# 

Volume III

The State of the World's Sea Turtles



THE TURTLE MOTHER AND OTHER INDIGENOUS TALES THE HAZARDS OF PLASTIC | A LEATHERBACK'S LONGEST VOYAGE | AND MORE...



Hawksbills are often seen by divers and snorkelers because of their tendency to swim near coral reefs. © BRIAN SKERRY / NATIONAL GEOGRAPHIC IMAGE COLLECTION

"SWOT Report is not just a magazine but the public face of a global movement."



# Foreword

what do I know about sea turtles? Scientifically speaking, not a lot. I know I've seen them when snorkeling in Hawaii. I know they're much more graceful in the water than I am. I know they are really old and really cool. And I know they deserve a chance.

More importantly, I also know a lot about how to captivate audiences—like *SWOT Report* is doing. And I know that photography, when it is made honestly and used intelligently, has the power to elevate any subject off of the flat plane of written observation and into the hearts and minds of readers. It is fitting that I started my career as a photographer and designer in Missouri, the United States' "show-me" state, since that basic credo has inspired my own mission to help various publications

"Photography, when it is made honestly and used intelligently, has the power to elevate any subject off of the flat plane of written observation and into the hearts and minds of readers."

present the world in an engaging blend of words, photographs, and graphics. Don't just tell it; show it.

SWOT Report was brought to my attention recently by one of SWOT's founders, Rod Mast, and by Cristina Mittermeier, the creator of the International League of Conservation Photographers (ILCP), a group of professional photogra-

phers whose images are featured throughout this magazine. This *SWOT Report* begins with a photo essay of some of the greatest sea turtle imagery that exists today. A great photograph is one that straddles a line between journalism and art, uniquely weighted one way or another but never entirely devoid of either. The new partnership between SWOT and the ILCP taps into some of these great images, created by the world's best natural history photographers. *SWOT Report* uses honest photos of sea turtles to tell the story of marine conservation to an audience who can make a difference for the future of the ocean.

I get what this publication is doing. It's not just a magazine but the public face of a global movement. This magazine, much like the one for which I work, delivers its messages to the public through carefully crafted words and thoughtful imagery. The messages herein are optimistic and exemplary. The focus is neither doom nor gloom, despite that sea turtles and their ocean homes face numerous threats. Rather, *SWOT Report* provides proof positive that there are ways to prevent the extinction of these graceful reptiles that have been with us for many millennia, setting a tone of hope and success that is vital to the conservation movement as a whole.

David Griffin

Director of Photography / Senior Editor

National Geographic magazine

Duil Ceiffer



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FRONT COVER: Look very closely at the turtle on the cover of this year's magazine, and you may notice something odd. This hawksbill is missing one of her back flippers. Dive staff members at White Sands Island Resort in the Maldives believe she is the same turtle they rescued near South Ari Atoll, where this photograph was later taken. When they rescued the turtle, she was ensnared in a plastic bag with her back flipper tightly entangled in the plastic. Although they were not able to save her flipper when they cut her free, she is still commonly seen near this dive site and appears to be living a normal, healthy life. © STEVE JONES / WWW.MILLIONFISH.COM; THIS PAGE: A tribesman in Myanmar's Mergui Archipelago in the Andaman Sea holds a green turtle. © NICOLAS REYNARD / NATIONAL GEOGRAPHIC IMAGE COLLECTION; AT RIGHT: The average size of an adult hawksbill is approximately 2.5 feet in length and 95 to 165 pounds, although some may reach up to three feet in length and weigh up to 300 pounds. Hawksbills are found throughout tropical and subtropical regions of the Atlantic, Pacific, and Indian Oceans. © CAROLINE ROGERS

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The State of the World's Sea Turtles

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Back cover The State of the World's Sea Turtles at a Glance



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! See page 30 for a hint.

# Sea Turtles through the Lens

ny person who has encountered a sea turtle in the wild or at a rescue center can tell you just how moving such an encounter can be. These captivating creatures have survived millions of years on Earth but are now widely threatened, struggling for survival against human-induced threats. Their story has evoked many powerful narrative and visual works of art in recent years.

The following images represent that body of craftsmanship, capturing—through the camera lens and through personal accounts of the photographic experience—the unique character of each of the seven species of sea turtle.



© MICHELE BENOY-WESTMORLAND

# A Green turtle (Chelonia mydas)

"Just weeks before my book Ocean Duets went to press in 2006, I was finally able to photograph my turtle pair during an assignment in Tahiti. There, the Le Méridien Bora Bora Resort encompasses a large open lagoon where the hotel staff cares for immature turtles before releasing them into the wild. When these two young turtles swam into my camera frame, it made for a very happy ending to my turtle quest." —Michele Benoy-Westmorland

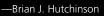


## A Kemp's ridley (Lepidochelys kempii)

"Each year, to help the Kemp's ridley turtle population that nests along the Gulf of Mexico, the U.S. National Park Service incubates the turtles' eggs laid on Padre Island National Seashore in Texas and later releases the hatchlings into the Gulf. In July 2005, I was at the Texas seashore photographing for a National Geographic story about the coastline of the United States (July 2006) and stayed longer just to photograph this wonderful event." —Tyrone Turner

# > Leatherback (Dermochelys coriacea)

"In most places on Earth, it is rare to see a leatherback nest in broad daylight. On Grande Rivière beach on Trinidad's north coast, however, there are so many nesting turtles that they can be seen nearly every morning during the nesting season. To be face to face with a 1,500-pound turtle is a moving and truly primordial experience. This photograph, taken one morning in May 2007, hopes to capture that feeling and show a perspective that few people ever see."





# Flatback(Natator depressus)

"Numerous birds of prey such as white-bellied sea eagles and brahminy kites soar above the nesting beach at Bare Sand Island in the Northern Territory of Australia in search of hatchling turtles. This little flatback hatchling was lucky to escape the predators on its journey down the beach as we chanced upon it during our turtle research in August 2004."

—Andrea Whiting



© ANDREA WHITING



# **≺ Loggerhead**(Caretta caretta)

"Sea turtles are most often seen by humans not in the turtles' natural habitats, but in rescue facilities, such as this Projeto TAMAR visitor center in Praia de Forte in Bahia, Brazil. Turtles are brought here after being rescued from fishing gear injuries, ingestion of debris, or other threats. At the TAMAR visitor centers, however, only turtles raised in captivity are exposed to the public for environmental education purposes. This photograph, taken with the lens half submerged, portrays one of the most important aspects of such facilities: the opportunity for visitors to make an emotional connection to sea turtles as they learn about conservation."

—Enrico Marcovaldi

© ENRICO MARCOVALDI / PROJETO TAMAR IMAGE BANK



### © STEVE WINTER / NATIONAL GEOGRAPHIC IMAGE COLLECTION

# < Olive ridley (Lepidochelys olivacea)

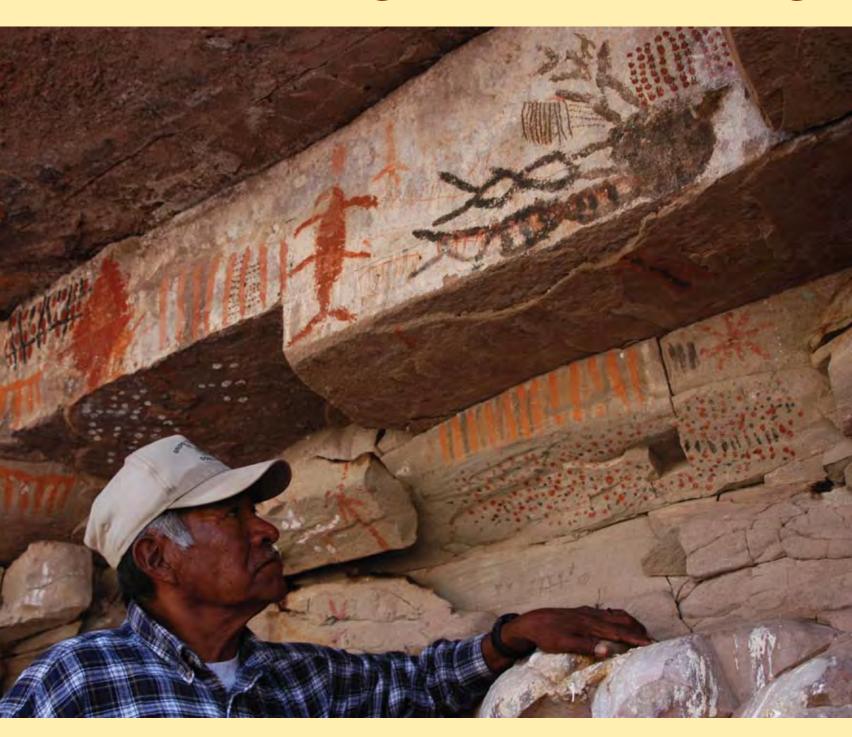
"In September 1995, while on assignment for National Geographic to document the incredible synchronized mass nesting of olive ridley turtles at Costa Rica's Ostional Wildlife Refuge, I witnessed tens—perhaps hundreds—of thousands of turtles sweeping onto the shore to bury their eggs in the sand. This event, known as an arribada, which is Spanish for "arrival," occurs each month on only nine beaches around the world and exclusively with olive ridleys." —Steve Winter

# **Y Hawksbill** (Eretmochelys imbricate)

"Swimming along a wall in waters near Indonesia's Komodo National Park, I saw these two hawksbill turtles move toward each other, then take positions on the reef wall. They touched noses, inspected each other, and then left, swimming in opposite directions." —Norbert Wu



# The Departure of the TURTLE MOTHER



Along Nicaragua's Miskito Coast lives the legend of the "Turtle Mother," a magic rock that once was situated on the shores of Turtle Bogue—the lone volcanic mountain in Costa Rica called *Cerro Tortuguero* that is one of the Caribbean's most important green turtle nesting beaches today. According to this story, at the start of each nesting season, the rock—which was shaped like a turtle and faced the sea—turned to point toward land. When it turned, the villagers knew that the turtles were coming ashore and that they could begin to harvest the turtles' meat and eggs. When the season's last hatchlings had emerged from their nests and scampered down to the sea, the turtle rock would turn back around to face the sea.

It was commonly stated that long before Turtle Mother was discovered in Tortuguero, the magic, turning rock existed in Great Sandy Bay in the Miskito Keys. But when people ate too many turtles and harassed the rock—trying to forcibly turn her ashore or move her from her perch—the Turtle Mother vanished, taking her turtles with her. Simultaneously, the sandy beach washed away, leaving only rocks. The old timers claimed there were a number of Turtle Mother rocks around the Miskito Keys, associated with headlands and areas of high relief, each guiding in separate populations of turtles.

Most of the old turtle hunters from the Cayman Islands, Tortuguero, and the Miskito Keys claimed they last saw the rock in the late 1940s, sitting on the beach near the mountain. As exploitation of the turtles escalated, the rock moved onto the mountain. At the height of the calipee (sea turtle cartilage) trade, when the green turtles were butchered and left to rot on the beach, the Turtle Mother rock vanished completely into a cave on Cerro Tortuguero. After villagers tried to find her inside the cave, a landslide buried the entrance.

The Turtle Mother legend has remained amazingly consistent since I first heard it in 1973. In a war-torn community where rumors run rampant, consistency of any tale is unusual. Nevertheless, the size, shape, and type of rock in this legend have remained generally the same.

A new twist, however, was added to the lore in 1988 when I again visited the Miskito Coast. Fishermen in the area stated that they had heard that "the rock was broken." Some said that when the rock was last seen, a foot or flipper had disjoined; others said that it had a crack in it. They believed that scientists, writers, and tourists had caused it to break by studying it. Allegorically, I believed the breaking of the rock symbolized the deterioration of the Miskito culture itself—cracked from war, dislocation, malnutrition, and misery.

For years, the Turtle Mother legend seemed to be an isolated mythological oddity, restricted to the Miskito Coast of Central America. Then, in 1991, Dr. Jeanne Mortimer advised me of a similar legend in Malaysia. There, a large rock that sat on a hill, calling leatherbacks to the beach, was deteriorating, causing turtle populations to decline.

A visit to Rantu Abang in the state of Terengganu on Malaysia's east coast confirmed that there was indeed a large rock. The 3-meter slab of limestone lay shattered atop a hill overlooking the ocean. Unlike the ethereal Turtle Mother of the Miskito Coast, this rock could be seen and touched. It did look like a turtle-with a broken head and limbs.

My guides informed me that this rock was called the "Turtle Father." Another rock, submerged in the nearby Rantu Abang River, was known as the "Mother of the Turtles." When the turtles came to nest each year, they would swim by to visit that rock. Extensive siltation and runoff from rainforest deforestation have buried the rock, however, and changed the mouth of the river, so the migrating turtles can no longer come.

The Seri tribe of Sonora, Mexico, is one indigenous culture that maintains its strong traditional, cultural ties to sea turtles. A four-day ceremony celebrating the ancient leatherback turtle is one of the Seris' most sacred traditions. Since 1981, the Seris had been unable to perform this ceremony in their home community, due to declines in the leatherback population. Mayra Olivia Estrella Astorga (at right) is one of five Seris who, in 2006, traveled across the Gulf of California to the Baja California Sur peninsula to perform the traditional ceremony with leatherback hatchlings. Ancient cave paintings—including illustrations of turtles—found near Loreto in Baja California Sur were likely created by Seri ancestors more than 750 years ago. Seri elder Alfredo Lopez (at left) appreciates the story these relics tell about his people's age-old veneration of leatherbacks. © OCEAN REVOLUTION



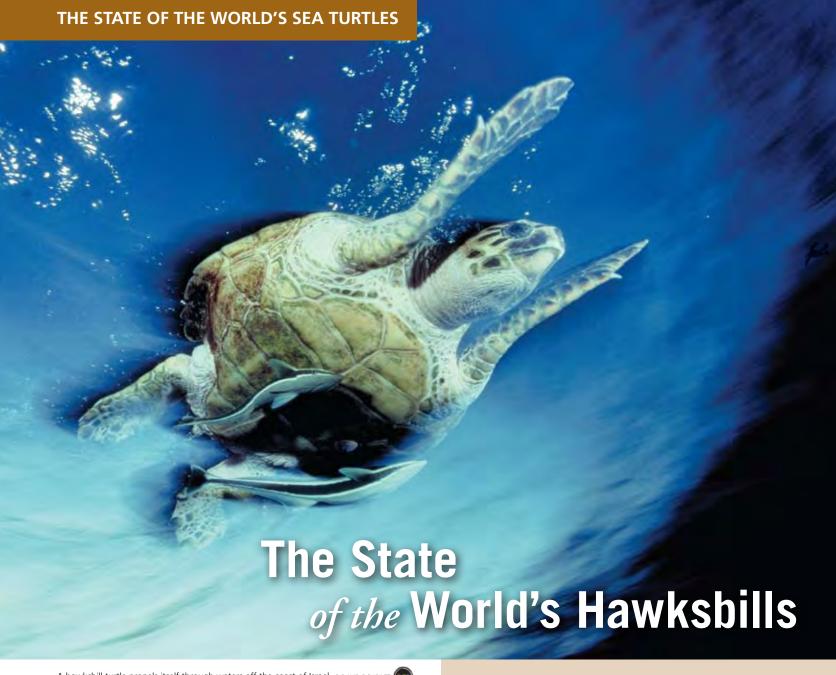
The local people said that environmental exploitation had also caused the rocks to break. Poaching of too many eggs, deforestation, slash-and-burn agriculture over the past 30 years, and a million tourists gawking at the leatherbacks had caused the Turtle Father to shatter into a dozen pieces and the Mother of the Turtles to vanish into the mud.

Versions of this legend exist throughout the Pacific. Dr. George Balazs, a turtle biologist, noted to me a similar legend in the Hawaiian Islands. A large stone at a hotel on Hawaii was called "Pohaku Honu," meaning "Turtle Stone." If the stone was cared for properly, legend said, the turtles in Hawaiian waters would be large, plentiful, and tasty.

The Turtle Mother lore is a manifestation of a greater mythology —the world rests on the back of a colossal turtle. Generations of people in the Asia-Pacific region and the Americas once held that belief.

The question must be asked: If we continue to exploit the turtle and spoil the world, will the creature beneath our feet become disgruntled and take a dive? Or is she already sinking slowly down into the depths, washing all our garbage and human trappings off her shell—a new allegory for rising sea levels and climate change? If so, take heart, for one day, the turtle must come back to the surface for air. The broken turtle rock can heal, and life can begin anew.

Jack Rudloe is one of America's foremost nature writers. For more than 40 years he has scoured the seas, exploring sea life and helping to protect marine species in six well-received books, including Search for the Great Turtle Mother and The Sea Brings Forth.



A hawksbill turtle propels itself through waters off the coast of Israel. © DAVID DOUBILET



The hawksbill sea turtle has been one of the most persecuted of the world's sea turtles; hunted not only for its meat and eggs like other sea turtle species, it is further cursed by its beauty. The mottled, translucent shell plates—called scutes by scientists and bekko by Japanese artisans—have been coveted for centuries as raw material for jewelry, spectacle frames, spurs for fighting roosters, and furniture embellishments.

The 2007 IUCN Red List of Threatened Species assessment of global hawksbill populations reveals that hawksbills still endure this menace and many others. They are especially threatened in the Indian and Pacific oceans and along the mainland Caribbean Coast. Historic and recent accounts indicate extensive declines—estimated at 90 percent globally—in all major oceans during the past 100 years. Much of the decline occurred in the 20th century, driven by intense international trade in bekko. (See "Trade Routes for Tortoiseshell," p. 24-25.) Although the volume of international trade has declined significantly in the past 10 to 15 years, it remains an active menace, especially in Southeast Asia and the Americas.

A relatively new threat is the massive trade in large stuffed hawksbills, intentionally netted in Southeast Asian waters, preserved with formaldehyde aboard Chinese vessels, and sold intact as adornments in Asia. Accidental capture in fisheries is another major concern. Meanwhile, hawksbills continue to suffer intense levels of



In addition to mapping the hawksbill nesting sites of the world, the SWOT Team has added another year of data (2006) to the global maps of leatherback and loggerhead nesting sites that were featured in volumes I and II of SWOT Report. These maps are now featured in interactive and downloadable formats on the SWOT website, www.SeaTurtleStatus.org.

egg exploitation in many areas; in Southeast Asia, egg take often approaches 100 percent.

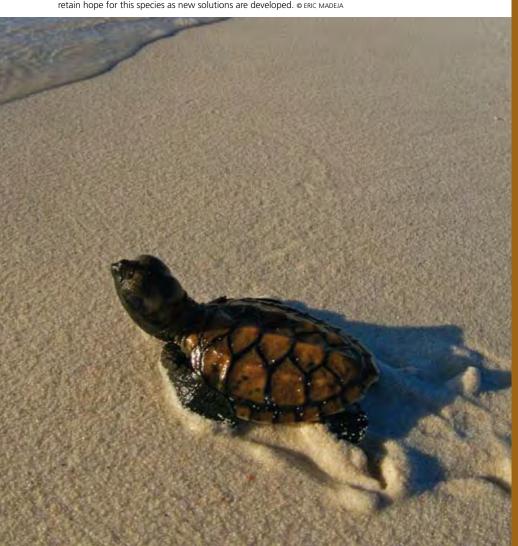
Habitat destruction may turn out to be an even greater threat. Hawksbills nest in some 60 of the 108 countries whose waters they ply—mostly on tropical beaches with unregulated coastal development, especially for tourism, becoming a huge problem. Oil exploration and seaborne pollution threaten hawksbill habitats in the Middle East and other parts of the Indo-Pacific. Likewise, the global scourge of climate change looms large, given hawksbills' dependence on coral reefs vulnerable to altered water temperatures and the potential loss of nesting beaches to rising waters.

Because much of the available data on global hawksbill populations come from protected sites, the actual rate of their decline is likely underestimated. What we do know is that hawksbill populations continue to decline at many sites, including important rookeries in eastern Mexico, northeastern Australia, and Indonesia.

With protection, however, some populations have stabilized, and a few are increasing at protected islands in the Caribbean and Indian oceans. Meanwhile, public awareness is at an all-time high, and international and regional agreements are addressing the issues at the governmental level. These are certainly causes for optimism that bring the solutions for hawksbill recovery into clear focus. If careful attention is paid to preserving beaches, curtailing the trade in bekko and stuffed turtles, stopping egg take, addressing fisheries bycatch, and eliciting the broad human behavioral changes that will reduce pollution and halt climate change, the hawksbill can find its way along the road to resurgence.

Dr. Jeanne A. Mortimer is a sea turtle biologist and conservationist who has worked in some 20 countries during the past 30 years. She coauthored (with Marydele Donnelly) the forthcoming IUCN Hawksbill Red List Assessment for the IUCN Marine Turtle Specialist Group.

Globally, hawksbill turtles have declined an estimated 90 percent in the past 100 years, but conservationists retain hope for this species as new solutions are developed. © ERIC MADEJA



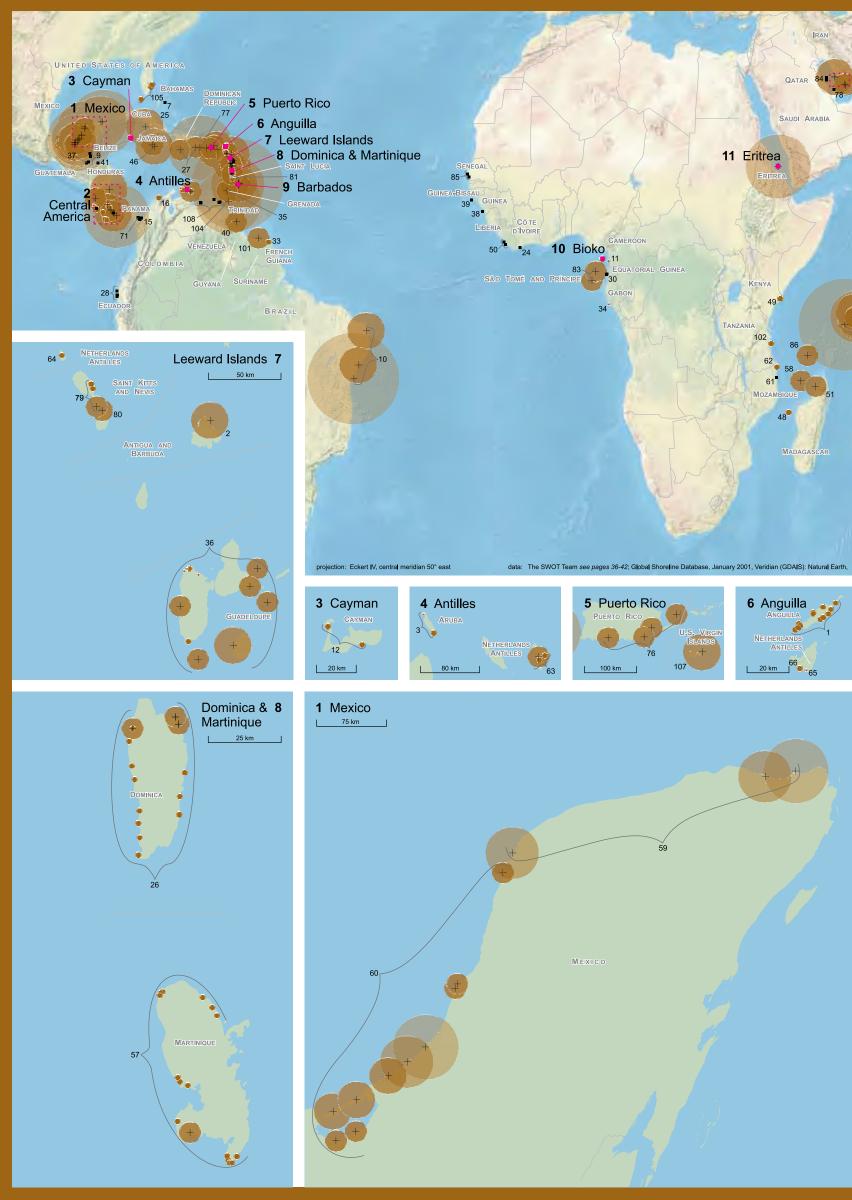
# The Global Hawksbill **Nesting Map**

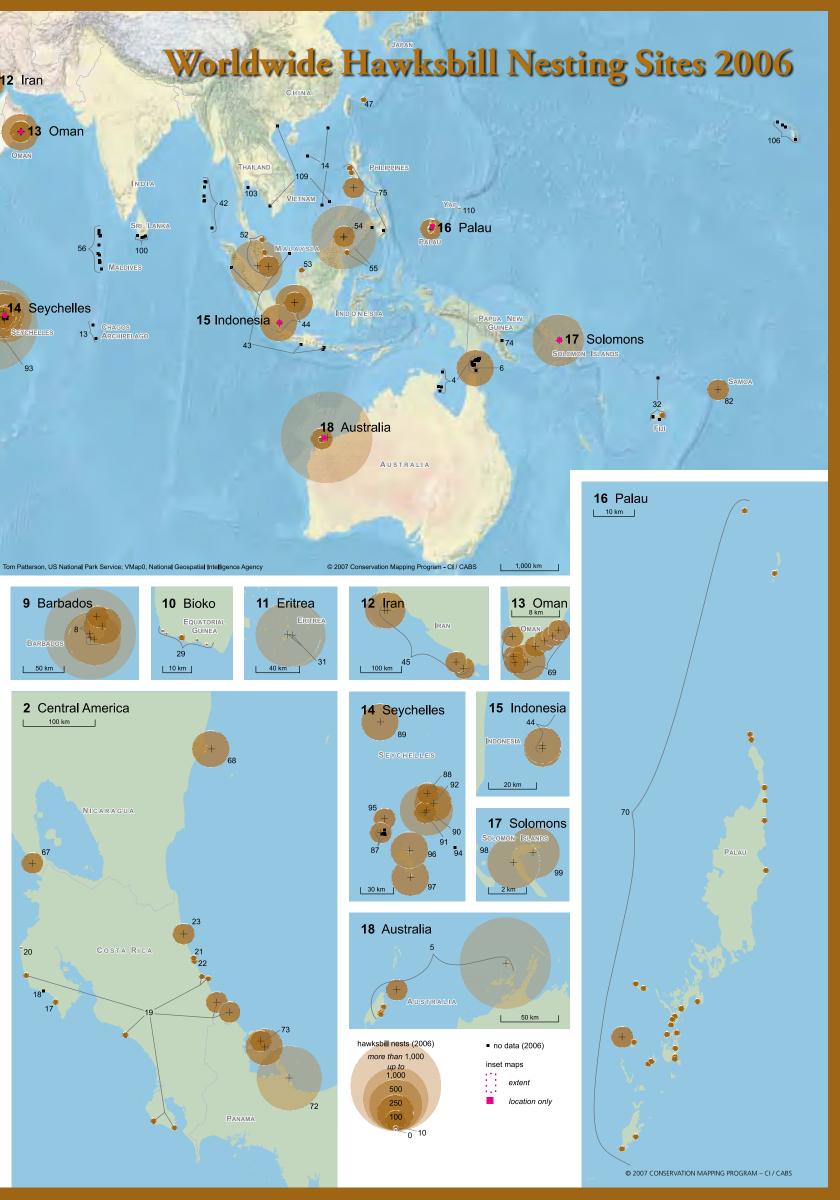
Tawksbills are well known for their tendency beaches. Perhaps the result of centuries of exploitation, they appear determined to nest wherever humans are not. This presents real challenges to the people who monitor hawksbills' nesting populations or wish to globally map their nesting distribution. Special recognition is therefore warranted for the hundreds of data contributors that are listed in the citations of this publication (pp. 36-42)—not only for their determination to study and protect these animals in all of their remote habitats, but for their willingness to work together as the "SWOT Team." They have created the linchpin of this report, the foldout map that is SWOT's (and the world's) first global depiction of hawksbill nesting sites, featuring 2006 data.

hawksbill's global nesting distribution has provided its own set of challenges and has been as much a lesson in geography as anything. Thoughtful consideration has gone into the preparation of the map, with mapping protocols based on the standards developed by the SWOT Scientific Advisory Board in 2006.

This map demonstrates the number of nests recorded or estimated at every available nesting site in the 2006 or 2005–2006 season. All points are numbered to correspond with their original sources (pp. 36-42). Where nest counts were not available, the number of nesting females was converted into an estimated number of nests using a bracketed conversion figure of 3 to 5 nests per female, taken from Mortimer and Donnelly's forthcoming IUCN Hawksbill Red List Assessment. Similarly, when only crawl counts were available they were converted into an estimated number of nests using a conversion figure of 1.8 crawls per nest, also from Mortimer and Donnelly. In total, 348 hawksbill nesting sites were recorded from 110 sources.

**Alec Hutchinson** is data coordinator for SWOT and director of nesting beach projects for PRETOMA. Brian J. Hutchinson is program officer of Conservation International's (CI) Sea Turtle Flagship Program and of the IUCN Marine Turtle Specialist Group. Kellee Koenig is GIS specialist and outcomes mapping cartographer for the CI Center for Applied Biodiversity Science.





# The Road to Conservation

# Sea turtles fulfill their ecological roles on a healthy planet where all peoples value and celebrate their continued survival.

—Vision Statement of the IUCN Marine Turtle Specialist Group

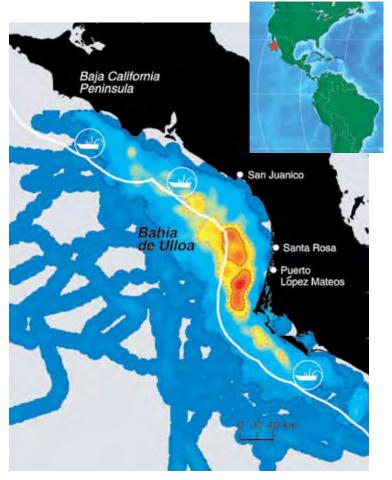
If you don't know where you are going, then any road will get you there. A clear vision of global sea turtle conservation is where the road begins.

Conservation of sea turtles is not simple. It is confounded by turtles' vast marine distributions, the many unsolved mysteries of their natural history, and the fact that sea turtles and the hazards to their survival are not distributed evenly over the face of the planet. Climate change, for instance, could spell the total loss of nesting beaches in the Maldives, but not so everywhere. Direct take of turtles is a serious issue in the Kei Islands of Indonesia, but not in the southeastern United States. Coastal development, fishing impacts, and marine pollution and pathogens all exact their toll on sea turtles with varying degrees of intensity, depending on the site, season, and species. Given the different approaches needed in different situations and the relative urgency of them all, conservationists must be strategic in their approach.

Being strategic means choosing priorities, balancing reactive efforts with proactive efforts, and constantly checking progress and redirecting the work on the basis of new information. Principal among the IUCN Marine Turtle Specialist Group's global priority-setting tools are assessments to determine sea turtles' extinction risk for the IUCN's *Red List of Threatened Species*. The aforementioned five hazards, the "top 10" list of the most threatened sea turtle populations, and the "key unsolved mysteries" (see www.SeaTurtleStatus.org to learn more) are other useful prioritization tools derived from the group's "Burning Issues" workshops. Furthermore, SWOT gathers and synthesizes global-scale data with the aim to measure trends and help frame priorities for sea turtle conservation. Countless other nonprofit organizations and governments also look at national and local priorities for sea turtle conservation, and the literature is rife

Though arguably still the most endangered sea turtle species on Earth, an IUCN ranking of "critically endangered" has helped to focus conservation attention on the Kemp's ridley, which is now on the road to recovery. © NPS PHOTO





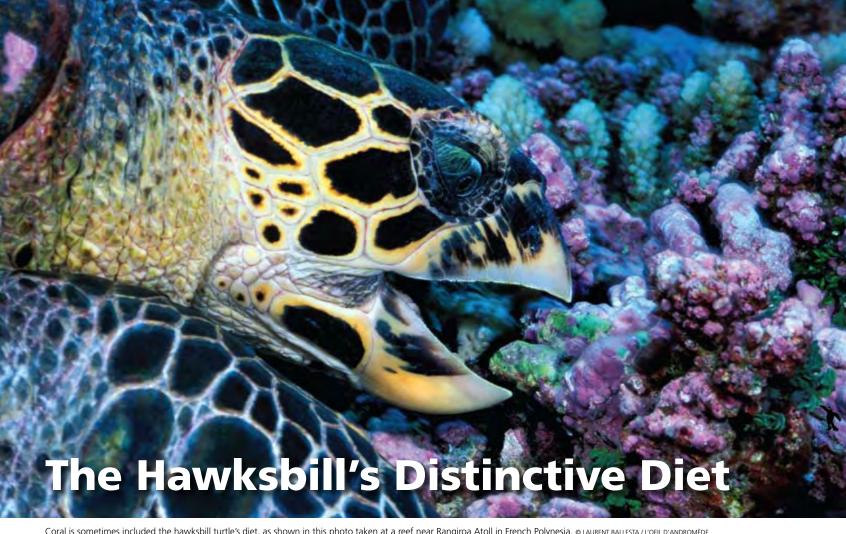
Identification of high-use areas for loggerheads off Baja (shown in orange and red) using satellite telemetry has stimulated efforts to create protected zones, an example of how innovative research tools help to set priorities for conservation. Figure Courtesy of Hoyt Peckham, David Diaz, andreas walli, georgita Ruiz, Larry Crowder, and Wallace J. NICHOLS, FROM THE ARTICLE "SMALL-SCALE FISHERIES BYCATCH JEOPARDIZES ENDANGERED PACIFIC LOGGERHEAD TURTLES" IN PLOS ONE, ISSUE 10, OCT. 2007.

with action plans, recovery plans, strategies, and templates that view the challenge from different angles and on varying scales.

The best prioritization template for sea turtle conservation will comprise parts of all these various schemes, but adaptability must be at its core. This implies perpetually reviewing and upgrading priorities—evaluating the most important species and populations on which to focus, the life stages most vulnerable to the most threatening hazards, and the conservation actions that will yield the greatest results and the greatest "bang for the buck" investments.

Even as we strategize in workshops and behind computers, "just do it" must remain the conservationist's credo. Conservation cannot wait for the perfect strategy to be penned. Actions that do no harm and employ the precautionary principle must be constantly pursued, because what we learn from doing the work of conservation will be the greatest source of wisdom in adapting our strategies for the future.

**Roderic B. Mast** is co-chair of the IUCN Marine Turtle Specialist Group, vice president of Conservation International's Sea Turtle Flagship Program, and an avid fan of Mr. Leatherback.



Coral is sometimes included the hawksbill turtle's diet, as shown in this photo taken at a reef near Rangiroa Atoll in French Polynesia. @ LAURENT BALLESTA / L'OEIL D'ANDROMÈDE

n strange company with a few species of fish and nudibranchs, the hawksbill turtle is one of very few animals that feeds principally on sponges. It is the largest vertebrate and only reptile to feed on this prey. Spongivory, or feeding on sponges, is rare, presumably because of the significant defenses of sponges, such as siliceous (glass) spicules, indigestible spongin fibers, and an array of chemical compounds.

In the Caribbean, hawksbills prey on only a few of more than 300 sponge species found in the region. The turtles feed primarily on sponges that lack spongin fibers, but many of these sponges do contain large amounts of glass spicules. Other items in the hawksbill's Caribbean diet are algae, corallimorpharians (coral-like anemones), zooanthids, and tunicates, but in only a few cases have these items constituted a significant part of its diet.

Gut samples of hawksbills from numerous localities in the Indian and Pacific oceans have revealed sponges as the turtles' predominant food item, suggesting that spongivory may be a worldwide feeding habit. Nonetheless, hawksbills in Australia's Northern Territory consume significant amounts of marine algae, seagrasses, and mangrove fruits.

Possibly as a result of what they eat, hawksbills are occasionally toxic to humans. In scattered cases, consumption of hawksbill meat has been conclusively linked to mass poisoning events that killed or severely sickened scores of people. Blue-green algae that are symbiotic with sponges, as well as secondary compounds present in sponges, are among the suspected causes of the poisonings, but definitive evidence is lacking.

Young hawksbills appear to feed at the ocean's surface on plants and animals associated with the drift community, including Sargassum algae, fish eggs, tunicates, and goose barnacles. Unfortunately, young turtles also frequently consume bits of plastic and tar balls that float on the surface.

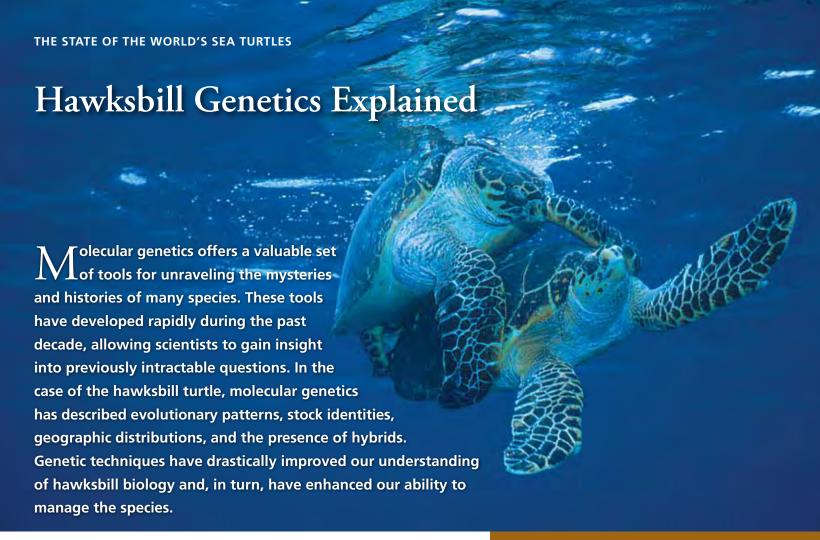
Reproductive female hawksbills also deviate from the spongedominated diet, greatly reducing their overall intake of food and consuming calcium carbonate rubble, possibly as a source for calcium to shell their eggs.

Although they occupy a variety of habitats, hawksbills are most closely associated with coral reefs, where they play a key role in the ecosystem's health. Using their sharp, hawk-like beaks to penetrate the sponges' outer armor, they expose the soft internal parts to other sponge-eating animals. The turtle's peculiar dietary habit also helps to keep sponge populations in check, freeing up space on the reefs for other organisms to settle and grow.



This electron micrograph shows the intestinal epithelia of a hawksbill turtle with embedded

Anne Meylan is a senior research scientist at the Florida Fish and Wildlife Conservation Commission in St. Petersburg, Florida, U.S.A. Scott Whiting is a marine vertebrate scientist in the marine biodiversity group of the Department of Natural Resources, Environment and the Arts, of the Northern Territory Government of Australia.



A female hawksbill can mate with several males within one reproductive season; males might also have multiple mates within the same season, @ R P VAN DAM

### **Recent Discoveries about Hawksbills from Genetic Studies**

- Hawksbill lineages in the Indo-Pacific and Atlantic oceans are evolutionarily distinct, a notion that was established previously on a morphological basis but later discarded.
- Hawksbills, with their unique diet of sponge, belong to a carnivorous sea turtle lineage that aligns them with the loggerhead and ridley subfamilies.
- Hybridization between hawksbills and olive ridleys, loggerheads, or green turtles is sporadically observed, especially in areas where hawksbill populations have declined greatly. In Bahía, Brazil, however, hawksbill-loggerhead hybrids apparently have integrated into the normal population, constituting about 40 percent of the rookery.
- · Nesting hawksbill populations are not closed, as previously thought. Rather, they share developmental and foraging grounds with individuals from multiple genetic stocks, and they migrate internationally, returning to their natal beaches to reproduce. These characteristics highlight the need for regional and multinational management schemes that take into account both nesting and foraging grounds.
- Distinctions exist among multiple nesting stocks within geographic regions. For example, there are at least 15 different nesting populations in the Caribbean region.

Clearly, genetic studies have uncovered numerous crucial clues about hawksbill populations worldwide. However, more information—particularly stock identifications for nesting populations in certain regions (for instance, the Eastern Atlantic and Indian oceans)—is necessary to solve many remaining hawksbill mysteries and to develop sound policies to conserve this species globally.

Alberto Abreu is head of the genetics laboratory at the Mazatlán Research Unit of the Instituto de Ciencias del Mar y Limnología (UNAM). Robin LeRoux is a research fisheries biologist with the National Marine Fisheries Service, Southwest Fisheries Science Center's Marine Turtle Research Program.

### **Known Genetic Stocks of the Hawksbill Sea Turtle**

In the **Pacific Ocean**, four main genetic stocks have been identified:

- Eastern Pacific (perhaps extending from Mexico
- Northeastern Australian
- Sabah, Malaysian
- Solomon Islands

In the **Indian Ocean**, at least five genetic stocks have been identified:

- Arabian Peninsula
- Northern Red Sea
- Peninsular Malaysian
- Seychelles and Chagos Islands
- Western Australia

In the Western Atlantic Ocean and the Caribbean Sea, all populations analyzed to date have proven distinct. Although six stocks await final analysis, nine distinct stocks have already been identified:

- Antiqua
- Brazil
- Mexico
- Barbados
- Costa Rica
- Puerto Rico
- Cuba
- U.S. Virgin Islands

In the **Eastern Atlantic Ocean,** at least one stock occurs around the regionally important rookeries in the Democratic Republic of São Tomé and Príncipe and in Equatorial Guinea, principally on the Island of Bioko, although hawksbill nestings have been rare in recent years.

# Pacific Leatherback Sets Long-Distance Record



This map illustrates the migration of one female leatherback turtle, after nesting in Jamursba-Medi, Papua, Indonesia, to foraging grounds off the coast of Oregon, United States—a distance of 20,558 kilometers (12,774 miles). © STEPHEN NASH / CONSERVATION INTERNATIONAL

It has long been known that leatherbacks are the most widely distributed marine reptile on our planet. They have been seen in the frigid waters off Argentina, southern Chile, and Tasmania and are not uncommon in the subarctic northern latitudes off Alaska, Nova Scotia, and the North Sea. Adults migrate periodically from these temperate foraging habitats to tropical breeding grounds, and a growing body of scientific research is yielding information on the migratory routes and geographic links between these areas. In the Pacific, where leatherback populations continue to decline, we urgently need to understand where these creatures spend their lives at sea in order to mitigate human-induced threats.

The National Marine Fisheries Service, Southwest Fisheries Science Center, leads a program with international partners in Indonesia, Papua New Guinea, and the Solomon Islands. The program uses increasingly sophisticated molec-

ular, genetics, and satellitetracking tools. Early genetics results showed that the leatherbacks living in the North Pacific, including waters near the U.S. west coast, are part of the western Pacific breeding population.

Those results have now been confirmed by a trans-Pacific satellite track of a nester, tagged on Jamursba-Medi beach in Papua, Indonesia, which made the trans-Pacific odyssey to the foraging area off the coast of Oregon, United States, and back westward. This female leatherback was tracked for 647 days over a minimum distance of 20,558 kilometers (12,774 miles) before the signal was lost. This distance

set a new record for sea turtles—among the longest documented migrations between breeding and foraging areas by any marine vertebrate (see map at left).

Additional research is showing that nesters from the western Pacific metapopulation, the last sizable nesting population remaining in the Pacific, migrate through areas in the Philippines, South China Sea, and Japan, into the Southern Hemisphere. As such, sea turtle populations are often the shared responsibility of several nations. The urgency for protecting leatherbacks in the Pacific, in particular, has served as a catalyst to develop an internationally coordinated conservation strategy.

In July 2007, the second Bellagio Sea Turtle Conservation Initiative workshop convened in Terengganu, Malaysia, to develop a strategic plan to guide the prioritization and long-term financing of Pacific leatherback turtle conservation and recovery objectives. Forty-five experts on sea turtles, fisheries, conservation, and finance from 10 countries gathered to discuss the priorities for the western Pacific leatherback nesting populations as one component of a broader pan-Pacific plan.

The Pacific leatherback turtle has drawn teams of dedicated people to its cause. The conservation fund planned during this workshop will make it possible for stakeholders to engage in long-term planning and avoid the risk that critical conservation investments made in some years will be lost in others when funding is low.

Meanwhile, we continue to track leatherbacks and other sea turtle species to discover what areas are most critical to their survival.

**Dr. Peter Dutton** leads the Marine Turtle Research Program at the National Marine Fisheries Service, Southwest Fisheries Science Center. **Scott Benson** is a marine vertebrate ecologist at the National Marine Fisheries Service, Southwest Fisheries Science Center. **Creusa "Tetha" Hitipeuw** is marine turtle conservation program coordinator for WWF-Indonesia.

 $Leather backs \ can \ dive \ up \ to \ a \ mile \ deep \ and \ can \ cross \ thousands \ of \ miles \ of \ ocean \ in \ a \ year. \ @ {\tt TAMAR-IBAMA}$ 



# ¡CAREY!

# Where Have the Eastern Pacific Hawksbills Gone?!

Make a list of the world's most endangered sea turtle populations.

Is the eastern Pacific hawksbill on it? If not, it's no surprise. Essentially nothing is known of the biology, distribution, abundance, or conservation needs of this enigmatic population. Until recently, virtually nothing had been done to study what remains of these animals in the eastern Pacific, hunted nearly into extinction long before the start of the modern sea turtle conservation movement.



In 2005, the IUCN Marine Turtle Specialist Group recognized the lack of information about this population, listing it among global-scale "critical research and conservation needs." According to communities and conservation projects in the region, some hawksbills do still remain in the eastern Pacific, but no one knows how many or if there are enough remaining to bring them back from the edge.

The Sea of Cortez, or Gulf of California, Mexico, has produced more recent sightings than anywhere in the eastern Pacific and is known to have hosted significant numbers of juvenile and adult

hawksbill turtles in the past—so much so that hawksbill fisheries once thrived in the coastal towns of La Paz and Loreto. Records in La Paz suggest that hawksbill turtle shell was an important component of the regional economy in the early 1900s. Fishermen from the region say that in the 1940s and 1950s the three-man crew of a single fishing canoe could capture five to seven hawksbills in one night.

Miguel del Barco, an 18th-century Jesuit missionary-naturalist who traveled the western coast of the Sea of Cortez, wrote of coastal indigenous people who caught hawksbills from their rafts



Three hundred years later, the Eastern Pacific Hawksbill Initiative is beginning its work, village by village, in search of the lost hawksbills of the Sea of Cortez. Conducted in collaboration with the Grupo Tortuguero, a grassroots conservation organization with 500 individual partners in communities along the coast of northwestern Mexico, the initiative is referred to as "¡CAREY!"—the

local name of the hawksbill, and similar to the common Spanish exclamation "¡caray!" used to express excitement or surprise.

In its first phase, as of January 2008, the investigators leading the project have begun interviewing local community members, establishing a sighting network, poring over historical archives, and monitoring the region's coastal waters to begin to fill the information gaps, raise local awareness and solve the mysteries of the hawksbill population in the Sea of Cortez.

Of more than 20 coastal communities visited thus far, all have been highly supportive. Community members have reported recent hawksbill sightings to ¡CAREY! staff on more than a dozen occasions already—observations that often previously went undocumented or were recorded but subsequently lost.

Boding well for the turtles, more hawksbills are being reported now than were reported several decades ago—a result of the increased protection afforded to sea turtles in the early 1990s, many local fishers believe. As explained by Juan de la Cruz, a former turtle hunter from a small fishing village just south of Loreto, "Thirty years ago it was almost impossible to see a hawksbill, because hunting of the species was rampant. Once the laws were established, the market for penca [tortoiseshell] died, and seeking hawksbills became too risky. If people wanted to eat turtle meat, they trapped other turtles that were easier to capture."

In addition to generating data and calling local and international attention to this fragile population, future plans of the initiative include evaluating hawksbill populations in other areas of the eastern Pacific by replicating the efforts undertaken in the Sea of Cortez and for establishing a regionwide hawksbill information and sighting network.

Many questions remain, but the mysteries of this forgotten population are beginning to reveal themselves. By shedding light on the biology and conservation status of the eastern



This hawksbill was captured in September 2007 at Isla Pardito, a small island north of La Paz in the Sea of Cortez. Local fisherman Gilberto Cuevas (shown) and staff at the organization Niparaja are some of the first participants to report hawksbills to the ¡CAREY! network Several hawksbill sightings have already been recorded at Isla Pardito. © JUAN SALVADOR ACEVES

Pacific hawksbill, ¡CAREY! will provide critical information for local and regional conservation management plans that will ultimately determine the feasibility of the turtles' recovery in this region of the world—hopefully transforming their vanishing act into a comeback.

Alexander Gaos and Ingrid Yañez, a husband and wife team, are conservation scientists spearheading the Eastern Pacific Hawksbill Initiative with the Grupo Tortuguero. Wallace J. Nichols (wallacejnichols. org) is a senior scientist at Ocean Conservancy and research associate at California Academy of Sciences.

Hawksbills once commonly inhabited the waters of the Sea of Cortez but today could be in threat of local extinction. The Eastern Pacific Hawksbill Initiative is now carefully investigating just how endangered that sea turtle population is. © STEVE JONES / WWW.MILLIONFISH.COM

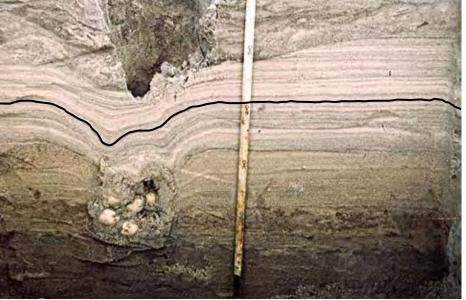
# **Modern Meaning in an Ancient Turtle Nest**

ate Cretaceous seas contained giant swimming marine reptiles, including mosasaurs (9 meters in length), plesiosaurs (18 meters in length), and sea turtles (nearly 5 meters in length) that joined toothed, diving birds and flying reptiles that fed on the abundant vertebrates, bivalves, ammonites, squids, and other invertebrates. Most of these behemoths accompanied the dinosaurs in the late Cretaceous mass extinction event that killed off 75 percent of the plants and animals on Earth but not the sea turtles. Fossils prove sea turtles' abundance in



the Western Interior Seaway—across western North America from the Gulf of Mexico to the Arctic Ocean—during the Cretaceous period, and a hypothesis formed in 1996 suggested that turtles nested on sandy beaches there.





These two images show cross-sections of the fossilized sea turtle nest (above) from the late Cretaceous period located in Fox Hills Sandstone, Colorado, and a modern loggerhead turtle nest (bottom) on St. Catherines Island, Georgia. Both are collapsed nests with eggs remaining in the egg chamber. © GALE BISHOP; ABOVE RIGHT: The illustration above is an artist's rendering of Archelon ischyros, a sea turtle from the Late Cretaceous period of North America. © ARTHUR WEASLEY / WIKIPEDIA COMMONS (GNU FREE DOCUMENTATION LICENSE

In 1997, in the Cretaceous Fox Hills Sandstone near Limon, Colorado, my colleagues and I helped to prove that hypothesis true. During an industrial study of ghost shrimp burrows to help delineate heavy mineral deposits in the area, my colleagues showed me an enigmatic sedimentary structure. Almost immediately, I recognized the structure as a fossilized sea turtle nest! Inside the partially collapsed nest were preserved egg impressions.

When we discovered the egg chamber, a nearby covering pit, and cross-section of a sea turtle crawlway leading away from the nest, I realized with astonishment that we had located a shoreline in the Cretaceous Western Interior Seaway and discovered the first documented suite of fossil sea turtle nesting

The covering pit, a surface disturbance dug by the turtle to camouflage the neck of the egg chamber, provided fascinating evidence that Cretaceous sea turtles had already evolved defenses against destruction of their nests by their predators, the dinosaurs. Modern sea turtles use this same technique, making covering pits in the sand to disguise their eggs from wild hogs, raccoons, foxes, birds, and other predators.

This nest is the first and only known fossilized sea turtle nest. More significantly, it indicates that the camouflaging behavior of ancient sea turtles had already evolved and been integrated into the nesting behavior of sea turtles 70 million years ago.

Gale A. Bishop, geologist, paleontologist, and conservationist, is Emeritus Professor of Geology at Georgia Southern University, where he taught from 1971 to 1999. He founded the St. Catherines Island Sea Turtle Program in Georgia, which he has directed since 1990. He now splits his time between sea turtle conservation in Georgia and science education reform in Iowa. Fredric L. Pirkle, is an economic geologist with Gannett Fleming Inc. of Jacksonville, Florida, whose additional input to this article is appreciated.

# **Traditional** Sensibility in the Andamans

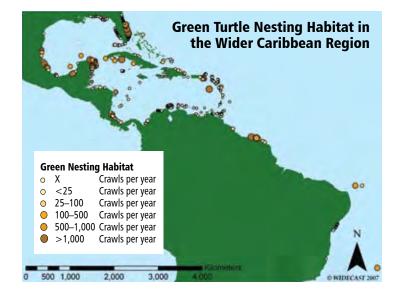
uring a visit to India's Little Andaman Island in January 2006, members of the Andaman and Nicobar Islands Environmental Team met a man named Tai, an elder of the Onge community who lives within a tribal reserve along the island's west coast. Team members explained their intent to study the impact of the recent tsunami on sea turtles and asked Tai if he had any information on how the turtles had been affected. After recounting how he and others had escaped the tsunami, Tai told a story that highlights the important human relationship with nature that often exists within traditional communities.

Following the tsunami, the Onge women craved sea turtle meat and asked the men to go hunting. They did, and returned with a few green turtles, which feed in nearby seagrass beds.

The turtles, however, were very lean and lacked the fat and thick flesh that the Onge women desired. The women were disappointed. The community concluded that because the nearby seagrass beds had been damaged by the tsunami, the turtles were not finding enough food to stay healthy and fat. As a result, the women decided that despite their hunger for sea turtle meat, the men should not hunt again until the seagrass beds had recovered and the turtles had returned to feed and regain their health. Since then, Tai said, the men had stopped hunting not only turtles, but dugongs, which also feed on the grasses.

The Andaman and Nicobar Islands are home to many indigenous communities who live traditional lifestyles of hunting, gathering, and small-scale cultivation. These islanders are exempt from the Indian Wildlife Protection Act and are allowed to use wildlife for sustenance, but not for sale. Their traditional lifestyles and direct relationships with nature provide an enlightening contrast to more recently settled communities in this same island group.

There are many other threats to sea turtles in the area, such as ghost fishing nets, poaching, and beach loss attributable to sand mining most of these brought on by recent settlers or by changes in traditional





Consumption of sea turtles is not uncommon among peoples of the Andaman Sea. Here, Nicobari villagers from Chingen on Great Nicobar Island prepare a green turtle for eating. © KARTIK SHANKER

lifestyles. The Onges' story highlights the simple wisdom of this community in managing resources effectively. It reminds us that conservation is not only about looking forward to new management systems, but also about looking back to traditional ideas and practices.

Manish Chandi is a member of the Andaman and Nicobar Islands Environment Team.

# Where Do Sea Turtles Nest in the Caribbean Sea?

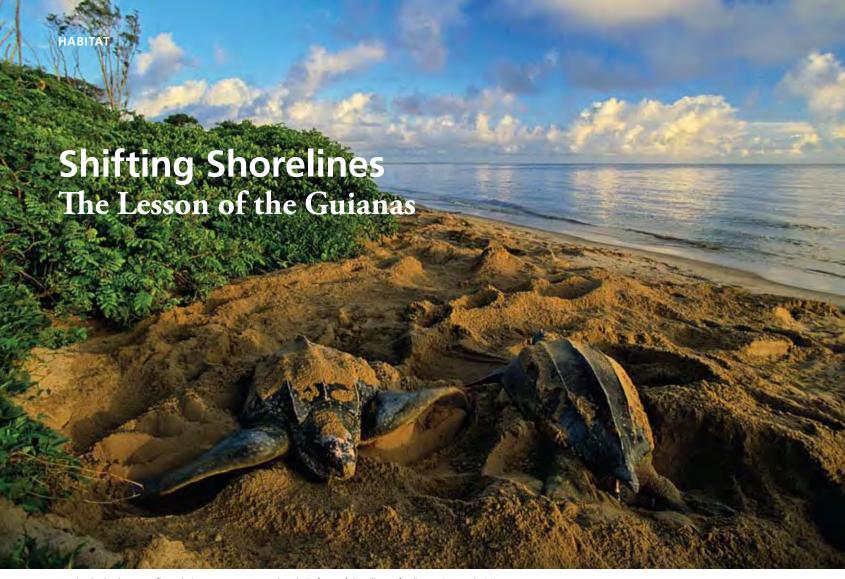
In a recent assessment, the Wider Caribbean Sea Turtle Conservation ▲ Network (WIDECAST) answered the question definitively. Current nesting grounds for six sea turtle species, including 592 sites for the green turtle (shown in the map at left), were georeferenced and mapped in collaboration with The Nature Conservancy, the United Nations Environment Programme-Caribbean Environment Programme, the Pegasus Foundation, the U.S. Fish and Wildlife Service, and more than 100 data contributors in the Caribbean region.

The study concludes that Caribbean green turtles typically nest in small colonies. More than half of all known nesting beaches receive fewer than 25 crawls (including successful and unsuccessful nesting attempts) each year. At 141 sites (23.8 percent of the total sites), current data are insufficient to estimate annual crawl abundance, although these colonies are also likely to be very small.

The 32 beaches (5.4 percent of total beaches) reporting more than 500 crawls per year are mostly distributed along the continental margins of the wider Caribbean region. Tortuguero, Costa Rica, recorded more than 50,000 crawls in the 2005 nesting season—by far the region's largest green turtle nesting colony.

The database—which will soon be accessible through OBIS-SEAMAP at http://seamap.env.duke.edu/—significantly expands conservationists' understanding of habitat use, helping them monitor stock recovery and safeguard the turtles' habitat in new and collaborative ways.

Text and map courtesy of Wendy Dow and Karen Eckert at WIDECAST



Two leatherbacks camouflage their nests on Les Hattes beach, in front of the village of Yalimapo in French Guiana. © OLIVIER GRÜNEWALD

Tearly a decade ago, I made a trip through the Guianas three small, tropical countries on the northern coast of South America. From Georgetown, Guyana, I traveled east into Suriname and on to Cayenne, French Guiana. I traveled outward by small aircraft and returned overland by a complex formula of taxis, minibuses, and river ferries. I passed villages galore, with crowds of people of seemingly every race on Earth waiting for ferries or bargaining for vegetables. I journeyed through agricultural areas and sugar estates. The languages changed at every border— English Guyana-style, then Dutch and Taki-taki, and then French and Creole.

But from the air, I was reminded how truly narrow that coastal band of human development really was. For hours as I flew, the impact of humans on the landscape was essentially invisible, the lumpy green carpet of the forest broken only by rivers. What a prize, I thought to myself, in a world where human overpopulation is overwhelming natural resources almost everywhere.

But sea turtles had first brought me to this coast in 1964. I was intrigued by an adult olive ridley on exhibit in the Georgetown museum. What on Earth was a Pacific ridley doing in the western

Atlantic Ocean? This was a first. The rumor in the city was that sea turtles nested at Shell Beach, and so I went there. By the time I arrived, the turtle hunters had done their work for the season. Everywhere lay shells and skulls of slaughtered turtles—hawksbills, greens, and ridleys—and one or two old leatherback skulls. However, these carcasses represented the first vouchered nesting records for all four species for South America. I returned the next year during nesting season and tagged mostly hawksbills. The hawksbills were unusually large, but the green turtles were huge—twice the weight of greens from Tortuguero in the western Caribbean.

In later years, I worked the beaches of eastern Suriname, where I saw not only my first nesting leatherbacks, but also the olive ridley arribada at Eilanti, a small beach overlooking the broad Marowijne estuary. Later still, following a tip-off from fishers, my colleagues and I discovered the Holy Grail of nesting sites—the open-sea beach of Silébache in French Guiana, where approximately 300 turtles nested each night.



Forty-three years later, I still work with turtles of the Guianas. I have remained intimately involved with the Guyana effort, now an Arawak-run project—an excellent example of local stakeholder involvement. I have witnessed vast changes. Shell Beach washed away years ago, and the turtles have rotated through a series of other beaches. Each season, we set up conservation camps on two or more important beaches, as opportunity presents. The leatherback is now the most abundant turtle by far, while ridleys have mostly left the scene. We have seen a progressive, although unsteady, upsurge in nesting, and we are still trying to understand the 2000 season, when we had about 10 times more turtles than ever before—nearly all leatherbacks.

In Suriname, some beaches have disappeared, while others have shifted, grown, or stabilized. The Galibi River beaches are stable, with important leatherback colonies. The ridleys have mostly left Eilanti now choked with silt behind a mud bank—and are relocating to Montjoly beach, east of Cayenne, and to Brazil. For several years in the 1990s, a new beach—Samsambo—in front of the Eilanti mud banks was colonized by leatherbacks.

Since the "discovery" of French Guiana's leatherbacks in the late 1960s, the country has been known to be the home of one of the largest leatherback nesting colonies in the world. Leatherbacks lost their open-sea beach to erosion around 1973, forcing most of the nesting into the Mana River mouth. Today, however, leatherback nesting in French Guiana has rebounded along all the oceanfront beaches, with 60 percent of turtles nesting on the open coast and 40 percent on the more protected estuarine and river beaches.

The lesson of the Guianas is that we cannot know the parameters of a turtle population after a single visit, a single month, or even a single year. Turtles are here for the long haul, having endured rising sea levels and similar drastic changes many times throughout their ancient histories. They have survived by making adjustments. We, as conservationists,



A new study reinforces that long-term protection of green turtle nesting sites is a successful conservation effort, with populations increasing by 4 to 14 percent over the the past 20 to 30 years at protected beaches. © Luciano Candisani

must prepare for changes. We must adapt, we must make adjustments, and—like the turtles themselves—we must be in it for the long haul.

Peter C. H. Pritchard is one of the world's foremost experts on turtles and tortoise and founder of the Chelonian Research Institute.

# **Good News for Greens Beach Protection Works**

or centuries, the world's largest marine herbivore, the green  $oldsymbol{\Gamma}$  turtle, was exploited for eggs and meat until it teetered on the edge of extinction. Now, thanks to sustained conservation efforts, encouraging news has emerged for this megaherbivore: long-term nesting beach protection works.

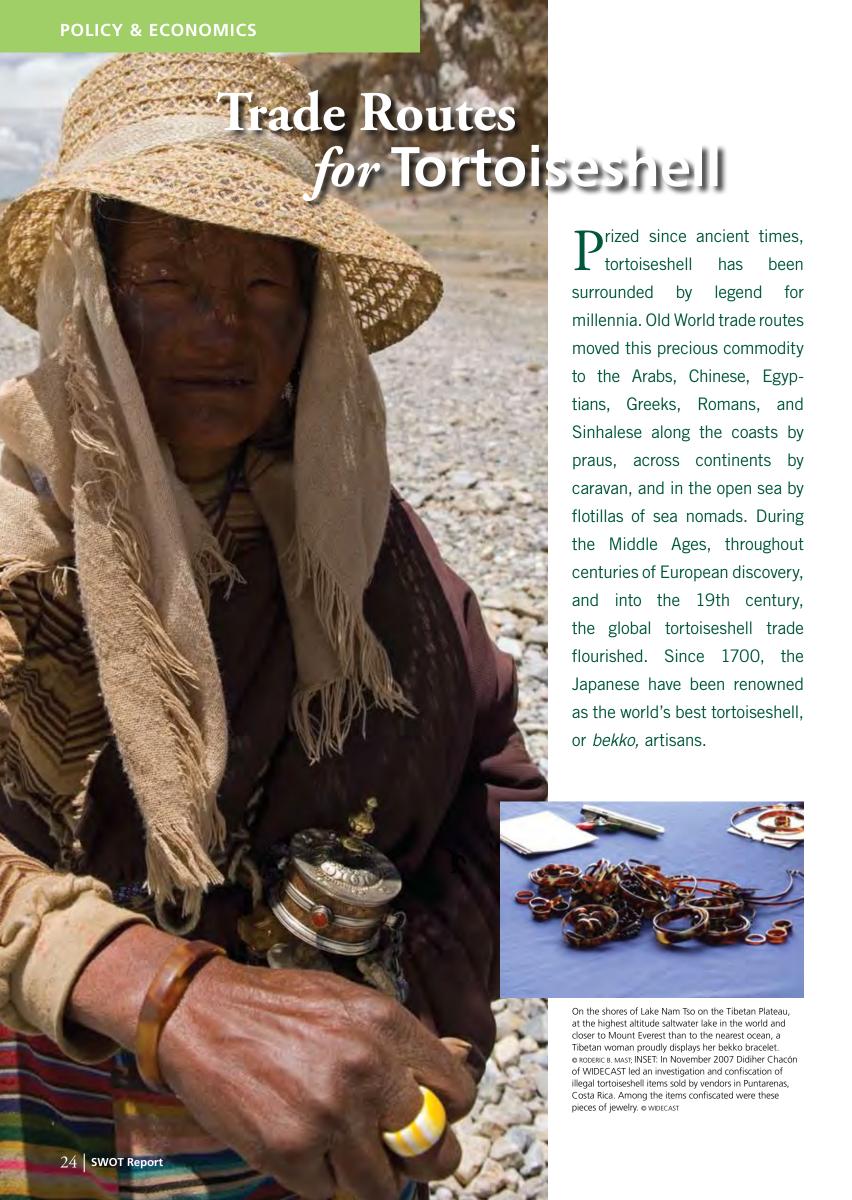
In a recently released study, Milani Chaloupka and his coauthors, while researching green turtles in Australia, Costa Rica, Japan, and the United States, analyzed nesting data from six of the world's major green turtle rookeries for which there are reliable long-term data of 25 years or more. The analysis showed that green turtle nesting on four beaches in the Pacific Ocean (Ogasawara, Japan; French Frigate Shoal, Hawaii, U.S.A.; and Heron and Raine Islands, Australia) and two beaches in the Atlantic Ocean (Archie Carr National Wildlife Refuge, Florida, U.S.A. and Tortuguero, Costa Rica) have increased by an estimated 4 to 14 percent each year during the past two to three decades. The increases in nesting varied considerably among the rookeries, most likely because historical and current exploitation of green turtles is different at each site.

These results should be celebrated as they demonstrate that green turtle populations and presumably the green turtles' ecosystem roles can be recovered in spite of drastic population declines in the past. Green turtles and their nests at all of the study sites have been protected for decades, underscoring the fact that conservation works—that the hard work of the researchers, community members, park rangers, and other conservationists who have spent tens of thousands of hours patrolling these six nesting beaches to protect sea turtles has paid off. The study gives hope to those working on other nesting beaches that their efforts will generate positive results if the conservation work continues for several years.

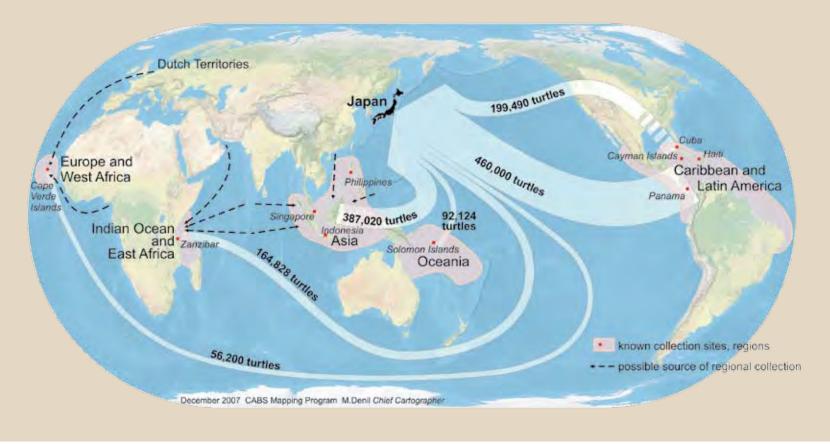
The authors of the study offer a word of caution. This good news is not ultimate news. Green turtles and nests are still poached at some of the studied sites, which could threaten the populations' long-term recovery. Furthermore, some important green turtle nesting populations are probably still reduced from their past numbers and will require ongoing protection to ensure their full recovery.

Even so, in a world brimming with grim reports about our planet's health, this study's testimony that conservation works is a beacon of light for turtles and conservationists alike.

For more information, read the article "Encouraging outlook for recovery of a once severely exploited marine megaherbivore" by Milani Chaloupka, Karen A. Bjorndal, George H. Balazs, Alan B. Bolten, Llewellyn M. Ehrhart, Colin J. Limpus, Hiroyuki Suganuma, Sebastian Troëng, and Manami Yamaguchiin in Global Ecology and Biogeography (www.blackwellpublishing.com/geb).



## Japanese Bekko Imports by Region, 1950–1992



Hawksbill shell has been traded throughout the world for millennia. The Japanese have figured prominently in the trade of this commodity, which they call "bekko." The figure above depicts Japanese bekko imports from 1950 to 1992, using Japanese customs statistics. Japan was the world's major importer of hawksbill shell during the 20th century; its imports did not cease until the end of 1992. Major locations of export in each region are marked with red dots. Data on bekko volume were compiled and converted to approximate numbers of turtles from Japanese government trade statistics (from Mortimer and Donnelly's forthcoming IUCN Hawksbill Red List Assessment).

During the past 100 years, millions of hawksbills have been killed to supply luxury and craft markets around the world. In the early decades of the 20th century, warnings in the Caribbean and in Asia to end wanton hawksbill killing and intense egg collection went unheeded. Excessive exploitation has had an enduring effect on the world's hawksbill populations and is central to understanding and predicting current population trends. As the largest market for bekko in the 20th century, Japan imported shells from nearly 2 million hawksbills from 1950 to 1992—more than 1.3 million large turtles and 575,000 stuffed juveniles. Although the global trade is much reduced after decades of conservation, it remains an ongoing and pervasive threat in the Americas, Asia, and parts of Africa.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) came into force in 1975. By 1977, it prohibited international tortoiseshell trade among its signatory nations. At that time, at least 45 countries were involved in exporting and importing raw tortoiseshell. As trading nations ratified CITES, the volume of trade diminished.

Trading did not stop for several decades, however, because Japan took an exception or reservation to the ban when it joined CITES in 1980. By 1992, international pressure forced Japan to end its tortoiseshell imports. Although Japan agreed to retrain hundreds of bekko artisans, it has not followed through on this commitment and has supported several unsuccessful efforts to reopen the international tortoiseshell trade. The standing bekko stockpile should now be exhausted, but the industry remains intact, and demand for tortoiseshell jewelry, eyeglass frames, and other items is high. The Japanese government continues to fund hawksbill research with the aim to reopen the trade. In early 2007, it announced its intention to support the bekko industry for another five years.

Despite the important progress in reducing global trade and the increases in some hawksbill nesting in areas where populations have received long-term protection, many of today's populations are declining or remain depleted. Numerous nesting populations have neither stabilized nor begun to recover.

Better management and law enforcement are keys to the future of the species, and an educated public is the hawksbill's greatest ally in preventing exploitation for bekko. Although worldwide awareness campaigns with pleas not to buy tortoiseshell products are helping to stamp out this archaic practice, greater international enforcement efforts are also needed to end the trade in the 21st century.

Marydele Donnelly is the international policy director for Caribbean Conservation Corporation. She has worked on hawksbill trade issues since 1988.

# Mass Turtle Poaching: A Case Study from Southeast Asia

Tust when it seemed that conservation efforts were turning the tide against declining sea turtle populations in Southeast Asia, a newer and bigger threat than ever imagined has emerged: illegal and unregulated poaching of sea turtles by vessels from China and Vietnam. Turtle poaching has gone on for centuries, but in 2007, such a noteworthy increase occurred that we now must look more closely to determine the severity of this practice.

How much poaching goes unrecorded or undetected? How severe are the impacts on turtle populations? What drives this trade, and how can it be curtailed? What we know is already quite alarming.

In March 2007, Malaysian authorities seized a Chinese trawler in waters off the Sabah (Borneo) Coast. More than 200 protected green and hawksbill turtles were onboard, and only 20 were still alive. Just a week earlier, Malaysian officers had stopped a fishing trawler in a nearby area and discovered more than 70 green and hawksbill turtles onboard, most of them dead.

In May 2007, newspapers reported the shocking news that 397 dead turtles were discovered by Indonesian authorities aboard a Chinese vessel in the Derawan Archipelago in East Kalimantan. In a disturbing twist, authorities believe that the boat crew purchased the turtles from local fishers, because of the short time the Chinese vessel had spent in the area and the large number of turtles the crew had amassed. Also in May 2007, a mysterious abandoned vessel was found floating off the coast of China. Dubbed "Noah's Ark," it held some 5,000 rare animals, including turtles. This find exposed one of the most lucrative and destructive wildlife smuggling routes in the world—from the threatened jungles of Southeast Asia to the restaurant tables and markets of southern China.



An illegal Chinese fishing vessel with 397 dead turtles aboard was seized in East Kalimantan, Indonesia, in May 2007. The captain of the boat was later sentenced to 4 years in prison by the Tarakan Court in East Kalimantan, and 22 members of the vessel's crew were deported to China. © WWF-TNC JOINT MARINE PROGRAM, BERAL

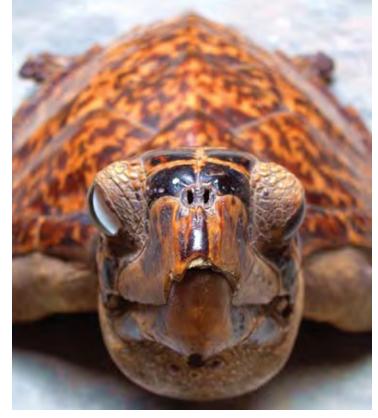
These latest accounts, however, are not news to Indonesian, Malaysian, or Philippine conservationists, who have been documenting turtle poaching for years. In June 2003, Bali police arrested five suspected turtle poachers and rescued 120 green turtles in a boat raid. In May 2004, Malaysian authorities apprehended 12 Chinese nationals in a vessel in Malaysian waters with 160 dead turtles onboard. In June 2005, researchers discovered a hidden turtle net with almost 150 turtles entangled and drowned. In February 2006, marine police in Bali, Indonesia, seized a boat loaded with 158 green turtles after being alerted by local fishers.

Similarly, Philippine authorities have apprehended numerous poachers originating from China and Vietnam. From as far back as 2002, vessels loaded with sea turtles, live reef fish, and sharks have been apprehended. Some incidents occur within areas of rich biological diversity, such as the Philippines' Tubbataha Reef Natural World Heritage Site. One of the most recent incidents occurred within the Turtle Islands Wildlife Sanctuary, where a Chinese vessel was found with more than 100 sea turtles. The story, if one tracks back long enough, is alarming.

What concerns Philippine conservationists most are the large numbers of hawksbill turtles that are being landed by the poachers. Fishers on apprehended vessels have the skills and materials to stuff and polish hawksbills onboard so they are ready for the curio trade when the vessels reach their home ports. Hawksbill shells are also fashioned into a variety of items, such as jewelry, violin bows, and guitar picks, all finding their way to countries as far away as the United States (see "Trade Routes for Tortoiseshell," pp. 24-25).

Green turtles are largely slaughtered for their meat, which is kept in ice storage. Dynamite and cyanide have also been taken as evidence in the seizures, creating concern that poachers are not only affecting sea turtles but also destroying coral reefs and other marine ecosystems.

Given that most of the apprehended vessels originate from Hainan province in China and that China is a signatory of the Convention on International Trade in Endangered Species and other protective treaties, conservationists are calling on the Chinese government to make significant and urgent inroads into curbing this illegal trade.



Stuffed, shellacked hawksbill turtles such as this one are often illegally caught in Southeast Asian waters to be sold as ornamentations in Asia. © VERONICA STEVANIA ANJAN

Research also must be conducted to fully understand the market forces at play in illegal wildlife trade and to design economic deterrents to such trade.

Beyond these measures, the Association of Southeast Asian Nations must strengthen its enforcement through collaborative initiatives that build on the many existing formal arrangements to protect turtles. Combating these destructive practices requires a multinational, multisector approach that will address this urgent, tragic situation.

Nicolas J. Pilcher is co-chair of the IUCN Marine Turtle Specialist Group and executive director of the Marine Research Foundation, based in Malaysia. Professor Chan Eng Heng heads the Turtle Research and Rehabilitation Group at Universiti Malaysia Terengganu. Romeo Trono is the executive director of the Sulu-Sulawesi Seascape project and the Philippines program for Conservation International. These three authors collaborate often on the issues addressed in this article.

# Big Conservation Impact from a Small Island

n a remote island in Indonesia's Raja Ampat archipelago, the Ayau people have pledged to forgo the main dish of their typical Christmas feast this year and every year: green turtle.

The Ayau community of 2,000, on an outlying island northwest of Papua, Indonesia, is a major consumer of turtle eggs and meat in Raja Ampat, especially during religious and adat (traditional) events. Traveling to nesting sites at Sayang and Piai Islands, also in Raja Ampat, for many years they poached 100 or more turtles and the eggs they carried for a single religious event each year. In the photo shown at right, in a symbolic ceremony to express their new commitment to sea turtle conservation, the Ayau turtle hunters burned a net used to capture the turtles.

The local Raja Ampat government and Indonesia's national government have declared Sayang and Piai Islands as one of seven marine protected areas within the archipelago. These commitments by the governments and the Ayau community are positive steps toward protecting one of Indonesia's remaining sea turtle rookeries. In 2007, approximately 1,000 nests laid on Sayang and Piai Islands were protected from poachers.



© CONSERVATION INTERNATIONAL-INDONESIA

The Ayau community, with the help of Papua Sea Turtle Foundation, Conservation International, and private donors, is now seeking a protein alternative for the previously relished turtle meat, such as establishing a small pig farm on the island. Taking their commitment one step further, the Ayau have begun reaching out to other island communities about also ceasing their turtle consumption.

"There's a great future in plastics..."



Mr. McGuire: I just want to say one word to you—

just one word.

Ben: Yes, sir.

Mr. McGuire: Are you listening?

Ben: Yes, I am. Mr. McGuire: "Plastics."

Ben: Exactly how do you mean?

Mr. McGuire: There's a great future in plastics. Think

about it. Will you think about it?

Ben: Yes, I will.

When Walter Brooke, as Mr. McGuire, spoke those words to Dustin Hoffman in his legendary role as Benjamin Braddock in the classic film *The Graduate*, audiences would not have known just how enduring the future of plastics would be. Quite likely, the very same plastics discarded in 1967, the year *The Graduate* took moviegoers by storm, still persist in landfills and in the ocean today. In fact, plastics now make up 60 to 80 percent of all marine debris—a percentage increasing at an alarming rate—with dire consequences for marine wildlife, including sea turtles.

Whether you live far inland or near the coasts, your actions have an impact on marine pollution. About 80 percent of marine debris, including plastics, comes from land-based sources such as landfills, industrial facilities, recreational activities, and sewage and storm runoff. These wastes can be carried great distances to the coasts and oceans by rivers, storm drains, and winds.

The other 20 percent of marine debris comes from merchant and passenger ships; offshore oil and gas platforms; fish farming operations; and other recreational, commercial, and military craft.

Plastics are popular because they are strong, durable, lightweight, and inexpensive. Unfortunately, these same characteristics also make plastics a danger to the environment, as they are persistent and easily carried on winds and currents. Aside from the direct physical impacts of plastic debris, the production of plastics, which are petroleum based, is also resource intensive and may contribute to climate change.

Sea turtles and other marine species are affected by plastic debris. The impacts of plastics on sea turtles fall into two main categories: entanglement and ingestion. Sea turtles entangled in plastic straps, ropes, lines, and nets can become trapped beneath the ocean surface and drown or may suffer injury or interference with their regular behaviors.

Ingestion of plastic fragments is also a real risk for sea turtles. Evidence suggests that turtles—especially young ones—feed indiscriminately, and plastic pieces often collect with passive drifting food sources. When ingested, some small plastic pieces can pass through the gut, but larger pieces completely block the digestive passages, and sharp-edged fragments cause internal injuries and infections. Plastic particles can also accumulate in the gut, where they suppress hunger and may lead to death.

An informal survey of professionals studying sea turtle stranding shows that the threats to sea turtles from plastic debris vary considerably around the world. More systematic studies are needed to explain these differences and to explore the possible ecosystemwide effects of marine plastic debris.

Despite some noteworthy efforts to reduce marine pollution (see "Leatherbacks—Going Faster Than You Think" on pages 30–31), the problem is growing. Fortunately, we, as individuals, can have a profound, positive effect by taking simple steps to reduce, recycle, and clean up:



- Reduce. Decrease your consumption of single-use, disposable plastic products.
   Bring your own reusable bags to the store, use refillable water bottles instead of single-use bottles and containers, and avoid products that use excessive packaging.
- Recycle. It is nearly impossible to avoid plastic altogether. When you do use plastic, be sure to recycle it. If you don't have a recycling program in your town, school, or workplace, request one! The demand for recyclable PET (polyethylene terephthalate, made from natural gas and petroleum) plastic is so high and the supply so low that recyclers are looking everywhere for new sources.
- Clean up. The Ocean Conservancy's International Coastal Cleanup (www.coastalcleanup.org) is one successful effort in which volunteers around the world collect trash from local coasts and waterways.

Roz Cohen, now retired, was a biological oceanographer with the National Oceanic and Atmospheric Administration. She currently volunteers with Conservation International's Sea Turtle Flagship Program. She gratefully acknowledges those who responded to her survey with valuable data, images, and insights that contributed to this article.

# **Plastics by the Numbers**

- More than 2.27 billion kg. (5 billion lbs.) of PET (polyethylene terephthalate) plastic products were manufactured in the U.S. in 2005.
- In the U.S., less than 25% of plastic bottles are recycled.
- Anywhere from 500 billion to 5 trillion plastic bags are used worldwide each year. Americans alone use about 380 billion plastic bags, sacks, and wraps each year.
- According to the city of San Francisco, less than 1% of plastic bags are recycled worldwide; 2% are recycled in the U.S.
- Roughly 6.4 million tons of marine litter are deposited in oceans and seas each year.
- 60% of trash on beaches is plastic. 90% of debris floating in the ocean is plastic.
- More than 13,000 pieces of plastic litter are floating on every square kilometer of ocean today (46,000 pieces per square mile).
- On a single day in 2006, volunteers with the Ocean Conservancy's International Coastal Cleanup helped clean 55,619 km. (34,560 mi.) of shoreline and removed about 3.18 million kg. (7 million lbs.) of trash; divers collected 103,079 kg. (227,250 lbs.) of debris from the riverbed and seafloor.
- In the North Pacific gyre, there are about 3 kg. (6 lbs.) of plastic for every 0.5 kg. (1 lb.) of zooplankton in the water column.
- Discarded plastic fishing gear and other plastic marine debris kill more than 1 million seabirds and 100,000 marine mammals and sea turtles each year.
- Worldwide, at least 267 species are affected by marine debris.

As far as the eye can see, marine debris litters the windward side of Laysan Island (Kauo) in the Northwestern Hawaiian Islands—from the book *Archipelago* by David Liittschwager and Susan Middleton.

© DAVID LIITTSCHWAGER AND SUSAN MIDDLETON

GREAT TURTLE

# Leatherbacks— Going Faster Than You Think

n April 2007, scientists, corporations, conservation partners, publicists, and educators joined together to host a creative new kind of conservation

awareness campaign: the Great Turtle Race. This major international event was organized by The Leatherback Trust, Tagging of Pacific Predators, Costa Rica's Ministry of Environment and Energy, and Conservation International.

In the race, satellite tags on 11 female leatherbacks tracked the turtles' migratory movements from the "starting line" at Playa Grande, Costa Rica, to the "finish zone" near Ecuador's Galapagos Islands, where the leatherbacks forage. Ten of the turtles were sponsored by a corporation or other institution.

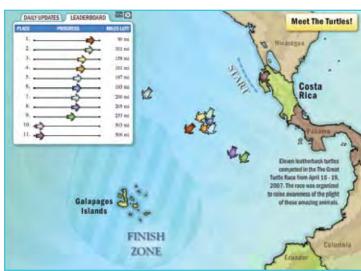
The eleventh turtle was named Stephanie Colburtle in honor of comedian Stephen Colbert. When notified of the tribute, Colbert introduced Stephanie and the Great Turtle Race to his audience of approximately one million fans on his hit Comedy Central show, "The Colbert Report," providing updates on Stephanie's progress throughout the race.

As a result of this and the hundreds of articles, television news reports, radio interviews, and online blogs covering the 14-day event, the Great Turtle Race captured the hearts, consciences, and fundraising dollars of U.S. and international audiences, reaching more than 28 million individuals in North America and more than 100 million internationally.

All of this was a great boon for leatherback turtles, which are "going faster than you think." Leatherbacks are 100 million-year-old, massive sea animals that survived the dinosaurs but are now dangerously close to extinction. Their numbers have decreased at Playa Grande from thousands of nesting turtles 10 years ago to fewer than 100 in the past five years. This online event raised funds to protect Playa Grande and raised awareness about what we humans can do—no matter where they live—to help protect sea turtles in our daily actions.

Stay tuned for a second Great Turtle Race, set to take place in May 2008. Keep an eye on www.greatturtlerace.com to find out more and cheer on your favorite turtle!





The turtles' movements were updated every few minutes on this animated map on the homepage of www.greatturtlerace.com, hosted by Yahoo!

#### Europe: In Paris, **France,** non-degradable plastic bags Asia-Pacific: are now banned in large In Bangladesh, polyethylene bags are banned in Since 1994, Denmark has the capital city of Dhaka. taxed retailers for their use Since 1999, plastic bags **Americas:** of plastic bags. and bottles have been In North America, millions of banned in the Khumbu dollars are being invested in region, near Mt. Everest, "bag to bag" recycling, using in Nepal. material from recycled plastic bags to create new plastic bags. In March 2007, Mayor Gavin Africa: Newsom of San Francisco, California, U.S.A. passed a city-Zanzibar has wide ban on nonbiodegradable banned the import plastic bags in supermarkets, and production of drugstores, and other large plastic bags retailers, requiring them to offer Eritrea introduced a bags made of recyclable paper, ban on plastic bags in 2005. compostable plastic, or reusable cloth instead.

Plastic bag policies are being implemented in many different locations around the world. These are a few examples.

Did you know that each year, thousands of sea turtles choke on plastic bags after mistaking them for jellyfish, a favorite food? During the Great Turtle Race, race fans and

> pollution for sea turtles like me and for other animals in the ocean. As a result, more than 17,000 people have taken a personal online pledge to reduce their personal plastic consumption!

I spread the word about the dangers of plastic

Governments and corporations around the world are also beginning to take note of this important issue. The map above shows a few examples, and I'd like to say "thanks!" and "great job!" to all of the leaders who are doing their part to reduce plastic pollution.

Be sure to read the article about plastic marine debris on pages 28–29

of the magazine to learn more about why plastics are so dangerous to ocean critters and how your daily actions can make a difference!

RIGHT: The turtle known as Billie, sponsored by Offield Center for Billfish Studies, took first place on Day 11 of the Great Turtle Race, followed by Stephanie Colburtle and GITI Tires Champira in second and third places, respectively, on Day 12.

BELOW: Each time Stephen Colbert included the Great Turtle Race in his comedy sketches on "The Colbert Report," website hits at www.greatturtlerace.com skyrocketed.





# **Reaching Out around the World**

### 2007 SWOT Outreach Grants

ne of the most successful aspects of the SWOT initiative has been the implementation of a small fund for grants to organizations wishing to incorporate SWOT Report into outreach efforts in communities around the world. For the second consecutive year, these grant recipients have sparked inspiration not only in their target audiences, but also in the editorial team of SWOT Report, which oversees the grants. We thank you for your efforts.



A ranger for the Nicaraguan Ministry of Environment holds eggs from the turtle nests damaged by poachers. © KIM WILLIAMS-GUILLEN / PASO PACÍFICO

### Paso Pacífico — Nicaragua

Paso Pacífico's sea turtle outreach and education campaign in San Juan del Sur, Rivas, Nicaragua, is aimed at communities surrounding the La Flor Wildlife Refuge, an important olive ridley and leatherback nesting ground. Paso Pacífico strives to increase local appreciation for sea turtles and their environment and to enhance cooperation among La Flor reserve managers for the benefit of the sea turtles and sustainable tourism. With SWOT Outreach Grant funds, workshops were held in the communities of La Tortuga, Ostional, and Escamequita, sharing lessons from volumes I and II of SWOT Report, to emphasize the importance of community involvement. Sixty-five participants, including fishers and youth from the community, were introduced to the sea turtle species of the region and the conservation challenges they face. Individual meetings to explain the campaign were held with community leaders, members of the municipal government, and the Nicaraguan Ministry of Environment. Paso Pacífico plans to continue efforts to promote coastal and marine conservation through various ecotourism, educational, and community-led turtle monitoring programs.

### **Sea Turtle Conservation** Project — Lebanon

In a country where recent war has complicated daily life, Mona Khalil has been successful in creating the Sea Turtle Conservation Project in south Lebanon. The program raises awareness and helps to protect the sea turtle nesting beach of El Mansouri-El Koliala. Mona's SWOT Outreach project was targeted at volunteers on the beach. Initially, students from other regions of the country were enlisted to help protect the nesting beaches, but because of the recent war, they were unable to take part. Tourists on seaside holidays and soldiers stationed on the beach, however, were available and willing to lend a hand in monitoring and cleaning up the beach. Local teachers began to disseminate conservation information from sources



Soldiers stationed at El Mansouri-El Koliala beach engage in conservation efforts. © MONA KHALIL

such as SWOT Report, Vol. II—which featured an article by Khalil about El Mansouri-El Koliala—to their students and communities, raising awareness about the importance of protecting the nesting beach. Several groups of special needs children were also given the opportunity to assist in the release of sea turtle hatchlings. Despite rigorous challenges, Khalil's relentless effort has increased the conservation consciousness of nearby communities, government authorities, and foreign visitors, mitigating the hazards to turtles in their nesting habitat.



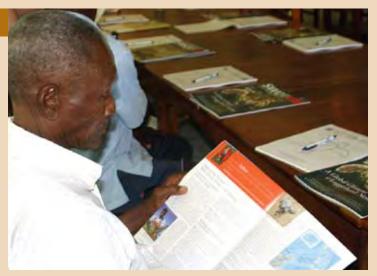
The sea turtle tagging crew on Gielop Island, Ulithi Atoll, finds an entertaining way to demonstrate how to measure a turtle's carapace. © OCEANIC SOCIETY

### Oceanic Society — Micronesia

The Ulithi Sea Turtle Conservation Project, conducted through the Oceanic Society, is located on Falalop Island, Ulithi Atoll, Yap, Micronesia. With SWOT Outreach Grant funds, sea turtle education programs for the local community and visiting ecotourists were enhanced by educational materials from SWOT Report. Educational outreach focused on regional sea turtle conservation activities that were created for teachers, students, and community leaders on Falalop Island. As a means of expanding outreach efforts, a Sea Turtle Information Workshop was held for educators from the whole of Yap state, attracting more than 30 participants, who received copies of SWOT Report and educational supplies to add to their schools' libraries. Funds from SWOT supported educational exchanges between ecotourists and community members employed by the sea turtle project. The SWOT grant, in combination with ecotourist donations, also facilitated a Sea Turtle Scholarship awarded to an outstanding Ulithi student to cover high school tuition fees. These programs have generated a greater commitment to the efforts of the local population involved in sea turtle conservation.

### **ProTECTOR** — Honduras

Using the SWOT Outreach Grant, Protective Turtle Ecology Center for Training, Outreach and Research (ProTECTOR) conducted two workshops at the Reef House Resort on the island of Roatan in Honduras. The workshops were designed to facilitate positive change among indigenous fishers of the Bay Islands. Workshop attendees, who varied in age from schoolchildren to retired fishers, learned to understand the critical links between tourism and marine conservation. Group discussions and open forums were held to discuss alternatives to harvesting turtles and their eggs as a source of income. The workshops resulted in the development of a plan for a conservation-based craft market that will combine community development, tourism interest, and conservation of sea turtles and the sea. Furthermore, a grassroots movement was launched among the attendees to facilitate a change from "poachers to ProTECTORs" within many communities.



Longtime fisher Gustav Bodden reads through SWOT Report for advice on sea turtle conservation at the first Fishermen's Conservation Workshop held in Oak Ridge on the island of Roatan in Honduras. © ProTECTOR

Puppets such as this Chennai fisherman and sea turtle are used to educate children about marine conservation issues. © MADRAS CROCODILE BANK TRUST

#### Madras Crocodile Bank Trust — India

The coast of Chennai in southern India has been a historically important nesting area for sea turtles. Recognizing the importance of educating and sensitizing local Chennai schoolchildren, the Madras Crocodile Bank Trust (MCBT) seeks to integrate those children into its Awareness Programs for Conservation of Sea Turtles. Using funds from its SWOT Outreach Grant, MCBT inaugurated its educational program at Bhuvana Krishnan Matriculation Higher Secondary School in the state of Tamil Nadu. There, nearly 200 children, ages 12 to 15, and their teachers enjoyed MCBT's puppet theater, poster exhibition, and slideshow about conservation of Chennai's olive ridley turtles. The bank plans to extend its program to several local schools in the coming months, contributing copies of SWOT Report to each school's library.

Visit www.SeaTurtleStatus.org to apply for a 2008 SWOT Outreach Grant!



An olive ridley turtle off the Pacific coast of Costa Rica is hooked on a longline. © SAM FRIEDERICHS

he impacts of fisheries are among the five top hazards to sea turtles worldwide according to the IUCN Marine Turtle Specialist Group. One of the gravest fishery concerns is that of incidental capture, or bycatch, which accounts for the deaths of tens of thousands of turtles annually—deaths that are unintended, unwanted even by the fishers involved, and preventable. With years of data, world opinion, and technology combining to make the problem solvable, the fight against sea turtle bycatch may be reaching its tipping point at last.

Among Eastern Tropical Pacific countries, for instance, three years of collaborative engagement of fishers, nonprofit organizations,



Bycatch is one of the greatest current threats to sea turtles, including olive ridleys (shown in this photo). Solutions that effectively reduce catch rates and do not put fishermen out of business are socially acceptable and likely to be sustainable. © ALVARO SEGURA / WWW

researchers, and government agencies have led the way toward a profound transformation in the longline fishing industry. Nearly 300 vessels, 1,200 fishers, and 300 captains now participate in a reduction program. bycatch Eighty-six vessels now fully use turtle-friendly circle hooks and best fishing practices, and many more are making the shift.

This regional effort was initiated in 2003 in Ecuador by fishers, WWF, the Inter-American Tropical Tuna Commission, the National Oceanic and Atmospheric Administration, and the Ocean Conservancy, as reported in SWOT Report, Vol. I (2005). The effort has expanded to a network of partners in Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Panama, and Peru, actively seeking solutions to bycatch problems and making changes that ensure the sustainability of their fisheries.

In the coming three years,

this network will reach at least 2,000 artisanal longline vessels—a testimony to the fishers' willingness to prevent sea turtle bycatch and to adopt an ecosystem perspective toward the business of extracting ocean resources. The change is timely, amid an international market that increasingly demands sustainably sourced seafood.

Sea turtle bycatch is a major issue in longline fisheries targeting mahi mahi, swordfish, tuna, and other large fish. To achieve solutions, fishers deploy experimental fishing lines and act as onboard observers to collect scientific information, including turtles' interactions with the fishing gear. More than 1,000 experimental fishing trips and 1.6 million set hooks feed the regional database to test the gear's ecological and economic performance. One important conclusion has been that circle hooks are less harmful for turtles than J-hooks.

Most fishers are satisfied with the gear change, because in addition to reducing marine turtle mortality, large circle hooks and J-hooks have similar catch rates of tuna. However, catch rates of mahi mahi may be reduced by certain circle hooks in some fisheries. Continued research will refine the solutions to best suit the industry and to protect the turtles.

By far the most important achievement of this program to date has been the development of a trusting relationship among the fishing industry, non-profit organizations, and government agencies in focusing on the common goal of bycatch reduction.

Carlos Drews is WWF's marine program and species coordinator for Latin America and the Caribbean. His work with sea turtles during the past four years addresses community well-being, bycatch, and climate change with a regional perspective and includes publications on the economic value and livelihoods value of turtles.



any tourists visit Florida each year with Mickey Mouse and Shamu on their minds. The Marco Island Marriott Beach Resort and Spa and the Harbor Beach, Fort Lauderdale, Resort and Spa are giving some Florida tourists another animal to consider: sea turtles. These tourists, however, are in the mood for something a bit more risqué than Disney's Magic Kingdom or Sea World.

During sea turtle nesting season, these two resorts market to couples looking for romantic getaways with puckish promotions such as their "Fertile Turtle" and "Nocturnal Nesting" promotions. Playing on sea turtles' age-old reputation for fertility and virility (after all, it is rumored that turtles can copulate for as long as two weeks), these promotional packages include fertility-enhancing teas, couples massages with pregnancy-promoting aromatherapy, aphrodisiacinfused cocktails, and romantic moonlight beach walks for couples hoping to fertilize eggs of their own.

The night walks, guided by park rangers, offer guests the opportunity to witness sea turtles nesting. Meanwhile, the resorts take precautions to protect the turtles and their nesting habitats with turtle-friendly black exterior light bulbs and blackout drapes in guest rooms. At the Harbor Beach property, agents from the U.S. Environmental Protection Agency survey the beach each morning to ensure that nests laid overnight are taped off. A portion of the proceeds from the Marco Island property's "Fertile Turtle" package goes to the

At the Marco Island Marriott Beach Resort and Spa, the "Fertile Turtle" package includes a couples massage with chasteberry aromatherapy. Chasteberry is an herb that purportedly increases fertility by stimulating the pituitary gland, which regulates the body's production of estrogen, progesterone, and testosterone. © MARCO ISLAND MARRIOTT BEACH RESOFT

National Save the Sea Turtle Foundation, which educates children about sea turtle conservation.

Both the "Fertile Turtle" and the "Nocturnal Nesting" packages have been well received, with numerous guests inquiring about each package. The hotels that have been successful in fostering loggerhead turtle conservation will offer these packages again in the summers ahead.

# **SWOT Data Contributors**

#### **Definitions of Terms**

Nests: A count of the number of nests laid by hawksbill females during the monitoring period.

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

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

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

Estimated nests: An estimate of the number of hawksbill nests laid in a season. Methods of estimation vary.

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

Year: The year in which a given nesting season ended (e.g., data collected between late 2005 and early 2006 are listed as year 2006).

### **Hawksbill Data Citations**

#### **Guidelines for Data Use and Citation**

The hawksbill nesting data below correspond directly to this report's feature map (pp. 11-12), organized alphabetically by country and beach name. Every data record with a point on the map is numbered to correspond with that point. These data have come from a wide variety of sources and in many cases have not been previously published. Data may be used freely, but must be cited to the original source as indicated in the "Data Source" field of each record. Only original data are reported here—not the converted values that were sometimes used in the feature map. For more information on data conversions, see the sidebar

In the records below, nesting data is reported from the last complete nesting season in 2006 from all available beaches. For those beaches from which recent data were not available, the most recently available data are reported.

#### **Important Note about Hawksbill Data**

Great effort has gone into providing sufficient information with each data record to allow the quality and source of the record to be fairly evaluated. While every attempt has been made to ensure the accuracy of these data, absolute accuracy cannot be guaranteed. Information on monitoring effort and its relativity to the nesting season are reported where available in order to allow for a more complete evaluation of

### ANGUILLA, BRITISH OVERSEAS TERRITORY

**Data Record 1** 

Data Source: Gumbs, J. 2008. Hawksbill nesting in Anguilla Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beaches: Barnes Bay, Cove Bay, Junk's Hole Bay, Limestone Bay, Long Bay, Mead's Bay, Mimi Bay, Savannah Bay, Windward Point, Sandy Hill Bay, and Shoal Bay East

Year: 2006 Count: 5-10 estimated nests at each

Nesting Beaches: Blackgarden Bay and Captain's Bay Year: 2006 Count: 1–5 estimated nests at each

Comments: At present, there is no nesting beach monitoring program in Anguilla. Nesting numbers are estimated annual averages based on historical data.

**SWOT Contact:** James Gumbs

#### ANTIGUA AND BARBUDA

Data Source: Munhofen, J., and S. Ramirez. 2007. Tagging and Nesting Research on Hawksbill Turtles (Eretmochelys imbricata) at Jumby Bay, Long Island, Antigua, West Indies. Jumby Bay Hawksbill Project, WIDECAST. Unpublished report.

Nesting Beach: Pasture Bay

Year: 2006 Count: 224 nests, 62 nesting females

Beach Length: 450 m

Monitoring Effort: Nightly patrols covering the entire beach were conducted between June 15 and November 15, 2006. Nesting season is June to mid-November, with its peak in August.

SWOT Contacts: Peri Mason and Jim Richardson

#### Data Record 3

Data Source: Van der Wal, E., and R. Van der Wal, Turtugaruba (Aruban Foundation for Sea Turtle Protection and Conservation). 2008. Hawksbill nesting in Aruba. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Arashi Beach

Year: 2006 Count: 0 nests Beach Length: 0.6 km **Monitoring Effort:** Daily morning patrols covering the entire beach were conducted between June 1 and October 15, 2006 Although no hawksbill nesting was recorded in 2006, hawksbills have been known to nest at this site in past years. Nesting season is June to November.

Nesting Beach: Baby Beach

Year: 2006 Count: 5 nests Beach Length: 100 m Monitoring Effort: Nightly patrols covering the entire beach were conducted between August 1, 2006 and January 20, 2007. Nesting season is June to November, with its peak in September and October.

SWOT Contacts: Edith and Richard Van der Wal

#### **AUSTRALIA**

Data Source: Limpus, C. J., and J. D. Miller. 2000. Final Report for Australian Hawksbill Turtle Population Dynamics Project. Queensland, Australia: Queensland Parks and Wildlife Service, and the Japan Bekko Association.

Nesting Beaches: Albany Island, Aukane Island, Bet Island, Bourke Island, Boydong Island, Dadalai Island, Layoak Island, Mimi Island, Mt. Adolphus Island, Saddle Island, Zuizin Island, and an unnamed island, Queensland

Comments: Nesting data from 2006 were not available. Aerial surveys combined with on-the-ground counts in February 1997 found that these 12 islands in the Torres Strait and Northeastern Queensland each hosted between 100 and 500 nesting hawksbills annually. An additional 28 islands in this region were found to have an estimated 10-100 nesting hawksbills per year, and another

27 islands were found to have an estimated 1–10 hawksbill nesting females per year. Limpus and Miller (2000) estimated that the total hawksbill nesting population in Queensland was approximately 4,000 nesting females annually.

Nesting Beaches: Dayman Island, Hawkesbury Island, and Long Island, Torres Strait, Queensland

**Comments:** Nesting data from 2006 were not available. Aerial surveys combined with on-the-ground counts in February 1997 found that these three islands each hosted more than 500 nesting hawksbills annually.

Nesting Beaches: Outer English Company Islands and the northeastern, northwestern, and southeastern areas of Groote Evlandt and nearby islands, Northeastern Arnhem Land,

Comments: Nesting data from 2006 were not available. Aerial surveys combined with on-the-ground counts in 1997 documented 12 sites in Northeastern Arnhem Land that are each estimated to host more than 100 nesting hawksbills annually. Nesting on these beaches is concentrated in the four general areas listed above: the outer English Company Islands, the northeastern area of Groote Eylandt Island, the northwestern area of Groote Eylandt Island, and the southeastern area of Groote Eylandt Island.

#### **Data Record 5**

Data Source: Pendoley, K., Howitt, L., Speirs, M., and A. Viternbergs. 2008. Hawksbill nesting in Western Australia. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008). Nesting Beach: Bivalve Beach, Pilbara, Western Australia Year: 2006 Count: 1 tagged female Beach Length: 0.6 km

Nesting Beach: Mushroom Beach, Pilbara, Western Australia Year: 2006 Count: 2 tagged females Beach Length: 1.2 km

Nesting Beach: YCN, Pilbara, Western Australia Year: 2006 Count: 2 tagged females Beach Length: 1.1 km

Nesting Beach: YCS, Pilbara, Western Australia Year: 2006 Count: 2 tagged females Beach Length: 0.9 km Monitoring Effort: Nightly patrols were conducted at each of the above beaches from November 22 to December 21, 2006 Nesting season is September to December, with its peak in October and November.

Nesting Beach: Rosemary Island, Western Australia Year: 2006 Count: 423 tagged females Beach Length: 2.2 km Monitoring Effort: Nightly patrols were conducted from October 13 to 27, 2006. Nesting season is September to December, with its peak in October and November.

Nesting Beach: Varanus Island, Western Australia Year: 2006 Count: 22 tagged females Beach Length: 320 m Monitoring Effort: Nightly patrols were conducted from October 26 to November 9, 2006. Nesting season is September to December, with its peak in October and November.

SWOT Contact: Kellie Pendoley

**Data Source:** Bell, I. P. 2006. *Milman Island Nesting Studies 8th to 29th January 2006*. Queensland Parks and Wildlife Service. Nesting Beaches: Cairncross Island, Crocodile Island, Douglas Island, and Sinclair Island, Oueensland

Comments: These islands, near Milman Island, were not monitored during 2006, but they are known to host low-density hawksbill nesting.

Nesting Beach: Milman Island, Queensland Year: 2006 Count: 229 confirmed nests, 112 nesting females Beach Length: 2.4 km

Monitoring Effort: Nightly patrols were conducted from January 8 to January 29, 2006. These counts should be considered minimum values; sting season was well advanced before the monitoring period. SWOT Contacts: Ian Bell, Kirstin Dobbs, and Colin Limpus

#### THE BAHAMAS

**Data Source: (1)** Bolten, A. 2008. Hawksbill nesting in Bahamas: Personal communication. In *SWOT Report—The State of the World's* Sea Turtles, vol. 3 (2008). (2) Mortimer, J. A., and M. Donnelly Forthcoming. Eretmochelys imbricata. In IUCN 2008, 2008 IUCN Red List of Threatened Species.

Comments: Nesting data from 2006 were not available. There is scattered low-density nesting throughout the approximately 700 cays of the Bahamas. Although there is no monitoring, rough estimates place between 500 and 1,000 hawksbill nests each year throughout the Bahamian Archipelago

SWOT Contacts: Karen Bjorndal and Alan Bolten

#### **BARBADOS**

**Data Source:** Horrocks, J., Krueger, B., and J. Beggs. 2008. Hawksbill nesting in Barbados. In *SWOT Report—The State of the World's* Sea Turtles, vol. 3 (2008).

Nesting Beach: Bath Beach

Year: 2006 Count: 102 nests Beach Length: 0.9 km

Monitoring Effort: The entire beach is patrolled each morning yearround. Peak nesting is May to September.

Nesting Beach: East Coast Beaches Year: 2006 Count: 59 nests Beach Length: 9 km

Monitoring Effort: Beaches were patrolled weekly from March 1 to July 31, 2006. Peak nesting is between March and July.

Nesting Beach: Needham's Point Beach

Year: 2006 Count: 354 nests Beach Length: 1.1 km **Monitoring Effort:** As an index beach, it was patrolled all night, every night, from May to September, twice every night from October to November, and once every week from December through April. Nesting is year-round, with its peak from May to September

Nesting Beach: South Coast Beaches

Year: 2006 Count: 261 nests Beach Length: 4.5 km Monitoring Effort: Beaches on the South Coast were patrolled twice every night during the peak nesting season from May to September, every night from October to November, and once every week from December to April.

Nesting Beach: West Coast Beaches

Year: 2006 Count: 1,044 nests Beach Length: 22 km Monitoring Effort: Beaches on the West Coast were patrolled twice every night during the peak nesting season from May to September, every night from October to November, and once every ek from December to April.

SWOT Contacts: Jen Beggs, Julia Horrocks, and Barry Krueger

#### BELIZE

Data Source: (1) Dow, W. E., and K. L. Eckert. 2007. Sea Turtle Nesting Habitat—A Spatial Database for the Wider Caribbean Region. Wider Caribbean Sea Turtle Conservation Network (WIDECAST) and The Nature Conservancy. WIDECAST Technical Report No. 6. Beaufort, North Carolina. (2) Mortimer, J. A., and M. Donnelly. Forth-coming. *Eretmochelys imbricata*. In IUCN 2008, 2008 IUCN Red List of Threatened Species. (3) Smith, G. W. 1992. Hawksbill turtle nesting at Manatee Bar, Belize, 1991. *Marine Turtle Newsletter* 57:1–5. **Nesting Beaches:** Manatee Bar, Sapodilla Cays, and South Water Caye

Comments: Nesting data from 2006 were not available. These areas are known to support hawksbill nesting.

#### **BRAZIL**

#### **Data Record 10**

**Data Source:** Marcovaldi, M., Soares, L., and C. Bellini. 2008. Hawksbill nesting in Brazil. In *SWOT Report—The State of the* World's Sea Turtles, vol. 3 (2008).

Nesting Beaches: Abaís, Pirambu, and Ponta dos Mangues, Sergipe state

Year: 2006 Count: 118 nests Beach Length: 125 km

**Nesting Beaches:** Arembepe, Costa do Sauipe, Praia do Forte, Costa do Sauipe, and Sitio do Conde, Bahía state Year: 2006 Count: 1,159 nests Beach Length: 213 km

Nesting Beaches: Pipa, Rio Grande do Norte state Year: 2006 Count: 240 nests Beach Length: 9 km

Monitoring Effort: At all of the above beaches, the entire beach was patrolled daily and nightly from September 1, 2005, to March 31, 2006. Nesting season is early September to late March, with its peak from December to February

SWOT Contacts: Claudio Bellini, Maria A. Marcovaldi, and Luciano Soares

#### CAMEROON

#### Data Record 11

Data Source: CEROCOMA and PROTOMAC. Rapport des Activités. Cameroon, Central Africa. Unpublished report.

Nesting Beaches: Beaches south of the town of Kribi Year: 2006 Count: 0 nests

Monitoring Effort: The entire beach was patrolled daily from September 11, 2005, to April 30, 2006. Nesting season is September

SWOT Contacts: Alain Gibudi and Jules Ngunguim

#### CAYMAN ISLANDS, BRITISH OVERSEAS TERRITORY Data Record 12

 $\textbf{Data Source:} \ \mathsf{Solomon, J., and J. Blumenthal.} \ \textit{Cayman Islands}$ Government, Department of Environment Annual Marine Turtle Beach Monitoring Program 2006. Unpublished report.

Nesting Beach: Frank Sound, Grand Cayman Year: 2006 Count: 4 nests Beach Length: 1.43 km

Nesting Beach: Seven Mile Beach, Grand Cayman Year: 2006 Count: 1 nest Beach Length: 8.83 km

Monitoring Effort: The entire beach was patrolled twice per week from April 28 to September 28, 2006. Nesting season is early-May to mid-July, with its peak from May to July.

SWOT Contacts: Joni Solomon and Janice Blumenthal

#### CHAGOS ARCHIPELAGO **BRITISH OVERSEAS TERRITORY**

**Data Source:** Mortimer, J. A., and M. Day. 1999. Sea turtle populations and habitats in the Chagos Archipelago. In C. R. C. Sheppard and M. R. D. Seaward, eds, 1999, *Ecology of the Chagos Archipelago*, Linnean Society Occasional Publications 2.

Nesting Beaches: Chagos Archipelago

**Comments:** Nesting data from 2006 were not available. An estimated 300 to 700 hawksbill nests are laid each year in the Chagos Archipelago. The most abundant nesting is on the islands of Peros Banhos and Diego Garcia.

SWOT Contact: Jeanne A. Mortimer

#### **CHINA**

#### Data Record 14

Data Source: (1) Cheng, I. J. 1995. Sea turtles at Dungsha Tao, South China Sea. *Marine Turtle Newsletter* 70:13–14. **(2)** Cheng, I. J. 1996. Sea turtles at Taipin Tao, South China Sea. Marine Turtle Newsletter letter 75: 6–8. **(3)** Liang, Y. L., Dai, Y. R., Liu, Y. Q., Liu, S. Y., Wan, X. J., Song, Z. H., Chen, D. T., et al. 1990. The investigation of sea turtle resources in the South China Sea and the development of artificial hatching techniques for sea turtles. *In Report of the South China Sea* Turtle Resources Conservation Station, Major Research Project of the Aquaculture Department. China: Bureau of Agriculture.

Nesting Beach: Donsha, Taiwan

Comments: Nesting data from 2006 were not available. The last record of nesting is from 1995 when 5 nests and beach crawls were found during nightly surveys. Nesting season is from May to October.

Nesting Beach: Qilianyu, Xhisha Archipelago Comments: Nesting data from 2006 were not available. Hawksbills are known to nest on this beach in limited numbers.

**Nesting Beach:** Taipin Tao, Nan-sha Archipelago, Taiwan **Comments:** This is a military-controlled island, and nesting data from 2006 were not available. Surveys conducted in 1996 found that hawksbills nest on these beaches.

SWOT Contact: I-Jiunn Cheng

#### COLOMBIA

Data Record 15

Data Source: Patiño-Martinez, J., and L. Quiñones. 2008. Hawksbill nesting in Colombia: Personal communication. In SWOT Report-The State of the World's Sea Turtles, vol. 3 (2008)

Nesting Beaches: Acandi-Chilingos, Capitancito, Playeta, Playona, and Pueblo Nuevo

Comments: Each of these beaches contains hawksbill nesting of unknown numbers, beginning in May and with an unspecified end date. This information was determined through track counts and interviews with local residents

SWOT Contacts: Juan Patiño Martinez and Liliana Ouiñones

**Data Source**: Pavia, A., and C. Monterrosa. 2008. Hawksbill nesting in Tayrona National Park, Colombia. In *SWOT Report—The State of* the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Arrecifes, Tayrona National Park, Magdalena

Year: 2006 Count: 3 nests, 11 crawls Beach Length: 2.5 km **Monitoring Effort:** The entire beach was patrolled daily from April to September, 2006. Nesting season is May to September, with its peak in July and August.

SWOT Contacts: Carolina Monterrosa and Alejandro Pavia

#### **COSTA RICA**

Data Source: Gaos, A. R., Yañez, I. L., and R. M. Arauz. 2006.

Sea Turtle Conservation and Research on the Pacific Coast of Costa Rica. Programa Restauración de Tortugas Marinas (PRETOMA).

Nesting Beach: Caletas-Ario National Wildlife Refuge Year: 2006 Count: 4 nests Beach Length: 5 km Monitoring Effort: The entire beach was patrolled nightly from July 1, 2005, to March 31, 2006.

SWOT Contacts: Alexander Gaos and Ingrid Yañez

**Data Record 18** 

Data Source: Hutchinson, A. 2008. Hawksbill nesting on Playa Camaronal, Costa Rica: Personal communication. In SWOT Report—

The State of the World's Sea Turtles, vol. 3 (2008). **Nesting Beach:** Camaronal National Wildlife Refuge

Comments: Nesting data from 2006 were not available. Camaronal is known to host sporadic hawksbill nesting of one or two nests

**SWOT Contact:** Alec Hutchinson

#### **Data Record 19**

Data Source: Chacón-Chaverrí, D. 2008. Hawksbill nesting in Costa Rica: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Isla Uvita, Limón Year: 2006 Count: 1–2 nests per year Nesting Beach: Manuel Antonio National Park

Year: 2006 Count: 1–2 nests per year Nesting Beach: Playa Cahuita Year: 2006 Count: 25-75 nests per year

Nesting Beach: Playa Gandoca Year: 2006 Count: 15-25 nests per year

Nesting Beach: Playa Pacuare Year: 2006 Count: 1-2 nests per year Nesting Beach: Playa Platanares, Osa Peninsula

Year: 2006 Count: 1-3 nests per year Nesting Beach: Punta India to Rayo, Guanacaste

Year: 2006 Count: 1–2 nests per year Nesting Beach: Rio Oro, Osa Peninsula Year: 2006 Count: 1 estimated nest per year

Nesting Beach: Punta India to Rayo, Guanacaste Year: 2006 Count: 1-2 nests per year

Comments: Pacific Costa Rica hosts sporadic hawksbill nesting.

SWOT Contact: Didiher Chacón

### **Data Record 20**

**Data Source**: Piedra, R. 2008. Hawksbill nesting on Playa Langosta, Costa Rica: Personal communication. In *SWOT Report—The State of* the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Playa Langosta, Las Baulas National Marine Park,

Year: 2006 Count: 0 nests Beach Length: 1.3 km Comments: The most recently recorded hawksbill nests on Playa Langosta were noted in 2003, when two nests were encountered. SWOT Contact: Rotney Piedra

**Data Source:** Venegas, R. 2006. *Report of Activities and Research in Pacuare Reserve, 2006 Season.* Pacuare Reserve Marine Turtle Conservation Project, Playa Mondonguillo. Endangered Wildlife Trust. Unpublished report.

Nesting Beach: Playa Mondonguillo, Limón province Year: 2006 Count: 2 nests, 5 nesting females

Beach Length: 5.7 km



© COURTESY OF MAHTA GOITON

Mahta Goitom, Yohannes Teclemariam, and Tekle Mengstu Eritrea's Coastal Marine and Island Biodiversity Project: Location: Massawa, Eritrea

Our project has found that 109 sites in the Eritrean Red Sea host hawksbill nesting. Our goals have been to summarize the status of sea turtle populations in Eritrea and provide conservation recommendations to coastal and marine authorities. Our project phased out in December 2007, but we hope that our work will generate long-term efforts to conserve and study sea turtles in our country.



Cartography Special Interest Group has presented SWOT map coordinator Kellee Koenig, based at

Monitoring Effort: The entire beach was patrolled daily and nightly from February 28 to September 30, 2006.

**SWOT Contact:** Ruben Venegas

#### Data Record 22

**Data Source:** Castro-Morales, C., and F. Campos-Rodriguez. 2006. *Final Report: Research and Protection of the Leatherback, Green and* Hawksbill Turtles of the Parismina River Mouth. Asociación Salvemos Las Tortugas de Parismina. Unpublished report. Nesting Beach: Playa Parismina, Limón province

Year: 2006 Count: 3 nests Beach Length: 5.6 km Monitoring Effort: The entire beach was patrolled nightly from February 15 to October 15, 2006. Nesting season is May to August. SWOT Contact: Vicky Taylor

#### Data Record 23

Data Source: De Haro, A., et al. 2007. Report on the 2006 Green Turtle Program at Tortuguero, Costa Rica. Caribbean Conservation Corporation. Unpublished report.

Nesting Beach: Playa Tortuguero, Tortuguero National Park Year: 2006 Count: 14 nesting females Beach Length: 29 km Monitoring Effort: Approximately 8.0–14.5 kilometers of beach were patrolled nightly from March 5 to October 31, 2006. Nesting is April to November with its peak from May to July.

SWOT Contact: Emma Harrison

### **CÔTE D'IVOIRE**

#### Data Record 24

**Data Source:** Fretey, J. 2001. *Biogeography and Conservation of Marine Turtles of the Atlantic Coast of Africa*. CMS Technical Series, Publication No. 6. Bonn, Germany: United National Environment Program / Convention on Migratory Species Secretariat.

Nesting Beaches: Beaches of Balmar and Many-Dodo Comments: Local fishermen report hawksbill nesting on these beaches. Nesting numbers are unknown, and are presumed to be low. **SWOT Contact:** Jacques Fretey

#### **CUBA**

#### Data Record 25

**Data Source: (1)** Moncada, F., Carrillo, E., Saenz, A., and G. Nodarse. 1999. Reproduction and nesting of hawksbill turtle, *Eretmochelys* imbricata, in the Cuban Archipelago. Chelonian Conservation and Biology, vol. 3, no. 2 (1999). (2) Moncada, F., Nodarse, G., Medina, Y., and E. Escobar. 2006. Annual Report on Hawksbill Turtle (Eretmochelys imbricata) Research in Cuba (February 2006–February 2007). Cuba: Marine Turtle Project, Fisheries Research Center. (3) Moncada, F. 2008. Hawksbill nesting in Cuba: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008). Nesting Beaches: Playas del Laberinto de las Doce Leguas,

Camaguey and Ciego de Avila provinces

Year: 2006 Count: 120 nests Beach Length: 37.71 km Monitoring Effort: Nightly beach patrols were conducted from October 1, 2006 to January 31, 2007. Nesting season is October to January with its peak in November.

Comments: Hawksbills nest throughout the Cuban archipelago in many sites where monitoring is not possible. Previous estimates of annual nesting are that between 2,000 and 2,500 nests are laid per year throughout Cuba. However, these estimates are not current and nay need revision

SWOT Contact: Félix Moncada

#### **DOMINICA**

Data Record 26

Data Source: Byrne, R. 2008. Hawksbill nesting in Dominica: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beaches: Bodega Bay, Cabana Beach/Londonderry, Hamstead Beach, Marigot Beach, and Woodford Hill **Year:** 2006 **Count:** 10–15 nests per year at each beach Beach Length: Each beach is less than 1 km in length, with the exception of Cabana Beach/Londonderry, which is slightly less

Nesting Beaches: Castaways Beach, Castle Bruce, Donkey Beach, La Plaine-Bout Sable Beach, Maho Beach, Massace Beach, Petit Soufiere, Point Michele, Pottersville Roseau, Rockaway Beach, Rosalie Beach, Scotts Head, and Soufiere

Year: 2006 Count: 1-5 nests per year at each beach

Nesting Beaches: Dublanc Beach, Macousirie Beach, Portsmouth Beach, Salisbury Beach, and Toucarie Beach

Year: 2006 Count: 5–10 nests per year at each beach

#### SWOT Contact: Rowan Byrne DOMINICAN REPUBLIC

#### **Data Record 27**

Data Source: Tomás, J., León, Y. M., Feliz, P., Geraldes, F. X., Broderick, A. C., Fernández, M., Godley, B. J., and J. A. Raga. 2007. Sea turtle nesting populations of the Dominican Republic. In 14th European Congress of Herpetology, Porto (Portugal), 19–23 September 2007. Book of abstracts.

Nesting Beach: Jaragua National Park Year: 2006 Count: 23 nests

Monitoring Effort: Data were collected during intensive surveys and interviews in 2006. These surveys are the first systematic surveys of hawksbill nesting in the Dominican Republic in more than 25 years. Nesting season is from July to November.

Comments: Illegal egg take at this site was observed to be nearly 100 percent.

Nesting Beach: Saona Island, East National Park

Year: 2006 Count: 62 nests

Monitoring Effort: Data were collected during intensive surveys and interviews in 2006. These surveys are the first systematic surveys of hawksbill nesting in the Dominican Republic in more than 25 years. Nesting occurs year-round at this site.

Comments: Illegal egg take at this site was observed to be about 50 percent. During these surveys, low-level hawksbill nesting (1–4 nests per season) was detected at another 10 sites in the Dominican Republic.

SWOT Contact: Jesús Tomás

#### **ECUADOR**

**Data Source:** Zarate, P. 2008. Hawksbill nesting in Ecuador: Personal communication. In *SWOT Report—The State of the World's* Sea Turtles, vol. 3 (2008).

Nesting Beaches: La Playita de Salango, Las Playitas de los Frailes, Las Tunas, Machalilla, and Playa Cerro Viejo.

Comments: Hawksbill nesting is sporadic in Ecuador, with limited nesting each year on these beaches.

SWOT Contact: Patricia Zarate

#### **FOUATORIAL GUINEA**

#### **Data Record 29**

**Data Source:** Rader, H., and G. Hearn. 2008. Hawksbill nesting on Bioko Island, Equatorial Guinea. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Beach A, Bioko Island Year: 2006 Count: 0 nests Beach Length: 1.78 km

Nesting Beach: Beach B, Bioko Island

Year: 2006 Count: 0 nests Beach Length: 3 km

Nesting Beach: Beach C, Bioko Island Year: 2006 Count: 2 nests Beach Length: 3.34 km

Nesting Beach: Beach D, Bioko Island

Year: 2006 Count: 0 nests Beach Length: 3.41 km

Nesting Beach: Beach E, Bioko Island

Year: 2006 Count: 0 nests Beach Length: 4.11 km

**Monitoring Effort:** Beaches were patrolled nightly from October 9, 2005 to April 30, 2006. Nesting season is October to April with its

peak in December and January. SWOT Contacts: Gail W. Hearn and Heidi Rader

#### **Data Record 30**

**Data Source:** Fretey, J. 2001. *Biogeography and Conservation of Marine Turtles of the Atlantic Coast of Africa*. CMS Technical Series, Publication No. 6. Bonn, Germany: United National Environment Program / Convention on Migratory Species Secretariat.

Nesting Beaches: Mainland beaches from Iduma to Etembue and

from Nendyi to Cabo San Juan
Comments: Hawksbill nesting has been reported at these sites. Nesting numbers are unknown

**SWOT Contact:** Jacques Fretey

#### **ERITREA**

Data Record 31

Data Source: Goitom, M., Teclemariam, Y., and T. Mengstu. 2006. Field Trip Report on Sea Turtle Nesting Assessment on the Islands of Mojeidi and Aucan. Massawa, Eritrea: Ministry of Fisheries. Unpublished report.

Nesting Beach: Aucan Island Year: 2006 Count: 735 nests Beach Length: 6.5 km

Monitoring Effort: These data are from a one-time nest count on June 1–2, 2006. Nesting season is early December to late June with its peak in February and March.

Nesting Beach: Mojeidi Island

Year: 2006 Count: 840 nests, 47 nesting females

Beach Length: 5.8 km

Monitoring Effort: The entire beach was surveyed nightly from May 18 to June 3, 2006. Nesting season is early December to late with its peak in February and March

SWOT Contacts: Mahta Goitom, Tecle Mengstu, and Yohannes Teclemariam



online advertising through Google AdWords. This

grant has allowed SWOT to raise awareness about SWOT Report—The State of the World's Sea Turtles and increase traffic to the SWOT website.

#### Data Record 32

Data Source: Batibasaga, A., and N. Nand, Fiji Fisheries Department. 2008. Hawksbill nesting in Fiji. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Kiuva Beach, Tailevu, Viti Levu

Year: 2006 Count: 130 hatchlings

**Comments:** This beach is not regularly monitored. These data are from a one-time encounter on February 20, 2006.

Nesting Beach: Makogai Island, Lomaviti province

Year: 2006 Count: 5 nests

Monitoring Effort: The beach was patrolled weekly in December 2005 and January 2006. Peak nesting is from November to February.

Nesting Beaches: Hatana Island, Rotuma, and the South Sea Islands and Treasure Island in the Mamanuca island group

Comments: Nesting data from 2006 were not available. Hawksbills are known to nest on these beaches in low numbers

SWOT Contacts: Aisake Batibasaga and Neema Nand

#### **FRENCH GUIANA**

#### **Data Record 33**

Data Source: Kelle, L. 2008. Hawksbill nesting in French Guiana Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Comments: Hawksbills nest in low numbers in French Guiana, with less than 20 nests per year recorded in the entire coast. The highest density nesting is near Cayenne, with approximately 2–10 nests per year.

SWOT Contact: Laurent Kelle

#### **GABON**

#### Data Record 34

Data Source: Verhage, B., Moundjim, E. B., and S. R. Livingstone. 2006. Four Years of Marine Turtle Monitoring in the Gamba Complex of Protected Areas, Gabon, Central Africa, 2002-2006. Gabon: WWF. **Nesting Beach:** Pont Dick, Gamba Complex

Year: 2006 Count: 0 nests Beach Length: 5.75 km

Comments: This beach hosts occasional low-level hawksbill nesting. In 2003-04, three nests were recorded, and in 2004-05, zero nests

**SWOT Contact:** Bas Verhage

#### **GRENADA**

#### Data Record 35

**Data Source**: Lloyd, C., Ocean Spirits. 2008. Hawksbill nesting in Grenada: Personal communication. In *SWOT Report—The State of* the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Caille Beach, Caille Island

Year: 2006 Count: 6 nesting females Beach Length: 350 m Monitoring Effort: Nightly patrols were conducted from July 22 to August 15, 2006. Nesting season is July to October, with its peak in June and July.

SWOT Contact: Carl Lloyd

#### **GUADELOUPE, FRENCH OVERSEAS DEPARTMENT**

#### **Data Record 36**

Data Source: Delcroix, E. 2006, Rapport d'Activité Gestion du Réseau Tortues Marines de Guadeloupe 2006. Unpublished report. **Nesting Beaches:** Anse à Sable, Côte Sous le Vent Bouillante, Galets Rouges, Machette, and Malendure beaches, Basse-Terre Island

Year: 2006 Count: 19 nests Beach Length: 0.7 km Monitoring Effort: The beaches were patrolled during nightly surveys

and track counts from May 14 to September 14, 2006. Nesting season is May to late September, with its peak in July and August.

Nesting Beach: Cluny Beach, Basse-Terre Island

Year: 2006 Count: 3 nests Beach Length: 1 km Monitoring Effort: Night surveys and track counts were conducted twice per week from April 1 to July 15, 2006. Nesting season is May to late September.

**Nesting Beaches:** Figuier, Grande Anse, and Pompierre beaches, Terre-de-Haut des Saintes Island

Year: 2006 Count: 12 nests Beach Length: 1.7 km Monitoring Effort: The beaches were surveyed three times per week for tracks from May 1 to October 1, 2006. Nesting season is May to late September, with its peak in July and August.

Nesting Beaches: Folle Anse and Trois-Ilets beaches, Marie

Year: 2006 Count: 231 nests Beach Length: 3.7 km Monitoring Effort: Nightly surveys were conducted June 10–30 and August 6–26, 2006, as were occasional night patrols during other periods

Nesting Beaches: Grande Anse Deshaies, La Perle Beach, and Plage Naturiste, Basse-Terre Island

Year: 2006 Count: 0 nests at each

Beach Length: 1.4 km, 0.9 km, and 200 m, respectively Monitoring Effort: Several track counts were conducted from April 1 to July 15, 2006. Nesting season is May to late Septembe

Nesting Beach: Grande Anse Troix-Rivières, Basse-Terre Island Year: 2006 Count: 3 nests Beach Length: 0.9 km Monitoring Effort: Regular night surveys were conducted twice-

weekly from April 1 to September 30, 2006. Track counts were conducted in August and September only. Nesting season is May to late September.

Nesting Beach: Petite-Terre Island

Year: 2006 Count: 53 crawls Beach Length: 4.6 km Monitoring Effort: The entire beach was surveyed for tracks twice per week from March 15 to November 15, 2006. Nesting season is May to late September, with its peak in July and August.

Nesting Beach: Plage du Four à Chaux, llet Fajou Year: 2006 Count: 78 crawls Beach Length: 0.8 km Monitoring Effort: The entire beach was surveyed for tracks weekly

from April 22 to September 15, 2006. Nesting season is May to late September, with its peak in July and August. Nesting Beach: Pointe des Châteaux, Basse-Terre Island

Year: 2006 Count: 30 nests Beach Length: 10.2 km Monitoring Effort: The entire beach was patrolled during nightly surveys and track counts from May 1 to September 30, 2006. Nesting season is May to late September, with its peak in July and August. SWOT Contact: Eric Delcroix

#### **GUAM**

Data Source: Wusstig, S. 2008. Hawksbill nesting in Guam: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Comments: Hawksbills were last reported to be nesting in Guam in 1995. Monitoring efforts in recent years have not found evidence of hawksbill nesting.

**SWOT Contact:** Shawn Wusstig

#### **GUATEMALA**

#### Data Record 37

Data Source: Fundación Mario Dary Rivera, Consejo Nacional de Áreas Protegidas and The Nature Conservancy. 2006. Plan de Conservación de Área 2007–2011 Refugio de Vida Silvestre Punta de Manabique. Guatemala: FUNDARY-PROARCA-TNC

Nesting Beach: Punta de Manabique

Comments: Nesting data from 2006 were not available. The last available data are from 2005, when 10 nests were located and moved to a local hatchery.

#### **GUINEA**

#### Data Record 38

Data Source: Fretey, J. 2001. Biogeography and Conservation of Marine Turtles of the Atlantic Coast of Africa. CMS Technical Series, Publication No. 6. Bonn, Germany: United National Environment Program / Convention on Migratory Species Secretariat.

Nesting Beaches: Beaches of Blanche Island, Cabri Island, Roume

Island, and Tamara Island in the Los Islands

Comments: Nesting data from 2006 were not available. Low-level hawksbill nesting has been noted on each of these islands.

**SWOT Contact:** Jacques Fretey

### **GUINEA-BISSAU**

Data Source: (1) Barbosa, C., Broderick, A., and P. Catry. 1998. Marine turtles in the Orango National Park (Bijagós Archipelago Guinea-Bissau). Marine Turtle Newsletter 81: 6–7. (2) Fretey, J. 2001. Biogeography and Conservation of Marine Turtles of the Atlantic Coast of Africa. CMS Technical Series, Publication No. 6. Bonn, Germany: United National Environment Program / Convention on Migratory Species Secretariat.

Nesting Beaches: Scattered beaches in Orango National Park, Bijagós Archipelago

Comments: Hawksbill nesting has been noted on various islands in the Bijagós Archipelago, including, Adonga, Baia las Escaramucas, Cavalos, Meio, Poiläo, and Uité. Annual nesting numbers are uncertain, but thought to be low.

#### **GUYANA**

#### Data Record 40

Data Source: Kalamandeen, M., DeFreitas, R., Stewart, K., and P. Pritchard, 2006. Aspects of Marine Turtle Nesting in Guyana, 2006. Guianas Forests and Environmental Conservation Project (GFECP). World Wildlife Fund: Technical Report.

Nesting Beaches: Almond, Annette, Luri, and Tiger beaches Year: 2006 Count: 10 nesting females, 3 false crawls

Beach Length: 140 km total

Monitoring Effort: Nightly patrols covering approximately 25 percent of the beaches were conducted from March 4 to August 28, 2006. Nesting season is early March to late August, with its peak in May

SWOT Contact: Michelle Kalamandeen

#### **HONDURAS**

#### **Data Record 41**

Data Source: Aronne, M. 2000. Anidación Semiartificial para la Conservación de Tortuga Marina Carey (Eretmochelys imbricata) en el Área Protegida de Cayos Cochinos, del 18 Junio al 30 Octubre 2000. Fundación Hondureña para los Arrecifes Coralinos (HCRF). Nesting Beach: Cochinos Cays

Comments: Nesting data from 2006 were not available. The last available data are from 2000, when 10 nests were recorded during surveys from June 18 to October 30.

#### INDIA

#### **Data Record 42**

Data Source: Andrews, H., Krishnan, S., and P. Biswas. 2006. The Status and Distribution of Marine Turtles Around the Andaman and Nicobar Archipelago. India: Andaman and Nicobar Islands Environmental Team, Center for Herpetology/Madras Crocodile Bank Trust. Nesting Beach: Beaches throughout the Andaman Islands

Comments: Nesting data from 2006 were not available. The most significant hawksbill nesting sites in the Andaman Islands include the Snark Islands, South Reef Island, and North Brother Island. Additional nesting sites include Trilby, Temple, Smith, Ross, and Sound islands off North Andaman Island; North Passage Island; North Button Island; Middle Button Island; Inglish Island; Neil and Sir Hugh Rose Islands; and Baratang Island.

Nesting Beach: Little Andaman Island

Comments: Nesting data from 2006 were not available. Hawksbills are known to nest on several beaches of the island

Nesting Beach: Mahatma Ghandi Marine National Park, South Andaman Island

Comments: Nesting data from 2006 were not available. Hawksbills have been known to nest on Jolly Boy, Grub, Boat, and Tarmugli islands within the park. Nesting Beaches: Beaches of the Nicobar Islands

Comments: Nesting data from 2006 were not available. Eleven beaches in the Nicobar Island group are reported to host hawksbill nesting. **SWOT Contacts:** Harry Andrews and Manish Chandi

#### **INDONESIA**

**Data Record 43** 

Data Source: Putra, K. S. 2005. Brief Overview of Turtle Conservation in Indonesia (May 2005). Unpublished report.

Nesting Beach: Bantul, Yogyakarta

Comments: Nesting data from 2006 were not available. The last available data are from 2002, when the nesting of three hawksbills was recorded. Annual numbers of nesting hawksbills were not available

Nesting Beach: Natuna and Anambas Islands, Riau Islands Comments: Nesting data from 2006 were not available. Hawksbills are known to nest throughout these islands.

Nesting Beach: Ngagelan beach, Alas Purwo National Park, East Java

Beach Length: 19 km

Comments: Nesting data from 2006 were not available. The last available data are from 2004, when the nesting of 10 hawksbills was recorded. Annual numbers of nesting hawksbills were not available.

Nesting Beach: Perancak, Bali

Beach Length: 3 km

Comments: Nesting data from 2006 were not available. The last available data are from 2004, when the nesting of 3 hawksbills was recorded. Annual numbers of nesting hawksbills were not available.

Nesting Beach: Pulau Banyak, North Sumatra Comments: Nesting data from 2006 were not available. Hawksbills

are known to nest throughout these islands.

SWOT Contact: Ketut Sarjana Putra

Data Record 44

Data Source: Everlasting Nature of Asia. Project in Indonesia.

http://www.elna.or.jp/en/pj\_id/index.html. **Nesting Beach:** Momperang Island, Momperang Islands Year: 2006 Count: 50-150 estimated nests Beach Length: 1 km

Nesting Beach: Pesemut Island, Momperang Islands

Year: 2006 Count: 100–200 estimated nests Beach Length: 1.5 km

Nesting Beach: Segama Besar Island

Year: 2006 Count: 150–250 estimated nests per year recorded Beach Length: 1.4 km

Nesting Beach: Segama Kecil Island

Year: 2006 Count: 100-150 estimated nests per year estimated

Beach Length: 1 km

Comments: Nesting data from 2006 were not available from the four beaches listed above. Hawksbills are known to nest on these islands and these estimates are based on past monitoring efforts of varving levels of effort.

SWOT Contact: Hiroyuki Suganuma

#### **Data Record 45**

Data Source: Mobaraki, A. 2006. Report on Sea Turtle Tagging Program in Iran. Bureau of Wildlife and Aquatic Affairs, Department of the Environment. Unpublished report.

Nesting Beach: Hendourabi Island, Hormozgan province

Year: 2006 Count: 25 tagged females, >100 crawls

Beach Length: Approximately 5 km

Monitoring Effort: The entire beach was patrolled nightly from April 14 to April 19, 2006. Nesting season is March to May, with its

**Nesting Beach:** Nakhiloo Island, Booshehr Province **Year:** 2006 **Count:** 34 tagged females, >100 crawls

Beach Length: 1.5 km

Monitoring Effort: The entire beach was patrolled nightly from May 26 to May 31, 2006. Nesting season is April to June, with its peak in May

Nesting Beach: Ommolkaram Island, Booshehr province

Year: 2006 Count: 32 tagged females, >100 crawls

Beach Length: 10 km

Monitoring Effort: Two kilometers of beach were patrolled nightly from June 1 to June 5, 2006. Nesting season is April to June, with its peak in May.

Nesting Beach: Shidvar Island, Hormozgan province Year: 2006 Count: 21 tagged females, >100 crawls

Beach Length: 1.5 km

Monitoring Effort: The entire beach was patrolled nightly from April 1 to April 14, 2006. Nesting season is March to May, with its peak in April.

SWOT Contact: Asghar Mobaraki

#### **JAMAICA**

Data Record 46

**Data Source: (1)** Tennant, M. 2008. Hawksbill nesting on Gibraltar Beach, Jamaica. In *SWOT Report—The State of the World's Sea* Turtles, vol. 3 (2008). (2) Harker, T. 2006. Status and Conservation

of Sea Turtles in Jamaica. Unpublished report. **Nesting Beach:** Gibraltar Beach, Oracabessa, St. Mary Year: 2006 Count: 26 nests Beach Length: 0.5 km Monitoring Effort: The entire beach was patrolled nightly and each

morning from April 6 through December, 2006. Nesting season is April to November, with its peak in July and August.

Nesting Beach: Hellshire Area and Portland Bight Cays

Year: 2006 Count: 102 nests

Monitoring Effort: The entire beach was patrolled twice per week from May 1 to October 26, 2006. Nesting is year-round, with its

peak from July to September.

SWOT Contacts: Shakira Azan and Andrea Donaldson

#### **Data Record 47**

Data Source: Sea Turtle Association of Japan. 2006. Sea turtle data in 2006: Nesting of hawksbill turtles in 2006. In Proceedings of the 17th Japan Sea Turtle Symposium. November 18–20, 2006, Kumano Shichirimihama, Japan. Japan: Sea Turtle Association of Japan.

Nesting Beach: Ishigakishima Island Year: 2006 Count: 1–10 nests

SWOT Contacts: Irene Kinan and Yoshi Matsuzawa



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#### JUAN DE NOVA ISLAND, FRENCH OVERSEAS TERRITORY

Data Record 48

Data Source: Bourjea, J., and S. Ciccione. 2008. Hawksbill nesting in French Overseas Territories: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008). Nesting Beaches: Juan de Nova and other scattered islands

Year: 2006 Count: 10 tracks Beach Length: 7 km Monitoring Effort: These beaches were patrolled daily from January 1 to December 31, 2006. Nesting is November to January, with its peak in December

SWOT Contacts: Jérome Bourjea and Stephane Ciccione

#### **KENYA**

Data Record 49

Data Source: Olendo, M. 2008. Hawksbill nesting in Kenya Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Kongowale Year: 2006 Count: 1 confirmed nest

Comments: In May 2006, one hawksbill nesting event was recorded on this beach. Nesting of hawksbills in Kenya is very sporadic. SWOT Contact: Mike Olendo

#### **LIBERIA**

**Data Record 50** 

Data Source: Save My Future Foundation (SAMFU). 2008. Hawksbill nesting in Liberia: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Bafu Bay, Sinoe County Comments: Nesting data from 2006 were not available. In the 2006–2007 nesting season, seven hawksbill nests were recorded between November 15, 2006, and September 15, 2007.

Nesting Beach: Borgor Point, Rivercess County Comments: Nesting data from 2006 were not available. In the 2006–2007 nesting season, eight hawksbill nests were recorded from October 2006 to April 2007.

SWOT Contact: Alex Peal

#### **MADAGASCAR**

Data Record 51

Data Source: Bourjea, J., Ciccione, S. and R. Rantsimbazafy. 2006. Marine turtle survey in Nosy Irania Kely, northwestern Madagascar, Western Indian Ocean Journal of Marine Science, 5(2): 209–212.

Nesting Beach: Iranja Kely Island, Nosy Be

Beach Length: 0.5 km Monitoring Effort: Nesting data from 2006 were not available. The last available data are from 2003 to 2004, when 28 nests were recorded. These beaches were patrolled nightly from January 1, 2000, to December 31, 2004, during which an estimated 20 nests were recorded per year. Hawksbill nesting season is December to March,

with its peak in December and January SWOT Contact: Jérome Bourjea and Stephane Ciccione

#### **MALAYSIA**

**Data Record 52** 

Data Source: Wagiman, S., Malaysia Fisheries Department. 2008. Hawksbill nesting in Johor, Malacca, Pahang, and Terengganu, Malaysia. In SWOT Report—The State of the World's Sea Turtles,

Nesting Beach: Cherating, Pahang state
Year: 2006 Count: 1 nest Beach Length: 3.5 km **Monitoring Effort:** The entire beach was patrolled nightly from February through October, 2006. Nesting season is April through October.

Nesting Beaches: Beaches of Malacca state

Year: 2006 Count: 388 nests Beach Length: 20 km Monitoring Effort: These data were collected during nightly patrols conducted by licensed egg collectors year-round. At Upeh Island, nightly patrols were conducted by staff of WWF Malaysia between April and August, and by licensed egg collectors during offpeak months. Nesting occurs year-round, with its peak from April to August.

Comments: This is an overall count for all areas in Malacca, specifically including beaches around Kampung Padang Kemunting, Kem Terendak, Kuala Linggi, and Upeh Island.

Nesting Beaches: Mak Kepit Beach and Mak Simpan Beach, Pulau Redang, Terengganu state

Year: 2006 Count: 4 nests Beach Length: 450 m

**Monitoring Effort:** Nightly patrols were conducted at both beaches from April through October, 2006.

Nesting Beaches: Mersing Islands, Johor state

Year: 2006 Count: 39 nests
Monitoring Effort: Part of the beach was patrolled nightly from March through September, 2006. Nesting season is April through August.

SWOT Contacts: Eng-Heng Chan and Sukarno Wagiman

Names: Edith and Richard van der Wal Project: Turtugaruba Foundation

Location: Aruba

The Turtugaruba Foundation protects the nests of leatherback, loggerhead, green, and hawksbill turtles against the threats of coastal development in Aruba: artificial lighting, beach driving, pollution, and habitat loss. Turtugaruba's turtle hotline, operated 24 hours a day and 7 days a week, has greatly raised sea turtle conservation awareness among Aruba's citizens and tourists.

#### **Data Record 53**

Data Source: Bali, J., Sarawak Forestry Corporation. 2008. Hawksbill nesting in Sarawak, Malaysia. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Pulau Satang Besar, Sarawak Year: 2006 Count: 10 nests Beach Length: 150 m Monitoring Effort: Nightly surveys of the entire beach were conducted year-round. Nesting occurs year-round, with its peak from December to March.

SWOT Contacts: James Bali and Eng-Heng Chan

#### **Data Record 54**

Data Source: Sabah Department of Wildlife. 2008. Hawksbill nesting in Sabah, Malaysia. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Lankayan Island, Sabah

Year: 2006 Count: 45 nests Beach Length: 1 km

Monitoring Effort: Nightly surveys of the entire beach were conducted year-round. Nesting is year-round, with its peak from June to July. SWOT Contact: Eng-Heng Chan

**Data Source:** Marine Research Unit, Sabah Parks. 2007. Turtle Islands Park and Sipadan Island Turtle Research Report. Unpublished report. Nesting Beaches: Beaches of the Sabah Turtle Islands, Sabah Year: 2006 Count: 514 nests Beach Length: 2.7 km

Monitoring Effort: Nightly surveys were conducted year-round at these beaches. Nesting is year-round, with its peak from February to April and from June to July.

Nesting Beach: Sipadan Island, Sabah

Year: 2006 Count: 3 nests Beach Length: 1.7 km Monitoring Effort: Nightly surveys of the entire beach were conducted from January 1 to December 31, 2006. Nesting season is January to June

SWOT Contact: Fazrullah Rizally

#### **MALDIVES**

**Data Record 56** 

Data Source: Zahir, H. 2008. Hawksbill nesting in Maldives: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Dharaboodhoo Island
Comments: Nesting data from 2006 were not available. The last

recorded nesting was in 1999, when seven nests were noted. Nesting Beach: Dhebaidhoo Island Comments: Nesting data from 2006 were not available. The last

recorded nesting was in 2003, when seven nests were noted.

Nesting Beach: Feevah Island **Comments:** Nesting data from 2006 were not available. The last recorded nesting was in 2000, when seven nests were noted.

Nesting Beach: Kuburudhoo Island

Comments: Nesting data from 2006 were not available. The last recorded nesting was in 1999, when six nests were noted.

Nesting Beach: Maalhoss Island

Comments: Nesting data from 2006 were not available. The last recorded nesting was in 1998, when eight nests were noted. Nesting Beach: Maavah Island

Comments: Nesting data from 2006 were not available. The last

recorded nesting was in 1996, when seven nests were noted. Nesting Beach: Maroshi Island Comments: Nesting data from 2006 were not available. The last recorded nesting was in 1996, when 7 nests were noted.

Nesting Beach: Medhafushi Island

Comments: Nesting data from 2006 were not available. The last recorded nesting was in 1996, when six nests were noted.

Nesting Beach: Minimasgali Island

Comments: Nesting data from 2006 were not available. The last recorded nesting was in 1995, when six nests were noted.

Nesting Beach: Muthaafushi Island

**Comments:** Nesting data from 2006 were not available. The last recorded nesting was in 1998, when eight nests were noted.

Nesting Beach: Vaikaramuraidhoo Island

Comments: Nesting data from 2006 were not available. The last recorded nesting was in 2000, when seven nests were noted. SWOT Contact: Hussein Zahi

#### MARTINIQUE, FRENCH OVERSEAS DEPARTMENT Data Record 5

Data Source: (1) National Office of Wildlife and Hunting. Unpublished data from the 2006 nesting season. (2) NGO SEPANMAR. Nesting Season 2006: Parts 1, 2, and 3. Fort de France, Martinique: Ministère de l'Écologie et du Développement Durable. Technical report. (3) NGO KAWAN, Marine Turtle Network of Martinique. 2008. Hawksbill nesting in Martinique. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008). Nesting Beach: Anse à Prunes (southeastern coast) Year: 2006 Count: 2 nests, 5 nesting activities Beach Length: 0.54 km

Nesting Beach: Anse à Voile (northern Caribbean coast) Year: 2006 Count: 4 confirmed nests, 4 crawls

Beach Length: 260 m

Nesting Beach: Anse Charpintiere (northeastern Atlantic coast)
Year: 2006 Count: 2 nests, 5 false crawls Beach Length: 0.845 km

Nesting Beach: Anse Colas (middle Caribbean coast) Year: 2006 Count: 2 crawls Beach Length: 250 m

Nesting Beach: Anse Couleuvre (northern Caribbean coast) Year: 2006 Count: 1 confirmed nest, 9 crawls

Beach Length:  $340\ \text{m}$ 

Nesting Beach: Anse Lévrier (northern Caribbean coast) Year: 2006 Count: 5 crawls Beach Length: 200 m

Nesting Beach: Anse Meunier (southeastern coast) Year: 2006 Count: 1 nest Beach Length: 1.5 km Nesting Beach: Anse Trabaud (southeastern coast) Year: 2006 Count: 1 nest Beach Length: 1.5 km

Nesting Beach: Dizac Diamant (southern coast) Year: 2006 Count: 11 nests, 14 false crawls, 12 crawls

Year: 2006 Count: 1 nest Beach Length: 0.9 km

Beach Length: 2.9 km Nesting Beach: Grande Anse d'Arlet (southern Caribbean coast)

Nesting Beach: Grande Anse Loraine (northeastern Atlantic coast) Year: 2006 Count: 9 nests, 1 false crawl Beach Length: 1.65 km

Nesting Beach: Grande Anse Salines (southeastern coast) Year: 2006 Count: 9 nests, 44 crawls, 16 nesting activities Beach Length: 1.23 km

Nesting Beach: Grande Terre (southeastern coast) Year: 2006 Count: 3 nests, 4 nesting activities Beach Length: 0.59 km

Nesting Beach: Madiana (middle Caribbean coast) Year: 2006 Count: 4 crawls Beach Length: 200 m

Nesting Beach:Plage de la Française (middle Caribbean coast) Year: 2006 Count: 1 nest Beach Length: 150 m

Nesting Beach: Rade de Sainte Marie (northeast Atlantic coast) Year: 2006 Count: 2 nests Beach Length: 1.2 km Monitoring Effort: The above beaches in Martinique were monitored at varying levels, ranging from daily or nightly patrols, to semi-weekly patrols, to one-time observations during various portions of the nesting season. Nesting season at all beaches is

May to September, with its peak in June. SWOT Contact: Claire Cayol

## **MAYOTTE, FRENCH OVERSEAS COLLECTIVITY**

Data Source: Bourjea, J., and S. Ciccione. Hawksbill nesting in French Overseas Territories: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Mayotte Island

**Comments:** Nesting data from 2006 were not available. An estimated 30 nests are laid per year on Mayotte Island. SWOT Contacts: Jérome Bourjea and Stephane Ciccione

#### **MEXICO**

**Data Source:** Cuevas, E., Canul-Rosado, D., Tzeek-Tuz, M., Muñoz-Terán, K., and F. Loyo-Buenfil. 2006. *Reporte Final de Actividades* de Conservación en las Playas de Anidación de Celestún y El Cuyo en Yucatán e Isla Holbox en Quintana Roo, México. Mérida, Yucatán, Mexico: Pronatura Península de Yucatán. Unpublished report.

Nesting Beach: Celestún, Reserva de la Biosfera Ría Celestún, Yucatán Year: 2006 Count: 348 nests Beach Length: 24 km

Nesting Beach: El Cuyo, Reserva de la Biosfera Ría Lagartos, Yucatán Year: 2006 Count: 286 nests Beach Length: 31 km Nesting Beach: Isla Holbox, Área de Protección de Flora y Fauna

Yum Balam, Quintana Roo Year: 2006 Count: 602 nests Beach Length: 24 km Monitoring Effort: Nightly patrols of the entire beach were conducted from April 1 to August 31, 2006, at each of the three beaches above. Nesting season is April to August, with its peak in June.

**SWOT Contact:** Eduardo Cuevas **Data Record 60** 

Data Source: CONANP, and Comité Estatal para la Protección y Conservación de las Tortugas Marinas del Estado de Campeche. 2008. Hawksbill nesting in Campeche, Mexico. In *SWOT Report*— The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Chacahito, Campeche Year: 2006 Count: 35 nests Beach Length: 8.1 km

Nesting Beach: Ensenada, Campeche

Year: 2006 Count: 55 nests Beach Length: 6 km Nesting Beach: Isla Arena, Campeche

Year: 2006 Count: 35 nests Beach Length: 8 km

Nesting Beach: San Lorenzo, Campeche Year: 2006 Count: 23 nests Beach Length: 1.8 km

Nesting Beach: Victoria, Campeche Year: 2006 Count: 40 nests Beach Length: 22.73 km

Monitoring Effort: Daily patrols were conducted from April 1 to September 30, 2006 at each of the five beaches above. Nesting season is April to September, with its peak in June.

Nesting Beach: Chenkan, Campeche

Year: 2006 Count: 279 nests Beach Length: 20 km

Nesting Beach: Isla Aguada, Campeche Year: 2006 Count: 236 nests Beach Length: 27.75 km

Nesting Beach: Isla del Carmen, Campeche Year: 2006 Count: 245 nests Beach Length: 35 km

Nesting Beach: Punta Xen, Campeche

Year: 2006 Count: 520 nests Beach Length: 30 km

Nesting Beach: Sabancuy, Campeche

Year: 2006 Count: 227 nests Beach Length: 24.5 km **Monitoring Effort:** Daily patrols were conducted from April 1 to October 30, 2006 at each of the five beaches above. Nesting season is April to October, with its peak in June

SWOT Contact: Vicente Guzman H.

#### **MOZAMBIQUE**

Data Source: Costa, A. 2007. Report of Marine Turtle Conservation in Quirimbas National Park, Cabo Delgado. Maputo, Mozambique:

Marine Programme, WWF Mozambique.

Nesting Beaches: Lemani Beach and Paquissico Tchawane Beach,

Quirimbas National Park, Cabo Delgado

Beach Length: 5 km

Comments: Nesting data from the 2005–06 season were not available. In 2006–07, 104 hawksbill hatchlings were observed during early morning and nightly patrols from October 1, 2006, to June 6, 2007.

**SWOT Contact:** Alice Costa

#### **Data Record 62**

Data Source: Garnier, J., and I. Silva. 2008. Hawksbill nesting in Mozambique. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Rongui Island and Vamizi Island Year: 2006 Count: 3 nests Beach Length: 12 km

Monitoring Effort: Daily patrols were conducted on both islands year-round, including additional nightly patrols during the nesting season from November to March.

SWOT Contacts: Julie Garnier and Isabel Silva

#### **NETHERLANDS ANTILLES, BONAIRE Data Record 63**

**Data Source:** Nava, M. 2006. Sea Turtle Conservation Bonaire Progress Report 2006. Unpublished report.

Nesting Beach: No Name Beach, Bonaire Year: 2006 Count: 42 nests Beach Length: 2 km

Nesting Beach: Playa Pali Mangel

Year: 2006 Count: 7 nests Beach Length: 0.7 km

**Monitoring Effort:** At each of the above beaches, the entire beach was patrolled every other morning from May 15 through December, 2006. Peak nesting is in August and September.

Nesting Beach: Playa Washikemba

Year: 2006 Count: 3 nests Beach Length: 400 m Monitoring Effort: The entire beach was patrolled every other morning from May 15 through December, 2006. Peak nesting

SWOT Contact: Mabel Nava

#### ST. EUSTATIUS

Data Source: Harrison, E., and A. Herrera. 2006. St. Eustatius Sea Turtle Conservation Programme Annual Report 2006. Unpublished report.

Nesting Beach: Kay Bay, Oranje Bay, and Zeelandia Beach,

Year: 2006 Count: 6 nests, 2 false crawls, 1 nesting female

Beach Length: 1.2 km

Monitoring Effort: Daily and nightly patrols of the entire beach were conducted from March 17 to October 6, 2006. Peak nesting is in July. SWOT Contact: Arturo Herrera

ST. MAARTEN

#### **Data Record 65**

Data Source: Nisbeth, B. M., Nature Foundation. 2008. Hawksbill nesting in Gibbs Bay, St. Maarten. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Gibbs Bay Year: 2006 Count: 1 crawl Beach Length: 0.5 km

Monitoring Effort: The beach was patrolled twice per week from April 1 to November 1, 2006. Nesting season is April to November, with its peak from July to October

SWOT Contact: Beverly Mae Nisbeth

### **Data Record 66**

Data Source: Vissenberg, D., Nature Foundation. 2008. Hawksbill nesting in Guana Bay, St. Maarten. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Guana Bay Year: 2006 Count: 4 nests Beach Length: 1 km Monitoring Effort: This beach was patrolled three to four nights per week from April to October, 2006. Nesting season is April to late-October, with its peak from May to October.

**SWOT Contact:** Dominique Vissenberg

### **NICARAGUA**

Data Source: Urteaga, J. 2008. Hawksbill nesting in Nicaragua Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: La Flor

Year: 2006 Count: 10-20 estimated nests

**Comments:** Hawksbill nesting is sporadic along the Pacific coast of Nicaragua, with 10–20 nests recorded per year around La Flor.

SWOT Contact: José Urteaga



SWOT Report, Vol. II was selected from more than 10,000 entries to be featured in the December 2007 issue of *Graphic Design USA*, an annual magazine highlighting the year's best graphic design publications

#### **Data Record 68**

Data Source: Campbell, C. L., Lagueux, C. J., and V. Huertas. 2007. 2006 Pearl Cays Hawksbill Conservation Project, Nicaragua. Wildlife Conservation Society Final Report.

Nesting Beach: Pearl Cays

Year: 2006 Count: 200 nests (minimum) Beach Length: 3.3 km Monitoring Effort: Daily patrols were conducted from June to October, 2006. During the rest of the nesting season, beaches were patrolled weekly or bi-weekly. Nesting season is May to November, with its peak from July to September

SWOT Contacts: Cathi Campbell and Cynthia Lagueux

#### **OMAN**

Data Source: Rees, A. 2008. Hawksbill nesting in Oman. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008)

Nesting Beach: Ros Shiban Beaches 1-3 Year: 2006 Count: 14 nests Beach Length: 2 km

Nesting Beach: Ros Shiban Beaches 3-5

Year: 2006 Count: 27 nests Beach Length: 2 km Nesting Beach: Ros Shiban Beaches 5-7

Year: 2006 Count: 50 nests Beach Length: 2 km

Nesting Beach: Ros Shiban Beaches 7–9 Year: 2006 Count: 70 nests Beach Length: 2 km

Nesting Beach: Southeast Beaches Year: 2006 Count: 188 nests Beach Length: 2 km

Nesting Beach: Southwest Beaches N

Year: 2006 Count: 11 nests Beach Length: 1 km

Nesting Beach: Southwest Beaches Omedu Year: 2006 Count: 66 nests Beach Length: 1 km

Nesting Beach: Southwest Beaches S

Year: 2006 Count: 36 nests Beach Length: 1 km

SWOT Contact: ALan Rees

#### PALAU

#### **Data Record 70**

Data Source: Klain, S., and J. Eberdong. 2007. Palau Marine Turtle Conservation and Monitoring Program, 2005–2006: Report to National Oceanic and Atmospheric Administration (NOAA). Unpublished report. Nesting Beaches: Ngerbelas, Ngeruangel, and Orak, Kayangel state Year: 2006 Count: 2, 3, and 5 nests, respectively

Beach Length: 410, 200, and 100 m, respectively
Monitoring Effort: Each of these beaches was monitored once per

month during the nesting season.

Nesting Beaches: Breu Rock Island, Kmekumer, Moir, Neco Beach / Ngeanges, Ngeremdiu, Ngerukeuid, Ngerureomel, Omekang, Ongtekatl, Ouiars, Such, and Ulong, Koror state Year: 2006

Count: 3, 13, 3, 3, 2, 2, 1, 1, 1, 1, 1, and 7 nests, respectively Beach Length: 70, 60, 150, 400, 650, 750, 300, 150, 175, 125, 25, and 200 m, respectively

Monitoring Effort: Each of these beaches was monitored once per month during the nesting season.

Nesting Beaches: East Beach/Lisel a Lekeok, Euidelchol. Loulomekang, Kisaks, and KItaliis, Koror state **Year:** 2006 **Count:** 1, 1, 1, 4, and 2 nests, respectively **Beach Length:** 0.1, 1.5, 0.7, 0.3, and 0.02 km, respectively Monitoring Effort: Each of these records was made during a

one-time observation Nesting Beaches: East Beach, Melekeok state Year: 2006 Count: 1 nest Beach Length: 3.5 km

Nesting Beaches: Chol, Ngesar/Kwabs, and Ngkeklau, Ngaraard state Year: 2006 Count: 5, 1, and 2 nests, respectively

Beach Length: 2.75, 0.4, and 0.3 km, respectively Nesting Beaches: Ngerchur and Ngerkeklau, Ngarchelong state Year: 2006 Count: 5 and 2 nests, respectively Beach Length: 0.9 and 0.6 km, respectively

Nesting Beaches: Honeymoon Beach and Mesubedumail, Peleliu state Year: 2006 Count: 4 and 2 nests, respectively

Beach Length: 1 km each Monitoring Effort: Each of the above beaches in Melekeok, Ngaraard, Ngarchelong, and Peleliu states was monitored once per month during the nesting season, with the exception of Ngerchur,

Ngarchelong state, which was visited only once Comments: Nesting season at all beaches in Palau is May to August. SWOT Contacts: Joshua Eberdong and Sarah Klain

#### **PANAMA**

**Data Source:** Patiño-Martínez, J., and L. Quiñones. 2008. Hawksbill nesting in Panama: Personal communication. In *SWOT Report—The* State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beaches: Anatxukuna and Armila, Kuna Yala

Beach Length: 0.88 and 4.5 km, respectively

Comments: Each of these beaches contains unquantified hawksbill nestings beginning in May, with an unspecified end date. This information was gathered by personal observation during track counts and interviews with the local population.

SWOT Contact: Juan Patiño-Martínez

#### **Data Record 72**

Data Source: Ordoñez, C., et al. 2007. Report on Monitoring and Research Activities, Chiriqui Beach, Panama. Unpublished report. Nesting Beaches: Chiriqui Beach, Bocas del Toro province

Year: 2006 Count: 537 nests Beach Length: 24 km Monitoring Effort: The entire beach was surveyed for tracks weekly

in January and December 2006 and three to four times weekly in February and November. Fifteen kilometers of beach were patrolled nightly from March 1 to October 31, 2006. Nesting season is March to November, with its peak from June to August.

SWOT Contacts: Emma Harrison and Cristina Ordoñez

#### Data Record 73

Data Source: Meylan, P., and A. Meylan. 2007. Ecología y Migración de las Tortugas Marinas en la Provincia de Bocas del Toro, Panamá. Unpublished report to Autoridad Nacional del Ambiente.

Nesting Beach: Playa Larga, Bocas del Toro province Year: 2006 Count: 34 nests Beach Length: 3 km

Comments: Daily patrols of the entire beach were conducted from March 25 to October 21, 2006. Nesting season is April to October, with its peak in July and August.

Nesting Beach: Zapatilla Cays, Bocas del Toro province Year: 2006 Count: 172 nests Beach Length: 4.2 km Monitoring Effort: Daily patrols of the entire beach were conducted

from May 1 to November 30, 2006. Nesting season is April to October, with its peak in July and August. SWOT Contact: Anne Meylan

#### PAPUA NEW GUINEA

#### Data Record 74

**Data Source:** Krueger, B. 2008. Hawksbill nesting in Papua New Guinea: Personal communication. In *SWOT Report—The State of the* World's Sea Turtles, vol. 3 (2008).

**Nesting Beaches:** Kudube Island, Takala Island, and Utube Island Beach Length: 525 m total

Comments: Nesting data from 2006 were not available. In the 2007 nesting season, 116 hawksbill nests were recorded. Nesting season is October to March.

SWOT Contact: Barry Krueger

#### **PHILIPPINES**

Data Source: (1) Torres, D., Santa Cruz, E., Mansanero, L. I., and G. A. Santa Cruz. 2004. Conservation of a Remnant Hawksbill Nesting Habitat in Punta Dumalag, Brangay Matina Aplaya, Davao City, Philippines. (2) Cruz, R. 2008. Hawksbill nesting in the Philippines: Personal communication. In SWOT Report—The State

of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Apo Reef Island, Sablayan, Occidental

Mindoro province **Year:** 2006 **Count:** 4 nesting females

Comments: Nightly patrols were conducted around this 22 hectare island as weather permitted. Initial findings indicate that the nesting son is from May to September.

Nesting Beaches: Bagac and Morong, Bataan province Beach Length: Approximately 7 km

Comments: Based on nightly monitoring during the olive ridley nesting season (August to March), there are an estimated one or two nests per year at these beaches.

Nesting Beaches: Botolan, Iba, and San Antonio, Zambales province

Beach Length: 48.6 km

Comments: Based on ongoing monitoring, there are an estimated one to three nesting females per year at these beaches

Nesting Beaches: Davao City, Matina, Punta Damalag, and Samal Island, Davao Gulf

Year: 2006 Count: >3 nesting females Beach Length: 1.04 km

Nesting Beaches: Panikian Island, Pitogo, Zamboanga del

Comments: Nesting data from 2006 were not available. The last available data are from 2000, when three nesting females were recorded.

SWOT Contact: Renato Cruz and Romeo Trono

#### **PUERTO RICO**

#### **Data Record 76**

Data Source: L. Montero, 2006. Proyecto de Conservación de Tortugas Marinas Humacao, Yabucoa y Maunabo, Puerto Rico, Temporada 2006. DNER-PR, Unpublished report.

Nesting Beach: Caja-de-Muertos

Year: 2006 Count: 64 nests Beach Length: 1.5 km Monitoring Effort: Daily morning patrols were conducted on onehalf of the beach from January 1 to December 30, 2006. Nesting season is January to December, with its peak in September and October.

Nesting Beach: Culebra

Year: 2006 Count: 51 nests Beach Length: 6 km

Nesting Beach: Humacao

Year: 2006 Count: 94 nests Beach Length: 9 km

Nesting Beach: Beaches of El Faro, Mario, Los Bohios, and California, Maunabo Year: 2006 Count: 31 nests Beach Length: 5.15 km

Monitoring Effort: Daily morning patrols of the entire beach were conducted at each of the three areas listed above from July 12 to December 15, 2006. Nesting season is July to December, with its peak in September and October.

**SWOT Contacts:** Carlos Diez and Robert van Dam

Data Source: Diez, C. E., and R. P. van Dam. 2007. Mona and Monito Island, Puerto Rico, Hawksbill Turtle Research Project, Research Report for 2006. Unpublished report.

Nesting Beach: Mona Island

Year: 2006 Count: 951 nests Beach Length: 7.1 km Monitoring Effort: Daily morning patrols of the entire beach were conducted from August 8 to December 5, 2006. Peak nesting is in September and October

SWOT Contacts: Carlos Diez and Robert van Dam

**Data Source**: Pilcher, N. J., Marine Research Foundation. 2005. *Final Report: Status of Sea Turtles in Qatar*. Qatar: Supreme Council for the Environment and Natural Reserves.

Nesting Beach: Fuwairit Beach

Comments: Nesting data from 2006 were not available. During a survey from April 15 to July 31, 2005, 27 nesting females and 67 nesting events were recorded.

#### **SWOT Contact:** Nicolas Pilcher **SAINT KITTS AND NEVIS**

#### Data Record 79

**Data Source: St.** Kitts Sea Turtle Monitoring Network, Ross University School of Veterinary Medicine. 2008. Hawksbill nesting in St. Kitts. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Cayon to Keys, St. Kitts Year: 2006 Count: 1 estimated nest Beach Length: 4 km

Nesting Beach: Conaree, St. Kitts

Year: 2006 Count: 6 estimated nests Beach Length: 3 km

Nesting Beach: Majors Bay, St. Kitts

Year: 2006 Count: 22 estimated nests Beach Length: 0.6 km Monitoring Effort: The three beaches above were each surveyed during weekly morning patrols from July 1 to September 30, 2006.

Nesting season is July to February. **SWOT Contact:** Kimberly Stewart

**Data Source:** Pemberton, E., Nevis Department of Fisheries. 2008. Hawksbill nesting in Nevis. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Lover's Beach, Nevis

Year: 2006 Count: 86 nests Beach Length: 0.5 km  $\textbf{Monitoring Effort:} \ \textbf{Nightly patrols were conducted three to five}$ nights per week as well as morning patrols following unmonitored nights from April 1 to December 10, 2006. Nesting season is March to early December, with its peak from July to September.

SWOT Contact: Emile Pemberton

#### **SAINT LUCIA**

#### Data Record 81

Data Source: Durrell Wildlife Conservation Trust and St. Lucia Forestry Department (Ministry of Agriculture). 2008. Hawksbill nesting in St. Lucia. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Grande Anse Beach

Year: 2006 Count: 2 crawls Beach Length: 1.26 km

Nesting Beach: Louvet Beach

Year: 2006 Count: 4 nests Beach Length: 406 m

Monitoring Effort: Weekly surveys were conducted from February 23 to August 10, 2006 at each of the above beaches. Nesting season is March to November, with its peak from April to June.

SWOT Contact: Matthew Morton

#### **SAMOA**

#### Data Record 82

**Data Source:** Momoemausu, M., Ward, J., Iakopo, M., Ifopo, P., and F. Sio. 2006. *Report on the Hawksbill Turtle Nesting Survey* 2005-2006. Samoa: Division of Environment and Conservation, Ministry of Natural Resources and Environment. Unpublished report. Nesting Beaches: Namua and Nuulua beaches on Upolu Island, and

Nuutele and Vini beaches on Nuutele Island Year: 2006 Count: 27 nests

Beach Length: 430, 680, 160, and 420 m, respectively Monitoring Effort: These beaches were patrolled nightly during one week of the peak nesting season in January and February. During off-peak months of the nesting season (October to June), beaches were visited bi-weekly.

SWOT Contacts: Malama Momoemausu and Juney Ward

#### SÃO TOMÉ AND PRÍNCIPE

### **Data Record 83**

**Data Source:** MARAPA ONG and PROTOMAC. Rapport des Activités São Tomé and Príncipe, Central Africa. Unpublished report. Nesting Beaches: Beaches of Príncipe

Year: 2006 Count: 36 nests

Nesting Beaches: Beaches of São Tomé Year: 2006 Count: 38 nests

Monitoring Effort: Daily patrols of all the beaches were conducted from October 3, 2005 to April 30, 2006. Nesting season is Septem-

**SWOT Contact:** Alain Gibudi and Elisio Neto

#### SAUDI ARABIA

Data Source: Pilcher, N. J. 1999. The hawksbill turtle, Eretmochelys imbricata, in the Arabian Gulf. Chelonian Conservation and Biology, vol. 3, no. 2 (1999).

Nesting Beach: Jana Island Beach Length: 1.6 km

Comments: Nesting data from 2006 were not available. The most recent available data were from 1992, when 120 nesting females were tagged on Jana Island during a study from June 3 to June 24.

Nesting Beach: Jurayd Island

Comments: Nesting data from 2006 were not available. The most recent available data were from 1991, when 10 nesting females were tagged from May 27 to June 18.

Nesting Beach: Karan Island

Comments: Nesting data from 2006 were not available. The most recent available data were from 1992, when seven nesting females were tagged during surveys between July 5 and July 30. This study was conducted during the peak green turtle nesting season and not during the peak nesting period for hawksbills.

Nesting Beach: Kurayn Island

Comments: Nesting data from 2006 were not available. The most recent available data were from 1991, when an estimated 34 nesting attempts were recorded on Kurayn Island.

**SWOT Contact:** Nicolas Pilcher

#### **SENEGAL**

#### Data Record 85

Data Source: Fretey, J. 2001. Biogeography and Conservation of Marine Turtles of the Atlantic Coast of Africa. CMS Technical Series, Publication No. 6. Bonn, Germany: United National Environment Program / Convention on Migratory Species Secretariat.

Nesting Beaches: Beaches near Guéréo and on the Saloum Delta Comments: Nesting data from 2006 were not available. Hawksbills have been reported to nest in low numbers in these areas of Senegal. **SWOT Contact:** Jacques Fretey

#### **SEYCHELLES**

#### Data Record 86

Data Source: Seychelles Islands Foundation (SIF). 2008. Hawksbill nesting in Aldabra Atoll, Seychelles. In SWOT Report—The State of

the World's Sea Turtles, vol. 3 (2008). Nesting Beach: Aldabra Atoll Year: 2006 Count: 20-50 estimated nests

Comments: Sparse nesting occurs in the Aldabra Atoll, with most nests laid in the Aldabra lagoon area. Nesting estimates are based on track counts conducted by rangers of the Seychelles Islands Foundation (SIF) since 1981.

SWOT Contact: Jeanne A. Mortimer

#### Data Record 87

Data Source: Nature Protection Trust of Seychelles. 2007. 2006–2007 Silhouette Conservation Project: Quarterly Report. Unpublished report.

Nesting Beach: Anse Lascars, Silhouette Island

Beach Length: 440 m Comments: Nesting data from 2006 were not available. In 2006–2007, two nests were encountered during irregular patrols. Nesting season is September to April, with its peak in December and January.

Nesting Beach: Anse Patates, Silhouette Island

Beach Length: 180 m

**Comments:** Nesting data from 2006 were not available. Hawksbills are known to nest at this site.

Nesting Beach: Baie Cipailles, Silhouette Island

Beach Length: 0.51 km

Comments: Nesting data from 2006 were not available. In 2006–2007, five nests were encountered during irregular patrols. Nesting season is September to April, with its peak in December and January.

Nesting Beach: Grande Barbe, Silhouette Island

Beach Length: 1.45 km

Comments: Nesting data from 2006 were not available. In 2006-2007, 250 nests were observed and there were an estimated 360 nests overall. Nesting season is September to April with its peak in December and January

Nesting Beach: La Passe, Silhouette Island

Beach Length: 1.77 km Comments: Nesting data from 2006 were not available. In 2006–2007, 5 nests were encountered during irregular patrols. Nesting season is September to April with its peak in December and January.

Nesting Beach: Pointe Etienne, Silhouette Island Year: 2006 Count: 13 nests Beach Length: 370 m Monitoring Effort: Data are from a one-time observation on

mber 8. 2006 SWOT Contact: Justin Gerlach



Joshua Eberdong and Sarah Klain Name:

**Project:** Marine Turtle Conservation and Monitoring Program (MTCMP)

Location: Palau

The MTCMP at Palau's Bureau of Marine Resources is a collaborative effort between Palau's state and national governments. State conservation officers work on nesting beaches on the main islands of Palau and on the remote Merir and Helen Islands. Our work includes nesting beach monitoring, tagging research, and a fishery observer program.

Documenting international migrations has been one of the most successful results of this project.

#### **Data Record 88**

Data Source: (1) Island Conservation Society of Seychelles. 2008. Hawksbill nesting in Aride Island Nature Reserve, Seychelles. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008). (2) Mortimer, J. A. 2004. Seychelles Marine Ecosystem Management Project (SEYMEMP): Turtle Component. Final report, vol. 1 and vol. 2.

Nesting Beach: Aride Island Nature Reserve

Year: 2006 Count: 50–60 estimated nests Comments: Nesting estimates are based on daily track counts conducted by personnel of the Island Conservation Society of Seychelles. SWOT Contact: Jeanne A. Mortimer

#### **Data Record 89**

**Data Source:** Mortimer, J., and Bird Island Lodge. 2008. Hawksbill nesting on Bird Island, Seychelles: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Bird Island

Year: 2006 Count: 125–200 estimated nests **Comments:** Nesting estimates are based on track counts and tagging data collected by personnel of the Bird Island Lodge.

SWOT Contact: Jeanne A. Mortimer

#### **Data Record 90**

Data Source: Nature Seychelles. 2008. Hawksbill nesting on Cousin Island, Seychelles. In SWOT Report—The State of the World's Sea Turtles vol 3 (2008)

Nesting Beach: Cousin Island Special Reserve

Year: 2006 Count: 331 nests, 91 tagged females, 419 nesting events

Beach Length: 1.73 km

Monitoring Effort: This beach was patrolled at least once per day from August, 2005, to March 15, 2006. Nesting season is September to mid-March, with its peak from November to January. **SWOT Contact:** Naomi Doak

**Data Source:** Jolliffe, K., and S.-M. Jolliffe. 2008. Hawksbill nesting on Cousine Island, Seychelles: Personal communication. In *SWOT* Report—The State of the World's Sea Turtles, vol. 3 (2008)

Nesting Beach: Cousine Island, Granitic Islands

Year: 2006 Count: 66 nests, 47 false crawls, 36 nesting females Beach Length: 0.9 km

Monitoring Effort: Daytime hourly patrols were conducted from August 20, 2005 to March 5, 2006. Nesting season is September to March, with its peak from November to January.

SWOT Contacts: Kevin and San-Marie Jolliffe

#### Data Record 92

Data Source: (1) Marine Parks Authority of Seychelles. 2008. Hawksbill nesting in Curieuse Island Marine Park, Seychelles. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008). (2) Mortimer, J. A. 2004. Seychelles Marine Ecosystem Management Project (SEYMEMP): Turtle Component. Final report, vol. 1 and vol. 2. (3) Rulie, A. C. 2002. Reflexion sur la conservation de la tortue imbriquee (Eretmochelys imbricata): Application aux Seychelles. Ecole Nationale Veterinaire Toulouse. Annee 2002 These: 2002-TOU3-4166.

Nesting Beaches: Eight beaches at Curieuse Island Marine Park Year: 2006 Count: 200–250 estimated nests

Comments: Nesting estimates are based on track counts conducted by Anne-Claire Rulie and Park Rangers of the Marine Park Authority

SWOT Contact: Jeanne A. Mortimer

#### **Data Record 93**

Data Source: Mortimer, J. A. 2005. Sea Turtles of D'Arros Island and St. Joseph Atoll: Status and Recommendations. In U. Engelhardt, ed. 2005. Proceedings of a Scientific Symposium held at the D'Arros Research Centre 15–17 April 2005. Seychelles: D'Arros Research Centre. Technical Report No. 1.

Nesting Beaches: D'Arros Island and St. Joseph Atoll

Year: 2006 Count: 250–300 estimated nesting females Comments: Nesting estimates are based on track counts conducted by personnel of D'Arros Development (Pty) Ltd. and the D'Arros Research Centre. It is estimated the more than 1,000 nests are laid

SWOT Contact: Jeanne A. Mortimer

#### **Data Record 94**

Data Source: Bovenberg, M., and R. Vonk. 2007. The Hawksbill Turtle (Eretmochelys imbricata) on Fregate Island: The Hawksbill Turtle's Nesting Population and Nesting Habitat on Fregate During the North-West Monsoon in 2006-07. Unpublished report.

Nesting Beach: Fregate Island

Comments: Nesting data from the 2005–06 season were not available. In the 2006–07 nesting season, an estimated 150 nests were laid on Fregate Island, representing approximately 50 individual females. SWOT Contact: Jeanne A. Mortimer

#### **Data Record 95**

Data Source: Vanherck, L. 2008. Hawksbill nesting on North Island, Seychelles: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: North Island

Year: 2006 Count: 30-50 estimated nests

Comments: An estimated 30 to 50 nests were laid per year in the 2005-06 and 2006-07 nesting seasons on North Island. Nesting season is September to January.

SWOT Contact: Linda Vanherck

#### Data Record 96

Data Source: Mortimer, J. A. 2004. Seychelles Marine Ecosystem Management Project (SEYMEMP): Turtle Component. Final report, vol. 1 and vol. 2.

Nesting Beaches: Five beaches in the Ste. Anne Marine Park Year: 2006 Count: 200-250 estimated nests

Comments: Nesting estimates are based on track counts conducted by Park Rangers of the Marine Park Authority of Seychelles. SWOT Contact: Jeanne A. Mortimer

Data Source: Talma, E. 2006. Interim report on 2005–06 Turtle Nesting Season in the South of Mahe, Seychelles. Marine Conservation Society Seychelles. Technical report. Nesting Beach: Beaches of South Mahe Island

Year: 2006 Count: 242 nests Beach Length: 1.83 km

Monitoring Effort: Daily patrols were conducted three times per week between September 2005 and March 2006, and once every one to two weeks throughout the rest of the year. Nesting season is October to February, with its peak in November and December Comments: Data are combined for five adjacent beaches.

SWOT Contact: Elke Talma

Data Source: Mortimer, J. A. 2008. Hawksbill nesting in the Seychelles: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Comments: Seychelles comprises more than 120 islands and many hundreds of beaches. Most beaches in the country host some hawksbill nesting each year. The reports above present data that were collected at some of the best protected and best studied sites in the country, but are by no means exhaustive.

#### SOLOMON ISLANDS

#### **Data Record 98**

Data Source: Siota, C., and P. Ramohia. 2007. Peak Hawksbill Nesting Activities in the Arnavon Community Marine Conservation Area: A Report for The Nature Conservancy, Solomon Islands Field Office, Honiara. Unpublished manuscript.

Nesting Beach: Arnavon Community Managed Conservation Area,

Year: 2006 Count: 286 nests Beach Length: Approximately 4.5 km Monitoring Effort: These beaches were patrolled daily and nightly from June 1 to August 31, 2006.

SWOT Contacts: Peter Ramohia and Catherine Siota

Data Source: Ramohia, P., Siota, C., Motui, D., Routanis, F., Pema, M., Rini, C., Zama, M., Tetabea, T., Madada, L., and G. Willy. 2007. Hawksbill and Green Turtle Nesting Activities on Kerehikapa Island in the Arnavon Community Managed Conservation Area A Report for The Nature Conservancy, Solomon Islands Field Office.

Unpublished manuscript. **Nesting Beach:** Kerehikapa Island, Santa Isabel Year: 2006 Count: 345 nests Beach Length: 1.2 km

Monitoring Effort: These beaches were patrolled daily and nightly from January 1 to December 31, 2006.

SWOT Contacts: Peter Ramohia and Catherine Siota

#### **SRI LANKA**

**Data Source: (1)** Ekanayake, E. M. L., Ranawana, K. B., Kapurusinghe, T., Premakumara, M. G. C., 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. (2) The Turtle Conservation Project. Turtle Nesting Beaches in Sri

Lanka. http://www.tcpsrilanka.org/download/Map.pdf
Nesting Beaches: Southern coast of Sri Lanka

Comments: Nesting data from 2006 were not available. Hawksbills are known to nest along the southern beaches of Sri Lanka

#### SURINAME

#### Data Record 101

Data Source: (1) Mitro, S. Forthcoming. Country report of Suriname. In Proceedings of the Seventh Sea Turtle Symposium for the Guianas (October 25–27, 2004). Georgetown, Guyana. (2) Hilterman, M. L., Goverse, E., Tordoir, M. T., and H. A. Reichart. Forthcoming. Beaches come and beaches go: Coastal dynamics in Suriname are affecting important sea turtle rookeries. In *Proceedings of the Twenty-Fifth Annual* Symposium on Sea Turtle Biology and Conservation: NOAA Technical Memorandum NMFS-SEFC. (3) De Dijn, B. 2003. Country report of Suriname: Marine turtle season 2002. In Proceedings of the Sixth Sea Turtle Symposium for the Guianas, compilers I. Nolibos, L. Kelle, B. De Thoisy, and S. Lochon, 8–10. Remire–Montjoly, French Guiana.

Nesting Beach: Matapica Beach (formerly Bigisanti)
Comments: Nesting data from 2006 were not available. Based on three decades of nest monitoring in Suriname, it is known that Matapica Beach (formerly called Bigisanti) receives 99 percent of all hawksbill nests in the country. The last available data are from 2002 and 2003, when 21 and 16 nests were recorded, respectively **SWOT Contacts:** Edo Goverse and Maartje Hilterman

#### **TANZANIA**

#### Data Record 102

Data Source: Muir, C. 2008. Hawksbill nesting in Tanzania: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Kilindoni, Mafia Island

Year: 2006 Count: 1 nest Beach Length: 2.5 km Comments: Hawksbill nesting in Tanzania is rare.

#### **SWOT Contact:** Catharine Muir **THAILAND**

#### Data Record 103

Data Source: Charuchinda, M., and S. Monanunsap. 1998. Monitoring survey on sea turtle nesting in the Inner Gulf of Thailand, 1994–1996. *Thailand Marine Fisheries Research Bulletin* 6:17-25.

Nesting Beach: Khram Island, Chonburi province

Comments: Nesting data from 2006 were not available. The last available data are from 1996, when 42 hawksbill nests were recorded during nightly patrols throughout the nesting season (May to August). From 1973 to 1996, an average of 74 hawksbill nests were recorded at this site. Sporadic hawksbill nesting has also been

recorded on other islands in the Gulf of Thailand, including the Man, Lan, Chang, Samet, and Thalu Islands.

#### TRINIDAD AND TOBAGO

#### Data Record 104

Data Source: Livingstone, S. R. 2006. Sea Turtle Ecology and Conservation on the North Coast of Trinidad. PhD diss., University of Glasgow, Scotland.

Nesting Beaches: 5 small sandy bays around Grande Riviere (North coast), Trinidad

Beach Length: 50 km

Comments: An estimated 675 hawksbill nests are laid per year on these beaches, combined. Estimate is based on data collected from April to September in 2000 to 2004 during patrols of the entire coast two to three nights every one to two weeks. Nesting season is May to September, with peak nesting in July and August.

SWOT Contact: Suzanne Livingstone

### **UNITED STATES OF AMERICA**

**Data Source: (1)** Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Statewide Nesting Beach Survey Program. http://research.myfwc.com. (2) Brost, B. 2008. Hawksbill nesting in Florida, USA: Personal communication. In SWOT Report— The State of the World's Sea Turtles, vol. 3 (2008).

Nesting Beach: Bahia Honda State Park, Monroe County, Florida Year: 2006 Count: 3 nests Beach Length: 4.7 km Monitoring Effort: Daily beach patrols were conducted from April 17 to September 1, 2006. Nesting occurs between early August and

Nesting Beaches: Boca Raton Beaches, Palm Beach County, Florida Year: 2006 Count: 1 nest Beach Length: 8 km

Nesting Beach: Breakers Beach, Palm Beach County, Florida Year: 2006 Count: 1 nest Beach Length: 0.5 km Monitoring Effort: The above beaches in Palm Beach County were

atrolled each morning from March 1 to October 31, 2006

#### **SWOT Contact:** Beth Brost

**Data Record 106** Data Source: Pacific Whale Foundation. Sea Turtles: A Hawai'i

Wildlife Guide. http://www.pacificwhale.org.

Nesting Beaches: Beaches on Hawai'i Island (Big Island), Mau'i Island, Moloka'i Island, and O'ahu Island, Hawaii

Comments: Approximately 10–15 hawksbill nests are laid per year

in the state of Hawaii. Ninety percent of the nesting occurs or the Ka'u coast of Hawai'i Island. Nesting season is from mid-May through November.

SWOT Contact: George Balazs

#### U.S. VIRGIN ISLANDS

#### **Data Record 107**

**Data Source**: NPS Buck Island Reef National Monument Sea Turtle Research Program Seasonal Report 2006. St. Croix, U.S. Virgin Islands: National Park Service, Buck Island Reef National Monument, Division of Resource Management. Unpublished report.

Nesting Beaches: Buck Island Reef National Monument, St. Croix Year: 2006 Count: 133 confirmed nests, 101 suspected nests Beach Length: 1.5 km

Monitoring Effort: These beaches were patrolled from July 1 to September 30, 2006. Nesting occurs year-round, with its peak from

SWOT Contact: Zandy Hillis-Starr and Ian Lundgren

#### **VENEZUELA**

Data Source: (1) Guada, H. 2008. Hawksbill nesting in Venezuela: Personal communication. In SWOT Report—The State of the World's Sea Turtles, vol. 3 (2008). **(2)** Guada, H. J., and G. Solé. 2000. WIDE-CAST Plan de Acción para la Recuperación de las Tortugas Marinas de Venezuela. Informe Técnico del PAC No. 39. Kingston, Jamaica: United Nations Environment Programme Caribbean Environment Programme. **Nesting Beaches:** Beaches along the Caribbean coast

Comments: Nesting data from 2006 were not available. Extensive surveys in the late 1980s found that hawksbills nested in unknown numbers on many beaches along the coast. Further studies in the late 1990s and in recent years have found scattered nesting throughout other areas of the coast. Hawksbill nesting sites have been recorded in the following Venezuelan states and federal dependencies: Estado Anzoátegui, Estado Aragua, Estado Falcón, Estado Miranda, Estado Sucre, Estado Vargas, Isla de Aves, and Isla La Blanquilla **SWOT Contact**: Hedelvy Guada

#### VIETNAM

#### Data Record 109

 $\label{eq:DataSource:} \textbf{Data Source:} \ Hamann, \ M., \ The \ Cuong, \ C., \ Duy \ Hong, \ N., \ Thuoc, \ P., \\ and \ B. \ Thi \ Thuhien. \ 2006. \ Distribution \ and \ abundance \ of$ marine turtles in the Socialist Republic of Viet Nam. *Biodiversity and Conservation* 15: 3703–20.

Nesting Beaches: Gulf of Thailand, Gulf of Tonkin, and Spratly

Comments: Data from 2006 were not available. Recent surveys indicate that less than 10 nests per year are laid in Vietnam

#### YAP, FEDERATED STATES OF MICRONESIA

Data Source: Cruce-Johnson, J. 2006. Yap State Sea Turtle Conservation Program, Ulithi Tagging Project, Gielop and Iar islands, Summer 2005. Yap State, Federated States of Micronesia: Marine Resources Management Division Report. Unpublished report.

Nesting Beach: Gielop Island Year: 2006 Count: 0 nests

Comments: No hawksbill nesting was observed in 2006. In 2005, one nesting hawksbill was observed and tagged while nesting on Gielop Island. Nightly patrols were conducted on most nights from June 9 to August 24, 2005, and from June 2 to August 20, 2006. **SWOT Contacts:** Jennifer Cruce and Wayne Sentman

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Edo Goverse

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Like many conservation efforts, SWOT has relied on a broad and diverse network of contributors to realize its success. This "SWOT Team" of dataholders, authors, photographers, volunteers, advisers, and donors continues to grow and to achieve its goals. Thanks go out to all of you, with special gratitude to the Moore family; Paxson and Susan Offield; Barbara Bauer; and the Panaphil Foundation (we miss you, Frances). The support of this group has allowed important information to be made widely available, raising awareness of the current status of sea turtles globally and instilling a conservation ethic in many audiences around the world.

Sincerely,
Rod, Lisa, and Brian—SWOT Report Editors



# In Memoriam

David Liittschwager

Lance Ferris (1946–2007). Lance Ferris, known by many in Australia as their "Pelican Man," was also a dedicated sea turtle conservationist. Many years into his career of rescuing and rehabilitating seabirds, in 1992 Lance founded the Australian Seabird Rescue (ASR) in New South Wales, Australia, an excellent center for seabird conservation and for education about marine and coastal conservation issues. Five years later, Lance helped to develop a marine turtle division at the ASR. One of the center's most important achievements was New South Wales' ban on mass release of helium balloons, passed in 2002—legislation that certainly saved the lives of many seabirds, sea turtles, and other marine wildlife. Lance passed away in October 2007, but his legacy lives on at the ASR.

#### **Bringing Conservation into Focus**



PHOTOGRAPHERS

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The International League of Conservation Photographers (ILCP), a consortium of professional photographers working to raise conservation awareness through photography, has provided several photos to this issue of *SWOT Report*. The SWOT Team thanks ILCP for

those important contributions, which are indicated throughout the magazine with the ILCP logo.

# The State of the World's Sea Turtles *at a Glance*Major Headlines of 2007

Sea Turtle Conservationist Named Animal ➤ Planet's 2007 Hero of the Year

Source: Animal Planet (Nov. 1, 2007)

Baja Fishermen Make a Change to Aid Sea Turtles Source: New Scientist (Oct. 19, 2007)

U.S. Report Shows Decline in Loggerhead Sea Turtles

Source: New York Times / Associated Press (Sept. 22, 2007)

World's Largest Green Turtle Rookery at Raine Island, Australia, Given Highest Protection Status

Source: Queensland Government (Aug. 22, 2007)



Biologists have found a major clue in the age-old mystery of green turtles' "lost years"—the period of time between crawling out of their sandy nests into the surf and reappearing several years later in coastal foraging grounds as juveniles. New research shows that these young turtles hide themselves in the open ocean, feeding on jellyfish and other small animals. © RODERIC B. MAST / CONSERVATION INTERNATIONAL



At the Karen Beasley Sea Turtle Rescue and Rehabilitation Center on Topsail Island in North Carolina, U.S.A., Jean Beasley (second from left), engages volunteers of all ages in sea turtle conservation. In Nov. 2007, Jean was voted Animal Planet's Hero of the Year. © NEIL OSBORNE / WWW.VISIONSBYNEILOSBORNE.COM

### **IUCN Red List Shows Olive Ridleys' Status Improved**

Source: IUCN—The World Conservation Union (Sept. 10, 2007)

# Costa Rica Expropriates Land at Las Baulas to Protect Leatherbacks

Source: Reuters (Oct. 11, 2007)

# Poachers with Nearly 300 Endangered Sea Turtles Caught Near Malaysia

Source: MSNBC News Service (March 30, 2007)

✓ Biologists Begin to Understand Mystery of Sea Turtles' "Lost Years"

Source: Science Daily (Oct. 3, 2007)

# Scientists Warn of Climate Change Risk to Marine Turtles

Source: Science Daily (Feb. 22, 2007)

To read these stories, visit the SWOT website at www.SeaTurtleStatus.org.

State of the World's Sea Turtles

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