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MARINE TURTLE CONSERVATION IN THE ASIA PACIFIC REGION

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Green turtle (*Chelonia mydas*) swimming over a coral reef.

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Authors: Liz McLellan, Amanda Nickson, Jo Benn

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Cover image: Loggerhead turtle (*Caretta caretta*) swimming in open sea.

21ST CENTURY VOYAGERS

Just two centuries ago, marine turtles roamed the oceans in their millions, gracing thousands of beaches each year as they laid their eggs.

Yet over the last 100 years numbers have dropped dramatically, and some populations have simply disappeared.

Today, six out of the seven species are either Critically Endangered or Endangered (IUCN Red List 2003), whilst the status of the seventh species remains unknown due to insufficient information.







They may have outlived the dinosaurs - but the future of marine turtles looks bleak unless we take action now.

Six of the world's seven marine turtle species are found in the Asia Pacific Region – making this region a critical set of habitats for the survival of these ancient mariners.



Hawksbill turtle (*Eretmochelys imbricata*).

Marine turtle species found in Asia-Pacific:

	Leatherback turtle (<i>Dermochelys coriacea</i>)	CR
	Hawksbill turtle (<i>Eretmochelys imbricata</i>)	CR
	Olive ridley turtle (<i>Lepidochelys olivacea</i>)	E
	Loggerhead turtle (<i>Caretta caretta</i>)	E
	Green turtle (<i>Chelonia mydas</i>)	E
	Flatback turtle (<i>Natator depressus</i>)	DD

CR = Critically Endangered

E = Endangered

DD = Data Deficient

The seventh species, Kemp's ridley turtle (*Lepidochelys kempii*), nests only in the Gulf of Mexico and forages in the Western Atlantic Ocean.

Modern marine turtles arose in the oceans over 100 million years ago, when dinosaurs still roamed the earth.

BIOLOGICAL, CULTURAL AND ECONOMIC SIGNIFICANCE

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Throughout their life-cycle, marine turtles play an important role in the ecology and well-being of coastal and open ocean environments. Though marine turtles maintain their air of ancient mystery, we know more today than ever before about how marine turtles help maintain healthy oceans.

Scientists believe that hawksbill turtles may maintain the health of coral reef systems by grazing on sponges, which if left to grow unchecked, outgrow the corals, cover them up and kill the reef. Because of this, researchers believe that declining numbers of hawksbill turtles may be a factor in the inability of reefs to resist increasing pressures from pollution, algal overgrowth, overfishing and climate change.

Green turtles are largely herbivorous, and their constant grazing on sea grasses increases the healthiness and growth rate of seagrass beds. Leatherback turtles, which forage in the open ocean throughout their life, are the top predators of oceanic jellyfish. These jellyfish, in turn, eat larval fish. As the numbers of leatherbacks in the ocean decrease, jellyfish numbers may increase locally and eat more larval fish, leaving fewer fish to grow into adults. A wide variety of marine ecosystems dependent on these fish, and indeed commercial fisheries, may end up suffering from this cascading effect.

Marine turtles return to inshore areas for the nesting season and lay hundreds of eggs each season. In doing so, they provide a source of nutrients that plays a vital role in coastal dune ecosystems. The eggs and hatchlings provide food for many predators, and the empty shells and eggs that don't hatch provide nutrients that can be recycled by invertebrates and micro-organisms. In turn, these nutrients are used by plants, which help stabilise dune structure. In this way, turtles transport nutrients from productive far-away feeding grounds to nutrient-poor coastal ecosystems, and play a vital part in their stability.

Male turtles stay at sea for all of their lives, and only females ever come ashore to lay their eggs on sandy beaches – usually the exact same beach where they were born. Unlike many animals, a marine turtle's gender is not genetically determined, but is dependent on the temperature of the sand where the egg develops. Female hatchlings result from higher temperatures, while males are produced by cooler temperatures. Different beaches and different positions in the nest can both affect the eventual gender of the hatchling.



© WWF-Canon/Michel Gunther

Loggerhead (*Caretta caretta*) hatchling.

Like humans, marine turtles take many years to become reproductively mature - it may take up to 30 years for some species before a female is able to lay eggs. In between hatching and returning to their nesting beach to lay eggs, most marine turtles migrate vast distances. Leatherback and loggerhead turtles for example, travel across the entire Pacific Ocean between feeding and nesting grounds – a journey of over 12,000 kilometres one way, or more than one third of the way around the world. Other species stay much closer to home - for example the flatback turtle does not move outside the waters of the northern Australian continental shelf.

The long time to reach maturity and the many natural dangers faced by hatchlings and juveniles through their incredible migrations mean that as few as 1 in 1,000 eggs may survive to adulthood.



Marine turtles play an important role in Australian Aboriginal culture, and are reflected in both historical and contemporary art. This contemporary design is drawn by Karen Puruntatameri - Munupi Arts and Crafts, Melville Island.

Turtles have been of major cultural, traditional, social and economic significance to many coastal communities in the Asia Pacific region for centuries. For example, according to Hindu mythology, the Indian deity Vishnu was reincarnated as "Kachhapa" – a turtle, holding the burden of the world on its back.

Turtle meat and eggs have provided valuable sources of sustenance, while shells were sought after for ceremonial and ornamental purposes. Hawksbill turtle shells made into jewellery, ornaments, and utensils have been a part of trade in the Asia Pacific region for centuries.

Large amounts of turtle eggs are consumed in the South East Asian sub-region. The exploitation of eggs initially started as a traditional source of food within local communities. Customary beliefs about the aphrodisiac and medicinal properties of turtle eggs have also encouraged a huge commercial market for the eggs within South East Asia.

The expansion of European civilisation across the globe in the 1600s and 1700s depended in part upon adequate food supply for ships' crews. Marine turtles were a ready and seemingly inexhaustible source of food. The northern hemisphere's subsequent fondness for turtle soup in the Victorian era led to large-scale commercial turtle harvesting, putting many turtle populations under even more severe strain. Turtle harvesting and canning factories were still operational in places like Western Australia as late as the 1970s.

WHY ARE MARINE TURTLES ON THE EDGE OF EXTINCTION?

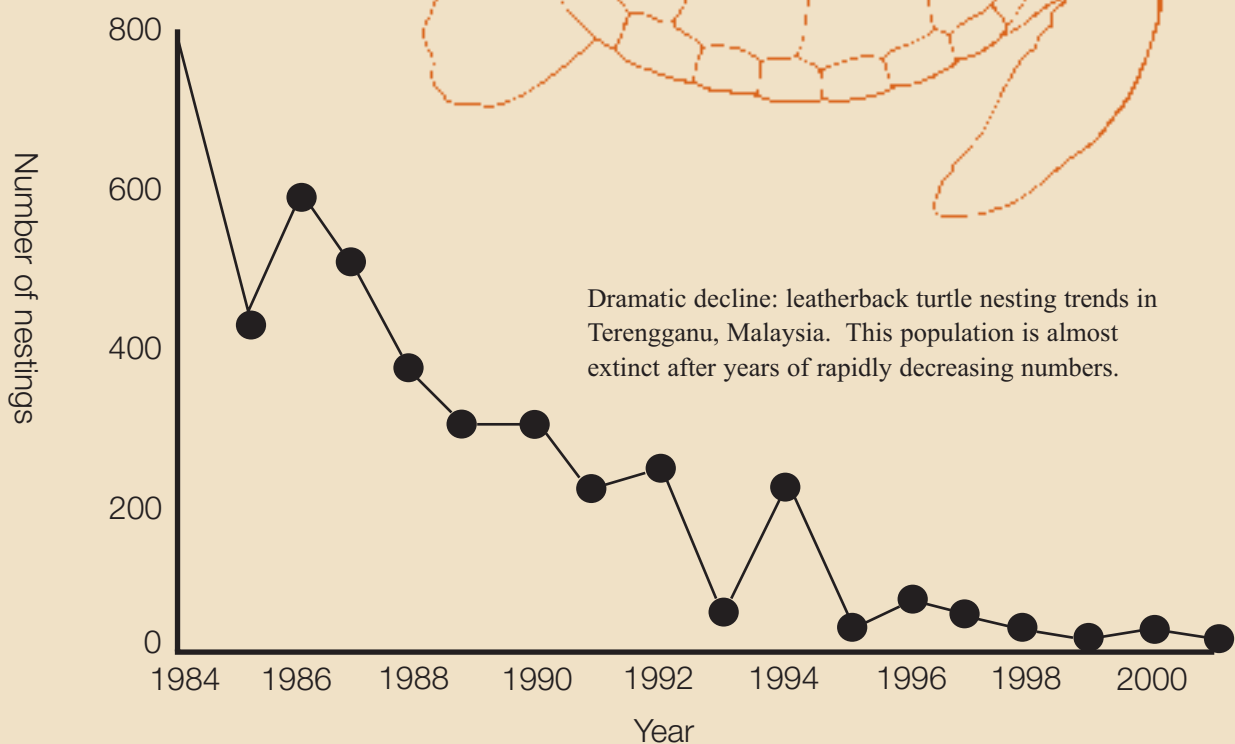
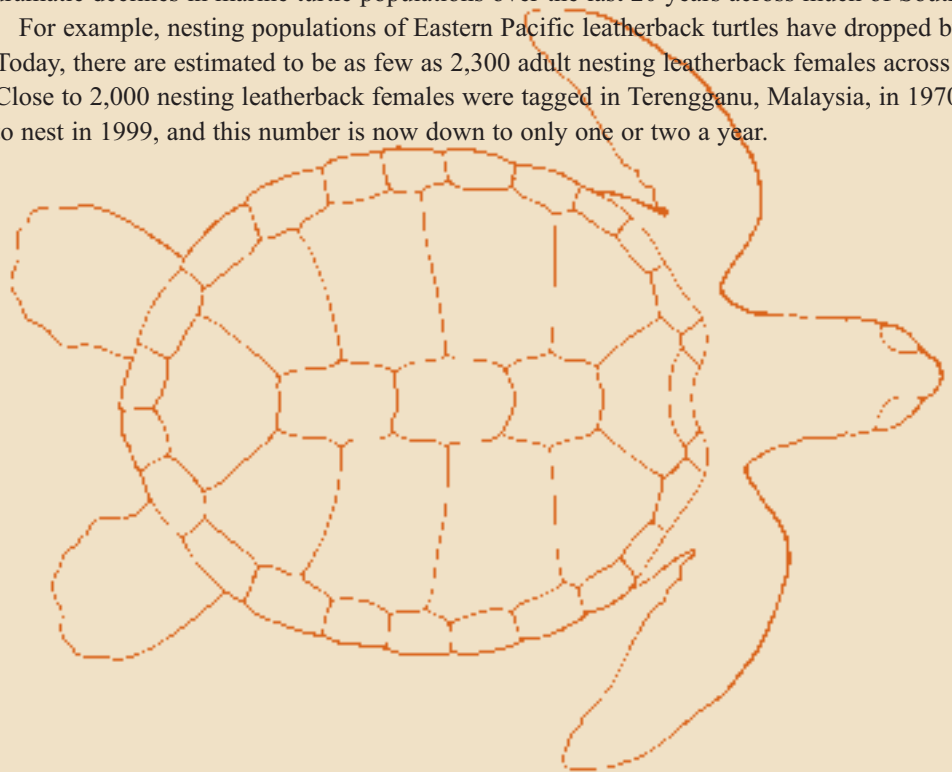
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Marine turtles travel freely across the maritime borders of many nations, and face a wide range of threats. Mortality from these threats, at all stages of marine turtles' life-cycles, means that many populations cannot recover from the sustained pressure on their numbers.

Threats include over-consumption of turtle meat and eggs, illegal trade in turtles and turtle products, destruction of nesting beaches and nearshore habitats through inappropriate coastal development, and perhaps most importantly, frighteningly high levels of capture in modern industrial fishing gears.

Climate change and its likely consequences is also a growing threat. Warmer temperatures shift the gender ratio of hatchlings, and rising sea levels will inundate nesting beaches.

Monitoring has revealed dramatic declines in marine turtle populations over the last 20 years across much of South East Asia and the Pacific. For example, nesting populations of Eastern Pacific leatherback turtles have dropped by 90% in the last 20 years. Today, there are estimated to be as few as 2,300 adult nesting leatherback females across the entire Pacific Ocean. Close to 2,000 nesting leatherback females were tagged in Terengganu, Malaysia, in 1970, while only nine returned to nest in 1999, and this number is now down to only one or two a year.



Dramatic decline: leatherback turtle nesting trends in Terengganu, Malaysia. This population is almost extinct after years of rapidly decreasing numbers.

Source: H.C. Liew, (KUSTEM, Malaysia), International Leatherback Survival Conference 2002 presentation.

CHALLENGES TO CONSERVATION

Saving marine turtles poses a range of challenges, mainly a function of their unique biology and life cycle characteristics:



Olive ridley turtle (*Lepidochelys olivacea*) entangled in discarded net.

- Marine turtles are long-lived and require several decades to mature sexually, which means that conservation efforts have to be sustained for decades to make a difference.
- A single marine turtle will make seasonal migrations over vast areas through the waters of several countries and the open ocean - in some cases over 12,000 km - making conservation and management a shared responsibility between many countries.
- Marine turtles need a wide range of habitats to complete different life-cycle stages – including beaches, tropical and subtropical coastal waters, sea grass meadows, coral reefs, and open ocean pelagic waters. This requires coordinated management actions between land and sea.

Marine turtle conservation activities will benefit not only turtles, but will also help to make fisheries sustainable, ensure good governance of marine resources, and secure access to and benefits from, marine resources for local communities.

By taking concrete and cooperative action through the regional initiatives outlined in this booklet, WWF's Asia-Pacific Marine Turtle Programme will assist governments, communities and industries to better manage one of their major economic assets: the ocean and its valuable natural resources.



Hawksbill turtle (*Eretmochelys imbricata*) foraging on a coral reef for this species' favourite food - sponges.

Mortality from human-induced threats at all stages of marine turtles' life cycles, means that many populations cannot recover from the sustained pressure on their numbers

SAVING MARINE TURTLES BY REDUCING THE THREATS – WWF'S GLOBAL RESPONSE

WWF's immediate goal is to reduce the threats that are currently decimating populations of marine turtles, and to help communities, governments and industries address the underlying causes of these threats. By creating sustainable opportunities and solutions in collaboration with communities and governments, we hope this will eventually lead to stabilising the populations and allow for their recovery.

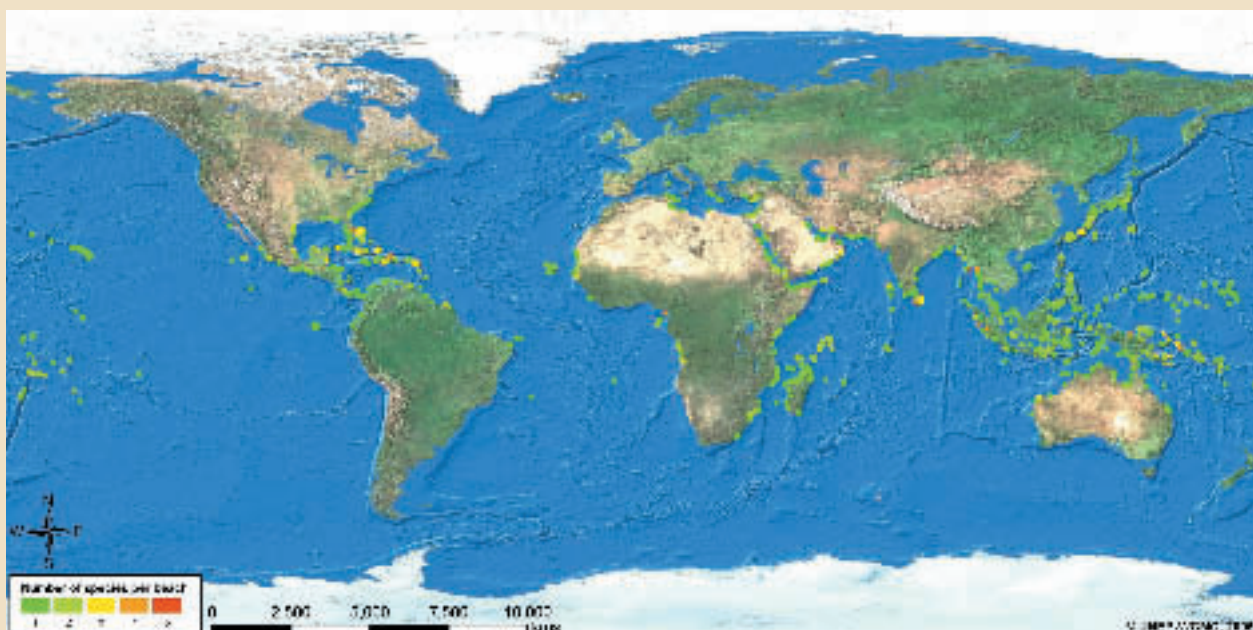
The scale of the response needed for most populations across their range, and the urgency of this response, requires significant resources and collaborative partnerships.

WWF is conducting or supporting turtle conservation work in 45 countries across the world, including many countries within the Asia Pacific region and is engaged in every current major international turtle conservation policy discussion – linking countries on the basis of marine turtles' migratory routes.

With an extensive network of offices, staff and projects throughout the Pacific, and over 40 years' experience in turtle conservation and community-based conservation, WWF is applying cutting-edge science to conservation practice, linking field conservation to national and international policy and legislation, as well as developing innovative partnerships, involving communities in the management, decision-making and livelihood opportunities from turtle conservation.

WWF has four regional marine turtle conservation programmes, which are collectively designed to deliver the goal of restoring turtle populations globally to ecologically healthy levels.

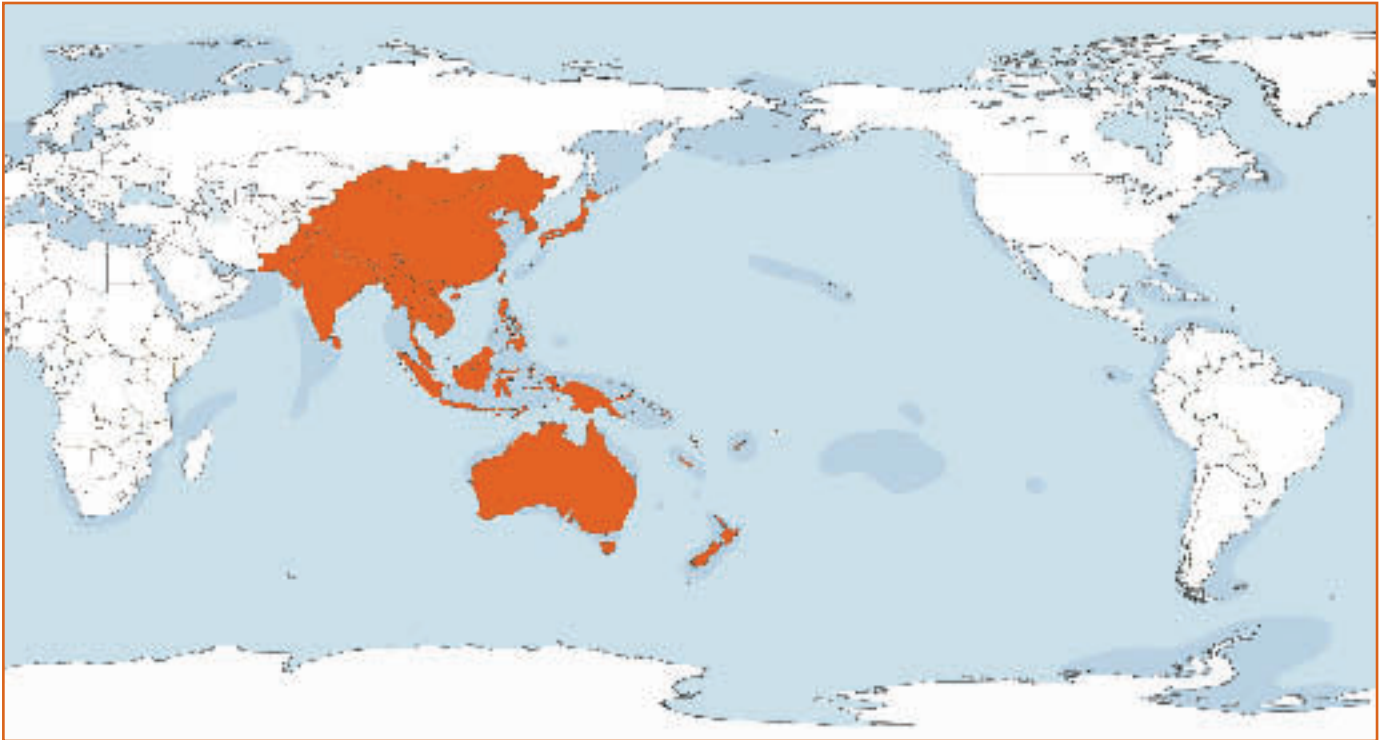
These programmes are: Asia Pacific, Latin America and the Caribbean, Africa and Madagascar, and Europe and the Middle East.



Worldwide distribution of major marine turtle rookeries.

WWF's Asia Pacific Region

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© Scott Benson, NOAA
WWF staff and community members pause after attaching a satellite transmitter harness to a female leatherback turtle (*Dermochelys coriacea*) on Jamursba Medi beach, Papua, Indonesia. The local community, WWF, and scientists from NOAA (National Oceanic and Atmospheric Administration) are collaborating in a research and conservation programme to understand more about these turtles' movements and critical habitats.

WWF'S ASIA PACIFIC MARINE TURTLE PROGRAMME

Globally, WWF aims to save marine turtles by:

1. Furthering relevant policy and legislation in all sectors and at all levels
2. Ensuring the necessary extent, integrity and functioning of critical habitats for turtles
3. Ensuring adequate protection and biological management of marine turtle populations
4. Creating mutually beneficial incentives for the co-existence of people and marine turtles
5. Mitigating threats to marine turtles by creating awareness and influencing human attitudes and behaviour

WWF's Asia Pacific Marine Turtle Programme is working in three key ways to address these challenges:

- ✚ Through linking individual conservation projects into cohesive units that effectively address threats across turtle migrations and life-cycles.
- ✚ Through innovative projects and alliances – bringing non-traditional partners together to find mutually beneficial solutions.
- ✚ Through collaboration and partnerships at all levels – including with local communities, governments, scientists, industry, religious leaders, and other non-government organisations.

Through turtle conservation work we can also address issues of broader global resonance such as:

- Broad scale fisheries management;
- A global network of adequate and representative marine protected areas;
- Illegal wildlife trade management and enforcement capacity in many of the range state countries; and
- Economically successful eco-tourism.

The following sections outline priority projects under development and implementation as key components of WWF's Asia-Pacific Marine Turtle Programme. Each of these seven projects combines conservation priorities for marine turtles with WWF's capacity to make a difference in the region. By working with communities, governments, scientists and other partners, WWF aims to save these ancient mariners for the benefit of future generations.

LINKING EAST AND WEST ACROSS THE PACIFIC: The Pan Pacific Initiative



Leatherback turtles (*Dermochelys coriacea*) and loggerhead turtles (*Caretta caretta*) best illustrate some of the challenges facing efforts to conserve marine turtles – and are excellent ambassadors for addressing the challenges to marine conservation across the Pacific Ocean basin.



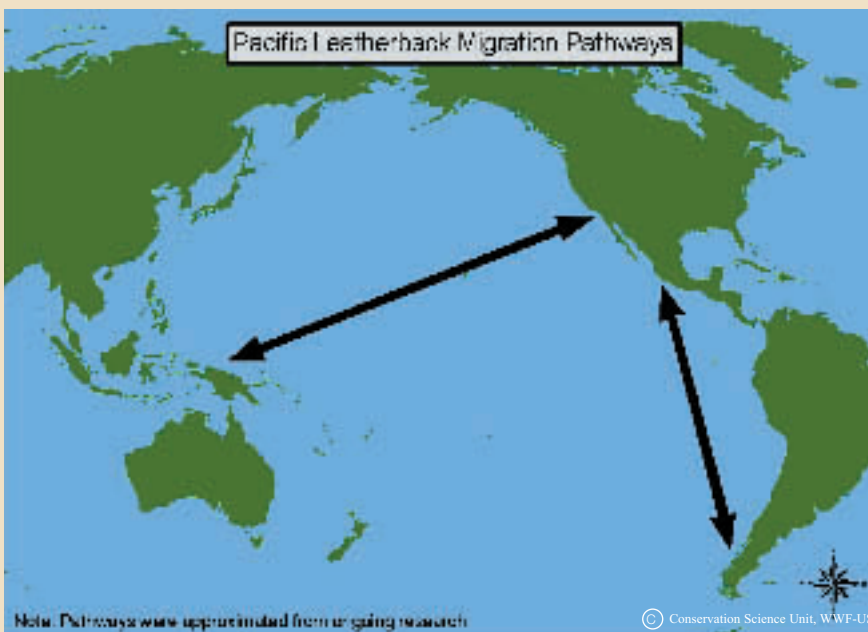
Leatherback turtle (*Dermochelys coriacea*) hatchlings going to sea.

With the Pacific Ocean now home to fewer than an estimated 2,300 adult leatherback females and fewer than 2,000 nesting loggerhead females, both populations are on the verge of certain extinction if current levels of mortality continue.

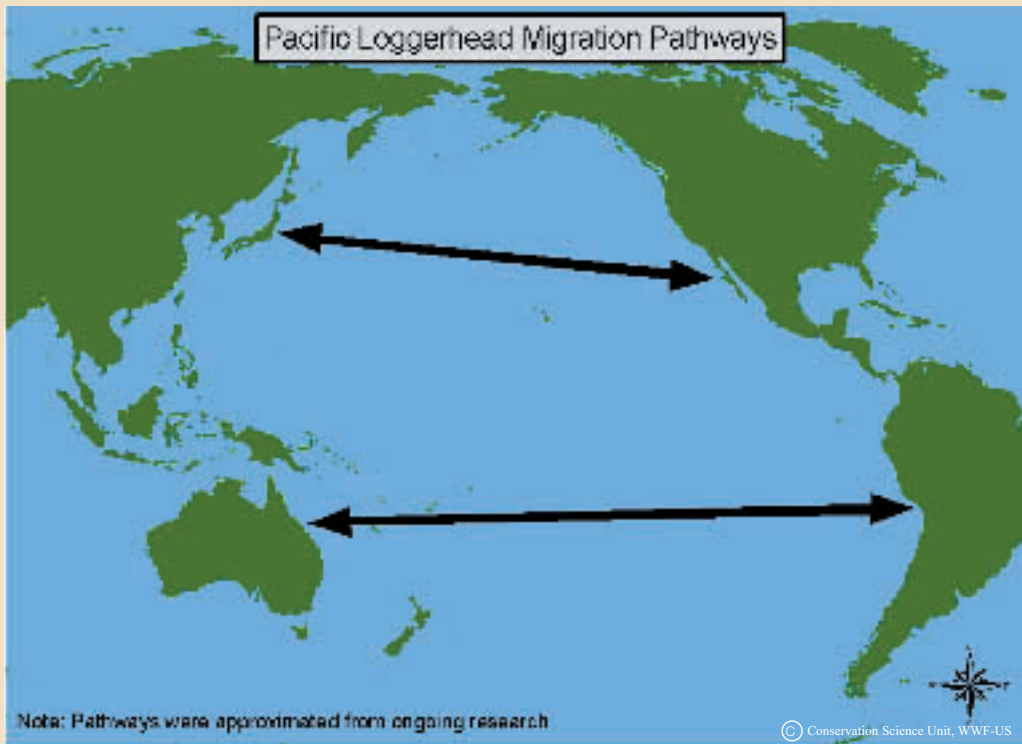
Leatherback turtles spend most of their lives roaming the open seas, coming close to shore only to nest. With their migrations crossing entire ocean basins, both leatherback and loggerhead turtles are at risk of being caught in the lines of hooks strewn throughout the Pacific Ocean by long-line fishing fleets. Together with threats of egg collection, beach erosion, coastal trawl nets and seagrass and coral reef destruction, this all adds up to pressures from which these populations cannot escape.

Pacific leatherback and loggerhead turtles need urgent conservation and management help at every stage of their life-cycles, and in every critical habitat- stretching across the Pacific Ocean, and covering both national and international waters.

WWF is developing a Pan-Pacific Initiative that will scale-up its existing work, forge new partnerships and build comprehensive conservation solutions to protect these species across the Pacific. These actions include:



- promoting and assisting implementation of bycatch reduction mechanisms across the Pacific;
- protecting nesting beaches and critical nearshore marine habitats;
- implementing community-based conservation and monitoring programmes, including alternatives to over-harvesting of eggs;
- using science to develop better management models; and
- enhancing the effectiveness of regional and global conservation and fisheries policy.



Pacific populations of leatherback and loggerheads are feared to be on the verge of certain extinction if current levels of mortality continue



TRADE IN TURTLES AND TURTLE PARTS



12

Turtle eggs are widely collected and eaten throughout South East Asia with serious consequences to turtle populations. For example, exhaustive egg collection was a major contribution to the almost complete extinction of the leatherback population nesting at Terengganu beaches, in Malaysia.

The reasons behind these high levels of egg collection are complex and include:

- a lack of suitable nutritional alternatives for the local communities
- cultural and religious practices - for example the belief in aphrodisiac or medicinal properties of turtle eggs
- the presence of a lucrative, mostly locally-based industry based on selling eggs.

At the international level, another serious trade threat is that of shells and stuffed whole turtles. Hawksbill turtle carapaces are the only source of tortoise-shell (also known as bekko or carey) and the species has declined dramatically over the last 50 years as the demand for tortoiseshell escalated.

There is also a sizeable market for turtle leather products, and curios of stuffed whole turtles. Although international trade in all marine turtle species is now prohibited amongst the more than 160 countries of CITES – the Convention on International Trade of Wild Species of Fauna and Flora – a large volume of illegal trade still occurs.



Mounted marine turtles, such as the ones shown here, are widely sold as decorations, predominantly on the domestic market.

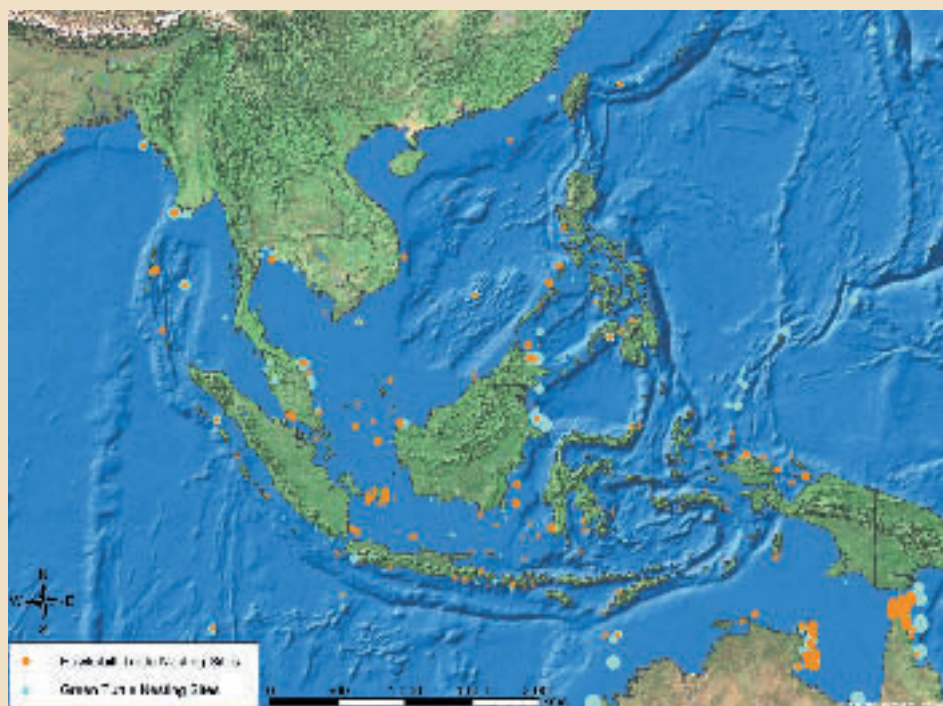
To effectively curb the supply and demand of the illegal trade, it is necessary to work with both producer and consumer countries in a coordinated strategy. TRAFFIC, the international wildlife trade monitoring network, organised and operated as a joint programme by and between WWF and IUCN, has conducted several investigations into marine turtle trade within South East Asia and found the trade levels are still significant.



Common green marine turtle (*Chelonia mydas*) being carried to be butchered.

WWF and TRAFFIC will continue to work together to develop a sub-regional strategy to address this trade. It will be principally focused on green and hawksbill turtles and will address both domestic and international trade by:

- enhancing the capacity of national governments to enforce CITES regulations and domestic species legislation;
- investigating opportunities for communities presently reliant on turtle egg and meat collection to find economically and culturally viable protein alternatives; and
- developing management plans for limited egg and meat collection where this is feasible, sustainable and well regulated.



Hawksbill and green turtles, the main species implicated in domestic and international trade, nest widely throughout South East Asia. Despite international trade being illegal, markets for marine turtles are active in many parts of Asia.

Bycatch - the grim reality

14

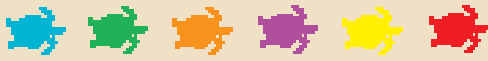


© WWF-Canon/Michel Gunther

A Leatherback turtle, (*Dermochelys coriacea*) caught in a coastal fishing net. This diver tried unsuccessfully to save it, but after days of struggle, it finally drowned.

BYCATCH

Promoting research and adoption of improved fishing gear and bycatch reduction measures



Incidental catch in nets or on fishing hooks and lines, commonly called bycatch, is a major threat to marine turtles - requiring urgent and immediate action. As many as 200,000 loggerheads and 50,000 leatherbacks are caught annually by commercial long-line tuna, swordfish, and similar fisheries around the globe.

Coastal small-scale gill net fisheries (sheets of mesh-like nets suspended in the water from boats or buoys, which effectively trap and entangle whatever swims into them), and coastal shrimp and other trawl fisheries all pose a serious threat to marine turtles.

There are some solutions on the horizon. Recent research conducted in the North Atlantic Ocean has demonstrated that long-line fishing gears and techniques can be improved to reduce bycatch of some turtle species by as much as 90%, while not significantly reducing the catch of target species.

WWF is working with several partners and long-line fleets in the Eastern Pacific, to trial the new gear changes and measure their impact on turtle populations.

WWF is promoting and facilitating this spread of knowledge through both the territorial waters of Eastern and Western Pacific countries, as well as investigating management measures for the high seas to protect migration routes.

While Turtle Excluder Devices (TEDs) fitted to shrimp trawl nets can reduce turtle mortality by up to 80% in some cases, and also improve the quality of the shrimp catch, their use is not yet widespread through shrimp trawling fleets in the Asia Pacific region.

Community-based solutions to small-scale gill-net fisheries, the increased use of TEDs, and fisheries' management plans, must be developed in consultation with fisheries in high-risk areas of South East Asia, the north Indian Ocean and the Western Pacific.

WWF is working with fishing communities, governments, regional fisheries' management bodies and financial institutions to promote bycatch reduction within the framework of sustainable fisheries management.



© WWF-Canon/Liz McLellan

Circle hooks surround a traditional "J" hook, at centre bottom. The use of large circle hooks and turtle de-hooking devices are proving to be successful in experiments designed to reduce turtle bycatch in longline fishing gear.

WESTERN PACIFIC MARINE PROTECTED AREA NETWORK



16

As turtles are highly migratory and require varied habitats throughout their life-cycles, conservation efforts cannot be restricted to single marine parks, countries or habitat. Networks of protected habitat linking one site to another are needed.

Additionally, without these networks spanning migratory routes, the marine turtle conservation efforts of one country may be in vain, since the turtles are unprotected in other countries during different stages of their life-cycles. For example, nesting and inter-nesting habitats may be well protected in one country, but turtles may spend the majority of their lives in foraging areas in other countries. These areas may not be well protected or managed, and the turtles may face numerous threats in these waters. Protected area network establishment and management must go beyond the national level, to the regional cross-border level.

These habitats that turtles need include: nesting beaches; foraging and developmental areas such as coral reefs and sea-grass meadows; and migratory pathways. A network of sites that protects marine turtles will automatically protect a suite of ecosystems and a vast array of other marine species, many of them ones upon which coastal people depend for subsistence or local fisheries.

WWF is working within priority ecoregions[#] (e.g. Sulu Sulawesi Seas, Bismarck Solomon Seas, Fiji Island Marine, Great Barrier Reef) and marine turtle critical habitats (e.g. Arafura and Timor Seas), to:

- facilitate inter-governmental cooperation for cross-border protected areas;
- increase the coverage of marine protected areas (MPAs);
- improve the management of existing and new MPAs; and
- create networks of protection for marine turtles across Asia Pacific.

Networks of marine protected areas are also critical to securing and sustainably managing the resources that the economies of many countries throughout the region depend upon.



Flatback turtle (*Natator depressus*) with satellite transmitter attached, through a joint monitoring project in northern Australia between WWF-Australia and the Mabunji Aboriginal Resource Association. Data from the transmitter will inform conservation planning and management by providing vital information about critical habitats and migratory pathways.

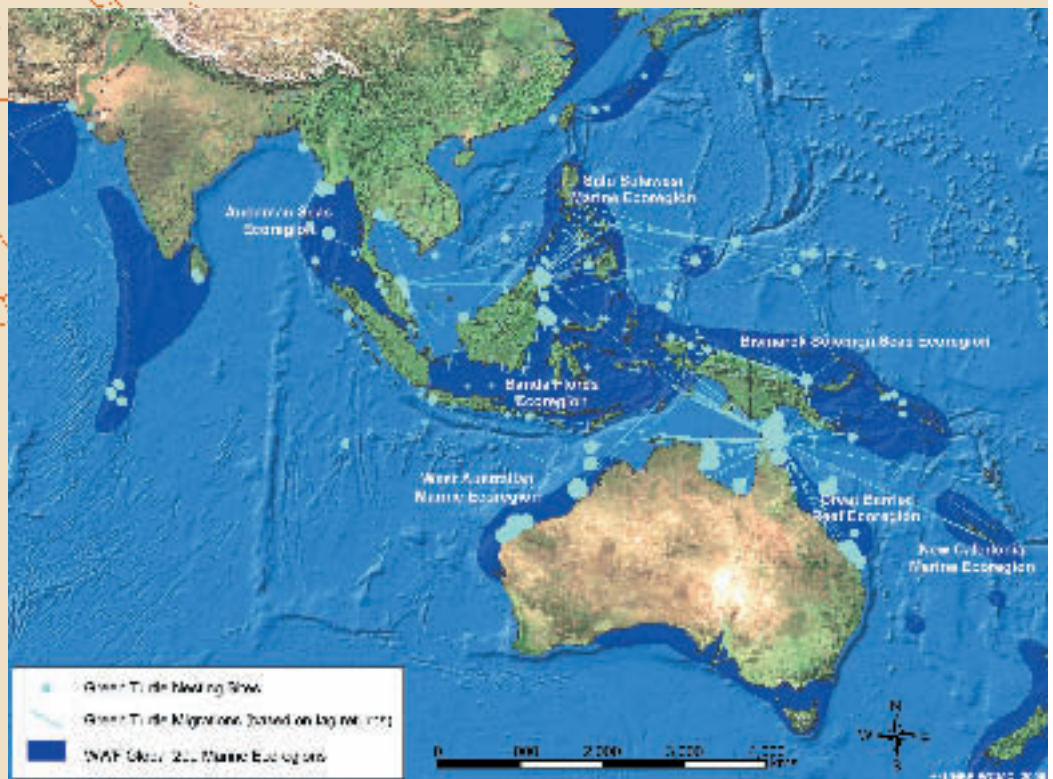
© WWF Australia/Scott Whiting

[#] Ecoregion conservation is implemented across large units of land or water that contain geographically distinct species, habitats and processes. These units, defined by natural boundaries and limits, are known as ecoregions. Many marine ecoregions are important marine turtle habitats, however turtles also range farther afield than these boundaries.



© WWF Canon/Cat Holloway

Hawksbill turtle (*Eretmochelys imbricata*).



Green turtle migrations between ecoregions in the Asia Pacific region. As the migration patterns and distances illustrate, protection must include networks of nesting beaches, inshore habitats, pelagic waters and sometimes the high seas.

WORTH MORE ALIVE THAN DEAD

Helping turtles, Helping people



18 A recent WWF report, “Money Talks - Economic Aspects of Marine Turtle Use and Conservation” has revealed that in some countries industries based on live turtles, such as sensitively planned and operated beach and dive tourism activities, can generate as much as three times more income for local communities than using slaughtered turtles for their eggs, shells and meat.



Paying tourists watch as volunteers collect data during the nesting event of a female loggerhead turtle (*Caretta caretta*) in Queensland, Australia.

Many of the world’s most important turtle habitats are in developing countries with marginal economies, where local economies and livelihoods are dependent on unsustainable levels of local resource use. This provides a golden opportunity to help local communities and marine turtles at the same time.

Unsustainable levels of use have caused worldwide declines in the numbers of marine turtles. High levels of turtle mortality jeopardize potential future income for these communities.

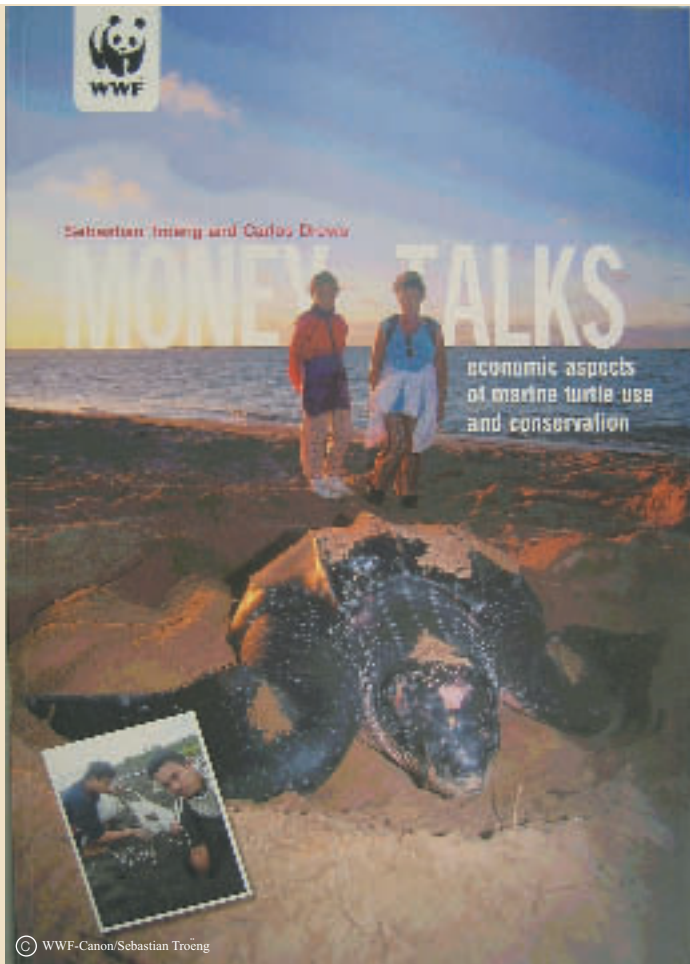
Research indicates that in most cases the income from non-lethal uses often grows on an annual basis, while income from consumptive uses has fallen over time as turtle populations decline.

Over-exploitation of turtles and their eggs is often a result of a lack of knowledge and/or concern about the impact of such use, coupled with a lack of suitable alternatives. This provides a compelling case for countries to investigate the options of economies based on live turtles, and to invest resources into their protection as part of a comprehensive poverty alleviation and sustainable development strategy.

WWF is working with coastal communities across the region to conserve turtles in a manner which benefits both turtles and people. This work includes bolstering local economies and investigating new livelihood opportunities for local peoples through a suite of options including sustainable ecotourism operations.

“It has been estimated that turtle-based tourism activities in Tortuguero, Costa Rica, generated more than US\$6.5 million through tourism services, souvenir sales and national park fees, in 2002 alone.”*

*from Money Talks, Troëng + Drews, WWF, 2004.



Money Talks - a recent report from WWF outlining cases of local and national economies benefiting from turtle-based tourism.

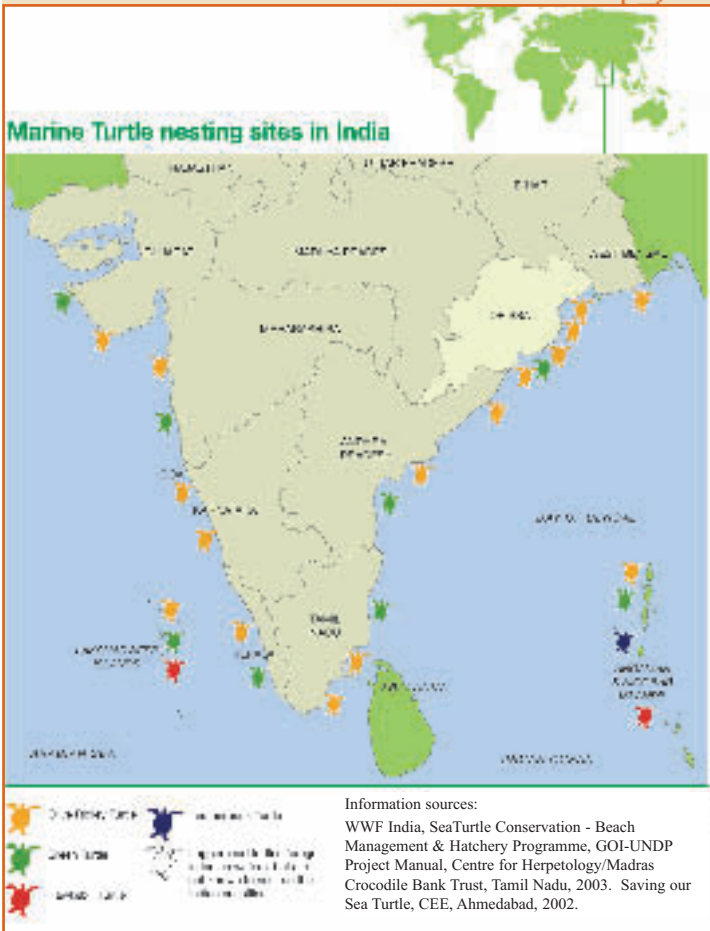
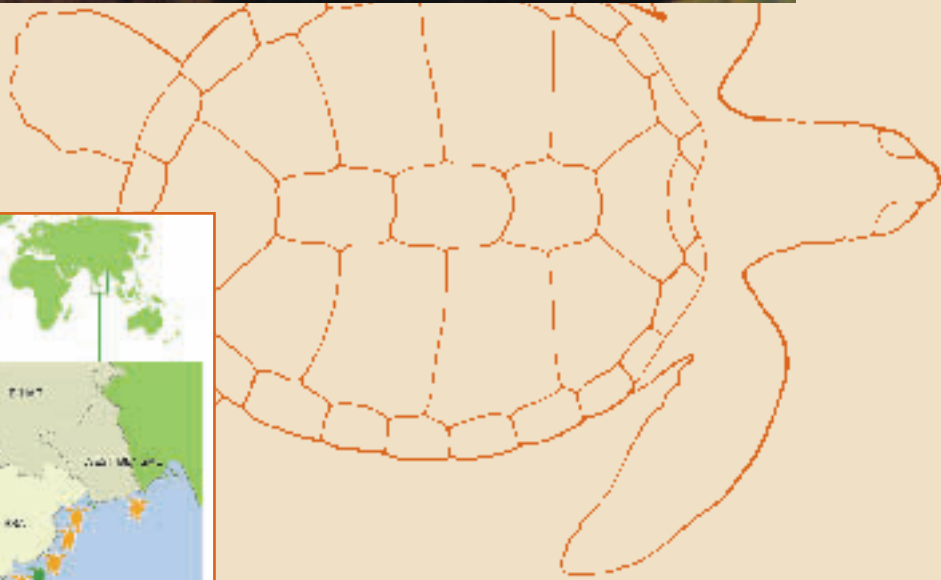


Watching a female leatherback turtle (*Dermochelys coriacea*) come ashore to nest and lay eggs is, for most people, an experience of a lifetime. If well managed, responsible tourism has the potential to benefit both turtle conservation and local economies. At left, tourists watch a researcher attach a satellite transmitter harness to a female leatherback turtle (*Dermochelys coriacea*), soon after she has laid her eggs (above).



© WWF-Canon/Guy Marcovaldi

Olive ridley turtle (*Lepidochelys olivacea*) coming ashore to nest.



OLIVE RIDLEY MASS NESTING PROTECTION AT ORISSA, INDIA 🇮🇳



© WWF-Canon / Michel GUNTHER

Olive ridley turtle hatchlings (*Lepidochelys olivacea*) on their way to the sea.

Orissa State, in the north east of India, hosts one of the world's major annual mass-nesting events of marine turtles. Hundreds of thousands of olive ridley turtles come ashore to nest each year in a spectacular "arribada" (mass arrival). About 150,000 –200,000 turtles arrive at the main nesting beach each year. There have been some years where as many as 600,000 turtles were reported to come ashore. This population is considered to be globally significant. It is genetically distinct from other populations, and may even be the ancestral stock of other olive ridley turtle populations in other oceans.

This incredible nesting event is threatened by a multitude of dangers, including: bycatch in mechanised shrimp trawlers off the coast in the nesting season; unregulated development of the coast; beach erosion; and predation of the eggs by dogs and foxes.

In the 1990s the impacts of the trawling alone led to tens of thousands of turtles becoming stranded and dying each year. An estimated 90,000 turtles have been counted as stranded since 1994, and this probably represents a small fraction of the actual numbers dying as a result of this bycatch. In addition, these turtles are known to travel through the coastal waters of India and Sri Lanka to nearby foraging grounds, where they may encounter coastal gill and trawl nets – usually with fatal consequences.

that this population will probably suffer a severe crash in numbers in the near future, when the hatchlings of the adults killed would have been reaching their reproductive maturity. It is essential to act now, while we can still influence the severity of such a crash.

WWF is implementing conservation strategies with local communities and the state government at the mouth of the Rushikulya River - the location of one of the three beaches where most of the nesting is concentrated. WWF will work with other key partners to develop and support an integrated conservation and management programme of work across the range states of this population. This will include:

- beach protection and monitoring through community based reserves;
- bycatch mitigation measures, and improved fishing practices in collaboration with the shrimp trawling industry off the Orissa coastline;
- advocacy for improved integrated coastal zone planning and management, including strategies to counteract inappropriate beach lighting;
- investigating bycatch mitigation measures with partners in Sri Lanka; and
- investigating opportunities for local people to benefit from turtle conservation through improved fishing practices, and involvement in turtle-based tourism.

GOVERNMENT COOPERATION: Regional Marine Turtle Agreements and Marine Management Frameworks



© Mabunji Aboriginal Resource Association

Flatback hatchling (*Natator depressus*) held by a Sea Ranger.



Multilateral marine management frameworks and agreements are an essential means of protecting migratory species such as marine turtles.

For example, regional marine turtle conservation agreements now cover many areas of the globe, including the Americas, the West coast of Africa, the Indian Ocean and South East Asia. The Indian Ocean and South East Asia Memorandum of Understanding on Marine Turtle Conservation and their Habitats (IOSEA) is a voluntary agreement between range state countries within the region, to protect and manage their turtle populations.

This coordinated management across migratory pathways is critical to providing adequate protection to turtles, and the communities that depend upon them, throughout their life-cycles.

Together with other agreements and conventions such as the Partnership for Ecosystem Management of East Asian Seas (PEMSEA), and the Convention on Biological Diversity (CBD), IOSEA encourages and supports cooperative broader marine management at the regional scale among all parties to the agreement.

WWF is a key partner to many of the governments in the range state countries, and will continue to work with these governments, local communities, and regional environmental agreements, to encourage full participation and effective implementation of the agreements.

WWF will also promote the adoption of the most appropriate form of regional marine turtle agreement to cover the South Pacific region, a part of the ocean which currently has no regional marine turtle conservation arrangement.



The Indonesian Ambassador to Thailand, Mr Ibrahim Yusuf, signing the IOSEA MOU in 2005, on behalf of the Indonesian Government. Signatory States of this MOU commit to protect, conserve, replenish and recover marine turtles and their habitats throughout the range of the Agreement.

WWF will continue to advocate and demonstrate the links between marine turtle conservation, sustainable development of coastal communities and the broader marine management agenda in relevant international conventions and agreements.



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Olive ridley turtle (*Lepidochelys olivacea*) being released from a discarded net on a beach near Cape Arnhem, Australia, by Dhimurru community members, and a Parks and Wildlife Ranger.



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Villagers in Karachi, Pakistan, returning a lost and disoriented green turtle (*Chelonia mydas*) back to the sea.



© WWF-Canon/Michel Gunther

Researchers swimming with a loggerhead turtle (*Caretta Caretta*).

ACHIEVING GOALS THROUGH PARTNERSHIPS - HOW CAN YOU HELP?

The continued survival of marine turtles is indicative of our willingness to engage and mobilise as a modern world toward sustainable development. The scale of marine turtle conservation in the Asia Pacific region is a challenge for governments, local communities, non-government organisations and scientists alike. WWF cannot do this alone. **WE ASK YOU TO GET INVOLVED.**

Strong partnerships are, and will continue to be essential to achieving shared goals. WWF has partnerships with many key government agencies, local partners, international NGOs and local communities. WWF will be seeking to strengthen these and initiate new relationships and secure significant resources, in order to achieve an ambitious and rewarding marine turtle conservation programme for the benefit of communities and marine turtles globally.

The actions we take today will determine whether or not marine turtles will survive into the next century. Those same actions will also determine whether or not local communities who live with turtles will succeed in building secure livelihoods based on sustainable marine management.

WE HAVE A PLAN

CAN YOU HELP US MAKE IT REALITY?

To get involved in this exciting initiative, please email species@wwfint.org

Billboard on Sandpit Beach, Karachi, Pakistan.



WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

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

WWF International
Avenue du Mont-Blanc
1196 Gland
Switzerland

www.panda.org



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