero Ayotlcalli A.C.—Mexico

This established turtle camp will organize several outreach and education workshops with local communities in the state of Guerrero to engage schoolchildren, fishermen, tourist service providers, and visitors in hands-on efforts to build a culture of turtle protection as the community develops and grows.

Barreros de San Luis A.C.—Mexico

A community organization that was originally pioneered by local fishermen, Barreros de San Luis will continue to build its sea turtle conservation activities, including the monitoring of 11.5 kilometers (over 7 miles) of nesting beach, hatchery construction, and morphometrics research, as well as the promotion of citizen participation in conservation activities.

Sea Turtle, Inc.—U.S.A.

Sea turtle, Inc., will invite disabled individuals from the Rio Grande Valley area to enjoy an evening on South Padre learning about turtles, meeting the animals face-to-face, and appreciating the importance of the region and its commitment to the protection of Kemp's ridley turtles.

GroBios A.C.—Mexico

GroBios A.C. will connect with and convene multiple community stakeholders, including about 30 sea turtle conservation projects working in Guerrero, to develop a shared strategy for the monitoring and protection of the nesting beaches used by the native species of turtle, including eastern Pacific leatherbacks.

New York Marine Rescue Center (NYMRC)—U.S.A.

To decrease sea turtle injuries and mortality from vessel strikes and to improve the reporting of boater–sea turtle interactions, the NYMRC will post educational signage and will launch a statewide series of informative lectures directed at the fishing and boating community of New York.

Patricia Huerta Rodríguez—Mexico

Patricia Huerta Rodríguez will continue ongoing work to collect identification photos for a mark-recapture program and to create a database that will allow researchers to better analyze the long-term population dynamics of the green, hawksbill, and Kemp's ridley turtles that nest on Isla Aguada, Mexico.

Gladys Porter Zoo and Rancho San José—Mexico

In support of the Mexico and U.S.A. binational program in Tamaulipas, Mexico, SWOT funds will help to expand tagging on two major Kemp's ridley nesting beaches—La Pesca and Tepehuajes—with state-of-the-art tags and tagging protocols to generate data needed to determine a variety of population trends.

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LIVING LEGENDS OF Sea Turtle Conservation

Dimitris Margaritoulis

Biography

A lifelong nature enthusiast, Dimitris Margaritoulis is credited with discovering the Mediterranean's largest aggregation of nesting loggerheads in Zakynthos, Greece, in the 1970s. This discovery launched a career in sea turtle conservation and resulted in the founding of ARCHELON, Greece's principal nongovernmental organization dedicated to long-term sea turtle monitoring programs, and in pioneering public awareness and environmental education. Dimitris played an important role in the elaboration of the "Action Plan for Marine Turtles in the Mediterranean" (1989) and the IUCN–Marine Turtle Specialist Group's "Global Strategy for the Conservation of Marine Turtles" (1995), and he served 12 years (1999–2010) as MTSG regional chair for the Mediterranean. Dimitris helped to launch the triennial Mediterranean Conference on Marine Turtles and was president of the International Sea Turtle Society, for which he organized the 26th Sea Turtle Symposium on the island of Crete. He has received numerous awards for his lifetime commitment to the conservation of sea turtles.

What Was Your First Sea Turtle Moment?

In the summer of 1977, while beach camping on Zakynthos Island with my wife, Anna, and our two children, we wondered at the peculiar tracks we were seeing every morning on the sand. We suspected that they were from sea turtles coming out at night to lay eggs, so we stayed up and walked along the high beach and among the thorny bushes. After a fruitless three-hour effort, disappointed and covered in scratches, we returned to our tent on the beach to find a huge turtle covering her nest. Astonished, we stayed with her until she returned to the sea. This moment changed our lives completely.

What Is Your Proudest Accomplishment?

The creation of the Sea Turtle Protection Society of Greece, now called ARCHELON, which has been in continuous operation for 40 years, with long-term programs now being overseen by a new generation of responsible and committed conservationists.

What Is Different Now from When You Started?

Unlike four decades ago, legislation, as well as onsite monitoring and conservation programs, now ensures sea turtle protection at the major nesting beaches in Greece. People, especially children, are well informed and engaged in meeting the conservation needs of sea turtles.

What Are You Most Hopeful (and Worried) About?

I am inspired by the hundreds of volunteers who participate every year in ARCHELON's field programs. Yet I worry about the negative impacts of ever-expanding tourism and the encroachment of human development on Greece's once-pristine coastline.

What Is Your Advice to People New to This Field?

Focus your vision; network with colleagues; share your work; give priority to the turtles' ecosystems. •

Neca Marcovaldi

Biography

After obtaining a degree in oceanography, Neca Marcovaldi began her sea turtle conservation journey with a team of colleagues who surveyed the entire Brazilian coast in the early 1980s. They interviewed fishers in dozens of small communities, identified the nesting beaches for Brazil's five turtle species, and characterized the main threats the turtles face. She and her husband, Guy, founded Fundação Projeto Tamar (TAMAR) in 1988, which has since led pioneering efforts to integrate sea turtle conservation with community-based development and rural empowerment. TAMAR's programs have improved the lives of countless Brazilians, and the programs currently provide more than 1,800 jobs in 23 communities, thus promoting environmental sustainability through a circular economy model. Neca's achievements have been recognized by UNESCO, the International Sea Turtle Society, and other entities, and she holds an honorary doctorate from Universidade Estadual de Santa Cruz (Brazil). She served as the chair of the MTSG and is currently regional vice chair for the Southwest Atlantic. She remains active in sea turtle conservation in Brazil and beyond.

What Was Your First Sea Turtle Moment?

After two years of assessment along the coast, TAMAR opened its first three field stations, but we still hadn't seen turtles! We rented a fisherman's house in Pirambu, Sergipe state, as a base from which to do beach patrols from 6:00 p.m. to 6:00 a.m. every day. After a full month of surveys without finding a turtle, a fisherman came to visit early one morning. He was so happy. He brought with him an adult female olive ridley in a basket on the back of his donkey (the basket that is normally used to carry coconuts). The poor animal was upside down, and a second basket was full of sea turtle eggs. He was so proud and announced, "Since you guys weren't able to find any turtles, I brought you one!" Needless to say, this was not how we had envisioned seeing our first nesting turtle, but it was progress, and that fisherman, Seo Clarivaldo, became the first fisher hired to work as a patroller for TAMAR. Today, Pirambu is the second-largest olive ridley nesting beach in the Atlantic.

What Is Your Proudest Accomplishment?

My proudest accomplishment is having converted old fishers—people who had spent much of their lives collecting eggs and slaughtering turtles for food—into equally dedicated turtle protectors. This was the beginning of a virtuous cycle that, step by step, created a circular economy in which turtles are more valued alive than dead.

What Is Different Now from When You Started?

So many important changes! When we started, turtles were seen primarily as food, yet nowadays they are a symbol of income and opportunity in the main nesting areas of Brazil. The populations of the five species of sea turtles in Brazil were scarce and declining, but now four species are on the rise and another is stable. Back in the 1980s, few people were talking about marine conservation. Now, as a result of our public awareness campaigns and social inclusion programs, sea turtles are icons and flagships for conservation in Brazil. And of course, the science has changed drastically. New tools and techniques—from stable isotopes to genetics, telemetry (remote sensing), and more—allow us to deepen our understanding of sea turtle ecology, thereby promoting more extensive local and international networks to conserve sea turtles better.

What Are You Most Hopeful (and Worried) About?

I am most hopeful that the new generations will have access to more and better information about turtles and their habitats, thus promoting more engagement and awareness about marine conservation and giving people tools to fight for conservation. What worries me is that despite the existence of laws to protect sea turtles (for example, from unsustainable fisheries, beach development, pollution, and so on), there is a tremendous lack of enforcement. With an ever-growing human population, we need to find a way to solve the imbalance between human needs and the use of natural resources.

What Is Your Advice to People New to This Field?

Be patient—sea turtles have long life cycles, and significant time is needed to accomplish any goal and to see results. Think in terms of sea turtle generations. Get connected with people dedicated to making a change, no matter how much time it takes. •

SWOT Data Citations

We are grateful to all who generously contributed their sea turtle data for inclusion in the maps featured throughout this volume. Data sources are cited throughout the following pages. For information about how the feature maps of leatherback biogeography were created, please see the text on p. 27.

GUIDELINES OF DATA USE AND CITATION

The nesting and satellite telemetry data that follow correspond to the maps of leatherback biogeography on pp. 27 to 29. Nesting data records are numbered to correspond with their respective points on the map. To use data for research or publication, you must obtain permission from the data providers.

Leatherback Nesting Data Citations

To save space, clutch counts have been omitted from the following citations, but additional metadata may be found online at http://seamap.env.duke.edu/swot or by viewing the original data source (if published). In addition, we have used the abbreviation "Spatial Database for the Wider Caribbean" to refer to Dow, W. E., and K. L. Eckert. 2007. *Sea Turtle Nesting Habitat: A Spatial Database for the Wider Caribbean Region*. WIDECAST Technical Report No. 6, Wider Caribbean Sea Turtle Conservation Network (WIDECAST) and The Nature Conservancy, Beaufort, NC, U.S.A.

ANGOLA

DATA RECORD: 1

Data Source: Brian, C. 2007. Loggerhead nesting in Angola. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007).
Nesting Beaches: Luanda North to Rio Longa South
SWOT Contact: Conrad Brian

DATA RECORD: 2

Data Sources: (A) Ron, T. 2006. Leatherback nesting in Angola. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007); **(B)** Weir, C. R., T. Ron, M. Morais, and A. D. C. Duarte. 2007. Nesting and at-sea distribution of marine turtles in Angola, West Africa, 2000–2006: Occurrence, threats and conservation implications. *Oryx* 41 (2): 224–231.
Nesting Beaches: (1) Beaches along the coast of the Cabinda Province in the North to Baia Farta Benguela Province in the South;[A] **(2)** Palmeirinhas[B]
SWOT Contact: Tamar Ron

DATA RECORD: 3

Data Source: Morais, M., and M. Tiwari. 2020. Angola. In C. K. Kouerey Oliwina, S. Honarvar, A. Girard, and P. Casale (eds.), *Sea Turtles in the West Africa/East Atlantic Region: MTSG Annual Regional Report 2020*, pp. 20–39. Report of the International Union for Conservation of Nature (IUCN)–Species Survival Commission (SSC) Marine Turtle Specialist Group (MTSG).
Nesting Beaches: (1) Cuio; **(2)** Kissembo; **(3)** Longa; **(4)** Manono; **(5)** Sangano; **(6)** Soyo

ANGUILLA

DATA RECORD: 4

Data Sources: (A) Anguilla National Trust, Anguilla. 2014. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. VIII (2013) and vol. IX (2014); **(B)** Spatial Database for the Wider Caribbean; **(C)** Godley, B. J., A. C. Broderick, L. M. Campbell, S. Ranger, and P. B. Richardson. 2004. An assessment of the status and exploitation of marine turtles in Anguilla. In *An Assessment of the Status and Exploitation of Marine Turtles in the U.K. Overseas Territories in the Wider Caribbean*, pp. 39–77. Final project report for the Department of Environment, Food, and Rural Affairs and the Commonwealth Office; **(D)** Gumbs, J. 2006. Leatherback nesting in Anguilla. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007); **(E)** Mulhida F., L. Soanes, and K. Gumbs. 2021. Anguilla. In M. A. Nalovic, S. A. Ceriani, M. M. P. B. Fuentes, J. B. Pfaller, N. E. Wildermann, A. Uribe-Martínez, and E. Cuevas (eds.), *Sea Turtles in the North Atlantic and Wider Caribbean Region: MTSG Annual Regional Report 2021*, pp. 49–60. Draft Report to the IUCN-SSC Marine Turtle Specialist Group.
Nesting Beaches: (1) Barnes Bay;[D] **(2)** Captains Bay;[A] **(3)** Crocus Bay;[D] **(4)** Great Bay Dog Island;[A] **(5)** Katouche Bay;[B,C] **(6)** Maunday's Bay;[D] **(7)** Meads Bay;[A] **(8)** Rendezvous Bay;[D] **(9)** Road Bay;[B,C] **(10)** Shoal Bay East;[E] **(11)** Shoal Bay West;[B,C] **(12)** Spring Bay Dog Island[A]
SWOT Contacts: James Gumbs, Farah Mukhida, and Janeczka Richardson

ANTIGUA AND BARBUDA

DATA RECORD: 5

Data Sources: (A) Spatial Database for the Wider Caribbean; **(B)** Fuller, J. E., K. L. Eckert, and J. I. Richardson. 1992. *Sea Turtle Recovery Action Plan for Antigua and Barbuda*. CEP Technical Report No. 16., Caribbean Environment Program (CEP), Kingston, Jamaica.
Nesting Beaches: (1) Big Rendezvous Bay;[A,B] **(2)** Bleaky Bay beaches;[A,B] **(3)** Carlisle Bay;[A,B] **(4)** Coco Point;[A,B] **(5)** continuous beach from river to Billy Point;[A,B] **(6)** Curtain Bluff;[A,B] **(7)** Dickenson Bay;[A,B] **(8)** Dutchman Bay;[A,B] **(9)** Five Islands Estate beaches;[A,B] **(10)** Half Moon Bay;[A,B] **(11)** Jabberwock[A,B] **(12)** Mill Reef beaches;[A,B] **(13)** Morris Bay;[A,B] **(14)** Pearn's Point beaches;[A,B] **(15)** Pigeon Cliff to Griffen Point[A,B]
SWOT Contacts: Cheryl Appleton, Peri Mason, James Richardson, and Tricia Lovell

ARUBA

DATA RECORD: 6

Data Source: van der Wal, E., and R. van der Wal, TurtugAruba (Aruban Foundation for Sea Turtle Protection and Conservation). 2014. SWOT Database Online 2015.
Nesting Beaches: (1) Andicuri; **(2)** Arashi—sandy section (0.15 km); **(3)** Boca Grandi—sandy section (0.8 km); **(4)** Dos Playa–Boca Prins; **(5)** Eagle; **(6)** Palm
SWOT Contacts: Edith van der Wal and Richard van der Wal

AUSTRALIA

DATA RECORD: 7

Data Sources: (A) Limpus, C. J. 2006. Leatherback nesting in Australia. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006); **(B)** Limpus, C. J., and R. Chatto. 2004. Marine turtles. In *Description of Key Species Groups in the Northern Planning Area*. Hobart, Australia: National Oceans Office.
Nesting Beaches: (1) Northern Arnhem 1;[A,B] **(2)** Northern Arnhem 2;[A,B] **(3)** Northern Arnhem 3;[A,B] **(4)** Northern Arnhem 4;[A,B] **(5)** Northern Arnhem 5[A,B]
SWOT Contact: Colin Limpus

BAHAMAS

DATA RECORD: 8

Data Sources: (A) De Ruyck, C. 2006. Leatherback nesting in the Bahamas. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006); **(B)** Spatial Database for the Wider Caribbean.
Nesting Beaches: (1) Great Abaco (east coast and cays);[B] **(2)** Long Beach Abaco Island[A]
SWOT Contacts: Christopher De Ruyck and Eleanor Phillips

BANGLADESH

DATA RECORD: 9

Data Source: Islam, M. Z. 2002. Marine turtle nesting at St. Martin's Island, Bangladesh. *Marine Turtle Newsletter* 96: 19–21.
Nesting Beach: Shill Banyar Gula
SWOT Contact: M. Zahirul Islam

BARBADOS

DATA RECORD: 10

Data Sources: (A) Beggs, J. A., J. A. Horrocks, and B. H. Krueger. 2007. Increase in hawksbill sea turtle *Eretmochelys imbricata* nesting in Barbados, West Indies. *Endangered Species Research* 3: 159–168; **(B)** Spatial Database for the Wider Caribbean.
Nesting Beaches: (1) Foul Bay;[A,B] **(2)** Long[A,B]
SWOT Contacts: Julia Horrocks and Jennifer Dunn

BENIN

DATA RECORD: 11

Data Sources: (A) Dossou-Bodjrènou, J. S., and A. Tehou. 2002. The status of efforts to protect Atlantic sea turtles in Benin (West Africa). In A. Mosier, A. Foley, and B. Brost (compilers), *Proceedings of the Twentieth Annual Symposium on Sea Turtle Biology and Conservation*, pp. 108–110. NOAA Technical Memorandum NMFS-SEFSC-477, National Marine Fisheries Service, Miami, FL; **(B)** Nature Tropicale. 2006. Suivi ecologique et protection des tortues marines sur le littoral du Benin (2005–2006). Rapport d'activites n 0010/PTM/NT; **(C)** Dossou-Bodjrènou, J. S., T. J. Madogotch, D. M. Dossou Bodjrenou, M. D. Sossou, P. P. Sagbo, N. Hounsou, and I. Cobede. 2020. Benin. In C. K. Kouerey Oliwina, S. Honarvar, A. Girard, and P. Casale (eds.), *Sea Turtles in the West Africa/East Atlantic Region: MTSG Annual Regional Report 2020*, pp. 49–63. IUCN-SSC Marine Turtle Specialist Group.
Nesting Beaches: (1) Avlo Embouchure;[B] **(2)** Cotonou;[C] **(3)** Djegbadji;[A] **(4)** Gbecon (Grand-Popo);[B] **(5)** Grand-Popo;[C] **(6)** Hilla-Conji;[A] **(7)** Ouidah;C **(8)** Somo;[A] **(9)** Togbin[A]
SWOT Contact: Joséa S. Dossou-Bodjrènou

BONAIRE

DATA RECORD: 12

Data Sources: (A) Spatial Database for the Wider Caribbean; **(B)** Sea Turtle Conservation Bonaire. 2013. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. VI (2011) and vol. VIII (2013).
Nesting Beaches: (1) Chikitu;[B] **(2)** Klein Bonaire;[B] **(3)** Lagun[A]
SWOT Contacts: Mabel Nava and Sue Willis

BRAZIL

DATA RECORD: 13

Data Sources: (A) Fundação Projeto Tamar. 2014. Unpublished data from SITAMAR (Information System of Fundação Projeto Tamar). Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XIV (2014); **(B)** Fundação Projeto Tamar. 2022. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023).
Nesting Beaches: (1) Comboios;[B] **(2)** Guriri;[B] **(3)** Pontal Do Ipiranga;[B] **(4)** Povoação;[B] **(5)** Quissama Farol Atafona São Francisco do Itabapoana[A]
SWOT Contacts: Maria Ângela Marcovaldi, Alexsandro Santos, Frederico Tognin, Armando Barsante, César Coelho, Claudio Bellini, Gustave López, Jaqueline Castilhos, Ana Marcondes, and João Carlos Thomé

DATA RECORD: 14

Data Sources: (A) Mendilaharsu, M. L., M. Â. Marcovaldi, B. Giffoni, L. Medeiros, A. S. dos Santos, D. Monteiro, M. Proietti, P. Barata, A. Almeida, C. Baptistotte, C. Bellini, J. Castilhos, A. C. Dias da Silva, S. Leandro, G. López, G. Marcovaldi, A. Santos, L. Soares, and J. C. Thomé. 2021. Brazil. In M. Â. Marcovaldi, J. C. Thomé, and A. Fallabrino (eds.), *Sea Turtles in the Atlantic Southwest Region: MTSG Annual Regional Report 2021*, pp. 53–147. IUCN-SSC Marine Turtle Specialist Group, 2021; **(B)** Magalhães, W. M. de S., M. O. Magalhães Neto, S. B. Lopes, M. N. P. do Nascimento, W. M. de Santana, E. M. de Santana, A. L. da C. de Jesus, and P. C. R. Barata. 2021. Regular nesting by leatherback sea turtles (*Dermochelys coriacea*) in the Parnaíba Delta area, northeastern Brazil. *Marine Turtle Newsletter* 164: 6–11.
Nesting Beaches: (1) Monsaras;[A] **(2)** Parnaíba Delta[B]

CAMEROON

DATA RECORD: 15

Data Sources: (A) Angoni, H. 2004. Suivi et Conservation des Tortues Marines Dans l'UTO Campo-Ma'an. Technical report; **(B)** Ayissi, I., H. Angoni, and J. Fretey. 2016. Kudu Project–Cameroon component (Kudu à Tubé). Personal communication. SWOT Database Online 2017.
Nesting Beaches: (1) Beaches between Campo and Kribi;[A] **(2)** Bekolobé;[B] **(3)** Boussibelika;[B] **(4)** Ebodjé;[B] **(5)** Eboundja;[B] **(6)** Elombo;[B] **(7)** Ipeyendjé;[B] **(8)** Lolabé;[B] **(9)** Mbenddji;[B] **(10)** Nlendé[B]
SWOT Contacts: Isidore Ayissi and Hyacinthe Angoni

COLOMBIA

DATA RECORD: 16

Data Sources: (A) Cordoba Becerra, A., and Parques Nacionales Naturales de Colombia. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*,

vol. XI (2016); **(B)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(C)** Rodríguez-Baron, J. M., D. F. Amorocho, J. T. Artuluaga Reales, J. S. Ayala, C. Bejarano Rivas, J. de la Cruz, G. A. Lara, J. A. Loaiza, F. Muriel Hoyas, L. Payán, E. V. Pérez Castillo, S. Rivas, M. E. Rivas Roa, S. T. Rivas Roas, T. Zapata Tejada, and M. X. Zorilla Arroyave. 2021. Colombia. In J. M. Rodríguez-Baron, S. Kelez, M. J. Liles, A. Zavala-Norzagaray, D. Amorocho, and A. R. Gaos (eds.), *Sea Turtles in the Eastern Pacific Region: MTSG Annual Regional Report 2021*, pp. 255–273. IUCN-SSC Marine Turtle Specialist Group.
Nesting Beaches: (1) Acandí;[A] **(2)** Atazcosa: Via Parque Isla de Salamanca;[A] **(3)** Bobalito;[C] **(4)** Povoação and Comboios;[B] **(5)** Termales[C]
SWOT Contacts: Carlos Pinzón and Juan Manuel Rodríguez-Baron

DATA RECORD: 17

Data Sources: (A) Ceballos-Fonseca, C. 2004. Distribución de playas de anidación y áreas de alimentación de tortugas marinas y sus amenazas en el Caribe Colombiano. *Boletín de Investigaciones Marinas y Costeras* 33: 77–99; **(B)** Spatial Database for the Wider Caribbean.
Nesting Beaches: (1) Amarilla;[A,B] **(2)** Bahía Hondita;[A,B] **(3)** Bolita;[A,B] **(4)** Buritaca;[A,B] **(5)** Cabo Falso;[A,B] **(6)** Cano Lagarto;[A,B] **(7)** Capurgana;[A,B] **(8)** Chichibacoa;[A,B] **(9)** Chilingos;[C] **(10)** Corelca;[A,B] **(11)** Cuchicampo;[A,B] **(12)** Dibulla;[A,B] **(13)** Don Diego;[A,B] **(14)** El Cabo;[A,B] **(15)** El Medio;[A,B] **(16)** El Sequión;[A,B] **(17)** Goleta;[A,B] **(18)** Guachaca;[A,B] **(19)** La Candelaria;[A,B] **(20)** Larga;[A,B] **(21)** Los Achotes;[A,B] **(22)** Mata de Platano;[A,B] **(23)** Mendiguaca;[A,B] **(24)** Montanita;[A,B] **(25)** Moreno;[A,B] **(26)** Naranjo;[A,B] **(27)** Neimao;[A,B] **(28)** Palomino;[A,B] **(29)** Parajimaru;[A,B] **(30)** Piscinita;[A,B] **(31)** Puerto Ingles;[A,B] **(32)** Puerto Lodo;[A,B] **(33)** Puerto López;[A,B] **(34)** Punta Arenas;[A,B] **(35)** Punta Castilletes;[A,B] **(36)** Punta Espada;[A,B] **(37)** Punta Estrella;[A,B] **(38)** Punta Gallinas;[A,B] **(39)** Punta Huayapain;[A,B] **(40)** Pusheo;[A,B] **(41)** Rinconcito;[A,B] **(42)** Río Ancho;[A,B] **(43)** Río Ciego;[A,B] **(44)** Rocosa;[A,B] **(45)** San Pacho;[A,B] **(46)** San Salvador;[A,B] **(47)** Santa Cruz;[A,B] **(48)** Sardi;[A,B] **(49)** Serrana;[A,B] **(50)** Tarena;[A,B] **(51)** Taroa;[A,B] **(52)** Taroita;[A,B] **(53)** Titumate;[A,B] **(54)** Trigana;[A,B] **(55)** Valencia[A,B]
SWOT Contacts: Claudia Ceballos, Zunilda Baldonado, and Elizabeth Taylor

DATA RECORD: 18

Data Sources: (A) Aminta Jauregui, G., and Universidad de Bogotá Jorge Tadeo Lozano. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XI (2016); **(B)** Caicedo, D., and Fundación Omacha. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XI (2016); **(C)** Rodríguez, T., and Parque Nacional Natural Sierra Nevada de Santa Marta. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XI (2016).
Nesting Beaches: (1) Mendihuaca;[A] **(2)** Moñitos;[B] **(3)** Quintana[C]
SWOT Contacts: Dalila Caicedo Herrera, Tito Rodríguez, Guiomar Aminta Jauregui, and Carmen Lucia Noriega Hoyos

DATA RECORD: 19

Data Sources: (A) Franke Ante, R., Parques Nacionales Naturales de Colombia, and Dirección Territorial Caribe. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XI (2016); **(B)** Patiño Martínez, J., A. Marco, L. Quiñones, and B. Godley. 2008. Globally significant nesting of leatherback turtle (*Dermochelys coriacea*) on the Caribbean coast of Colombia and Panama. *Biological Conservation* (141) 1982–1991; **(C)** Patiño Martínez, J., and L. Quiñones. 2006. Leatherback nesting in La Playona, Acandí, Colombia. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007).
Nesting Beaches: (1) Arrecifes;[A] **(2)** Boca del Saco;[A] **(3)** Cañaveral;[A] **(4)** Capitancito;[B] **(5)** Castilletes;[A] **(6)** El Medio Parque Nacional Natural Tayrona;[A] **(7)** Gumarra;[A] **(8)** Playeta;[B] **(9)** Playona[C]
SWOT Contacts: Rebeca Franke Ante, Juan Patiño Martínez, and Liliana Quiñones

CONGO, REPUBLIC OF THE

DATA RECORD: 20

Data Sources: (A) Mianseko, N., A. Szadeczki, J.-G. Mavoungou, R. Marsac, and G. Akonou 2021. *Study and Conservation of Sea Turtles Nesting in the Republic of Congo, Season 2021–2022*. Renatura; **(B)** Mianseko, N., and J.-G. Mavoungou. 2022. Renatura. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023); **(C)** Patiño Martínez, J., and L. Quiñones. 2006. Leatherback nesting in La Playona, Acandí, Colombia. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007).
Nesting Beaches: (1) Bas-Kouilou Sud;[A,B] **(2)** Bas-Kouilou Nord;[A,B] **(3)** Bellelo;[A,B] **(4)** Bellelo and Longo-Bondi;[A,B] **(5)** Bondi;[A,B] **(6)** Cabinda Frontier (4.5 km);[A,B] **(7)** Djeno;[A,B] **(8)** Kondi;[A,B] **(9)** Longo-Bondi;[A,B] **(10)** Longo-Bondi Parc Conkouati;[A,B] **(11)** Mvandji;[A,B] **(12)** Mvassa;[A,B] **(13)** Niandji;[A,B] **(14)** Nkounda;[A,B] **(15)** Paris;[A,B] **(16)** Paris-Mvandji;[A,B] **(17)** Pointe-Noire;[A,B] **(18)** Tchissaou[C]
SWOT Contacts: Nathalie Mianseko and Jean-Gabriel Mavoungou

COSTA RICA

DATA RECORD: 21

Data Sources: (A) Chacón, D. 2014. Personal communication. SWOT Database Online 2015; **(B)** Fonseca, L. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. X (2015); **(C)** Harrison, E. 2014. Personal communication. SWOT Database Online 2015; **(D)** Ramírez-Vargas, M. 2014. *Reporte Final: Anidación de Tortugas Marinas en Playa de Barra de Parismina durante la Temporada 2014*. Asociación Salvemos las Tortugas Marinas de Parismina and Ministerio de Ambiente y Energía. Unpublished report; **(E)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(F)** Skliros, S., and S. Rodríguez Méndez. 2014. *Programa de Conservación e Investigación Colonia Anidadora de Tortugas Marinas* Dermochelys coriacea, *Estación Las Tortugas: Informe de Investigación 2014*; **(G)** WIDECAST. 2012. *Informe de Actividades de Conservación en Playas* (*31 de Marzo–15 de Octubre 2012*).
Nesting Beaches: (1) Barra del Parismina;[D] **(2)** Barra Norte de Pacuare;[E] **(3)** Cahuita;[A] **(4)** Estación La Tortuga;[E] **(5)** Gandoca;[E] **(6)** Moín;[G] **(7)** Mondonguillo;[F] **(8)** Negra;[E] **(9)** Playa Norte;[B] **(10)** Reserva Pacuare;[E] **(11)** Tortuguero[C]
SWOT Contacts: Didiher Chacón Chaverri, Emma Harrison, Luis Gabriel Fonseca López, Marco Ramírez-Vargas, and Vicky Taylor

DATA RECORD: 22

Data Sources: (A) Beange, M., and R. M. Arauz. 2015. Personal communication. SWOT Database Online 2015; **(B)** Francia, G. 2008. *Proyecto de Conservación Baulas del Pacífico de Junquillal* (WWF); **(C)** Francia, G. 2014. *Proyecto de Conservación de Tortugas Marinas de Junquillal* (Asociación Vida Verdiazul); **(D)** Gaos, A. R., I. L. Yañez, and R. M. Arauz. 2006. *Sea Turtle Conservation and Research on the Pacific Coast of Costa Rica: Programa Restauración de Tortugas Marinas* (*PRETOMA*).
Nesting Beaches: (1) Corozalito;[A] **(2)** Costa de Oro;[D] **(3)** Junquillal;[C] **(4)** Playa Lagarto Playa Frijolar Playa Azul Playa San Juanillo;[B] **(5)** San Miguel[A]
SWOT Contacts: Gabriel Francia, Randall Arauz, Maddie Beange, Ingrid Yañez, and Alex Gaos

DATA RECORD: 23

Data Sources: (A) Brenes-Arias, O. 2015. Reserva Playa Tortuga. Personal communication. SWOT Database Online 2015; **(B)** Chaves, G., R. Morera, and J. R. Avilés. 2014. *Seguimiento de la Actividad Anidatoria de las Tortugas Marinas* (Cheloniidae, Dermochelyidae) *en el RNVS Ostional: VI Informe Anual*. Escuela de Biología de la Universidad de Costa Rica; **(C)** Fonseca, L. G. 2015. Personal communication. SWOT Database Online 2015; **(D)** Piedra-Chacón, R., E. Vélez-Carballo, D. Chacón-Chaverri, P. Santidrián-Tomillo, L. Fonseca-López, G. Fallas-Bonilla, O. Brenes-Arias, D. Rojas-Cañizares, D. Arauz-Naranjo, B. Selles-Ríos, J. C. Cruz-Díaz, M. Heidemeyer, V. Guthrie, F. Alvarez-Ramírez, C. M Orrego, M. Ward, F. Paladino, Y. Cedeño-Solís, and C. Díaz-Chuquisengo. 2021. Costa Rica. In J. M. Rodríguez-Baron, S. Kelez, M. J. Liles, A. Zavala-Norzagaray, D. Amorocho, and A. R. Gaos (eds.), *Sea Turtles in the Eastern Pacific Region: MTSG Annual Regional Report 2021*, pp. 163–214. IUCN-SSC Marine Turtle Specialist Group; **(E)** Piedra, R., and E. Vélez. 2005. *Reporte de Actividades de Investigación y Protección de la Tortuga Baula* (Dermochelys coriacea), *Temporada de Anidación 2004–2005, Playa Langosta*. Unpublished manuscript, Proyecto de Conservación en Tortugas Marinas–Tortuga Baula, Parque Nacional Marino Las Baulas, Guanacaste, Costa Rica; **(F)** Malavar Montenegro, M., R. Arauz, and D. Chacón-Chaverri. 2009. Personal communication. SWOT Database Online 2010; **(G)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(H)** Roberto Solano and Asociación de Voluntarios para el Servicio en Áreas Protegidas (ASVO). Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XV (2020); **(I)** Umaña Ramírez, E., R. Pérez Durán, and R. Soto Pérez. 2009. *Manejo Sostenido de la Colonia Anidadora de Tortugas Marinas en las Playas del Refugio Nacional Vida Silvestre Playa Hermosa–Punta Mala, Pacífico de Costa Rica, Usando Como Base a Funcio*. ASVO; **(J)** Ward, M., and C. Elkins, Sea turtles forever. 2015. Personal communication. SWOT Database Online 2015.
Nesting Beaches: (1) Caletas;[G] **(2)** Camaronal;[D] **(3)** Carate Rio Oro and Pejeperro;[F] **(4)** Hermosa;[H,I] **(5)** Langosta;[E] **(6)** Nancite;[C] **(7)** Naranjo;[C] **(8)** Ostional;[B] **(9)** Playa Tortuga;[A] **(10)** Playas Nombre de Jesús;[D] **(11)** Punta Pargos;[J] **(12)** Sirena and Corcovado[F]
SWOT Contacts: Gerardo Chaves, Luis Gabriel Fonseca-López, Marc Ward, Mariana Malavar Montenegro, Marta Pesquero Henche, Oscar Brenes Arias, Roberto Solano, Roldán Valverde Espinoza, Rotney Piedra-Chacón, and Wagner Quirós Pereira

DATA RECORD: 24

Data Sources: (A) Paladino, F. 2014. Personal communication. SWOT Database Online 2015; **(B)** Santidrián-Tomillo, P. 2014. Personal communication. SWOT Database Online 2015; **(C)** The Leatherback Trust. 2005. *Las Baulas Conservation Project–Archive 2004–2005 Field Report*.
Nesting Beaches: (1) Buenavista;[B] **(2)** Cabuyal;[B] **(3)** Playa Grande Playa Ventanas (3.7 km);[C] **(4)** Playa Grande Playa Ventanas (4.7 km)[A]
SWOT Contacts: Pilar Santidrián-Tomillo, Jim Spotila, and Frank Paladino

CÔTE D'IVOIRE

DATA RECORD: 25

Data Sources: (A) Gómez, J. 2006. Projet de conservation de tortues marines en Côte d'Ivoire. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007); **(B)** Gómez, J. 2012. Personal communication. SWOT Database Online 2012; **(C)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(D)** Peñate, J. G. 2017. Sea turtle nesting in Côte d'Ivoire. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XII (2017).
Nesting Beaches: (1) Abréby;[A] **(2)** Addah;[C] **(3)** Jacqueville;[A] **(4)** Mani;[D] **(5)** Mondoukou;[B] **(6)** Noumouzou;[A] **(7)** Pitike;[A] **(8)** Soublake;[A] **(9)** Taki to Blieron[A]
SWOT Contact: José Gómez Peñate

CUBA

DATA RECORD: 26

Data Sources: (A) Azanza Ricardo, J., L. Márquez, D. Cobián, N. Hernández, L. García López, C. Gómez Pereda, and Guardaparques del Parque Nacional Guanahacabibes. 2010. *Informe Técnico con los Resultados de la Decimotercera Temporada del Proyecto Universitario para el Estudio y Conservación de las Tortugas Marinas en Guanahacabibes*; **(B)** Moncada, F. 2006. Leatherback nesting in Cuba. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006); **(C)** Moncada, F., G. Nodarse, Y. Medina, E. Escobar, C. Rodríguez, A. M. Rodríguez, and E. Morales. 2006. *Annual Report on Hawksbill Turtle* (Eretmochelys imbricata) *Research in Cuba* (*February 2005–February 2006*). Marine Turtle Project, Fisheries Research Center, Cuba.
Nesting Beaches: (1) Beaches of the Guahanacabibes Peninsula;[A] **(2)** Cayo Campos (Eastern Keys of Isla de la Juventud)[B,C]
SWOT Contacts: Felix Moncada and Julia Azanza

CURAÇAO

DATA RECORD: 27

Data Source: Debrot, A. O., N. Esteban, R. Le Scao, A. Caballero, and P. C. Hoetjes. 2005. New sea turtle nesting records for the Netherlands Antilles provide impetus to conservation action. *Caribbean Journal of Science* 41 (2): 334–339.
Nesting Beach: Groot Knip
SWOT Contacts: Paul Hoetjes and Brian Leysner

DOMINICA

DATA RECORD: 28

Data Sources: (A) Byrne, R. 2006. Leatherback nesting in Dominica. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006); **(B)** Byrne, R., and K. Eckert. 2004. *2003 Annual Report: Rosalie Sea Turtle Initiative* (*RoSTI*). *Roseau, Dominica, West Indies*. Prepared by WIDECAST for the Forestry, Wildlife, and Parks Division of the Ministry of Agriculture and the Environment; **(C)** Spatial Database for the Wider Caribbean.
Nesting Beaches: (1) Batalie;[C] **(2)** Batibou;[C] **(3)** Big Bottom;[C] **(4)** Hodges Bay;[C] **(5)** Jimmy's Bay;[C] **(6)** L'Anse Noir;[C] **(7)** L'Anse Tortue;[C] **(8)** Layou;[C] **(9)** Londonderry Bay (Cabana);[C] **(10)** Mero;[C] **(11)** Petite Soufriere Bay;[C] **(12)** Plaisance Bay;[C] **(13)** Ravine Cyrique;[C] **(14)** Rosalie (Coffee) and La Plaine–Bout Sable;[A,B] **(15)** Secret;[C] **(16)** Swaier;[C] **(17)** Thibaud;[C] **(18)** Walker's Rest Bay[C]
SWOT Contacts: Rowan Byrne, Seth Stapleton, and Stephen Durand

DOMINICAN REPUBLIC

DATA RECORD: 29

Data Sources: (A) 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, Dominican Republic; **(B)** Spatial Database for the Wider Caribbean; **(C)** León, Y. 2006. Leatherback nesting in the Dominican Republic. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. 1 (2006) and vol. II (2007); **(D)** Ottenwalder, J. A. 1982. *Estudio Preliminar sobre el Status, Distribución y Biología Reproductiva de las Tortugas Marinas en la República Dominicana*. Departamento de Biología, Universidad Autónoma de Santo Domingo.
Nesting Beaches: (1) Boca del Estero–Las Terrenas;[B,D] **(2)** Macao–Cabeza de Toro;[B,D] **(3)** Mosquea San Luis e Inglesa;[A,C] **(4)** Nisibon–Boca del Maimon;[B,D] **(5)** Playas de Oviedo (San Luis Mosquea Inglesa);[B] **(6)** Playas de Pedernales–Bahía de las Águilas;[B,D] **(7)** Playas de Pedernales–Bucán Yé;[B,D] **(8)** Playas de

Pedernales–Cabo Rojo;[B,D] **(9)** Playas de Pedernales–La Cueva;[B,D] **(10)** Playas de Pedernales–Lanza Zó[B]
SWOT Contacts: Yolanda León and Jesús Tomás

ECUADOR

DATA RECORD: 30

Data Sources: (A) Miranda, C. 2015. Equilibrio Azul: Sea Turtle Monitoring Project, Ecuador. Unpublished data; **(B)** Miranda C., F. Vallejo, E. Palomino, A. Sosa, A. García, J. F. Pesantez, K. Briones, I. Solórzano, M. Pomilia, S. Alvarado, J. P. Muñoz, and D. Alarcòn. 2021. Ecuador. In J. M. Rodríguez-Baron, S. Kelez, M. J. Liles, A. Zavala-Norzagaray, D. Amorocho, and A. R. Gaos (eds.), *Sea Turtles in the Eastern Pacific Region: MTSG Annual Regional Report 2021*, pp. 274–331. IUCN-SSC Marine Turtle Specialist Group; **(C)** Ponce, L. 2014. *Resultados del segundo periodo anual de monitoreo de tortugas marinas en el Refugio de Vida Silvestre y Marino Costera Pacoche y su zona de influencia Manta-Manabí, Ecuador, Junio de 2013–Marzo 2014*. Inter-American Convention for the Protection and Conservation of Sea Turtles.
Nesting Beaches: (1) Cabo San Francisco;[B] **(2)** Chirije;[B] **(3)** Coquito;[B] **(4)** Crucitas;[B] **(5)** El Balsamo;[B] **(6)** La Playita;[B] **(7)** Las Palmas;[B] **(8)** Los Esteros;[B] **(9)** Muisne;[B] **(10)** Puerto López;[A] **(11)** Puerto Rico–Las Tunas;[B] **(12)** San Clemente;[B] **(13)** San Lorenzo;[C] **(14)** Tongora[B]
SWOT Contacts: Cristina Miranda and Felipe Vallejo

EL SALVADOR

DATA RECORD: 31

Data Source: Liles, M. J., A. Henríquez, and F. Medina. 2021. El Salvador. In J. M. Rodríguez-Baron, S. Kelez, M. J. Liles, A. Zavala-Norzagaray, D. Amorocho, and A. R. Gaos (eds.), *Sea Turtles in the Eastern Pacific Region: MTSG Annual Regional Report 2021*, pp. 102–140. UCN-SSC Marine Turtle Specialist Group.
Nesting Beaches: (1) Ahuachapán; **(2)** La Libertad; **(3)** La Paz; **(4)** La Unión; **(5)** Sonsonante; **(6)** Usulután

EQUATORIAL GUINEA

DATA RECORD: 32

Data Sources: (A) D. Bocuma Mene, J. M. Esara Echube, B. Featherstone, M. K. Gonder, S. Honarvar, A. N. Ndong, E. M. Sinclair, and D. Venditti. 2020. Equatorial Guinea. In C. K. Kouerey Oliwina, S. Honarvar, A. Girard, and P. Casale (eds.), *Sea Turtles in the West Africa/East Atlantic Region: MTSG Annual Regional Report 2020*, pp. 157–181. IUCN-SSC Marine Turtle Specialist Group; **(B)** Honarvar, S., D. B. Fitzgerald, C. L. Weitzman, E. M. Sinclair, J. M. Esara Echube, M. O'Connor, and G. W. Hearn. 2016. Assessment of important marine turtle nesting populations on the southern coast of Bioko Island, Equatorial Guinea. *Chelonian Conservation and Biology* 15 (1):79–89; **(C)** Tortugas Marinas de Guinea Ecuatorial (TOMAGE). 2017. Personal communication. SWOT Database Online 2017; **(D)** Tomás, J., B. J. Godley, J. Castroviejo, and J. A. Raga. 2010. Bioko: Critically important nesting habitat for sea turtles of West Africa. *Biodiversity and Conservation* 19: 2699–2714.
Nesting Beaches: (1) Beach A;[A] **(2)** Beach B;[A] **(3)** Beach C;[A] **(4)** Beach D;[A] **(5)** Beach E;[A] **(6)** Beach F;[D] **(7)** Ilende;[C] **(8)** Nendyi;[C] **(9)** Southern beaches;[B] **(10)** Tika[C]
SWOT Contacts: Alejandro Fallabrino and Shaya Honarvar

FRENCH GUIANA

DATA RECORD: 33

Data Sources: (A) Berzins, R. 2016. Office National de la Chasse et de la Faune Sauvage (ONCFS). Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XIII (2018); **(B)** Chevalier, D. 2016. Réserve Naturelle Nationale de l'Amana and Centre National Recherche Scientifique–Institut Pluridisciplinaire Hubert Curien. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XI (2016) and vol. XIII (2018); **(C)** De Thoisy, B. 2016. Kwata. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XIII (2018); **(D)** Spatial Database for the Wider Caribbean; **(E)** Dutton, P. H., S. Roden, L. Garrison, and G. R. Hughes. 2003. Genetic population structure of leatherbacks in the Atlantic elucidated by microsatellite markers. In J. A. Seminoff (compiler), *Proceedings of the Twenty-Second Annual Symposium on Sea Turtle Biology and Conservation*, pp. 44–45. NOAA Technical Memorandum NMFS-SEFSC-503, National Marine Fisheries Service, Miami, FL; **(F)** Lasfargue, M., B. De Thoisy, R. Wongsopawiro, D. Chevallier, L. Kelle, and M. A. Nalovic. 2021. French Guiana. In M. A. Nalovic, S. A. Ceriani, M. M. P. B. Fuentes, J. B. Pfaller, N. E. Wildermann, A. Uribe-Martínez, E. Cuevas (eds.), *Sea Turtles in the North Atlantic and Wider Caribbean Region: MTSG Annual Regional Report 2021*, pp. 276–301. IUCN-SSC Marine Turtle Specialist Group.
Nesting Beaches: (1) Awala Yalimapo (3.0 km);[B] **(2)** Awala-Yalimapo (3.6 km);[F] **(3)** Azteque;[B] **(4)** Île de Cayenne;[C] **(5)** Kourou;[A] **(6)** Les Hattes;[E] **(7)** Pointe Isère Farez Irakumpapi Organabo;[D] **(8)** Rizières[B]
SWOT Contacts: Rachel Berzins, Marie-Klélia Lankester, Johan Chevalier, Ronald Wongsopawiro, Alain Auguste, Junior Alcine, Mail Thérèse, Damien Chevallier, Marc Bonola, Jordan Martin, Benoît de Thoisy, Sébastien Barrioz, Laurent Kelle, and Rodrigue Crasson

GABON

DATA RECORD: 34

Data Source: National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.
Nesting Beaches: All of Gabon coastline

GHANA

DATA RECORD: 35

Data Sources: (A) Adjei, R., G. Boakye, and S. Adu. 2001. Organisational profile: Ghana Wildlife Society. *Marine Turtle Newsletter* 93: 11–12; **(B) A**gyekumhene, A., and P. Allman. 2015. Personal communication. SWOT Database Online 2016; **(C)** Agyekumhene, A., and P. Allman. 2020. Ghana. In C. K. Kouerey Oliwina, S. Honarvar, A. Girard, and P. Casale (eds.), *Sea Turtles in the West Africa/East Atlantic Region: MTSG Annual Regional Report 2020*, pp. 202–216. IUCN-SSC Marine Turtle Specialist Group; **(D)** Beyer, K., W. Ekau, 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 A. Mosier, A. Foley, and B. Brost (compilers), *Proceedings of the Twentieth Annual Symposium on Sea Turtle Biology and Conservation*, pp. 108–110. NOAA Technical Memorandum NMFS-SEFSC-477, National Marine Fisheries Service, Miami, FL; (E) Wildlife Division of Forestry Commission. 2011. *Sea Turtle Nesting in Central Region of Ghana*. Final annual reports from an ongoing nesting beach surveys.
Nesting Beaches: (1) Angola-Volta;[C] **(2)** Mankodze;[C] **(3)** Ningo-Prampram;[A,D] **(4)** Warabeba;[E] **(5)** Winneba[B]
SWOT Contact: Andrews Agyekumhene

GRENADA

DATA RECORD: 36

Data Sources: (A) Charles, K. 2016. Ocean Spirits. Personal communication. SWOT Database Online 2016; **(B)** Charles, K. 2022. Ocean Spirits. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023); **(C)** Spatial Database for the Wider Caribbean.
Nesting Beaches: (1) Bathway;[A] **(2)** Conference;[C] **(3)** Levera;[B] **(4)** River Antoine;[C] **(5)** Savan Suaze[C]
SWOT Contacts: Kate Charles, Carl Lloyd, Gregg Moore, and Rebecca S. King

DATA RECORD: 37

Data Source: Fastigi, M. 2010. Sea turtle nesting on Carriacou Island, Grenada. Youth Wildlife Flora (YWF)–Kido Foundation. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. III (2008) and vol. V (2010).
Nesting Beaches: (1) Anse La Roche; **(2)** Big Field; **(3)** Blak Bay; **(4)** Bogles/Sparrow Bay; **(5)** Hillsborough; **(6)** L'Esterre; **(7)** Petit Carenage; **(8)** Sparrow Bay
SWOT Contact: Marina Fastigi

GUADELOUPE

DATA RECORD: 38

Data Sources: (A) Delcroix, E., et al. 2010. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. VI (2011); **(B)** Spatial Database for the Wider Caribbean; **(C)** Girard, A., and M. Girondot. 2016. *Analyse des Données d'Activités de Ponte des Tortues Marines en Guadeloupe* (*Incluant ses Dépendances et Saint-Martin*): *Période 2004–2014*. Office National de la Chasse.
Nesting Beaches: (1) Anse à l'Eau and Anse à la Croix;[A] **(2)** Anse à Sable;[A] **(3)** Anse Canot;[A] **(4)** Anse Caraïbe;[A] **(5)** Anse de la Perle;[B] **(6)** Anse de Mays;[A] **(7)** Anse des Chateaux;[A] **(8)** Anse Figuier;[A] **(9)** Anse l'Église;[A] **(10)** Anse la Chapelle;[A] **(11)** Anse Laborde;[A] **(12)** Anse Lavolvaine;[A] **(13)** Anse de Nogent;[B] **(14)** Bananier;[A] **(15)** Bois Jolan;[A] **(16)** Cayenne;[A] **(17)** Cluny;[A] **(18)** Feuillard;[A] **(19)** Feuillère;[A] **(20)** Fort Royal;[A] **(21)** Galets Rouges;[A] **(22)** Grande Anse;[B] **(23)** Grande Anse Deshaies;[A] **(24)** Grande Anse Terre-de-Haut des Saintes;[A] **(25)** Grande Anse Trois-Rivières;[A] **(26)** La Gourde;[A] **(27)** La Grotte;[A] **(28)** La Perle;[A] **(29)** La Saline;[A] **(30)** Le Souffleur;[A] **(31)** Les Alizes;[A] **(32)** Les Esclaves;[A] **(33)** Les Galets;[A] **(34)** Les Rouleaux;[A] **(35)** Machette;[A] **(36)** Malendure;[A] **(37)** Nogent;[A] **(38)** Pain de Sucre;[A] **(39)** Petite Anse;[A] **(40)** Petite-Terre;[A] **(41)** Plage de Cluny;[B] **(42)** Plage de Mambia;[A] **(43)** Plage Naturiste;[A] **(44)** Pointe Allegre;[A] **(45)** Pointe d'Antigues and Cimetière Souffleur;[A] **(46)** Pointe Vieux-Habitants Étang;[A] **(47)** Pompierre;[A] **(48)** Port-Louis Sud;[A] **(49)** Raisins Clairs;[A] **(50)** Rifflet;[A] **(51)** Rivières Sens;[A] **(52)** Sainte-Claire;[A] **(53)** Secteur 1: Grand Cul-de-Sac Marin;[C] **(54)** Secteur 10: Île de Saint Martin;[C] **(55)** Secteur 2: Basse Terre–Côte Sous-le-Vent;[C] **(56)** Secteur 3: Basse Terre–Côte au Vent;[C] **(57)** Secteur 4: Façade Littorale Nord-Est de Grande Terre;[C] **(58)** Secteur 5: Façade Littorale Sud-Est de Grande Terre;[C] **(59)** Secteur 6: la Désirade et Petite Terre;[C] **(60)** Secteur 7: Marie-Galante;[C] **(61)** Secteur 8: Îles des Saintes;[C] **(62)** Tillet;[A] **(63)** Trois-Îlets and Folle Anse beaches;[A] **(64)** Vieux-Fort[A]
SWOT Contacts: Alain Goyeau, Alain Saint-Auret, Alexandra Le Moal, Caroline Cestor, Caroline Rinaldi, Cécile Lallemant, Eric Delcroix, Fabien Créantor, Fortuné Guiougou, Franciane Le Quellec, Guilhem Santelli, Jean Boyer, Jérôme Flereau, Laurent Malglaive, Monique Charrieau, Pauline Malterre, Philippe de Proft, Renato Rinaldi, René Dumont, Simone Mege, Sophie Bedel, Sophie Guilloux-Glorieux, and Thierry Guthmuller

GUATEMALA

DATA RECORD: 39

Data Source: Spatial Database for the Wider Caribbean.
Nesting Beaches: (1) Estero Guinea–Montagua; **(2)** San Francisco del Mar
SWOT Contacts: Ana Beatriz and Anabella Barrios

DATA RECORD: 40

Data Sources: (A) Muccio, C. 2013. Personal communication. In SWOT Database Online 2013; **(B)** Muccio, C. 2006. Asociación Rescate y Conservación de Vida Silvestre (ARCAS): Leatherback nesting in the Hawaii area of Guatemala. In *SWOT Report—State of the World's Sea Turtles*, vol. IV (2009); **(C)** Pérez, J., R. Gómez, C. Estrada, A. Bran, and C. Alfaro. 2006. Leatherback nesting in Guatemala. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006).
Nesting Beaches: (1) El Garitón;[B] **(2)** El Rosario;[B] **(3)** Hawaii;[A] **(4)** La Barrona;[B] **(5)** Taxisco beaches[C]
SWOT Contacts: Colum Muccio and Jaime Pérez

GUINEA-BISSAU

DATA RECORD: 41

Data Source: Institute of Biodiversity and Protected Areas of Guinea-Bissau. 2015. Personal communication. SWOT Database Online 2015.
Nesting Beach: Orango National Park (52 km)
SWOT Contacts: M. Betânia Ferreira Airaud and Aissa Regalla

GUYANA

DATA RECORD: 42

Data Sources: (A) De Freitas, R., and P. C. H. Pritchard. 2011. *Aspect of Marine Turtle Nesting in Guyana, 2006–2010*. Technical report, Guianas Forest and Environment Conservation Project (GFECP) and World Wildlife Fund; **(B)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(C)** Saheed, D. 2010. Personal communication. SWOT Database Online 2011; **(D)** Stewart, K., R. de Freitas, M. Kalamandeen, and P. C. H. Pritchard. 2006. *Aspects of Marine Turtle Nesting in Guyana, 2005*. Technical report, GFECP and World Wildlife Fund.
Nesting Beaches: (1) Almond;[A] **(2)** Almond and Annette beaches;[A,C] **(3)** Almond, Annette, and Tiger;[A] **(4)** Luri, Almond, and Tiger beaches;[D] **(5)** Shell Beach Protected Area[B]
SWOT Contacts: Peter C. H. Pritchard, Romeo de Freitas, Michelle Kalamandeen, and Dominique Saheed

HAITI

DATA RECORD: 43

Data Sources: (A) Spatial Database for the Wider Caribbean; **(B)** Ottenwalder, J. A. 1982. *Estudio Preliminar sobre el Status, Distribución y Biología Reproductiva de las Tortugas Marinas en la República Dominicana*. Departamento de Biología, Universidad Autónoma de Santo Domingo, Santo Domingo.
Nesting Beach: Tiburón
SWOT Contact: Jean Wiener

HONDURAS

DATA RECORD: 44

Data Sources: (A) Spatial Database for the Wider Caribbean; **(B)** Flores E. 2005. *Estado de la Situación de Conservación Comunitaria de Tortugas Marinas en la Reserva de Biosfera de Río Plátano: Una Experiencia de Gestión Colectiva en la Comunidad de Plaplaya, Municipio de Juan Francisco Bulnes, "Walumugu": 1995–2005*. Unpublished report; **(C)** Macias, F. S. 2006. *Honduras Second Annual Report: Inter-American Convention for the Protection and Conservation of Sea Turtles*. Unpublished report, Dirección de Biodiversidad, Secretaría de Recursos Naturales y Ambiente; **(D)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.
Nesting Beaches: (1) Bahía de Tela;[A,C] **(2)** Barra Catarasca;[A,C] **(3)** Barra de Tabakunta;[A] **(4)** Batalla;[A,C] **(5)** Brus Laguna;[A,C] **(6)** Cabo Camarón–La Barra;[A] **(7)** Cauquira;[A,C] **(8)** Cocobila;[A,C] **(9)** De Plaplaya;[B] **(10)** Ibans;[A,C] **(11)** La Reserva del Hombre y la Biosfera del Río Plátano;[D] **(12)** Prunnitara;[A] **(13)** Punta Castilla;[A,C] **(14)** Tocamacho;[A,C] **(15)** Yahurabila[A]
SWOT Contacts: Carlos Molinero, Gerson Martínez, Norman Javier Flores, Marcio Aronne, and Rafael Gutiérrez

INDIA

DATA RECORD: 45

Data Sources: (A) Andrews, H. V., S. Krishnan, and P. Biswas. 2002. Leatherback nesting in the Andaman and Nicobar Islands. *Kachhapa* 6: 15–18; **(B)** Andrews, H. V., S. Krishnan, and P. Biswas. 2006. Distribution and status of Marine turtles in the Andaman and Nicobar Islands. In K. Shanker and B. C. Choudhury (eds.), *Marine Turtles of the Indian Subcontinent*, pp. 33–57. Hyderabad, India: Universities Press; **(C)** Bhaskar, S. 1993. *The Status and Ecology of Sea Turtles in the Andaman and Nicobar Islands*. Tamil Nadu, India: Centre for Herpetology/Madras Crocodile Bank Trust; **(D)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(E)** Swaminathan, A., S. Thesorow, S. Watha, M. Manoharakrishnan, N. Namboothri, and M. Chandi. 2017. Current status and distribution of threatened leatherback turtles and their nesting beaches in the Nicobar group of islands. *Indian Ocean Marine Turtle Newsletter* 25: 12–18.
Nesting Beaches: (1) beaches straddling the Alexandria and Dagmar Rivers;[A] **(2)** between Ekiti Bay and Jackson Creek Little Andaman Island;[A] **(3)** Coffee Dera North Andaman Island;[A] **(4)** Cuthbert Bay;[A] **(5)** Great Nicobar;[E] **(6)** Jahiji;[A] **(7)** Kamorta;[E] **(8)** Katchal;[E] **(9)** Little Andaman Island;[A] **(10)** Little Nicobar;[E] **(11)** Nancowry;[E] **(12)** Northeastern Coast of Teressa Island;[A–C] **(13)** South Bay 1;[D] **(14)** South Cinque Island;[A] **(15)** Southern Bay at Katchal Island;[A–C] **(16)** West Bay at Little Andaman Island;[E] **(17)** West Coast[A]
SWOT Contacts: Devi Subramanian, Naveen Namboothri, Kartik Shanker, and Manish Chandi

INDONESIA

DATA RECORD: 46

Data Sources: (A) Dutton, P. H., C. Hitipeuw, M. Zein, G. Petro, J. Pita, V. Rei, L. Ambio, K. Kisakao, J. Sengo, J. Bakarbessy, K. Mackay, S. Benson, H. Suganuma, I. Kinan, and C. Fahy. 2007. Status and genetic structure of nesting populations of leatherback turtles (*Dermochelys coriacea*) in the western Pacific. Chelonian Conservation and Biology 6 (1): 47–53; **(B)** Hitipeuw, C. 2007. Leatherback nesting in Papua, Indonesia, WWF Indonesia. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007); **(C)** 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*. Honolulu, HI: Western Pacific Regional Fishery Management Council; **(D)** Muurmans, M. 2010. Yayasan Pulau Banyak, Aceh, Indonesia. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. VI (2011); **(E)** Putra, K. S. 2007. Leatherback nesting in Indonesia. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007).
Nesting Beaches: (1) Amandangan;[D] **(2)** Mubrani-Kaironi;[A,C] **(3)** Ngagelan;[E] **(4)** Raja Ampat Islands;[A,C] **(5)** Sidei-Wibain;[B] **(6)** Warmon;[B] **(7)** Yapen Island[A,C]
SWOT Contacts: Creusa "Tetha" Hitipeuw, Ketut Sarjana Putra, and Maggie Muurmans

DATA RECORD: 47

Data Source: Tapilatu, R. F., P. H. Dutton, M. Tiwari, T. Wibbels, H. V. Ferdinandus, W. G. Iwanggin, and B. H. Nugroho. 2013. Long-term decline of the western Pacific leatherback, *Dermochelys coriacea*: A globally important sea turtle population. *Ecosphere* 4 (2): article 25. http://dx.doi.org/10.1890/ES12-00348.1
Nesting Beaches: (1) Jamursba Medi; **(2)** Wermon
SWOT Contact: Deasy Lontoh

DATA RECORD: 48

Data Sources: (A) National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(B)** Reischig, T. 2022. The Turtle Foundation. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2022).
Nesting Beaches: (1) Buggeisiata;[B] **(2)** Buru Island;[A] **(3)** Selaut Besar;[B] **(4)** Sipura Island[A]
SWOT Contact: Thomas Reischig

JAMAICA

DATA RECORD: 49

Data Sources: (A) Donaldson, A., and R. Kerr. 2006. Leatherback nesting in Jamaica. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006); **(B)** Spatial Database for the Wider Caribbean; **(C)** Haynes-Sutton, A., R. Kerr Bjorkland, A. Donaldson, and M. Hamilton. 2005. In K. L. Eckert (ed.), *Draft Sea Turtle Recovery Action Plan for Jamaica*, CEP Technical Report, Caribbean Environment Programme, Kingston, Jamaica.
Nesting Beaches: (1) Billy's Bay;[B,C] **(2)** Parottee;[B,C] **(3)** Rose Hall[A]
SWOT Contacts: Andrea Donaldson and Rhema Kerr Bjorkland

LIBERIA

DATA RECORD: 50

Data Source: National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.
Nesting Beach: Little Bassa and Rivercess County

MALAYSIA

DATA RECORD: 51

Data Sources: (A) National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the leatherback turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(B)** Turtle and Marine Ecosystem Center, Fisheries Department of Malaysia. 2006. Leatherback nesting in Malaysia. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006).
Nesting Beaches: (1) Dungun beaches;[B] **(2)** Terengganu[A]
SWOT Contact: Eng-Heng Chan

MARTINIQUE

DATA RECORD: 52

Data Sources: (A) Cremades, C., and S. Lefèvre. 2021. Martinique. In M. A. Nalovic, S. A. Ceriani, M. M. P. B. Fuentes, J. B. Pfaller, N. E. Wildermann, A. Uribe-Martínez, and E. Cuevas (eds.), *Sea Turtles in the North Atlantic and Wider Caribbean Region: MTSG Annual Regional Report 2021*, pp. 327–361. IUCN-SSC Marine Turtle Specialist Group; **(B)** Spatial Database for the Wider Caribbean; **(C)** Gaspar, C., R. Le Scao, C. Cayol, J.-C. Nicolas, and S. Raigné. 2016. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XV (2020); **(D)** National Wildlife and Hunting Agency. 2009. Unpublished data 2008 and 2009 season, NGO Eco-civisme. Personal communication via R. Le Scao. In *SWOT Report—State of the World's Sea Turtles*, vol. V (2010).; **(E)** Office National de la Chasse et de la Faune Sauvage Martinique. 2006. Leatherback nesting in Martinique. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007).
Nesting Beaches: (1) Anse Céron Couleuvre Lévrier à voile Prêcheur;[D] **(2)** Anse d'Arlet–Grande Anse and Bourg;[D] **(3)** Anse Madame;[B] **(4)** Carbet;[D] **(5)** Charpentier Sainte-Marie;[D] **(6)** Diamant;[D] **(7)** Diamant–Grande Anse Diamant;[C] **(8)** Grande Anse Macabou;[B] **(9)** Le Precheur–Anse à Voile;[A] **(10)** Le Precheur–Anse Levrier;[A] **(11)** Lorrain;[D] **(12)** Lorrain–Crabiere;[C] **(13)** Lorrain–Grande Anse Lorrain;[C] **(14)** Marigot;[D] **(15)** Petite Anse Macabou;[B] **(16)** Sainte-Anne–Anse à Prune;[C] **(17)** Sainte-Anne–Anse Four à Chaux;[A] **(18)** Sainte-Anne–Anse Grosse Roche;[C] **(19)** Sainte-Anne–Anse Laballe;[C] **(20)** Sainte-Anne–Anse Meunier;[C] **(21)** Sainte-Anne–Anse Salines;[A] **(22)** Sainte-Anne–Anse Trabaud;[C] **(23)** Sainte-Anne–Grande Terre;[C] **(24)** Sainte-Marie–Anse Charpentier;[C] **(25)** Salines and Anse Trabaud Sainte-Anne;[D] **(26)** Schoelcher–Bourg;[E] **(27)** Sainte-Anne–Anse Grosse Roche;[D] **(28)** Sainte-Anne–Anse a Prune;[D] **(29)** Sainte-Anne–Anse Meunier;[D] **(30)** Sainte-Anne–Anse Trabaud;[D] **(31)** Vauclin–Grand Macabou;[C] **(32)** Vauclin–Grand et Petit Macabou[D]
SWOT Contacts: Cécile Gaspar, Rozenn Le Scao, Claire Cayol, Jean-Claude Nicolas, and Séverine Raigné

MEXICO

DATA RECORD: 53

Data Sources: (A) Agúndez, G., F. Dvorak, R. Rodriguez, and Tortugueros Las Playitas, A.C. 2013. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. VIII (2013); **(B)** Amigos para la Conservación de Cabo Pulmo and Grupo Tortuguero de las Californias. 2005. Leatherback nesting in Baja California Sur, Mexico. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007); **(C)** Bravo, G., and H. Barrios. 2001. *Reporte de Comisión a las Playas de Tamiahua-Cabo Rojo*, Delegación de Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT) en Veracruz; **(D)** Bravo, G., and R. C. Martínez P. 2007. *Breve Reseña y Resultados en la Protección y Conservación de las Tortugas Marinas en el Estado de Veracruz, 2003–2006*. SEMARNAT, Comisión Nacional de Áreas Naturales Protegidas (CONANP) and Parque Nacional Sistema Arrecifal Veracruzano; **(E)** Burchfield, P., and L. J. Peña. 2014. Gladys Porter Zoo: Kemp's Ridley Binational Project. Data courtesy of U.S. Fish and Wildlife Service, National Marine Fisheries Service, CONANP, and Secretaría de Desarrollo Urbano y Medio Ambiente. Personal communication. In SWOT Database Online 2015; **(F)** Cuevas, H. 2005. R*eporte Global de las Cuatro Temporadas (1996-1997-1998-1999) de Protección de la Tortuga Verde* (Chelonia mydas) *en la Localidad de Santander, Municipio de Alto Lucero de Gutiérrez Barrios, Ver.* Delegación de SEMARNAT en Veracruz, Subdelegación de Gestión para la Protección del Medio Ambiente y Recursos Naturales, and Sociedad Cooperativa de Producción Pesquera "Santa Ana" Marzo de 2000; **(G)** Spatial Database for the Wider Caribbean; **(H)** Erosa, S. A., C. C. Aguilar, F. S. Aguilar, T. Bernal V., R. R. Fanjul, R. Figueroa P., J. Juárez G., and M. Rivero F. 1994. P*rograma de Protección de la Tortuga Marina, Temporada 1994*. Centro Regional de Investigación Pesquera Puerto Morelos, Instituto Nacional de la Pesca, Secretaría de Pesca, and Secretaría de Desarrollo Social; **(I)** Erosa, S. A., and J. Juárez G. 1996. *Primer Registro de Anidación de Dermochelys coriacea en la Zona Hotelera de Cancún*. Mem. del XIII encuentro Interuniversitario para la conservación de las tortugas marinas, Jalapa, Veracruz; **(J)** Erosa, S. A., and J. Juárez G. 1998. *Turtle Marine Protection in the Hotel Zone of Cancún, Quintana Roo: A Retrospective*. Mem. 18vo International Symposium on Sea Turtle Biology and Conservation, Mazatlán; **(K)** Erosa, S. A. 2003. *Informe de Resultados del Programa de Protección de Tortugas Marina en la Zona Hotelera de Cancún, Temporada 2002*. Dirección General de Ecología, Benito Juárez, Quintana Roo; **(L)** Gladys Porter Zoo Sea Turtle Conservation Program. 2013. Personal communication. In SWOT Database Online 2013; **(M)** 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.; **(N)** Gúzman, V., and Área de Protección de Flora y Fauna Laguna de Términos, CONANP. 2010. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. VI (2011); **(O)** Secretaría de Desarrollo Regional del Gobierno del Estado de Veracruz (SEDERE). 2003. Proyecto del Centro Veracruzano para la Investigación y Conservación de la Tortuga Marina. Gobierno del Estado de Veracruz, SEDERE-CEMA, Pemex, and Gerencia Regional de Seguridad Industrial y Protección Ambiental, Xalapa; **(P)** Trejos, J. A., and E. Carretero. 2006. Leatherback nesting in Mexico. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006).
Nesting Beaches: (1) Cabo Rojo;[C,G] **(2)** Cayo Arcas;[N] **(3)** del Coco;[P] **(4)** Dos–Barra del Tordo;[L] **(5)** Isla Cancún;[G–K] **(6)** La Gloria;[P] **(7)** Lechuguillas–El Llano;[D,G] **(8)** Marcelino Yépez;[G,O] **(9)** Rancho Nuevo;[L] **(10)** San José–Frailes;[B] **(11)** Santander;[F,G] **(12)** Tesoro–Altamira;[E] **(13)** Todos Santos;[M] **(14)** Todos Santos (36 km)[A]
SWOT Contacts: Laura Sati, Alberto Abreu Grobois, Luis Jaime Peña, Patrick Burchfield, Vicente Gúzman, Elizabeth González Payan, Carla Sánchez, René Pinal, Eréndira Valle Padilla, Francesca Dvorak, and José Antonio Trejo Robles

DATA RECORD: 54

Data Source: Delgado, C. 2022. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023).
Nesting Beach: Mexiquillo
SWOT Contact: Carlos Delgado

DATA RECORD: 55

Data Source: Smith, D. M. 2022. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023).
Nesting Beach: Playa Blanca
SWOT Contact: Damaris M. Smith

DATA RECORD: 56

Data Source: National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.
Nesting Beaches: (1) Bahía de Chacahua; **(2)** Barra de la Cruz; **(3)** Cahuitan; **(4)** Playa San Juan (Chacahua); **(5)** Tierra Colorada

MOZAMBIQUE

DATA RECORD: 57

Data Sources: (A) Costa, A., and A. Mate. 2009. Personal communication. SWOT Database Online 2010; **(B)** Fernandes, R. S., J. Williams, and J. Trindade. 2016. *Monitoring, Tagging and Conservation of Marine Turtles in Mozambique: Annual Report 2015/16*. Centro Terra Viva, Maputo; **(C)** Mate, A. 2010. Personal communication. SWOT Database Online 2007.
Nesting Beaches: (1) Bazaruto Archipelago National Park;[C] **(2)** Bilene;[C] **(3)** Inhaca Island;[C] **(4)** Malongane;[C] **(5)** Manhiça;[A] **(6)** Milibangalala;[A] **(7)** Monte Mutondo–Ponta Mucombo;[B] **(8)** Mucombo–Santa Maria;[C] **(9)** Ponta de Ouro;[C] **(10)** Ponta do Ouro–Ponta Malongane;[B] **(11)** Ponta Malongane–Monte Mutondo;[B] **(12)** Ponta Mucombo–Cabo de Santa Maria[B]
SWOT Contacts: Alfredo Mate, Alice Costa, Miguel Gonçalves, and Raquel Fernandes

MYANMAR

DATA RECORD: 58

Data Source: National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.
Nesting Beach: Honeymoon Beach

NICARAGUA

DATA RECORD: 59

Data Sources: (A) Altamirano, E., and Y. Rodríguez. 2009. *Informe de Proyecto de Conservación de Tortugas Marinas en la RN Isla Juan Venado, León-Nicaragua: Temporada 2008–2009*; **(B)** Torres, P., M. Chávez, and L. Salmerón. 2009. *Informe Proyecto de Conservación de Tortuga Tora* (Dermochelys coriacea) *en Playa Salamina, Villa El Carmen*

(*Departamento de Managua*), *Nicaragua: Temporada 2008–2009*; **(C)** Urteaga, J. R. 2009. Personal communication. SWOT Database Online 2010; **(D)** Urteaga, J. R. 2004. *Conservación de Tortugas Tora*, Dermochelys coriacea, *en el Refugio de Vida Silvestre Río Escalante–Chacocente: Temporada 2003–2004*, Informe Anual. Fauna and Flora International, Nicaragua; **(E)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. Endangered Species Act Status Review of the Leatherback Turtle (*Dermochelys coriacea*). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.
Nesting Beaches: (1) El Cocal;[E] **(2)** Reserva Natural Isla Juan Venado;[A–C] **(3)** Refugio de Vida Silvestre Río Escalante–Chacocente;[D] **(4)** Tecomapa[D]
SWOT Contacts: Alex Gaos, José Urteaga, Velkiss Gadea, Edgard Herrera, and Perla Torres Gago

DATA RECORD: 60

Data Source: Urteaga J. R., V. Gadea, and L. Gonzáles. 2021. Nicaragua. In J. M. Rodríguez-Baron, S. Kelez, M. J. Liles, A. Zavala-Norzagaray, D. Amorocho, and A. R. Gaos (eds.), *Sea Turtles in the Eastern Pacific Region: MTSG Annual Regional Report 2021*, pp. 141–162. IUCN-SSC Marine Turtle Specialist Group.
Nesting Beaches: (1) Ostional; **(2)** Playa Brasilon; **(3)** Playa el Coco; **(4)** Playa Escondida Rancho Santana; **(5)** Playa Guacalito (Anima); **(6)** Playa la Flor Rivas; **(7)** Salamina; **(8)** Veracruz de Acayo
SWOT Contact: Paso Pacífico

NIGERIA

DATA RECORD: 61

Data Source: Girondot, M., and A. Girard. 2017. Personal communication. In SWOT Database Online 2017.
Nesting Beaches: (1) Eastern Beach; **(2)** Port Lekki Beach; **(3)** Western Beach
SWOT Contact: Marc Girondot

PANAMA

DATA RECORD: 62

Data Sources: (A) Spatial Database for the Wider Caribbean; **(B)** Harrison, E. 2014. Personal communication. In SWOT Database Online 2015; **(C)** Meylan, A., and P. Meylan. 1985. Nesting of *Dermochelys coriacea* in Caribbean Panama. *Journal of Herpetology* 19 (2): 293–297; **(D)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(E)** Ordoñez, C. 2006. Leatherback nesting in Panama. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006); **(F)** Ordoñez, C., A. Ruiz, S. Troëng, A. Meylan, and P. Meylan. 2006. *Final Project Report: 2005 Hawksbill* (Eretmochelys imbricata) *Research and Population Recovery at Chiriquí Beach and Escudo de Veraguas Island and Bastimentos Island National Marine Park*; **(G)** Patiño-Martínez, J., A. Marco, L. Quiñones, and B. Godley. 2008. Globally significant nesting of the leatherback turtle (*Dermochelys coriacea*) on the Caribbean coast of Colombia and Panama. *Biological Conservation* 141: 1982–1989; **(H)** Troëng, S., D. Chacón, and B. Dick. 2004. Possible decline in leatherback turtle *Dermochelys coriacea* nesting along Caribbean Central America. *Oryx* 38 (4): 395–403.
Nesting Beaches: (1) Anatxukuna;[G] **(2)** Armila;[B] **(3)** Bastimentos Island;[E] **(4)** Big Zapatilla Cay;[A,F] **(5)** Carreto;[A,C] **(6)** Changuinola;[D] **(7)** Chiquita;[A,C] **(8)** Colón Island;[H] **(9)** Cuango;[A,C] **(10)** Escudo de Veraguas Island;[B] **(11)** Flores;[H] **(12)** Napakanti or Navagandi;[A,C] **(13)** Pito;[A,C] **(14)** Playa Bluff/Flores Beach–Colón Island;[B] **(15)** Playa Chiriquí;[D] **(16)** Playa Larga–Bastimentos (Long Bay);[H] **(17)** Playa Roja (Playa Colorado;[B] **(18)** Playa San San;[H] **(19)** Playa Sixaola;[H] **(20)** Primera;[H] **(21)** Punta Sasardí;[A,C] **(22)** Soropta;[B] **(23)** Soropta 2[H]
SWOT Contacts: Anne Meylan, Argelis Ruiz, Cristina Ordóñez, Emma Harrison, Juan Patiño-Martínez, and Liliana Quiñones

DATA RECORD: 63

Data Sources: (A) Rodríguez, J., A. Ruíz, M. Abrego, C. Peralta, and H. Chacón. 2009. Fotografías de neonatos y testimonio de moradores de la comunidad. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. V (2010); **(B)** Rodríguez, J., A. Ruíz, M. Abrego, C. Peralta, and H. Chacón. 2009. MarViva. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. V (2010); **(C)** Rodríguez, J., A. Ruíz, M. Abrego, C. Peralta, and H. Chacón. 2009. Observación de Rastros, Domingo Espino: Testimonio de moradores de Cambutal. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. V (2010); **(D)** Rodríguez, J., A. Ruíz, M. Abrego, C. Peralta, and H. Chacón. 2009. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. V (2010).
Nesting Beaches: (1) Isla Santa Catalina;[A] **(2)** La Barqueta;[D] **(3)** La Cuchilla;[B] **(4)** Morro de Puerco[C]
SWOT Contacts: Carlos Peralta, Marino Abrego, Harold Chacón, Argelis Ruíz, and Jacinto Rodríguez

PAPUA NEW GUINEA

DATA RECORD: 64

Data Sources: (A) Dutton, P. H., C. Hitipeuw, M. Zein, G. Petro, J. Pita, V. Rei, L. Ambio, K. Kisakao, J. Sengo, J. Bakarbessy, K. Mackay, S. Benson, H. Suganuma, I. Kinan, and C. Fahy. 2007. Status and genetic structure of nesting populations of leatherback turtles (*Dermochelys coriacea*) in the western Pacific. *Chelonian Conservation and Biology* 6 (1): 47–53; **(B)** 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*. Honolulu, HI: Western Pacific Regional Fishery Management Council; **(C)** Pilcher, N. J. 2010. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. VI (2011); **(D)** Pilcher, N. J. 2011. *Community-Based Conservation of Leatherback Turtles along the Huon Coast, Papua New Guinea*. Final report to the Western Pacific Regional Fishery Management Council, Honolulu; **(E)** Pilcher, N. J. 2013. *Community-Based Conservation of Leatherback Turtles along the Huon Coast, Papua New Guinea*. Final report to the Western Pacific Regional Fishery Management Council, Honolulu.
Nesting Beaches: (1) Bougainville;[A,B] **(2)** Busama (Buli);[E] **(3)** Fulleborn;[A,B] **(4)** Kamiali Wildlife Management Area;[E] **(5)** Kobo;[E] **(6)** Korapun;[A,B] **(7)** Labu Tale;[E] **(8)** Maus Buang (Buan-Buasi);[A,B] **(9)** Paiawa;[D] **(10)** Salus;[C] **(11)** Sapa[E]
SWOT Contacts: Nicolas Pilcher, Peter Dutton, and Vagi Rei

PUERTO RICO

DATA RECORD: 65

Data Sources: (A) Chelonia. 2012. Proyecto Tinglar-Dorado. Unpublished report to Departamento de Recursos Naturales y Ambientales (DRNA); **(B)** Concepción, M., and C. Díez. 2012. *Sea Turtle Nesting Activities at Arecibo*. Unpublished report to DRNA; **(C)** Crespo, L. 2022. Amigos de las Tortugas Marinas. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023); **(D)** Díez, C. E. 2005. *Proyecto de Tortugas Marinas en Culebra, 2005*. Internal report, DRNA; **(E)** Diez, C., and C. Arias. 2013. Unpublished data. SWOT Database Online 2013; **(F)** Spatial Database for the Wider Caribbean; **(G)** Horta, H., et al. 2005. *Reporte de Actividades de Conservación de Tortugas Marinas en el Noreste de Puerto Rico*. Internal report, DRNA; **(H)** Justiniano, M. 2004. *Leatherback Nesting Surveys 2004*. Internal report, DRNA; **(I)** Montero, L. 2004. *Leatherback Nesting at Humacao, 2004*. Internal report, DRNA; **(J)** Montero, L. 2006. *Proyecto de Conservación de Tortugas Marinas Humacao, Yabucoa y Maunabo, Puerto Rico, Temporada 2006*. Unpublished report, DRNA; **(K)** DRNA. 2022. *Recovery Actions for Marine Turtles Nesting Populations at Puerto Rico*, Internal report, DRNA; **(L)** DRNA. 2012. Unpublished database for nesting of sea turtles in Puerto Rico; **(M)** Ramos, R., and C. Díez. 2013. Unpublished data. SWOT Database Online 2013; **(N)** U.S. Department of the Navy. 2001. *Aerial Surveys for Marine Mammals, Sea Turtles, or Other Protected Resources at Vieques Island, Naval Station Roosevelt Roads, Puerto Rico and offshore areas*. Internal technical report.
Nesting Beaches: (1) Aguada;[F] **(2)** Aguadilla;[F] **(3)** Anyasco;[F] **(4)** Bahía Icacos (outside Live Impact Area);[N] **(5)** Bahía Salina del Sur 1;[N] **(6)** Bahía Salina del Sur 2;[N] **(7)** Bahía Salina del Sur 3;[N] **(8)** Bahía Salina del Sur 4;[N] **(9)** Beach next to Punta Icacos;[N] **(10)** Between Fanduca Beach and Jalovita Beach 1;[N] **(11)** Between Red Beach and Blue Beach;[N] **(12)** Blue 1;[N] **(13)** Blue 2;[N] **(14)** Blue 3;[N] **(15)** Blue 4;[N] **(16)** Blue 5;[N] **(17)** Brava–Culebra;[F] **(18)** Brava–Resaca–Zoni–Flamenco–Tortolo–Culebrita;[D] **(19)** Close to Cerro Faraón (north side);[N] **(20)** Corredor del Noreste;[K] **(21)** Covento–La Selva;[G] **(22)** Dorado;[A,L] **(23)** East of Puerto Diablo 1;[N] **(24)** Fajardo–Luquillo;[L,M] **(25)** Humacao;[I,J] **(26)** In the limit between Live Impact Area (north) and Conservation Zone;[N] **(27)** Isabela;[F] **(28)** Islote, Arecibo;[B,L] **(29)** Jalova;[N] **(30)** Jalovita 1;[N] **(31)** Jalovita 2;[N] **(32)** Live Impact Area (northeast);[N] **(33)** Live Impact Area (north) 1;[N] **(34)** Live Impact Area (north) 2;[N] **(35)** Live Impact Area (north) 3;[N] **(36)** Live Impact Area (northeast; Playa de Banco);[N] **(37)** Maunabo;[C] **(38)** Mayagüez;[H] **(39)** Metro beaches;[K] **(40)** North;[N] **(41)** Paulinas San Miguel Convento;[F] **(42)** Piñones;[K] **(43)** Playa Blanca 13;[N] **(44)** Playa Blanca 14;[N] **(45)** Playa Blanca 15;[N] **(46)** Playa Blanca 16;[N] **(47)** Playa Blanca 17;[N] **(48)** Playa Blanca 18;[N] **(49)** Playa Grande;[K] **(50)** Playa Grande El Paraiso;[N] **(51)** Playas de Culebra;[K] **(52)** Playas de Vieques;[K] **(53)** Puerto Diablo (old);[N] **(54)** Quebradillas;[F] **(55)** Red 2;[N] **(56)** Red 3;[N] **(57)** Red 4;[N] **(58)** Red 5;[N] **(59)** Resaca–Culebra;[F] **(60)** Rincón;[F] **(61)** To the west of Punta Icacos 1;[N] **(62)** Tres Hermanos;[K] **(63)** Yabucoa;[E,L] **(64)** Yellow (outside Live Impact Area) 1;[N] **(65)** Yellow (outside Live Impact Area) 2;[N] **(66)** Yellow 10;[N] **(67)** Yellow 11;[N] **(68)** Yellow 12;[N] **(69)** Yellow 13;[N] **(70)** Yellow 14;[N] **(71)** Yellow 15;[N] **(72)** Yellow 16;[N] **(73)** Yellow 17;[N] **(74)** Yellow 18;[N] **(75)** Yellow 19;[N] **(76)** Yellow 20;[N] **(77)** Yellow 21;[N] **(78)** Yellow 22;[N] **(79)** Yellow 23;[N] **(80)** Yellow 24;[N] **(81)** Yellow 25;[N] **(82)** Yellow 26;[N] **(83)** Yellow 27;[N] **(84)** Zoni–Culebra[F]
SWOT Contacts: Carlos Díez, Luis A. Crespo, Myma Concepción, M. Muñoz, Rosaly Ramos, Robert van Dam, Héctor C. Horta-Abraham, and P. López

SAINT KITTS AND NEVIS

DATA RECORD: 66

Data Sources: (A) Spatial Database for the Wider Caribbean; **(B)** Stewart, K. 2006. Leatherback nesting in St. Kitts. St. Kitts Sea Turtle Monitoring Network. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007).
Nesting Beaches: (1) Banana;[A] **(2)** Belle Tete;[A] **(3)** Cayon to Key;[B] **(4)** North Friars;[B] **(5)** North Frigate;[A] **(6)** Sea Haven (Lovers);[A] **(7)** South Friars[A]
SWOT Contacts: Kimberly Stewart, Kate Orchard, Ralph Wilkins, and Emile Pemberton

SAINT LUCIA

DATA RECORD: 67

Data Sources: (A) Bacon, P. R. 1981. *The Status of Sea Turtle Stocks Management in the Western Central Atlantic*. Western Central Atlantic Fishery Commission; **(B)** Carr, A., A. Meylan, J. Mortimer, K. Bjorndal, and T. Carr. 1982. *Surveys of Sea Turtle Populations and Habitats in the Western Atlantic*. NOAA Technical Memorandum NMFS-SEFC-91, National Marine Fisheries Service, Miami, FL; **(C)** d'Auvergne, C., and K. L. Eckert. 1993. *Sea Turtle Recovery Action Plan for St. Lucia*. CEP Technical Report No. 26, Caribbean Environment Programme, Kingston, Jamaica; **(D)** Spatial Database for the Wider Caribbean; **(E)** St. Lucia Department of Fisheries. 2006. Preliminary sea turtle figures for Grande Anse Beach, Saint Lucia. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006).
Nesting Beaches: (1) Anse de Sables;[D] **(2)** Anse Louvette;[C,D] **(3)** Cas-en-Bas;[A–D] **(4)** Fond d'Or;[D] **(5)** Grande Anse;[E] **(6)** Grande Anse;[C,D] **(7)** Maria Island;[B–D] **(8)** Marquis Bay;[C,D] **(9)** Point Sable;[C,D] **(10)** Praslin Bay;[A,D] **(11)** Reduit;[C,D] (12) Vigie;[C,D]
SWOT Contact: Dawn Pierre-Nathoniel

SAINT MARTIN (FRENCH PART)

DATA RECORD: 68

Data Source: Delcroix, E., et al. 2010. Unpublished data. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. VI (2011).
Nesting Beaches: (1) Baie aux Prunes; **(2)** Baie Longue; **(3)** Baie Rouge; **(4)** Bell Beach; **(5)** Galion; **(6)** Grandes Cayes; **(7)** Petites Cayes; **(8)** Pinel Arrière; **(9)** Pinel Côté; **(10)** White Bay Tintamarre
SWOT Contacts: Alain Goyeau, Alain Saint-Auret, Alexandra Le Moal, Caroline Cestor, Caroline Rinaldi, Cécile Lallemant, Eric Delcroix, Fabien Créantor, Fortuné Guiougou, Franciane Le Quellec, Guilhem Santelli, Jean Boyer, Jérôme Flereau, Laurent Malglaive, Monique Charrieau, Pauline Malterre, Philippe de Proft, Renato Rinaldi, René Dumont, Simone Mege, Sophie Bedel, Sophie Guilloux-Glorieux, and Thierry Guthmuller

DATA RECORD: 69

Data Sources: (A) RNN Saint-Martin. 2010. *Rapport 2009 Suivis des Pontes de Tortues Marines et des Tortues Marines en Alimentation*. RNN Saint-Martin; **(B)** RNN Saint-Martin. 2011. *Rapport 2010 Suivis des Pontes de Tortues Marines et des Tortues Marines en Alimentation*. RNN Saint-Martin; **(C)** Réserve Naturelle Nationale de Saint-Martin. 2012. *Suivi des pontes de tortues marines à Saint-Martin, Bilan de la campagne 2011*. RNN Saint-Martin; **(D)** RNN Saint-Martin. 2012. *Suivi des Pontes de Tortues Marines à Saint-Martin, Bilan de la campagne 2012*. RNN Saint-Martin; **(E)** Réserve Naturelle Nationale de Saint-Martin. 2014. *Suivi des Pontes de Tortues Marines à Saint-Martin, Bilan de la Campagne 2013*. RNN Saint-Martin; **(F)** Réserve Naturelle Nationale de Saint-Martin. 2015. *Suivi des Pontes de Tortues Marines à Saint-Martin: Saison 2014*. RNN Saint-Martin; **(G)** Chalifour, J. 2015. *Suivi des Tortues marines en Ponte et en Alimentation: Année 2015*. RNN Saint-Martin; **(H)** Bousquet, C., and J. Chalifour. 2017. *Suivi des Tortues Marines en Ponte et en Alimentation: Année 2016*. Réserve Nationale Naturelle de Saint-Martin (RNN Saint-Martin); **(I)** Chalifour, J. 2017. *Suivi des Pontes de Tortues Marines à Saint-Martin: Saison 2017*. RNN Saint-Martin; **(J)** Chalifour, J. 2019. *Suivi des Pontes de Tortues Marines à Saint-Martin: Saison 2018*. RNN Saint-Martin; **(K)** Eckert, K. L., and A. E. Eckert. 2019. *An Atlas of Sea Turtle Nesting Habitat for the Wider Caribbean Region*. WIDECAST Technical Report No. 19. (rev. ed); **(L)** Chalifour, J. 2022. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023).
Nesting Beaches: (1) Lagon Tintamarre;[A–L] **(2)** Long Bay;[A–L] **(3)** Orient Bay;[A–L] **(4)** Plum Bay;[A–L] **(5)** Red Bay[A–L]
SWOT Contacts: Julien Chalifour and Claire Saladin, Reserve Naturelle de Saint-Martin (French Caribbean)

SAINT VINCENT AND THE GRENADINES

DATA RECORD: 70

Data Sources: (A) Carr, A., A. Meylan, J. Mortimer, K. Bjorndal, and T. Carr. 1982. *Surveys of Sea Turtle Populations and Habitats in the Western Atlantic*. NOAA Technical Memorandum NMFS-SEFC-91, National Marine Fisheries Service, Miami, FL; **(B)** Spatial Database for the Wider Caribbean; **(C)** Morris, K. 1987. The national report for the country of St. Vincent and the Grenadines. In *Proceedings*

of the Western Atlantic Turtle Symposium II, September 1987, Mayagüez, Puerto Rico; **(D)** Scott, N. McA., and J. A. Horrocks. 1993. Sea turtle recovery plan for St. Vincent and the Grenadines. In K. L. Eckert (ed.), Sea turtle recovery action plan for St. Vincent and the Grenadines, CEP Technical Report No. 27, Caribbean Environment Programme, Kingston, Jamaica; **(E)** Morris, K. 1984. The national report for the country of St. Vincent. In P. Bacon, F. Berry, K. Bjorndal, H. Hirth, L. Ogren, and M. Weberet (eds.), *Proceedings of the Western Atlantic Sea Turtle Symposium Volume 3*, pp. 381–385. Miami, FL: University of Miami Press.
Nesting Beaches: (1) Barrouallie;[A,B,D] **(2)** Biabou Bay;[B–E] **(3)** Brighton Bay;[B–E] **(4)** Clare Valley;[A,B,D] **(5)** Colonarie Bay;[B–E] **(6)** Dark View;[A,B,D] **(7)** Georgetown Bay;[B–E] **(8)** Mahault Bay–Canouan;[B–E] **(9)** Mount Pleasant;[B–E] **(10)** Richmond;[B–E] **(11)** Richmond Beach–Union Island;[B–E] **(12)** Stubbs Bay[B–E]
SWOT Contact: Lucine Edwards

SÃO TOMÉ AND PRÍNCIPE

DATA RECORD: 71

Data Source: Bollen, A. 2016. Sea Turtle Conservation Programme of Fundação Príncipe Trust. Personal communication. In SWOT Database Online 2016.
Nesting Beaches: (1) Praia Banana; **(2)** Praia Boi; **(3)** Praia Bumbo; **(4)** Praia do Cemitério; **(5)** Praia Grande do Infante; **(6)** Praia Macaco; **(7)** Praia Micotó; **(8)** Praia Montanha; **(9)** Praia Río São Tomé; **(10)** Praia de Santa Rita
SWOT Contact: An Bollen

DATA RECORD: 72

Data Source: Matilde, E., and M. R. Henry. 2022. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023).
Nesting Beaches: (1) Banana; **(2)** Boi; **(3)** Bombom 1; **(4)** Bombom 2 (Santa Rita); **(5)** Bumbo; **(6)** Burra; **(7)** Cabinda; **(8)** Caixão; **(9)** Cajú; **(10)** Campanha; **(11)** Cemitério; **(12)** Franguinha; **(13)** Grande do Infante; **(14)** Lapa; **(15)** Macaco; **(16)** Maria Correia; **(17)** Micotó; **(18)** Montanha; **(19)** Novo; **(20)** Pedra Furada; **(21)** Pedrona; **(22)** Ponta Marmita; **(23)** Ponta Ramiro; **(24)** Popa; **(25)** Portinho; **(26)** Praia de Areia; **(27)** Praia Grande; **(28)** Praia Grande; **(29)** Praia Margarida; **(30)** Praia Seca; **(31)** Prainha; **(32)** Ribeira Izé; **(33)** Río São Tomé; **(34)** Sundy; **(35)** UVA; **(36)** Yola
SWOT Contacts: Estrela Matilde and Maguiña Ramilo Henry

DATA RECORD: 73

Data Sources: (A) Association for the Research, Protection, and Conservation of Sea Turtles in Lusophone Countries (ATM). 2012/13 and 2013/14. *Sea Turtle Conservation Project of the Island of Príncipe*. Nontechnical report; **(B)** ATM-MARAPA (Mar, Ambiente e Pesca Artesana). 2015/16. *Tatô Program: Sea Turtle Conservation Project of the Island of São Tomé*. Technical report. **(C)** Hancock, J., A. Marques, and S. Vieira. 2013. Personal communication. SWOT Database Online 2017; **(D)** Hancock, J., and H. Lima. 2012. Personal communication. SWOT Database Online 2017; **(E)** Loloum, B., H. Lima, and J. Hancock. 2012. *MARAPA Relatório de Actividades*. Personal communication. SWOT Database Online 2017; **(F)** Vieira, S., H. Lima, J. Hancock, and B. Ferreira. 2015. Personal communication. SWOT Database Online 2017.
Nesting Beaches: (1) Cabana;[B,F] **(2)** Comprida;[E] **(3)** Fernão Dias;[E] **(4)** Governador;[B,F] **(5)** Infante;[A,D] **(6)** Inhame;[B,F] **(7)** Jalé;[B,F] **(8)** Malanza;[E] **(9)** Margarida/Marmita;[A,C] **(10)** Micoló;[B,F] **(11)** Planta;[B,F] **(12)** Tartaruga[B,F]
SWOT Contact: Sara Vieira

SIERRA LEONE

DATA RECORD: 74

Data Sources: (A) Aruna, E. 2008. Loggerhead nesting in Sierra Leone. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007) and vol. III (2008); **(B)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.
Nesting Beaches: (1) Beaches in Sierra Leone;[B] **(2)** Hamilton;[A] **(3)** Lumley[A]

SINT EUSTATIUS

DATA RECORD: 75

Data Source: Berkel, J. 2014. St. Eustatius National Parks Foundation Sea Turtle Conservation Program: Personal communication. SWOT Database Online 2015.
Nesting Beach: Zeelandia
SWOT Contact: Jessica Berkel

SINT MAARTEN (DUTCH PART)

DATA RECORD: 76

Data Sources: (A) Spatial Database for the Wider Caribbean; **(B)** Vissenberg, D. 2006. Leatherback nesting in St. Maarten, Netherlands Antilles. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007).
Nesting Beaches: (1) Guana and Simpson Bay;[B] **(2)** Guana Bay[A]
SWOT Contacts: Dominique Vissenberg and Tadzio Bervoets

SOLOMON ISLANDS

DATA RECORD: 77

Data Source: (A) Dutton, P. H., C. Hitipeuw, M. Zein, G. Petro, J. Pita, V. Rei, L. Ambio, K. Kisakao, J. Sengo, J. Bakarbessy, K. Mackay, S. Benson, H. Suganuma, I. Kinan and C. Fahy. 2007. Status and genetic structure of nesting populations of leatherback turtles (*Dermochelys coriacea*) in the western Pacific. *Chelonian Conservation and Biology* 6 (1): 47–53; **(B)** 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*. Honolulu, HI: Western Pacific Regional Fishery Management Council; **(C)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(D)** Prakash, S., and S. Piovano. 2021. Solomon Islands. In T. M. Work, D. Parker, and G. H. Balazs (eds.), *Sea Turtles in the Oceania Region: MTSG Annual Regional Report 2021*. IUCN-SSC Marine Turtle Specialist Group; **(E)** Waldie, P., J. Pita, S. Vuto, and R. Hamilton. 2022. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023).
Nesting Beaches: (1) Baniata;[A,B] **(2)** Haevo;[E] **(3)** Havila;[A,B] **(4)** Katova Bay;[A,B] **(5)** Lilika;[A,B] **(6)** Litogahira;[A,B] **(7)** Quero;[A,B] **(8)** Rakata Bay;[A,B] **(9)** Rendova;[C] **(10)** Salona;[A,B] **(11)** Sasakolo;[E] **(12)** Sosoilo;[E] **(13)** Vachu River;[A,B] **(14)** Zaira Beach Vangunu Island[D]
SWOT Contacts: Peter Waldie, John Pita, Simon Vuto, and Richard Hamilton

SOUTH AFRICA

DATA RECORD: 78

Data Sources: (A) Nel, R. 2006. Leatherback nesting in South Africa. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006); **(B)** Nel, R. 2016. Turtle Monitoring and Research Report: 2013/14 and 2014/15 Seasons. Unpublished report.
Nesting Beaches: (1) Mabibi–Kosi Lake;[B] **(2)** Maputaland[A]
SWOT Contact: Ronel Nel

SRI LANKA

DATA RECORD: 79

Data Sources: (A) Amarasooriya, K. D., and M. R. A. Jayathilaka. 2002. *A Classification of the Sea Turtles' Nesting Beaches of Southern Sri Lanka*. Paper presented at Second Association of Southeast Asian Nations Symposium on Sea Turtle Biology and Conservation; **(B)** Ekanayake, E. M. L., K. B. Ranawana, T. Kapurusinghe, M. G. C. Premakumara, and M. M. Saman. 2002. Marine turtle conservation in Rekawa turtle rookery in southern Sri Lanka. *Ceylon Journal of Science* (*Biological Science*) 30: 79–88; **(C)** Ekanayake, E. M. L., T. Kapurusinghe, M. M. Saman, and M. G. C. Premakumara. 2002. 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; **(D)** Kapurusinghe, T. 2006. Status and conservation of marine turtles in Sri Lanka. In K. Shanker and B. C. Choudhury (eds.), *Marine Turtles of the Indian Subcontinent*, pp. 173–187. Hyderabad, India: Universities Press, Hyderguda; **(E)** Rajakaruna, R. S., L. Ekanayake, and P. A. C. N. B. Suraweera. 2021. Sri Lanka. In A. D. Phillott and A. F. Rees (eds.), *Sea Turtles in the Middle East and South Asia Region: MTSG Annual Regional Report 2021*, pp. 183–203. IUCN-SSC Marine Turtle Specialist Group.
Nesting Beaches: (1) Amaduwa;[D] **(2)** Ambalangoda;[D] **(3)** Arugambay;[D] **(4)** Balapitiya;[A,D] **(5)** Bentota;[B,C] **(6)** Bundala;[E] **(7)** Bussa;[D] **(8)** Buttawa;[D] **(9)** Godavaya;[B,C] **(10)** Habaraduwa;[D] **(11)** Induruwa;[A] **(12)** Kahandamodara;[A,D] **(13)** Kalametiya;[D] **(14)** Kosgoda;[A,D] **(15)** Kumana;[D] **(16)** Maggona;[D] **(17)** Mahaseeiawe;[D] **(18)** Nagashandiya;[D] **(19)** Palatupana;[D] **(20)** Patanangala;[D] **(21)** Pathiraja;[D] **(22)** Potuwil;[D] **(23)** Rekawa;[B,C] **(24)** Seenimodara;[D] **(25)** Tangalle;[D] **(26)** Uraniya;[D] **(27)** Ussangoda;[D] **(28)** Wedikandi;[D] **(29)** Wellode[D]
SWOT Contact: SWOT Database manager

ST. BARTHELEMY

DATA RECORD: 80

Data Sources: (A) Agence Territoriale de l'Environnement de Saint Barthelemy. *Rapport du Suivi des Pontes de Tortues Marines à Saint Barthelemy*; **(B)** Saladin, C. 2021. St. Barthelemy. In M. A. Nalovic, S. A. Ceriani, M. M. P. B. Fuentes, J. B. Pfaller, N. E. Wildermann, A. Uribe-Martínez, E. Cuevas (eds.), *Sea Turtles in the North Atlantic and Wider Caribbean Region: MTSG Annual Regional Report 2021*, pp. 446–505. IUCN-SSC Marine Turtle Specialist Group.
Nesting Beaches: (1) Anse des Cayes;[B] **(2)** Bonhomme;[B] **(3)** Colombier;[B] **(4)** Flamands;[A] **(5)** Fregate;[B] **(6)** Gouverneur;[B] **(7)** Grand Cul de Sac;[B] **(8)** Grand Fond;[B] **(9)** Lorient;[B] **(10)** Marechal;[B] **(11)** Marigot;[B] **(12)** Petit Cul de Sac;[B] **(13)** Public;[B] **(14)** Saline;[A] **(15)** Shell Beach;[B] **(16)** St. Jean;[B] **(17)** Toiny[B]
SWOT Contact: Agence Territoriale de l'Environnement de Saint Barthelemy (French Caribbean)

SURINAME

DATA RECORD: 81

Data Sources: (A) Hilterman, M. L., and E. Goverse. 2006. *Annual Report on the 2005 Leatherback Turtle Research and Monitoring Project in Suriname*. Technical Report of the IUCN Netherlands. World Wildlife Fund–Guianas Forests and Environmental Conservation Project; **(B)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service; **(C)** Nature Conservation Division and World Wildlife Fund–Guianas. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XV (2020).
Nesting Beaches: (1) Alusiaka;[A] **(2)** Babunsanti Galibi Nature Reserve;[A] **(3)** Braamspunt;[B] **(4)** Diana;[A] **(5)** Galibi;[C] **(6)** Kolukombo/Marie (formerly known as BGW-III);[A] **(7)** Matapica;[C] **(8)** Samsambo (formerly known as Spit);[A] **(9)** Thomas-Eilanti Galibi Nature Reserve[A]
SWOT Contacts: Claudine Sakimin, Romeo de Freitas, Suresh Kandaswamy, Sopheia Edghill, Catharina Bilo, and Michael Hiwat

THAILAND

DATA RECORD: 82

Data Source: Aureggi, M. 2006. Leatherback nesting in Thailand. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007).
Nesting Beaches: South Thailand
SWOT Contact: Monica Aureggi

TOGO

DATA RECORD: 83

Data Source: Segniagbeto, G. H. 2006. Leatherback nesting in Togo. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006).
Nesting Beaches: (1) Agbodrafo; **(2)** Gbétsogbé; **(3)** Kodjoviakope; **(4)** Kotokoucondji; **(5)** N'Lessi; **(6)** Palm
SWOT Contact: Gabriel Hoinsoude Segniagbeto

TRINIDAD AND TOBAGO

DATA RECORD: 84

Data Sources: (A) Livingstone, S. R. 2007. Leatherback nesting in Trinidad. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007); **(B)** Livingstone, S. R., and J. R. Downie. 2008. Unpublished data; **(C)** Walker, G. 2013. *An Update on Sea Turtle Nesting in the North-East of Tobago*. Unpublished report.
Nesting Beaches: (1) Bloody Bay;[C] **(2)** Cambleton Bay;[C] **(3)** Charlotteville;[C] **(4)** Dead Bay;[C] **(5)** Grand Tacaribe;[A,B] **(6)** Iguana Bay;[C] **(7)** Madamas;[A,B] **(8)** Murphy's Bay;[A,B] **(9)** Paria[A,B]
SWOT Contacts: Grant Walker and Suzanne Livingstone

DATA RECORD: 85

Data Sources: (A) Spatial Database for the Wider Caribbean; **(B)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.
Nesting Beaches: (1) Back Bay (Plymouth);[A] **(2)** Barbados Bay;[A] **(3)** Big Bay;A **(4)** Cachipa;[A] **(5)** Celery Bay;[A] **(6)** Culloden Bay;[A] **(7)** Englishmen's Bay;[A] **(8)** Fishing Pond;[B] **(9)** Goldsborough;[A] **(10)** Grand Riviere;[B] **(11)** Hermitage Bay;[A] **(12)** John Dial Beach (Hope);[A] **(13)** King Peters Back Bay (Cotton Bay);[A] **(14)** L'Anse Fourmi Bay;[A] **(15)** Little Rockley Bay;[A] **(16)** Man O War;[A] **(17)** Manzanilla Beach–Cocos Bay;[A] **(18)** Matura;[B] **(19)** Mayaro Bay;[A] **(20)** Minister Bay–Bacolet;[A] **(21)** Mission Bay;[A] **(22)** No Head;[A] **(23)** Pirate's Bay;[A] **(24)** Rocky Point (Mount Irvine Back Bay);[A] **(25)** Roxborough;[A] **(26)** Sans Souci;[A] **(27)** Speyside;[A] **(28)** Toco Bay;[A] **(29)** Turtle Beach (Great Courland Bay)[B]
SWOT Contacts: Heather Pepe, Tanya Clovis, Pat Turpin, Stephen Poon, Dennis Sammy, Scott Eckert, and Turtle Village Trust

UNITED STATES (CONTIGUOUS)

DATA RECORD: 86

Data Sources: (A) Godfrey, M. 2022. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023); **(B)** Godfrey, M. 2008. North Carolina Wildlife Resources Commission. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. IV (2009); **(C)** Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute. 2015. *Statewide Atlas of Sea Turtle Nesting Occurrence and Density*. http://myfwc.com/research/wildlife/sea-turtles/nesting/nesting-atlas/; **(D)** Rabon, D. R., S. A. Johnson, R. Boettcher, M. Dodd, M. Lyons, S. Murphy, S. Ramsey, S. Roff, and K. Stewart. 2003. Confirmed leatherback turtle (*Dermochelys coriacea*) nests from North Carolina, with a summary of leatherback nesting activities north of Florida. *Marine Turtle Newsletter* 101: 4–8; **(E)** Hopkins-Murphy, S. R., T. M. Murphy, C. P. Hope, J. W. Coker, and M. E. Hoyle. 2001. *Population Trends and Nesting Distribution of the Loggerhead Turtle* (Caretta caretta) *in South Carolina 1980–1997*. Final report to the U.S. Fish and Wildlife Service. South Carolina Department of Natural Resources, Division of Wildlife and Freshwater Fisheries, Wildlife

Diversity Section, Charleston, SC; **(F)** Shaver, D. 2008. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. IV (2009).
Nesting Beaches: (1) Bay;[C] **(2)** Brevard;[C] **(3)** Broward;[C] **(4)** Cape Lookout and Cape Hatteras National Seashores;[B] **(5)** Charlotte;[C] **(6)** Collier;[C] **(7)** Cumberland Island;[D] **(8)** Duval;[C] **(9)** Escambia;[C] **(10)** Flagler;[C] **(11)** Franklin;[C] **(12)** Gulf;[C] **(13)** Hillsborough;[C] **(14)** Huntington Beach State Park;[D] **(15)** Indian River;[C] **(16)** Lee;[C] **(17)** Manatee;[C] **(18)** Martin;[C] **(19)** Miami-Dade;[C] **(20)** Monroe;[C] **(21)** Nassau;[C] **(22)** North Carolina;[A] **(23)** North Padre Island;[F] **(24)** Okaloosa;[C] **(25)** Palm;[C] **(26)** Pinellas;[C] **(27)** Santa Rosa;[C] **(28)** Sapelo Island;[D] **(29)** Sarasota;[C] **(30)** Sea Island;[D] **(31)** St. Johns;[C] **(32)** St. Lucie;[C] **(33)** St. Phillips Island;[D,E] **(34)** St. Simons Island;[D] **(35)** Volusia;[C] **(36)** Walton[C]
SWOT Contacts: Donna Shaver, Matthew Godfrey, Florida Fish and Wildlife Conservation Commission, and Fish and Wildlife Research Institute

VANUATU

DATA RECORD: 87

Data Sources: (A) Fletcher, M. 2008. Personal communication. In SWOT Database Online 2010; **(B)** Hickey, F. 2022. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023); **(C)** Hickey, F., and F. David. 2022. Won Smol Bag turtle monitoring. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023); **(D)** 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*. Honolulu, HI: Western Pacific Regional Fishery Management Council; **(E)** MacKay, K., and Damelip. 2022. Won Smol Bag turtle monitoring. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023); **(F)** Petro, G., F. R. Hickey, and K. MacKay. 2007. Leatherback turtles in Vanuatu. *Chelonian Conservation and Biology* 6 (1): 135–137.
Nesting Beaches: (1) Ambrym 2;[A] **(2)** Ambrym 3;[A] **(3)** Ambrym 4;[A] **(4)** Ambrym 5;[A] **(5)** Ambrym 6;[A] **(6)** Araki;[A] **(7)** Beaches on Malakula Island;[D,F] **(8)** Big Bay;[D] **(9)** Epi 1;[A] **(10)** Epi 2;[A] **(11)** Epi 3;[A] **(12)** Epi 4;[A] **(13)** Epi 5;[A] **(14)** Malekula 1;[A] **(15)** Malekula 2;[A] **(16)** Malekula 4;[A] **(17)** Malekula 6;[A] **(18)** Malekula 7;[A] **(19)** Malekula 8;[A] **(20)** Malekula 9;[A] **(21)** Maranata Ambrym Island;[E] **(22)** Mele Bay;[D] **(23)** Port Narvin Erromango Island;[B] **(24)** Santo 15;[A] **(25)** Santo 2;[A] **(26)** Santo 3;[A] **(27)** Santo 4;[A] **(28)** Santo 5;[A] **(29)** Southern Ambrym Island;[D] **(30)** Southern Pentecost Island;[D] **(31)** Thion 2;[A] **(32)** Votlo[C]
SWOT Contacts: Francis Hickey, Falla David, Kenneth MacKay, and Damelip

VENEZUELA, BOLIVARIAN REPUBLIC OF

DATA RECORD: 88

Data Sources: (A) Balladares, C. 2015. Data from the Oficina Nacional de Diversidad Biológica, Ministerio de Ecosocialismo y Agua, Caracas, Venezuela; **(B)** Barrios-Garrido, H., and M. G. Montiel-Villalobos. 2006. First record of nesting activities of the sea turtle in the Gulf of Venezuela. In M. Frick, A. Panagopoulou, A. F. Rees, and K. Williams (compilers). *Book of Abstracts: 26th Annual Symposium on Sea Turtle Biology and Conservation*, p. 288. Athens: International Sea Turtle Society; **(C)** Buitrago, J., and H. J. Guada. 2002. La tortuga carey (*Eretmochelys imbricata*) en Venezuela. Interciencia 27 (8): 392–399; **(D)** Cruz, A. G., H. Barrios-Garrido, N. Espinoza, N. Wildermann, L. Morán, H. Guada, P. Vernet, A. Arias-Ortíz, C. Valladares, and E. Fajardo. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XI (2016); **(E)** de los Llanos, V. 2002. *Evaluación de la Situación de las Poblaciones de Tortugas Marinas en el Parque Nacional Archipiélago Los Roques*. Bachelor's thesis, Universidad Central de Venezuela; **(F)** Spatial Database for the Wider Caribbean; **(G)** Espinoza R., P. Vernet, L. Moran, H. Barrios-Garrido, and N. Wildermann. 2013. Primer reporte de la actividad de anidación de tortugas marinas en la costa nor-occidental del Golfo de Venezuela. *Boletín del Centro Investigaciones Biologicas* 47 (1): 86–95; **(H)** Fajardo, E. 2015. Grupo Trabajo de Tortugas Marinas de Venezuela and CICTMAR (Centro de Investigación y Conservación de Tortugas Marinas). Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVI (2020); **(I)** Guada, H. J. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XI (2016); **(J)** Guada, H. J. 2000. *Áreas de Anidación e Impactos Hacia las Tortugas Marinas en la Península de Paria y Lineamientos de Protección*. MSc thesis, Universidad Simón Bolívar, Sartenejas; **(K)** Guada, H. J. (ed.). 2004. *Status of the Leatherback Turtle in Venezuela: National Analysis*. CICTMAR-WIDECAST; **(L)** Guada, H. J. and G. Solé. 2000. *WIDECAST Plan de Acción para la Recuperación de las Tortugas Marinas de Venezuela*. Informe Técnico del Plan Annual de Contratación No. 39, Caribbean Environment Programme, Kingston, Jamaica; **(M)** Hernández, R., J. Buitrago, and H. Guada. 2006. Leatherback nesting in Venezuela. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006); **(N)** Juan Manuel Rodríguez-Baron. 2015. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XI (2016); **(O)** Pritchard, P. C. H., and P. Trebbau. 1984. The Turtles of Venezuela. Society for the Study of Amphibians and Reptiles; **(P)** Provita. 2006. Leatherback nesting in Venezuela. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. I (2006); **(Q)** Quijada, A., and C. Balladares. 2004. Conservación de las tortugas marinas en el Golfo de Paria. In R. Babarro, A. Sanz, and B. Mora (eds.), *Tortugas Marinas en Venezuela: Acciones para Su Conservación*, pp. 47–54. Caracas: Oficina Nacional de Diversidad Biológica and Fondo Editorial Fundambiente; **(R)** Rondón, M. A., R. S. Hernández, and H. J. Guada. 2008. Research and conservation of sea turtles in the Paria Peninsula, Venezuela: Results of the 2003 nesting season. In R. B. Mast, B. J. Hutchinson, and A. H. Hutchinson (compilers), *Proceedings of the Twenty-Fourth Annual Symposium on Sea Turtle Biology and Conservation*, p. 104. NOAA Technical Memorandum NMFS-SEFSC-567, National Marine Fisheries Service, Miami, FL; **(S)** Vernet, P, and A. Arias-Ortíz. 2015. Grupo de Trabajo de Tortugas Marinas del Estado Nueva Esparta, Instituto Venezolano de Investigaciones Científicas, Zulia, Venezuela.
Nesting Beaches: (1) Archipiélago Los Roques (44 nesting islands and islets);[N] **(2)** Archipiélago Los Testigos (2 islands with 6 nesting beaches);[N] **(3)** Barloventeña;[P] **(4)** Boca Aricagua;[P] **(5)** Cangua;[F,L] **(6)** Castilletes (Bahía de Malímansipa) North;[G] **(7)** Cipara;[I] **(8)** El Agua, Isla de Margarita;[F] **(9)** El Banquito;[K,R] **(10)** El Guamo;[F] **(11)** southeastern end of Parque Nacional Península de Paria, Sucre;[F,J,Q] **(12)** Golfo Triste, Carabobo (7 nesting beaches);[D] **(13)** Grande Venezuela;[P] **(14)** Isla La Tortuga (4 islands with 13 nesting beaches);[F] **(15)** Isla Tobejuba Reserve de Biósfera Delta del Orinoco;[F] **(16)** La Blanquilla;[F,L] **(17)** La Orchila;[F] **(18)** La Sabana and various beaches in Vargas;[F] **(19)** Los Pilones;[P] **(20)** Los Testigos Archipelago;[F,L] **(21)** Macurito;[A] **(22)** Maspana;[P] **(23)** other beaches at the extreme southeast of the Península de Paria[F,J,Q] **(24)** Pargo Parque Nacional Península de Paria;[F,L] **(25)** Parguito;[M] **(26)** Parque Nacional Archipiélago Los Roques;[C,E,F] **(27)** Parque Nacional Delta del Orinoco;[F,O] **(28)** Parque Nacional Laguna de Tacarigua;[F] **(29)** Parque Nacional Mochima;[D] **(30)** Península de Paraguana, Falcón;[F] **(31)** Puy Puy;[H] **(32)** Querepare;[D] **(33)** Quisiro;[B,F,L] **(34)** San Bernardo Sand Spit/San Carlos Peninsula;[B,F,L] **(35)** San Juan de las Galdonas;[F] **(36)** Sector Nororiental de Isla Margarita (El Cardón, Parguito, El Agua, El Humo, Puerto Real beaches);[S] **(37)** Uquire Parque Nacional Península de Paria;[F,L] **(38)** El Banquito and various other beaches in Miranda[F,P]
SWOT Contacts: Alfredo Arteaga, Héctor Barrios-Garrido, Hedelvy Guada, Alejandro Gallardo, Clemente Balladares, Diego Giraldo, Juan Carlos Figuera, Juan Manuel Rodríguez-Baron, Kelvin García Sanabria, Joaquín Buitrago, Ricardo Hernández, and Vincent Vera

VIETNAM

DATA RECORD: 89

Data Source: Hamann, M., C. T. Cuong, N. Duy Hong, P. Thuoc, and B. T. Thuhien. 2006. Distribution and abundance of marine turtles in the Socialist Republic of Viet Nam. *Biodiversity and Conservation* 15: 3703–3720.
Nesting Beaches: Quang Ngai and Binh Dinh Provinces
SWOT Contact: Mark Hamann

VIRGIN ISLANDS, BRITISH

DATA RECORD: 90

Data Sources: (A) Spatial Database for the Wider Caribbean; **(B)** Eckert, K. L., J. A. Overing, and B. B. Lettsome. 1992. *Sea Turtle Recovery Action Plan for the British Virgin Islands*. CEP Technical Report No. 15, Caribbean Environment Programme, Kingston, Jamaica; **(C)** Gore, S., M. Hastings, A. Pickering, and G. Frett. 2007. Leatherback nesting in the British Virgin Islands. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. II (2007).
Nesting Beaches: (1) Bercher's Bay–Virgin Gorda;[A,B] **(2)** Capoon's Bay–Tortola;[A,B] **(3)** Deep Bay–Virgin Gorda;[A,B] **(4)** Josiah's Bay;[C] **(5)** Lambert;[C] **(6)** Little Lambert;[C] **(7)** Long Bay;[C] **(8)** Long Bay–Belmont;[C] **(9)** North Shore;[C] **(10)** Rogues Bay–Tortola;[A] **(11)** Sandy Cay Beach–Sandy Cay;[A,B] **(12)** Trunk Bay–Tortola;[C] **(13)** West End–Anegada[A,B]
SWOT Contacts: Arlington Pickering, Bertrand Lettsome, Gaverson Frett, Joel Dore, Mervin Hastings, and Shannon Gore

VIRGIN ISLANDS, UNITED STATES

DATA RECORD: 91

Data Sources: (A) Buck Island Sea Turtle Research Program, National Park Service. 2016. Leatherback nesting at Buck Island Reef National Monument, St. Croix, US Virgin Islands. SWOT Database Online 2017; **(B)** Spatial Database for the Wider Caribbean; **(C)** National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2020. *Endangered Species Act Status Review of the Leatherback Turtle* (Dermochelys coriacea). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service.
Nesting Beaches: (1) Buck Island Reef National Monument;[A] **(2)** Good Hope;[B] **(3)** Halfpenny;[B] **(4)** Manchenil;[B] **(5)** Pelican Cove;[B] **(6)** Prune Bay;[B] **(7)** Sandy Point National Wildlife Refuge;[C] **(8)** Second Target;[B] **(9)** Southgate Pond;[B] **(10)** Sprat Hall;[B] **(11)** Stony Ground[B]
SWOT Contacts: Clayton Pollock and Steve Garner

Leatherback Telemetry Data Citations

The following data records refer to satellite telemetry datasets from tags that were deployed on leatherback turtles worldwide and were combined to create the maps on pp. 27–29. The data are organized by country of deployment. For information regarding data processing and filtering, see the note on the map on p. 27. These data were generously contributed to SWOT by the people and partners listed subsequently. Records that have a SWOT ID can be viewed in detail in the SWOT online database and mapping application at http://seamap.env.duke.edu/swot, which contains additional information about the projects and their methodologies.

To save space, we have used the following abbreviations in the data source fields: (1) "STAT" refers to Coyne, M. S., and B. J. Godley. 2005. Satellite Tracking and Analysis Tool (STAT): An integrated system for archiving, analyzing, and mapping animal tracking data. *Marine Ecology Progress Series* 301: 1–7. (2) "SWOT Online Database" refers to Kot, C. Y., E. Fujioka, A. DiMatteo, A. Bandimere, B. Wallace, B. Hutchinson, J. Cleary, P. Halpin, and R. Mast. 2022. The State of the World's Sea Turtles Online Database. Data provided by the SWOT Team and hosted on OBIS-SEAMAP. Oceanic Society, IUCN Marine Turtle Specialist Group, and Marine Geospatial Ecology Lab, Duke University. https://seamap.env.duke.edu/swot. (3) "OBIS-SEAMAP" refers to Halpin, P. N., A. J. Read, E. Fujioka, B. D. Best, B. Donnelly, L. J. Hazen, C. Kot, K. Urian, E. LaBrecque, A. DiMatteo, J. Cleary, C. Good, L. B. Crowder, and K. D. Hyrenbach. 2009. OBIS-SEAMAP: The world data center for marine mammal, sea bird, and sea turtle distributions. *Oceanography* 22 (2): 104–115. When listed, these sources indicate that the dataset was contributed online through STAT, SWOT, or OBIS-SEAMAP.

BRAZIL

DATA RECORD 1 | SWOT ID: 984

Project Title: Study of the Biology of Sea Turtles in Brazil through Satellite Telemetry
Metadata: 4 inter- and postnesting female *Dermochelys coriacea*
Data Sources: (A) Lopez, G. 2022. Study of the biology of sea turtles in Brazil through satellite telemetry. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/984) and originated from STAT (http://www.seaturtle.org/tracking/index.shtml?project_id=63). **(B)** STAT. **(C)** OBIS-SEAMAP.
SWOT Contact: Fundação Projeto Tamar

DATA RECORD 2

Project Title: Leatherback Satellite-Tracked from a Nesting Beach in the Parnaíba Delta Region
Metadata: 1 postnesting female *Dermochelys coriacea*
Data Source: W. M. de S. Magalhães et al. 2021. Regular nesting by leatherback sea turtles (*Dermochelys coriacea*) in the Parnaíba Delta area, Northeastern Brazil. *Marine Turtle Newsletter* 164: 6–11.
SWOT Contacts: Werlanne Magalhães and Paulo Barata

COSTA RICA

DATA RECORD 3

Project Title: Leatherbacks Tracked from Playa Grande, Costa Rica, in 2007
Metadata: 11 postnesting female *Dermochelys coriacea*
Data Sources: (A) Shillinger, G. L. 2009. *Satellite Tracking Reveals Movement, Behavior, and Distribution of Endangered Leatherback Turtles in the Eastern Tropical and Southeastern Pacific: Implications for Conservation.* PhD Thesis, Stanford University. **(B)** Shillinger, G. L., D. M. Palacios, H. Bailey, S. J. Bograd, A. M. Swithenbank, P. Gaspar, B. P. Wallace, J. R. Spotila, F. V. Paladino, R. Piedra, S. A. Eckert, and B. A. Block. 2008. Persistent leatherback turtle migrations present opportunities for conservation. *PLOSBiol* 6 (7): e171. doi:10.1371/journal.pbio.0060171. **(C)** Shillinger, G. L., A. M. Swithenbank, S. J. Bograd, H. Bailey, M. R. Castleton, B. P. Wallace, J. R. Spotila, F. V. Paladino, R. Piedra, and B. A. Block. 2010. Identification of high-use internesting habitats for eastern Pacific leatherback turtles: Role of the environment and implications for conservation. *Endangered Species Research* 10: 215–232. doi: 10.3354/esr00251. **(D)** Shillinger, G. L., A. M. Swithenbank, H. Bailey, S. J. Bograd, M. R. Castleton, B. P. Wallace, J. R. Spotila, F. V. Paladino, R. Piedra, and B. A. Block. 2011. Vertical and horizontal habitat preferences of post-nesting leatherback turtles in the South Pacific Ocean. *Marine Ecology Progress Series*. 422: 275–289. doi:10.3354/meps08884.
SWOT Contact: George Shillinger

DATA RECORD 4

Project Title: Leatherbacks Tracked from Pacuare, Costa Rica, in 2019
Metadata: 6 postnesting female *Dermochelys coriacea*
Data Source: Shillinger, G. L., S. R. Benson, A. Hoover, A. DiMatteo, and C. Quesada. 2019. Unpublished data.
SWOT Contact: George Shillinger

DATA RECORD 5

Project Title: Costa Rica Leatherback Tracking between 2004 and 2015
Metadata: 1 adult female *Dermochelys coriacea*
Data Source: Evans, D. 2020. Sea Turtle Conservancy leatherback tracking in Costa Rica. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XV (2020).
SWOT Contact: Daniel Evans

DOMINICA

DATA RECORD 6 | SWOT ID: 890

Project Title: Sea Turtles of Dominica
Metadata: 7 adult *Dermochelys coriacea*
Data Sources: (A) Levenson, J. 2022. Sea turtles of Dominica. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/890) and originated from STAT (http://www.seaturtle.org/tracking/index.shtml?project_id=773). **(B)** STAT. **(C)** OBIS-SEAMAP.
SWOT Contact: Jacob Levenson

DATA RECORD 7 | SWOT ID: 1174

Project Title: Georgia Aquarium/DomSeTCO Leatherbacks of Dominica
Metadata: 2 adult *Dermochelys coriacea*
Data Sources: (A) Levenson, J. 2022. Georgia Aquarium/DomSeTCO leatherbacks of Dominica. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1174) and originated from STAT (http://www.seaturtle.org/tracking/index.shtml?project_id=996). **(B)** STAT. **(C)** OBIS-SEAMAP.
SWOT Contact: Jacob Levenson

FRENCH GUIANA

DATA RECORD 8

Project Title: French Guiana Marine Turtle Tracking
Metadata: 19 adult *Dermochelys coriacea*
Data Source: Chevallier, D. 2020. Satellite tracking of marine turtles in French Guiana. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XV (2020).
SWOT Contact: Damien Chevallier

GABON

DATA RECORD 9 | SWOT ID: 1450

Project Title: Gabon 2005–07: Mayumba, Leatherback Turtles
Metadata: 8 adult female *Dermochelys coriacea*
Data Sources: (A) Godley, B. 2021. Gabon 2005–07: Mayumba, leatherback turtles. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1450) and originated from STAT (http://www.seaturtle.org/tracking/index.shtml?project_id=104). **(B)** STAT. **(C)** OBIS-SEAMAP.
SWOT Contacts: Brendan J. Godley and Marine Turtle Research Group

DATA RECORD 10 | SWOT ID: 1452

Project Title: Gabon 2007–08: Mayumba, Leatherback Turtles
Metadata: 7 adult *Dermochelys coriacea*
Data Sources: (A) Witt, M. 2021. Gabon 2007–08: Mayumba, leatherback turtles. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1452) and originated from STAT (http://www.seaturtle.org/tracking/index.shtml?project_id=270). **(B)** STAT. **(C)** OBIS-SEAMAP.
SWOT Contact: Matthew Witt

DATA RECORD 11 | SWOT ID: 1454

Project Title: Gabon 2008–09: Mayumba and Pongara, Leatherback Turtles
Metadata: 10 adult *Dermochelys coriacea*
Data Sources: (A) Witt, M. 2021. Gabon 2008–09: Mayumba and Pongara, leatherback turtles. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1454) and originated from STAT (http://www.seaturtle.org/tracking/index.shtml?project_id=340). **(B)** STAT. **(C)** OBIS-SEAMAP.
SWOT Contact: Matthew Witt

DATA RECORD 12 | SWOT ID: 1456

Project Title: Gabon 2009–10: Pongara, Leatherback Turtles
Metadata: 2 adult *Dermochelys coriacea*
Data Sources: (A) Witt, M. 2021. Gabon 2009–10: Pongara, leatherback turtles. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1456) and originated from STAT (http://www.seaturtle.org/tracking/index.shtml?project_id=466). **(B)** STAT. **(C)** OBIS-SEAMAP.
SWOT Contact: Matthew Witt

DATA RECORD 13 | SWOT ID: 1836

Project Title: Gabon 2012: Pongara, Leatherback Turtles
Metadata: 10 adult *Dermochelys coriacea*
Data Sources: (A) Witt, M. 2021. Gabon 2012: Pongara, leatherback turtles. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1836) and originated from STAT (http://www.seaturtle.org/tracking/index.shtml?project_id=776). **(B)** STAT. **(C)** OBIS-SEAMAP.
SWOT Contact: Matthew Witt

INDIA

DATA RECORD 14

Project Title: Tracking Leatherback Turtles from Little Andaman Island
Metadata: 10 *Dermochelys coriacea*
Data Sources: (A) Swaminathan, A., N. Namboothri, and K. Shanker. 2019. Tracking leatherback turtles from Little Andaman Island. *Indian Ocean Turtle Newsletter* 29: 8–10. **(B)** Namboothri, N., A. Swaminathan, B. C. Choudhury, and K. Shanker. 2012. Post-nesting migratory routes of leatherback turtles from Little Andaman Island. *Indian Ocean Turtle Newsletter* 16: 21–23.
SWOT Contacts: Adhith Swaminathan, Naveen Namboothri, and Kartik Shanker

INDONESIA

DATA RECORD 15

Project Title: Leatherbacks Tagged in Selaut Besar, West Sumatra
Metadata: 2 adult *Dermochelys coriacea*
Data Source: Reischig, T., R. Patricio, and BPSPL Padang. 2022. Leatherbacks Tagged. 2022. Leatherbacks Tagged in Selaut Besar, West Sumatra. Personal Communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023).
SWOT Contacts: Thomas Reischig and Rita Patricio

MARTINIQUE

DATA RECORD 16

Project Title: Martinique Marine Turtle Tracking
Metadata: 2 adult *Dermochelys coriacea*
Data Source: Chevallier, D. 2020. Satellite tracking of marine turtles in Martinique. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XV (2020).
SWOT Contact: Damien Chevallier

MEXICO

DATA RECORD 17 | SWOT ID: 1176

Project Title: Tortugas Marinas del Golfo de California
Metadata: 1 adult *Dermochelys coriacea*
Data Sources: (A) Zavala, A. 2022. Tortugas Marinas del Golfo de California. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/1176) and originated from STAT (http://www.seaturtle.org/tracking/index.shtml?project_id=998). **(B)** STAT. **(C)** OBIS-SEAMAP.
SWOT Contact: Alan Zavala

PANAMA

DATA RECORD 18

Project Title: Panama Leatherback Tracking
Metadata: 7 adult female *Dermochelys coriacea*
Data Source: Evans, D. 2020. Sea Turtle Conservancy tracking of leatherbacks in Panama. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XV (2020).
SWOT Contact: Daniel Evans

PUERTO RICO

DATA RECORD 19

Project Title: Puerto Rico Leatherback Tracking
Metadata: 1 adult female *Dermochelys coriacea*
Data Source: Evans, D. 2020. Leatherback satellite tracking in Puerto Rico. Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XV (2020).
SWOT Contact: Daniel Evans

SOUTH AFRICA

DATA RECORD 20 | SWOT ID: 1809

Project Title: Revealing Migratory Behaviour of South African Leatherback Turtles
Metadata: 16 postnesting female *Dermochelys coriacea*
Data Sources: (A) Robinson, N. J., S. J. Morreale, R. Nel, and F. V. Paladino. 2016. Coastal leatherback turtles reveal conservation hotspot. *Scientific Reports* 6: 37851. **(B)** OBIS-SEAMAP.
SWOT Contact: Nathan J. Robinson

DATA RECORD 21 | SWOT ID: 439

Project Title: Leatherback Tracking in South Africa
Metadata: 3 postnesting female *Dermochelys coriacea*
Data Sources: (A) Luschi, P., J. R. E. Lutjeharms, P. Lambardi, R. Mencacci, G. R. Hughes, and C. G. Hays. 2006. A review of migratory behaviour of sea turtles off southeastern Africa. *South African Journal of Science* 102: 51–58. **(B)** Luschi, P., A. Sale, R. Mencacci, G. R. Hughes, J. R. E. Lutjeharms, and F. Papi. 2003. Current transport of leatherback sea turtles (*Dermochelys coriacea*) in the ocean. *Proceedings of the Royal Society B: Biological Sciences*. 270 (suppl. 2): 129–132. **(C)** Lambardi, P., J. R. E. Lutjeharms, R. Mencacci, C.G. Hays, and P. Luschi. 2008. Influence of ocean currents on long-distance movement of leatherback sea turtles in the Southwest Indian Ocean. *Marine Ecology Progress Series* 353: 289–301. **(D)** Luschi, P. 2012. Leatherback Tracking in South Africa. Data downloaded from OBIS-SEAMAP (http://seamap.env.duke.edu/dataset/439). **(E)** OBIS-SEAMAP.
SWOT Contact: Paolo Luschi

URUGUAY

DATA RECORD 22

Project Title: Insights on Leatherback Turtle Movements and High Use Areas in the Southwest Atlantic Ocean
Metadata: 2 female, 1 male, and 1 sex-unknown *Dermochelys coriacea*
Data Source: López-Mendilaharsu, M., C. F. D. Rocha, P. Miller, A. Domingo, and L. Prosdocimi. 2009. Insights on leatherback turtle movements and high use areas in the Southwest Atlantic Ocean. *Journal of Experimental Marine Biology and Ecology* 378: 31–39.
SWOT Contact: Milagros López-Mendilaharsu, Alejandro Fallabrino, and Laura Prosdocimi

U.S.A.

DATA RECORD 23

Project Title: Postnesting Leatherbacks from Juno Beach, Florida
Metadata: 3 postnesting female *Dermochelys coriacea*
Data Source: Aoki, D. M., J. R. Perrault, A. Page-Karjian, and G. L. Shillinger. 2022. Satellite telemetry enables analysis of postnesting movement patterns for northwest Atlantic Ocean leatherback sea turtles (*Dermochelys coriacea*). Personal communication. In *SWOT Report—State of the World's Sea Turtles*, vol. XVIII (2023).
SWOT Contact: Derek Aoki

DATA RECORD 24

Project Title: Leatherbacks Tracked in the Northwest Atlantic
Metadata: 20 adult *Dermochelys coriacea*
Data Source: Dodge, K. L., B. Galuardi, T. J. Miller, and M. E. Lutcavage. 2014. Leatherback turtle movements, dive behavior, and habitat characteristics in ecoregions of the Northwest Atlantic Ocean. *PLOS ONE* 9 (3): e91726. https://doi.org/10.1371/journal.pone.0091726.
SWOT Contact: Kara Dodge

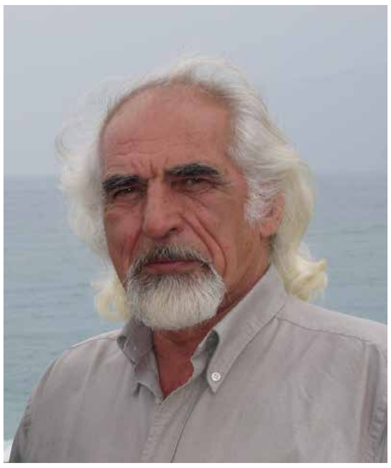
MULTINATIONAL

DATA RECORD 25

Project Title: Large-Scale Movements and High-Use Areas of Western Pacific Leatherback Turtles, *Dermochelys coriacea*
Metadata: 126 adult and subadult *Dermochelys coriacea*
Data Source: Benson, S. R., T. Eguchi, D. G. Foley, K. A. Forney, H. Bailey, C. Hitipeuw, B. P. Samber, R. F. Tapilatu, V. Rei, P. Ramohia, J. Pita, and P. H. Dutton. 2011. Large-scale movements and high-use areas of western Pacific leatherback turtles, *Dermochelys coriacea*. *Ecosphere* 2 (7): article 84. doi:10.1890/ES11-00053.1.
SWOT Contact: Scott Benson, NOAA Southwest Fisheries Science Center

In Memoriam

Since the publication of *SWOT Report*, vol. XVII, in June 2022, the sea turtle community has lost many beloved members of our community, including those memorialized in these pages, and certainly many more whose roles may have gone unnoticed or whose work may be forgotten, but whose legacies remain. Thanks to all the sea turtle researchers, conservationists, and enthusiasts who are no longer with us and to all those who have dedicated their lives to helping ensure that future generations can experience and enjoy sea turtles in healthy oceans.



Andreas Demetropoulos (1938–2022)

Head of the Cyprus Wildlife Society, Andreas led a lifetime of important sea turtle research and conservation work. For more than three decades, he headed the Cyprus Fisheries Department, where he was dedicated to sustainable development, fisheries, and aquaculture. He was responsible for a law enacted in 1971 to protect sea turtles. Then, he went on to launch a conservation program for loggerhead and green turtles in an area that was later named a turtle reserve in 1989, the Lara-Toxeftra Turtle Reserve. In his illustrious career, Andreas served as a member of the Marine Turtle Specialist Group and as a wildlife protection consultant to numerous agencies, and he was listed in the Global 500 Roll of Honour in 1988. Described as “a truly outstanding scientist and man,” Andreas leaves behind a powerful legacy for future generations. He was a mentor, friend, and inspiration to many, and his wisdom, humor, realism, and determined spirit helped him to surpass obstacles to ensure a brighter future for sea turtles in the Mediterranean.

Michael Donoghue (1949–2022)

A tireless champion for marine species, Mike worked first as a fisherman, then for the government of New Zealand, where he focused on marine mammal policy. Later, at the Pacific Regional Environment Programme, he worked for the benefit of all migratory species, including sea turtles. He led Conservation International in Samoa and was active for decades with the International Whaling Commission. Mike’s knowledge of the Pacific, along with his political savvy, charm, and powers of persuasion, brought people together for the good of wildlife. His accomplishments are many and include helping stop live dolphin exports, the 1978 banning of whale hunting by the king of Tonga, and much more. Mike was deeply respected, widely liked, and always fun; his warmth, smile, and easy laugh came with an often deliciously wicked sense of humor. His kindness knew no bounds, and many conservationists owe their success to his advice and sheer generosity of spirit. The blue Pacific has lost a great advocate, scientist, and friend.

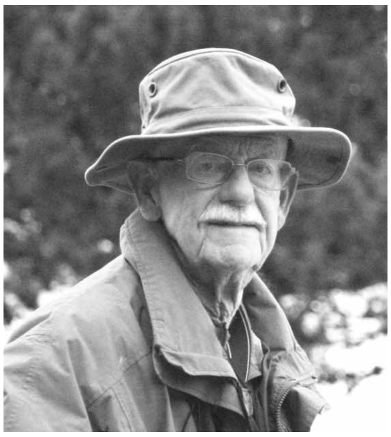
Marcel Collet Gorges (1957–2022)

Born in the Democratic Republic of the Congo (DRC), Marcel spent his entire life passionately committed to wildlife and nature conservation from Kisangani to Moanda, the Garamba National Park, and Kinshasa and, at the time of his death, as director of the Parc Marin des Mangroves. He loved and studied snakes, and ultimately he became a globally recognized expert. Marcel had an extraordinary talent for communicating with people, from children to tourists, academics, and policymakers, and for sharing his vision and convictions for the future of biodiversity. He stood firmly in defense of the environment and the importance of protected areas. His commitment to preventing poaching and other activities that violate the integrity of Congolese nature and national parks was total, even when this stance was unpopular. He launched and led an exceptional effort for sea turtle nest protection on the DRC coast that ultimately saved countless turtles from falling into the hands of poachers. His life in the service of the Congo and our common future was admirable.

A green turtle takes a breath at the surface during sunset in Maui, Hawaii. © Renee Capozzola

Bill Puleloa (1943–2022)

Bill was an aquatic biologist and an advocate for Native Hawaiian rights and traditional practices, having learned about his heritage from his maternal grandmother. He mentored dozens of young scientists, and he won the Mālama Kuleana Honua Award in 2012 for his lifetime of service and dedication to nature. Bill and his wife of 51 years, Linda, moved to the Marshall Islands in the 1970s, where their three children were born. While serving as director of fisheries there, he traveled throughout Asia and Oceania. Japan was a favorite, and he had many fond memories of visits to remote atolls in Micronesia, riding elephants in Cambodia, visiting rice paddies in Vietnam, and seeing relatives in Macao. Bill possessed true *pono* spirit and a heartfelt love of his people. "All humans are part of a shared resource," Puleloa said. "Our actions here on Hawaii—on Molokai even—do have an effect in other parts of the world. … The more we respect our resources, the more special they become."



Jim Stevenson (1933–2022)

A devoted lover of nature, Jim was a lifelong birder and photographer and he had a deep and abiding commitment to saving sea turtles. For three decades, he was part of the University of Central Florida's team monitoring the beaches of the Archie Carr National Wildlife Refuge, one of the greatest sea turtle conservation success stories in history. Attendees of the International Sea Turtle Symposia (ISTS) since the beginning, Jim and his friend of 42 years, Janet Hochella—the "J&J Turtle Team"—together won the ISTS Ed Drane Award for Volunteerism for their service aiding turtle projects from Topsail, North Carolina, south to Melbourne, Florida. In his youth, Jim was an avid hunter and fisher, and he served with the U.S. Navy, circumnavigating the globe on the *USS Heermann* from 1953 to 1957. He will be remembered for his boundless energy, enthusiasm, and inquisitiveness; for his love of sea turtles and commitment to nature conservation; and for his easy-going smile and steady hand at the tiller.

Ricardo F. Tapilatu (1966–2022)

A talented marine scientist, Ricky dedicated much of his life to sea turtles. He was a PhD graduate of the University of Alabama, a Pew Scholar, and a Marine Turtle Specialist Group vice chair. As a professor at the University of Papua Indonesia, he spent decades engaged in efforts to protect the western Pacific leatherback, helping to document the long-term decline of this species and monitor its main nesting beaches. Ricky and his team studied incubation temperatures, hatching success, and sex ratios, and they modeled climate change impacts. He also built a local outreach and education program to engage community members in the work. A friend said of Ricky, "He had a childlike passion for protecting Papua's wonderful nature and a deep sense of adventure; he embraced 'carpe diem' with openness to new experiences and opinions and had the authority of a true leader. His crews at the leatherback beaches in Jamursba Medi and Wermon, true conservation heroes in their own right, all agree that sea turtles lost a major conservation warrior."

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SWOT report
The State of the World's Sea Turtles

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