



Marine turtles

Global voyagers threatened with extinction



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- conserving the world's biological diversity
- ensuring that the use of renewable resources is sustainable
- promoting the reduction of pollution and wasteful consumption

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Introduction

Marine turtles have travelled the seas for over 100 million years. Once they shared the planet with prehistoric animals, most of which are long since gone. The marine turtles survived the extinction of the dinosaurs and they are still present in the world's oceans today. Until recently, their survival success was obvious as marine turtles crawled ashore to nest in abundance on tropical, subtropical and some temperate beaches around the globe.

Unfortunately, hunting for meat, shell and eggs, habitat destruction, fisheries by-catch, international trade, pollution, boat strikes, introduced predators, disease and climate change have entirely wiped out or severely reduced marine turtle populations to mere shadows of their former glory. Today, three of the seven existing species of marine turtle are critically endangered with extinction, three are endangered and due to insufficient information the status of the seventh species remains unknown.

As a result of the reduction in marine turtles, ecosystems such as coral reefs and seagrass beds are suffering. The balance between marine animal and plant species has changed with impacts on commercial fisheries.

The possibility of creating livelihoods through ecotourism to observe marine turtles is rapidly disappearing in coastal communities throughout the tropics. The cultural importance attached to marine turtles will fade, undermining the identity of many human societies. Marine turtles are awesome creatures and the world's oceans would be empty without them. Only a concerted global effort will ensure the survival of these ancient mariners and the continued existence of the ecological and economic benefits they provide.

Marine turtle conservation represents a formidable challenge. Geographically, a single marine turtle will pass through numerous habitats on land and at sea, cross the borders of several countries and swim through international waters during the course of its life. The time scale is equally overwhelming. Marine turtles take decades to reach maturity before returning to the beach area where they were born in order to lay eggs that ensure continuation of the species.

A wide range of conservation actions are required to reverse the decline in marine turtles. The creation of strategic networks of Marine Protected Areas will help conserve the ecosystems that marine turtles need for survival. Key nesting beaches where turtles are most vulnerable must be protected, as must priority nursery and feeding grounds and migratory corridors. Promotion of community participation and environmental education is needed to get local people involved in conservation activities. National policies and international treaties must address marine turtle conservation issues, and implementation of agreements must be ensured. By-catch in fisheries should be reduced through restrictions and the mandatory use of fishing gear that avoids trapping marine turtles.

Today, three of the seven existing species of marine turtle are critically endangered

Egg collection is thought to be the major reason for the decline in leatherback turtle nesting in Terengganu, Malaysia from over 10,000 nests in 1956 to none in 2003.



Caribbean Conservation Corporation

A nesting loggerhead turtle.



WWF-Carmon / P.C.H. PRITZ-HARD

Marine turtle lifecycle

Marine turtles are creatures of the ocean but they still depend on land for reproduction. Female turtles crawl painstakingly ashore to dig nests and lay eggs on sandy beaches. It takes hours for the female turtle to complete the nesting process before returning to the sea. The heat of the sand incubates the eggs and they develop without any help from parent turtles. Roughly two months later, tiny hatchlings emerge from the nest and dart towards the water. Once the hatchlings reach the sea, a swimming frenzy ensues to reach open ocean zones where currents meet and the small turtles find food and refuge from the many predators that prey on hatchling turtles. After several years far away from land, most marine turtle species approach the coast again as juveniles. The young turtles develop specialised feeding habits that vary between species. Hawksbill turtles *Eretmochelys imbricata* eat mainly sponges, green turtles *Chelonia mydas* like seagrass or algae and loggerhead turtles *Caretta caretta* prefer molluscs and crustaceans. Juvenile turtles migrating between feeding areas can move thousands of kilometres. Only once marine turtles become adults, after decades, do they return to the beach area where they were born to lay their own eggs. The long time to reach maturity and the many natural dangers faced by hatchlings and juveniles mean that as few as 1 in 1000 eggs will survive to adulthood. Adult marine turtles migrate hundreds or even thousands of kilometres between feeding habitats, mating areas and their preferred nesting beach. After nesting the first time, marine turtles may return to the same nesting beach to lay eggs every couple of years for over two decades.

Life cycle
the female comes to shore to lay her eggs

WWF-Carmon / M.HARVEY

Digital Vision

Worldwide status of marine turtles

Marine turtles are present in all the world's oceans. The leatherback turtle *Dermochelys coriacea* is the most widely distributed species and has been observed as far north as Norway, Canada and Alaska and as far south as Argentina, Chile and New Zealand. The flatback turtle *Natator depressus* has the most limited range with a distribution restricted to the Australian continental shelf. Although most marine turtle species occur in all major oceans, they are confined to habitats where they can find enough food items to prosper. Hawksbill turtles move through tropical waters to coral reefs where sponges can be found in abundance. Leatherback turtles can swim even further and migrate thousands of kilometres between tropical nesting beaches and temperate or sub-arctic waters, in pursuit of jellyfish to eat.

The first Europeans to arrive in the Caribbean Sea wrote of vast numbers of marine turtles filling the shallow seas around the islands. Nesting populations, known as rookeries, which no longer exist or have been severely reduced, were once described as enormous and the nearby waters so full of turtles that they looked like little rocks. Similarly impressive marine turtle rookeries existed in the Indo-Pacific region. Unfortunately, the days of tropical seas teeming with marine turtles have now passed. The leatherback, Kemp's ridley *Lepidochelys kempii* and hawksbill turtles have suffered severe population declines and are now considered critically endangered, according to the World Conservation Union (IUCN) Red List of Threatened Species. Significant reductions in populations mean that the olive ridley *Lepidochelys olivacea*, loggerhead and green turtles are endangered. Lack of information on long-term population trends makes it impossible to determine the exact risk of extinction for the flatback turtle.



In Suriname, people have used leatherback and green turtle eggs from nests laid below the high tide waterline as a source of protein. Egg collection is also widespread on marine turtle nesting beaches in South-East Asia.

Decline of leatherback turtles in the Pacific Ocean

Over the past decades, large leatherback nesting populations in Pacific Costa Rica, Mexico and Malaysia have dwindled. It has been estimated that in the Eastern Pacific the number of leatherback turtles has decreased from over 90,000 adults in 1980 to less than 2,000 adult females in 2000. Egg collection and by-catch in fisheries are believed to be behind the drastic decline.

Why is it important to conserve marine turtles?

Marine turtles are key species in the ecosystems they inhabit and their existence helps sustain marine biodiversity. The presence of marine turtles helps to maintain equilibrium between rival species that may otherwise eliminate each other. Marine turtle conservation benefits marine ecosystems as marine turtle survival and the future well-being of many ecosystems and the numerous species that share them, are closely linked.

Hawksbill turtles maintain the balance on coral reefs – Coral reefs abound with life forms that live together in a delicate balance. The hawksbill turtles' favourite food items are sponges common to coral ecosystems. Sponges compete with corals for space on the reef. In the absence of hawksbill turtles, sponges that are more aggressive will reduce the corals and increase their own presence in the reef. The killing of thousands of hawksbill turtles for their shell over the past centuries may have completely changed the way that some coral reef ecosystems now function.

Green turtles keep seagrass beds healthy – Seagrasses and algae are the green turtles' preferred snacks. Seagrasses grow in shallow waters and can cover extensive areas. Seagrass beds are amongst the most productive ecosystems on the planet. Green turtles both help to maintain the seagrass beds and make them more productive. Without green turtles, the seagrass blades grow tall and sediments that obscure the light and promote disease build up. If instead green turtles eat the seagrass, they will keep the plants short and prevent build-up of sediments. Also, the seagrass consumed by green turtles is quickly digested and become available as nutrients to the many species of plants and animals that live in the seagrass ecosystem. Seagrass beds function as nurseries for several species of invertebrates and fish, many which are of considerable value to commercial fisheries and important to human food security.

Marine turtles fulfil important roles in marine ecosystems – The olive and Kemp's ridley turtles feed on invertebrates and may play important roles in both open ocean and coastal ecosystems. Loggerhead turtles eat many types of invertebrates, in particular molluscs and crustaceans, and can change the seabed by "mining" the sediments for their favourite prey. Also, loggerhead turtles carry veritable animal and plant cities on their shell. As many as 100 species of animals and plants have been recorded living on one single loggerhead turtle. These animals and plants depend on turtles to have somewhere to live and to prosper. The future for many of these species is intimately linked to marine turtle survival. Flatback turtles prefer to eat jellyfish, sea pens and soft corals that live on the seabed and could be affecting species distributions and abundance in coastal ecosystems.

Leatherback turtles control jellyfish populations – The leatherback turtle is the largest of the living turtles and feeds mainly on jellyfish, which are made up of more than 95% water. As a major jellyfish predator, the leatherback turtle provides natural ecological control of jellyfish populations. Overabundance of jellyfish may reduce fish populations as jellyfish can feed on fish larvae and reduce population growth of commercially important fish. Hence, the presence of leatherback turtles benefits fish, fisheries and people.

Marine turtles feed many species in the open ocean – Most marine turtle species spend their first years in the open ocean. The small turtles eat tiny animals that they find in the floating sargassum seaweed concentrations where they live. Fish, sharks and birds in turn prey upon the young turtles. The marine turtles fill an important ecological role by controlling prey species and themselves providing food to larger predators. The disappearance of marine turtles could therefore have widespread effects in open ocean ecosystems.

Marine turtles are biological nutrient transporters – All species of marine turtle carry energy from the coastal and pelagic ecosystems where they feed to the sandy beaches where they deposit their eggs and therefore they function as biological nutrient transporters. The energy contained inside turtle eggs comes from the food items that the turtles have found in the marine environment. Through marine turtles, the health of the ocean and of the ecosystems on land are directly connected. Many wildlife species depend on marine turtles and their eggs as a source of food. If the decline in marine turtles is allowed to continue, it could have severe consequences for many marine and terrestrial plant and animal species that depend on turtles for their survival.

A live turtle is worth more than a dead turtle – Marine turtles are economically important to humans. Coastal communities in developing countries use marine turtles

as a source for food. Also, the catch of fish and invertebrates that are used for human consumption or commerce ultimately depend on healthy marine turtle populations. In recent years, marine turtles have become increasingly important as an ecotourism attraction. People are now travelling far to watch these amazing ancient mariners when they come ashore to lay eggs. This has led to a rise in tourism operations that in turn provide jobs and income to seaside communities throughout the tropical and subtropical part of the world. Observing a marine turtle laying eggs is a truly thrilling experience. Marine turtle watching increases people's interest in marine and coastal issues and inspires commitment to support conservation efforts. Marine turtles are flagship species that attract help to themselves as well as to the many species with which they co-exist.

Economic value of marine turtles

Tourists visiting Tortuguero National Park to observe marine turtle nesting spent over six million US dollars in 2002. Marine turtle ecotourism is now the most important economic activity for people living in this small village on the Caribbean coast of Costa Rica. In tropical developing countries, tourism to watch marine turtle nesting is creating livelihoods and is becoming an increasingly important source of income for local communities.

Cultural value of marine turtles – Marine turtles also have an intrinsic value. Many cultures and human societies have expressed fascination for marine turtles and they play important roles in diverse myths and stories. An ancient Taoist myth tells that far east from the Chinese coast, there are five islands resting on giant marine turtles and inhabited by immortal men and women living in perfect harmony. Creation myths from ancient Hindu culture and indigenous groups from as far apart as North America and Papua New Guinea have the Earth resting on the back of a gigantic marine turtle. Marine turtles should be conserved for future human generations to awe and ponder. The oceans of the world would be far less spectacular if marine turtles were allowed to slip into extinction.

Life cycle
the hatchlings
emerge after
two months

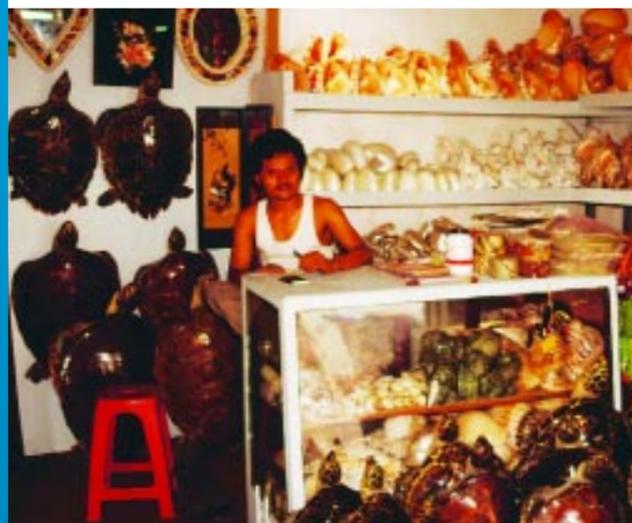


Threats to marine turtle survival

Habitat Destruction – Uncontrolled development has led directly to the destruction of critically important marine turtle nesting beaches. Under natural conditions, the brightest lights on a beach at night come from the direction of the sea where the waves break and where there is no vegetation to shade the moonlight or the reflection from the stars. The light provides a clue to hatchling turtles emerging from the nests at night and allows them to rapidly find their way to the water. Lights from roads and buildings attract hatchlings and disorient them away from the sea. Instead of finding the ocean, the hatchlings fall prey to predators or die the following day from the heat of the sun. Furthermore, vehicle traffic on beaches compacts the sand and makes it impossible for female turtles to dig nests. Sea walls and jetties change long-shore drift patterns and can cause erosion or destruction of entire beach sections. Beach restoration projects aimed at protecting seaside buildings, through dredging and sand filling, have destroyed important nearshore feeding grounds and have altered nesting beaches. Important marine turtle feeding habitats such as coral reefs and seagrass beds have been damaged or entirely destroyed as a result of sedimentation, nutrient run-off, insensitive tourist development, destructive fishing techniques and climate change.

In the Philippines, over 70% of coral reefs has been destroyed and only 5% remain in good condition. In Indonesia, where the world's most diverse coral reefs can be found, 50% of reefs are now dead or severely degraded. Hard coral cover on reefs in the Caribbean Sea have been reduced by 80% over the last three decades.

In the 1980s, seagrass mass mortality resulted in die-off of turtlegrass in Florida Bay and the Gulf of Mexico. Sub-tidal seagrasses in the offshore half of Moreton Bay near Brisbane, Australia have almost disappeared over the past 20-30 years.



Fishmarket souvenir shop selling sea turtles and shells, Jakarta, Indonesia

Directed take – Hunting and egg collection for consumption are major causes of the drastic decline in marine turtle populations around the world. Green turtles are caught for their meat, eggs and calipee. Calipee is the green body fat that has given the turtle its name and it is the main ingredient in turtle soup. Researchers estimate that each year poachers take 30,000 green turtles in Baja California and that more than 50,000 marine turtles are killed in Southeast Asia and the South Pacific. Hawksbill turtles are much sought after throughout the tropics for their beautiful brown and yellow carapace plates that are manufactured into tortoiseshell items and either exported or sold at local markets. Leatherback turtles are killed in some places for their meat and ovaries although in most countries only their eggs are consumed. Olive ridley turtles have been pursued for eggs and their skin used for leather production. In the 1960s, over one million olive ridley turtles were butchered each year on Mexico's Pacific coast. In many countries, juvenile marine turtles are caught, stuffed and sold as curios to tourists. Marine turtle eggs are considered an aphrodisiac in some countries and eaten raw or sold as snacks in bars and restaurants. In 1996, Mexican authorities seized a truck containing 500,000 olive ridley eggs collected illegally from an important marine turtle rookery.

International trade – International trade in products such as tortoiseshell from hawksbill turtles, green turtle calipee and leather from olive ridley turtles has exacerbated the directed take of marine turtles. During colonial times, European countries were the major importers of marine turtle products. Over the past decades, Japan has emerged as the principal country buying shell (known as Bekko) from tropical countries to produce costly handicrafts. All marine turtle species are currently listed on Appendix I of CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) prohibiting any commercial trade by more than the 160 signatory countries. Even so, trade between non-signatory countries and illegal trade persist.

By-catch – Each year, tens of thousands of olive ridley, Kemp's ridley, loggerhead and even green and leatherback turtles are trapped in shrimping operations. Marine turtles are reptiles and have lungs so when they can not reach the surface to breathe, they drown. Gill nets and long-line fisheries are now principal causes of marine turtle mortality. By-catch in open ocean fisheries is believed to be behind the drastic decline in Pacific leatherback turtles. Worldwide, hundreds of thousands of marine turtles are caught annually in trawls, on long-line hooks and in fishing nets.

Climate change – Changing climate and global warming have the potential to seriously impact marine turtle populations. Marine turtles have temperature-dependent sex determination, meaning that the temperature of the developing egg will determine the sex of the hatchling. An increase in global temperatures will change the proportion of female and male turtles and could result in marine turtle populations becoming unstable. A higher frequency of tropical storms caused by climate change will result in increased nest loss. Similarly, rising sea water levels threaten to wash out or erode entire nesting beaches. Key marine turtle habitats such as coral reefs are particularly vulnerable to increases in sea temperature. An increase of only a couple of degrees in water temperature is enough to cause bleaching that kills corals and threatens the foundation on which entire communities of species such as marine turtles depend. The 1998 coral bleaching incident is the worst on record, with reports of degradation from countries across all of the world's oceans. Vast reef areas have been devastated, with up to 90% of corals dead or dying in places. Other stresses such as pollution and sedimentation are likely to compound this threat. Seagrass beds are also increasingly impacted by climate change. Fewer coral reefs and seagrass beds mean less food and refuge for marine turtles so their populations will decline further. Higher temperatures also magnify other threats such as disease and pollution.

Pollution – Marine turtles can mistake floating plastic materials for jellyfish and choke to death when they try to eat them. Discarded fishing gear entangles marine turtles and can drown or render a turtle unable to feed or swim. Rubbish on beaches can trap hatchlings and prevent them from reaching the ocean. Oil spills can poison marine turtles of all ages. Marine turtles have been killed by oil pollution in the Gulf of Mexico and the Arabian Gulf. In 2003, an oil tanker ran aground close to Karachi, Pakistan. Oil from the vessel threatened green and olive ridley turtle beaches at the peak of the nesting season. Spills on nesting beaches affect hatchlings that are most vulnerable to oil, in addition to impacting adult turtles and their eggs.

Boat strikes – All marine turtles, with the exception of the leatherback turtle, have hard carapaces but their shells are unable to withstand the strike of a boat or the cut of a powerful propeller. Marine turtles staying close to the ocean surface to bask, mate or breathe are most likely to collide with boats or be hit by propellers. On Zakynthos Island, Greece, at least nine adult female loggerhead turtles were killed by boat collisions close to the nesting beaches in Laganas Bay in 1993.

Introduced predators – Marine turtles can lay more than 150 eggs to make up for the high mortality that prevent most marine turtles from reaching maturity. The subtle balance between marine turtles and their predators can be tipped against turtle survival when new predators are introduced or if natural predators suddenly increase in number as a result of human interference. On nesting beaches in the Guianas, dog predation now represent a major threat to marine turtle eggs and hatchlings. In South Eastern United States, household garbage has become a source of food for racoons. This has led to a major increase in racoon populations. The results for marine turtles have been devastating. On some beaches, racoons now dig up and destroy as many as 96% of loggerhead turtle nests.



Disease – Many types of diseases have been observed in marine turtles. Recent reports of a rise in the occurrence of fibropapillomas, a tumorous disease that can kill marine turtles, is of great concern. It has been suggested that the increased occurrence may be the result of run-off from land or marine pollution that may weaken the turtles' immune system, rendering them more susceptible to infection by the herpes-like virus that is thought to cause the disease. On some of the Hawaiian Islands, almost 70% of stranded green turtles are affected by fibropapillomas.

Life cycle
the hatchlings
head for the
open sea



WWF-Carson / F. LaGuen

What needs to happen to save marine turtles globally

Successful strategies to conserve marine turtles must consider their complex life cycle, and their migratory nature.

Conservation work to protect marine turtles must be long-term and involve all countries that share marine turtle populations. Threats to marine turtle survival have to be addressed both locally and internationally.

Around the world, WWF is working at the local, regional and international level to promote and carry out critical conservation action to help save marine turtles and the habitats upon which they depend. Priority actions undertaken by WWF to conserve marine turtles include:

Promoting Marine Protected Areas – Marine turtles will only survive if large enough sections of ocean and coasts where marine turtles eat, sleep, travel, breed and nest are effectively protected. A global network of Marine Protected Areas (MPAs) should form the cornerstone of international conservation efforts. Critically important nesting beaches, coastlines and areas in the open ocean should be identified and approved for conservation action. MPAs come in different shapes, sizes and management regimes and can be adapted to the habitats, species and marine turtle life-stages that most need protection. This could be a beach where marine turtles nest or an interlinked system of mangroves, seagrass beds and coral reefs which together provide marine turtles and countless other creatures with feeding grounds and nurseries. Other MPAs could be created in the open ocean along key turtle migratory routes to address threats caused by industrial fisheries and other oceanic activities.

Some MPAs may need complete protection from any type of exploitation, and will include no-take zones. In other cases, marine turtle conservation activities can co-exist with sustainable fishing, tourism and other economic pursuits that are carefully managed to minimise impacts on marine turtle populations.



Plastic materials can kill hatchling and adult marine turtles.

WWF works globally to reinforce and promote the establishment of MPAs in coastal regions and increasingly on the high seas. The long-term goal is to achieve a representative network of MPAs that support marine turtle habitats and human livelihoods that depend on marine ecosystems.

Protecting nesting beaches – Marine turtles congregate to nest at predictable times and on specific beaches. Therefore, populations are very susceptible to over-exploitation by humans during the nesting period. In many cases, the declaration of protected areas around nesting beaches, and active management, are necessary to protect turtles during the time when they are most vulnerable. Due to the prolonged time to maturity, hatchlings will not return as adults to lay eggs for decades. Therefore, nesting beach projects have to be maintained for long time periods before notable results are achieved. WWF works around the world to promote and strengthen protected areas around marine turtle nesting beaches.

Supporting community participation, environmental awareness and education – Many coastal communities use marine turtles for consumption. Active involvement of local people in projects is often crucial in order to win support for conservation activities. Alternative livelihoods may have to be identified and developed for stakeholder groups that are negatively affected by restrictions on marine turtle use. Non-consumptive uses such as ecotourism or employing former turtle poachers in conservation programmes may address both conservation and human development needs. WWF encourages activities that contribute to social and economic development as well as to conserving marine turtles.

Marine turtles take a long time to reach maturity. Even if poachers take many of the marine turtles that come to nest or collect all their eggs, turtles born decades ago reach maturity and return to the nesting beach area. Often, the continuous arrival of nesting turtles gives a false sense of security and the

population seems stable. A marine turtle population can appear to withstand heavy poaching for decades before the population is totally beyond recovery. Education at all levels is needed to increase the understanding of marine turtle biology and the importance of marine turtles to ecosystems and humans.

WWF raises awareness so that local communities and national authorities become more involved in conserving marine turtles.

Improving policy – Marine turtles spend part of their lifetime on land and the remainder in the sea. Therefore, within one country the responsibility for marine turtle conservation is often divided between many government agencies. National laws have to define clear responsibilities for marine turtle conservation and make sure that adequate protection is provided to turtles on land and in the ocean. WWF actively works with governments to promote new legislation and policies that benefit marine turtle conservation in the context of both the species themselves, and the spaces in which turtles live, travel, eat and breed.



Influencing international treaties and agreements – Marine turtles do not recognise national boundaries, and may pass through many countries and international waters during their extended lifetime. Marine turtles represent a shared resource. They may be used as an ecotourism attraction when they come to lay eggs on a nesting beach and then become a food source once they migrate to feeding grounds in neighbouring countries. International coordination and cooperation is paramount to achieve efficient marine turtle conservation. International and regional agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention for Migratory Species (CMS), the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC), the Convention on Biological Diversity (CBD) and the Ramsar Convention on Wetlands are much needed mechanisms that provide formal ways for member governments to work together to protect marine turtles and their habitats.

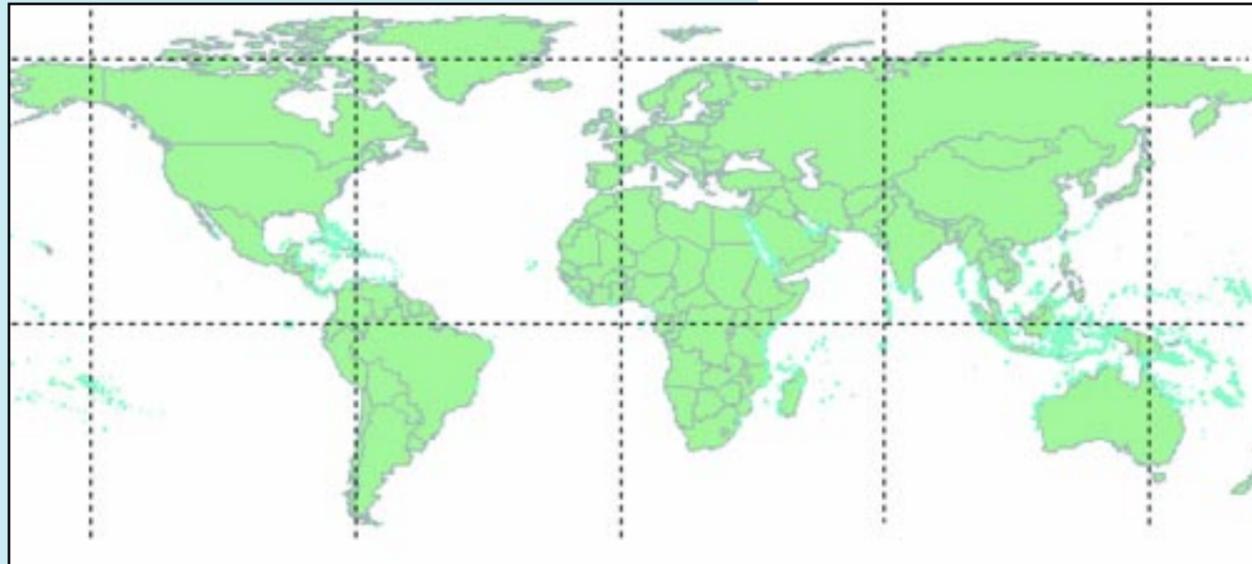
In Africa and Asia, the two Memorandums of Understanding on marine turtle conservation along the Atlantic Coast of Africa and in the Indian Ocean & South-East Asia will stimulate signatory countries to recover depleted marine turtle populations for which they share responsibility. International treaties are particularly important to address threats that occur over large areas such as fisheries by-catch, international trade and climate change. WWF plays an active role in making sure that conventions such as CITES, CMS and IAC are successful in protecting marine turtles. The CBD and Ramsar are playing a growing role in protecting coastal and marine habitats critical to marine turtle survival. WWF also works through TRAFFIC, the wildlife trade monitoring programme of WWF and the IUCN to monitor and halt illegal trade in marine turtle products. Recently, TRAFFIC reviewed the exploitation, trade and management of marine turtles in 11 countries and territories in the Northern Caribbean region.

Reducing by-catch – Incidental capture in fisheries has emerged as a significant threat to marine turtle survival. The only ways to address the threat are to restrict fishing in designated areas or to employ fisheries techniques that reduce by-catch to acceptable levels. Shrimp trawls have to be fitted with turtle-excluder-devices (TEDs) and new techniques have to be developed to ensure that marine turtles do not fall victims to incidental catch. WWF promotes responsible fisheries and advocates the use of technologies that reduce by-catch of marine turtles and other species in fisheries activities.

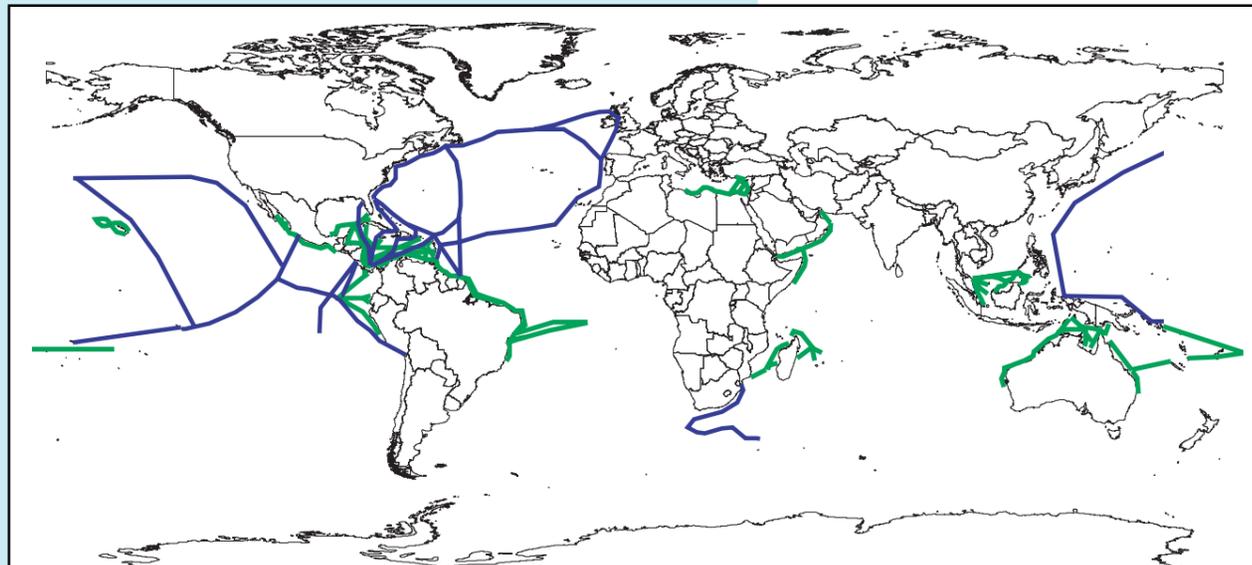
Funding research – Many marine turtle life stages take place far from land, away from human observers and remain little known. Research aimed at finding out marine turtle survival rates under natural conditions will allow identification of sensitive lifestages that are impacted most by humans and that should be priorities for active conservation. Research to identify migratory corridors and feeding habitats is needed so conservation action is taken where it is most needed. WWF funds research to find out more about poorly studied marine turtle lifestages so threats to marine turtle survival are identified and addressed.

Life cycle
juvenile turtles
can spend
several years
at sea before
returning to
the shore



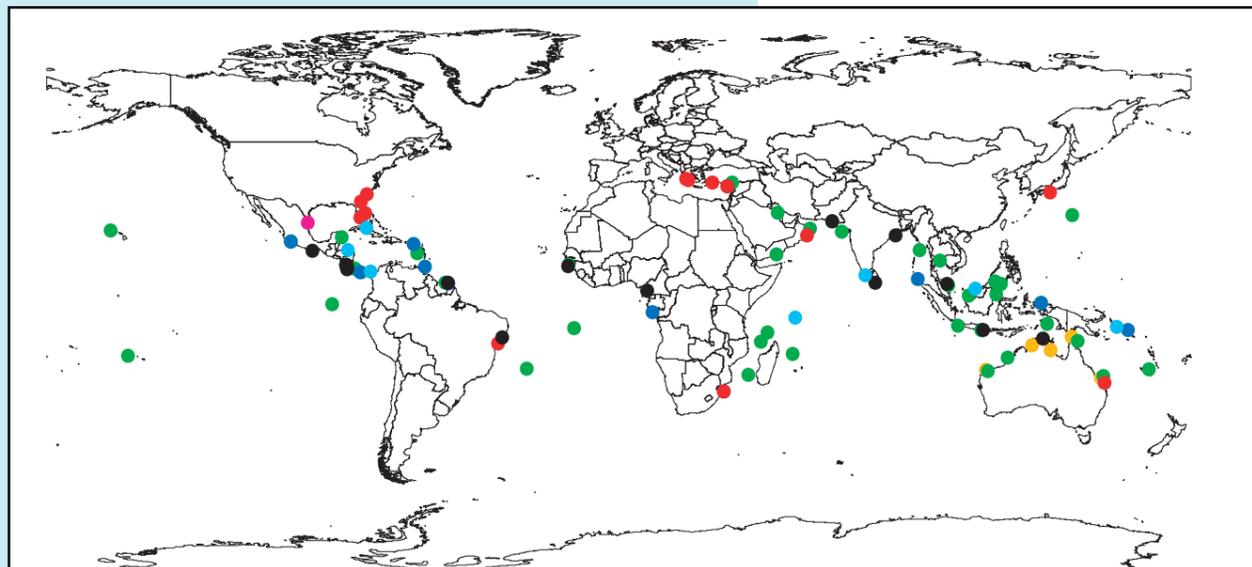


Distribution of important marine turtle habitats (coral reefs and seagrass beds)



Major marine turtle migratory pathways for green and leatherback turtles

— green turtles
— leatherback turtles



Worldwide distribution of major marine turtle rookeries.

- flatback
- green turtles
- kemp's ridley
- leatherback
- loggerhead
- olive ridley
- hawksbill

Case Study 1: Reducing turtle trade and increasing environmental awareness on Bali, Indonesia

The use of green turtles for religious and food purposes has long been common amongst Hindus on the island of Bali, Indonesia. Since 1996, WWF has worked to reduce the use and trade of green turtles on Bali. WWF staff developed innovative environmental education activities such as traditional dance and puppetry that are consistent with beliefs and religion known as adat. By incorporating a marine turtle conservation message in these activities, WWF managed to reach a wide audience, even in villages with high turtle consumption. In 1998, WWF organized a meeting between village leaders, high priests and Hindu theologians to discuss the use of green turtle meat in rituals and offerings. As a result, the priests and theologians urged people to reduce their consumption of turtle meat and instead replace turtle meat in rituals with drawings or turtle-shaped rice cakes.

Case Study 2: Researching marine turtles and creating incentives for conservation in the Guianas, South America

The beaches of the Guianas (French Guiana, Suriname and Guyana) in South America host the largest leatherback turtle nesting population in the world and also green, hawksbill and olive ridley turtle rookeries. In historical times, the nesting beaches in the Guianas were remote and isolated. The only human impacts came from indigenous tribes living in small communities near the nesting beaches. Subsistence hunting and egg collection had little noticeable effect on the marine turtle populations. However, as the Guianas became more populated and natural resources became more exploited, human activities began to threaten marine turtle survival. For the past 20 years, WWF has worked with local partners and indigenous communities in the region to improve marine turtle conservation. This has been achieved through enforcement and by developing ecotourism and alternatives to unsustainable fishing practices and the hunting of turtles for meat and eggs. New research techniques, like satellite tracking, special turtle tags and genetic research are allowing WWF to increase the understanding of marine turtle biology and to find ways to improve conservation. Through WWF's efforts, local organisations and communities have begun to play an even more crucial role in the conservation and management of marine turtles in the Guianas.

Case Study 3: Integrating conservation and development at the Turtle Islands Heritage Protected Area

The nine Turtle Islands represent one of South East Asia's major remaining green turtle rookeries and host important nesting of hawksbill turtles. There has been a 88% drop in green turtle egg production within the last 39 years and far-reaching conservation actions are urgently needed. WWF has supported various conservation efforts in this area since 1988. In 1996, the Philippine and Malaysian Governments established the Turtle Islands Heritage Protected Area, the world's first transfrontier protected area for marine turtles. WWF organizes and trains cooperatives to develop alternative sources of livelihood such as the collection of food fish and spiny lobsters in order to reduce the reliance on marine turtle egg collection. WWF also educates local conservation advocates through the informal Dalaw Turo method that includes nature skits and games.

What can you do to help marine turtles?

If you are working for your country's government – Support the establishment and management of Marine Protected Areas in critical marine ecosystems. Promote sustainable fisheries, and the use of turtle-excluder-devices (TEDs) to reduce by-catch of marine turtles.

If you are working for the fisheries industry – Promote sustainable fisheries by discussing the issue within your office. WWF can help you find technical assistance; please write to your nearest WWF office (contact details at http://www.panda.org/about_wwf/who_we_are/offices/office_s.cfm). To support marine turtle conservation, promote the use of turtle-excluder-devices (TEDs) that help you catch target species without the unnecessary by-catch of marine turtles.

When you are travelling – *Do Not Buy Marine Turtle Products* – Do not buy marine turtle products such as tortoiseshell souvenirs or any other items made from marine turtles. Report sale to authorities so action can be taken to stop illegal marine turtle trade.

Participate in Beach Cleaning Activities – Help to clean marine turtle nesting beaches so that hatchling turtles will have a safer passage from the nest to the ocean. Remove garbage that may be washed out to sea to stop marine turtles from ingesting materials that cause harm. Contact <http://www.coastalcleanup.org> for more information.

When you are at home – *Dispose of Garbage Properly* – Dispose of garbage properly so that damaging rubbish will not end up in rivers, on beaches or in the ocean where it may negatively impact marine turtles and other endangered species.

Write to Decision-Makers – Join panda passport (<http://passport.panda.org/>) and receive alerts calling for letters to decision-makers to express concern over threats to marine turtles and other environmental issues. Coordinated efforts by many people sending emails and letters can influence decisions that have important consequences for the survival of endangered species and ecosystems.

Spread the word – Tell your friends and families about the plight of marine turtles and ask them to support marine turtle conservation activities.

Life cycle
you can help
WWF ensure
this life cycle
continues...

