



for a living planet



WWF Global Marine Turtle Strategy
2009 – 2020



WWF Global Marine Turtle Strategy
2009-2020

Elisabeth McLellan, Elies Arps, Marydele Donnelly

Preface



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This strategy has drawn on two main sources in its development. Firstly, a consultant was commissioned to synthesize the current biological information, conservation status, population trends, major threats and main conservation priorities for all species of marine turtles. Secondly, an internal prioritization exercise was conducted based on conservation status and needs, WWF presence and niche, and other programme priorities.

This strategy draws extensively on the text and prioritization of the consultancy; hence the consultant, Marydele Donnelly of the Caribbean Conservation Corporation, is listed as a contributing author. However, the final strategies and priorities outlined in this document reflect the decisions of WWF alone.

This WWF Global Marine Turtle Strategy was written by Elisabeth McLellan, Elies Arps and Marydele Donnelly.

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1. Executive summary

All seven marine turtle species face continuing and ever-increasing threats to their very existence. They are the living representatives of an order of reptiles that has existed on Earth and travelled our seas for the last 100 million years. Until recently, their survival success appeared secure - as marine turtles, which live in most of the world's seas - 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 bycatch; international trade; pollution; boat strikes; introduced predators; disease; and climate change have entirely wiped out or severely reduced marine turtle populations around the planet to mere shadows of their former glory. As a result of the reduction in marine turtle numbers, ecosystems such as coral reefs and seagrass beds are suffering. The balance between marine animal and plant species has changed, with subsequent impacts on commercial fisheries. The possibility of creating livelihoods through ecotourism to observe marine turtles is rapidly disappearing in many coastal communities throughout the tropics. The cultural importance attached to marine turtles will undoubtedly fade, negatively impacting on the identity of many human societies. Only a concerted global effort will ensure the survival of these ancient mariners and the continued existence of the ecological, cultural, 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, as marine turtles take decades to reach maturity before returning to the beach or region where they were born in order to lay eggs that ensure continuation of the species. This long and varied life journey guarantees that marine turtles will face numerous threats during their life cycle.

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The main immediate threats facing marine turtles are: the loss and destruction of habitats; overexploitation of eggs and adults; and, bycatch in fisheries in coastal and pelagic habitats. Compounding all of these is the threat of climate change, which has the potential to have profound impacts on marine turtle distribution, foraging behaviour and reproductive fitness—and ultimately the very future survival of these species. Underlying these threats are issues of human subsistence, cultural and traditional practices, human population increases, and lack of information and/or lack of capacity to carry out the interventions required. To conserve marine turtles effectively requires conservation efforts that are carried out across entire oceans, transcend national boundaries, involve a wide range of decision makers, understand and address the reasons driving the threats, and are sustained for decades. Thus, this WWF Global Marine Turtle Strategy is guided by a long-term vision and recognition of the need for persistence in conservation efforts to enable the recovery of these species.

Because of their ecological characteristics, marine turtles are charismatic ambassadors for broader marine and coastal conservation issues. WWF recognizes that marine turtles can act as flagship species that inspire conservation action not only for their own protection, but also for the range of lesser-known but equally important species in the marine environment.

WWF has been working on marine turtle conservation for nearly 50 years, since its inception in 1961. As threats to these fascinating and unique species increase, the next 10 years of conservation work will be critical to ensure they continue to roam our seas and visit our beaches. This Global Strategy outlines the WWF priorities for marine turtle conservation, taking into account their conservation status and needs, and WWF's role and niche. From this Global Strategy, operational strategies and action plans will be developed at regional, multi-country and national levels. Through implementation of this ambitious strategy, WWF commits to taking on these formidable challenges. WWF is committed to stop the decline of marine turtles globally; work for the recovery of the species; and secure habitats and conditions – both ecological and social – in which turtles, and the people that depend upon them, can survive into the future.

Dr Susan Lieberman
Director, Species Programme,
WWF International
August 2009

WWF's Global Marine Turtle Priorities

Vision (50+ years)

Marine turtle populations worldwide are protected and restored to levels where they are no longer at risk of extinction; fulfilling their ecological, cultural and socio-economic roles.

Goal

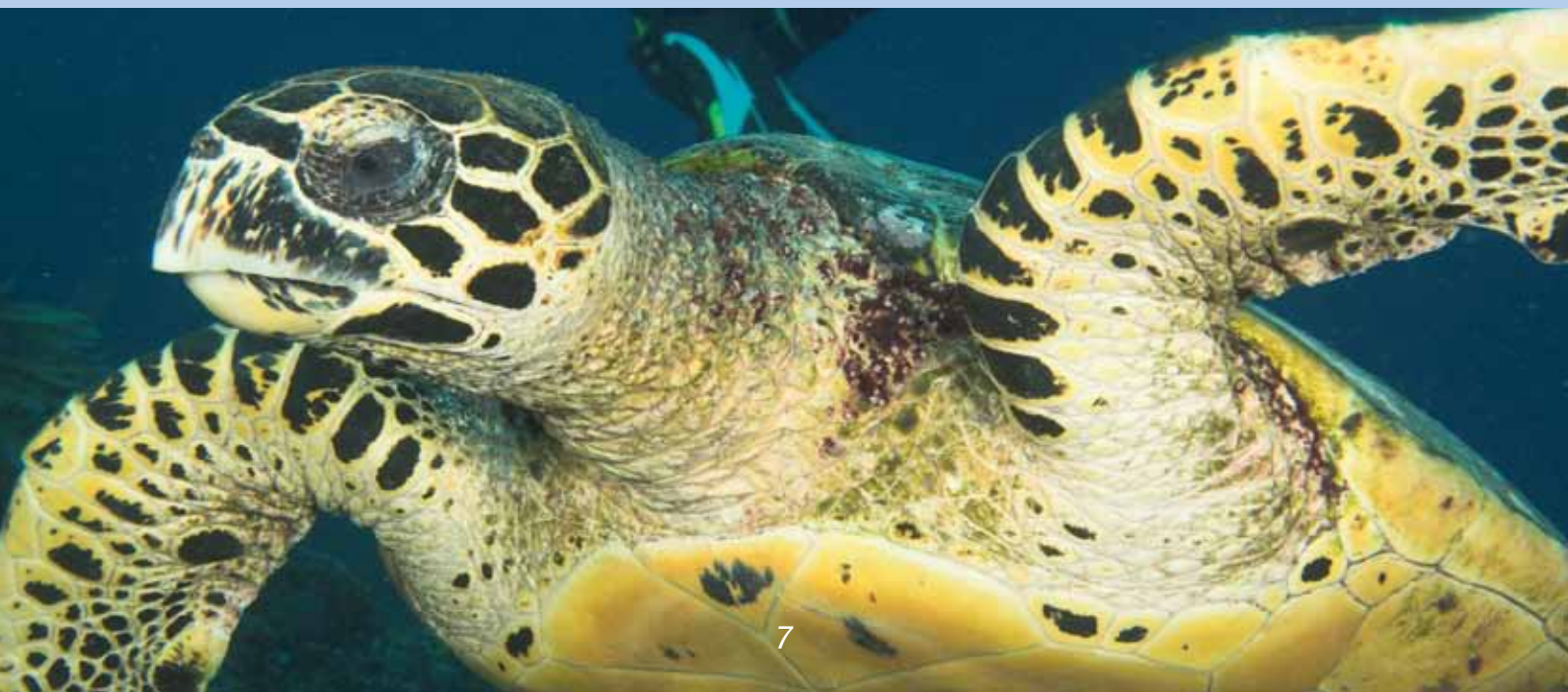
By 2020, marine turtles are recovering or stabilizing¹ in selected representative populations.

This Strategy includes site-based interventions, both on nesting beaches and in-water habitats (such as interesting areas, foraging grounds and migratory routes), as well as broader regional and international policy interventions. It focuses specifically on five of the seven marine turtle species, but broad international, intergovernmental policy interventions intended for these five species will most likely also benefit the other two species (Kemp's ridley and flatback turtles) as well.

WWF's global marine turtle priorities

- *Continue to identify critical habitats in each ocean basin, and protect/effectively manage those that are known*
- *Develop alternatives to over-exploitation, and reduce illegal trade*
- *Reduce bycatch in artisanal and industrial fisheries*
- *Support policies to reduce marine turtle mortality and improve implementation of existing agreements and international instruments*
- *Implement strategies to reduce the impact of climate change*
- *Highlight and strengthen the value of living turtles to the livelihoods of local communities, and to decision makers*

¹ Population trends (as measured by proxies such as number of nesting females, number of nests, etc) increasing or, at least, not declining.



OBJECTIVES

The five year species objectives² are:

Species Objective 1. By 2014, leatherback populations are stabilizing or increasing at 10 major nesting beaches, and major threats to leatherbacks in priority sites are measurably reduced.

Species Objective 2. By 2014, hawksbill populations are stabilizing or increasing at 10 nesting beaches with long term monitoring schemes, and major threats to hawksbills in priority sites are measurably reduced.

Species Objective 3. By 2014, loggerhead populations are stabilizing or increasing at 6 major nesting beaches, and major threats to loggerheads in priority sites are measurably reduced.

Species Objective 4. By 2014, green turtle populations are stabilizing or increasing at 6 major nesting beaches, and major threats to green turtles in priority sites are measurably reduced.

Species objective 5. By 2014, olive ridley turtle populations are stabilizing or increasing at 3 nesting beaches of global importance, and major threats to olive ridleys in priority sites are measurably reduced.

In addition, global overarching objectives address actions that need to be taken or coordinated at regional or global levels across the species-specific work. These include:

Overarching Objective 6. By 2020, adaptation measures significantly reduce the threats from climate change to marine turtles at key nesting and foraging sites³.

Overarching Objective 7. By 2020, the development and application of policies and legislation that benefit marine turtle conservation facilitated in all range states covered by WWF target sites and through at least five international marine turtle (or other relevant) instruments.

Overarching Objective 8. By 2020, the livelihoods of people living in coastal areas are improved through economic development activities linked to marine turtle conservation.

² Priority sites in these objectives are those nesting beaches, interesting areas, foraging grounds and migratory routes identified as important for each species.

³ A subset of the sites defined in the species' objectives; those particularly likely to be affected by climate change.

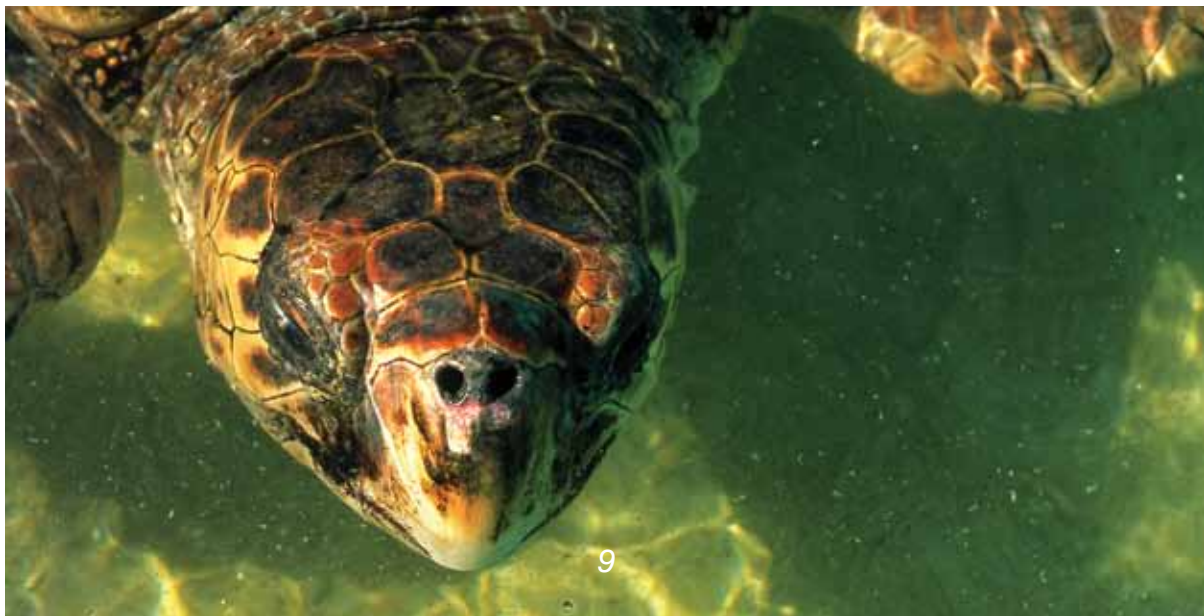
2. Introduction

Marine turtles have flourished on Earth for well over 100 million years, surviving the demise of the dinosaurs and the Earth's cataclysmic events. Sadly, however, the world's seven marine turtle species have declined dramatically in the last several hundred years - due to human exploitation, bycatch in fisheries, loss of habitat, and marine pollution. Recognition of their plight in the mid-20th century resulted in the enactment of global and regional agreements, backed-up by national legislation and regulations to protect them. Despite these developments, however, marine turtles remain vulnerable to extinction from a suite of ongoing and emerging threats. Although these threats vary according to species and region, with some populations faring better than others, it is clear that marine turtles will remain conservation-dependent in the modern world.

In terms of their distribution, leatherbacks, greens, hawksbills, olive ridleys and loggerheads have circumglobal ranges, while the flatback is limited to the waters of Australia and New Guinea, and the Kemp's ridley to the Gulf of Mexico and eastern United States. Conserving marine turtles is challenging because these long-lived animals are constrained by their biology and must survive for decades to thrive. Most marine turtle species do not mature for 20-30 years and then remain reproductively active for at least a decade. They also migrate thousands of kilometres in their lifetimes, across ocean basins and through the territorial waters of numerous countries. Thus, strategies for conservation and management must address threats on the land, in coastal waters, and on the high seas.

In recent decades, national and international programmes to conserve marine turtles have prevented extinction at the species level. With long-term protection, some assemblages have rebounded, but numerous populations are either mere remnants of their former size or are gone altogether. Ensuring the survival of individuals is not enough – the ultimate goal should be to avert both biological and ecological extinction, and to enable recovery. Recovered populations must be large enough to fulfil their ecological roles in marine and coastal habitats, and resilient enough to survive unexpected events.

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2.1 Biology and life history of marine turtles

Marine turtles spend their lives at sea, but females must leave the ocean and venture ashore to lay their eggs in the warm sands of tropical and subtropical beaches. Adult males and females undertake long distance migrations between foraging grounds and nesting beaches, and display natal homing by returning to the same beach or region where they were hatched many years earlier, to breed. Depending on the species, females nest in multi-year cycles of 1-9 years; males breed more frequently. Females typically lay 2-6 clutches, each containing 65 to 180 eggs, at intervals of about two weeks. Incubation generally lasts eight weeks, with warmer nests producing female hatchlings and cooler nests producing males, but incubation temperatures above 35° C or below 25° C are fatal. Emerging at night or on a rainy day when the sand is cool, the hatchlings scurry to the ocean. Once beyond the waves, each small turtle is guided to the open ocean by its internal magnetic compass.

Young turtles passively drift in oceanic gyres for some period of years. Growth rates are very slow, with most species requiring 20-30 years to mature. The older juveniles of most species move into developmental habitat and eventually into adult foraging habitat. Marine turtles often display fidelity to foraging habitat as well as nesting beaches.

As a result of this delayed maturity, a very large population of hatchlings, juveniles and sub-adults is needed to sustain an adult breeding population. Small turtles are preyed upon by a host of terrestrial and marine species, and natural mortality is high. For survivors of these early years, natural predation diminishes over time but remains an active threat. Marine turtles are valuable to marine and coastal ecosystems as both predators and prey, and also have major effects on nutrient cycling and the structure of these systems—particularly when populations are robust. In some areas different species compete for the same resources, but overall differences in food habits and foraging areas minimize competition.

Ultimately, the success of any species is based on its ability to reproduce and survive. Changes in marine turtle populations are most commonly assessed by nesting beach surveys. Nesting populations fluctuate naturally from year to year, so regular surveys are needed for 6-10 years or more. Although this assessment method focuses on only one part of the population, it provides a dependable measure of whether reproduction is stable, increasing or declining over time. With decades between hatching and breeding, however, the outward response to both overexploitation and protection/removal of overexploitation is slow. Foraging ground assessments are useful but complicated by the presence of turtles of various ages from different populations whose futures remain unknown.

Did you know that marine turtles...?

- ... require several decades to mature sexually
- ... have a sex ratio of hatchlings that is temperature dependent
- ... occupy several trophic levels from herbivorous grazers to carnivores
- ... disperse and migrate over vast areas; one turtle was recorded to travel 10,000 kilometres in a year
- ... 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
- ... breathe air, and are thus affected by many fishery practices which may result in their drowning
- ... move within the territorial waters of many countries as well as the high seas

Leatherback

Leatherbacks (*Dermochelys coriacea*) are the world's largest marine turtles and they are the only survivors of an evolutionary line that diverged from the other species of marine turtles 100-150 million years ago. Leatherbacks are the most migratory of all marine turtle species, making both trans-Atlantic and trans-Pacific crossings. The world's largest nesting leatherback populations are found on both sides of the Atlantic. Although nesting has increased and the discovery of the large nesting assemblage in Central Africa has significantly increased the total



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number of Atlantic leatherbacks, they remain conservation dependent. In contrast to the Atlantic, leatherback populations in the Pacific and the Indian Ocean have declined precipitously as a result of intense egg collection and fisheries bycatch and may now number only a few thousand females nesting each year. Without urgent conservation, these leatherbacks face regional extinction.

Hawksbill

The hawksbill (*Eretmochelys imbricata*) is a medium-sized turtle weighing 60-80 kg and with a carapace measuring up to 90 cm. It is found throughout the world's tropical oceans and, to a lesser extent, in subtropical waters. Numerous accounts document the rich historic abundance of hawksbills in the Atlantic, Indian and Pacific Oceans. For thousands of years the hawksbill has been hunted for tortoiseshell, the beautiful scutes of its carapace which, in legend and history, has been a valued and prized commodity. Although a worldwide ban on tortoiseshell currently prohibits international trade, hawksbills remain at risk from clandestine and local exploitation, and illegal trade.



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Loggerhead

Found around the world in temperate, sub-tropical and occasionally tropical waters, the loggerhead (*Caretta caretta*) is easily distinguished from other species of marine turtles by its massive head and large powerful jaws. Loggerheads occupy numerous near-shore and off-shore habitats during their lives and thus are exposed to multiple human-made threats. Loggerheads are less likely to be hunted deliberately than other marine turtles: their meat



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is considered less desirable than that of the green turtle, and the shell is less prized than that of the hawksbill. However, loggerheads come in contact with numerous pelagic and near-shore fisheries. Reducing bycatch in artisanal and industrial fisheries is a critical need everywhere but especially in the Pacific - where the fewest numbers of loggerheads are found, and in the Mediterranean - where levels of capture are very high.

Green

The green turtle (*Chelonia mydas*) is the largest of the hard-shelled marine turtles and as an herbivore is unique among these species. The term "green" refers to the colour of its fat, not its carapace. Green turtles are distributed throughout the tropics and subtropics, and, to a lesser extent, in temperate waters. They are highly migratory and undertake complex movements during their lifetimes, including periodic migrations from breeding to foraging grounds, but green turtles do not cross ocean basins frequently. In the Eastern Pacific



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a unique subspecies referred to as black turtles nests from Mexico to Ecuador. Black turtles are not sufficiently distinct genetically from green turtles to be considered a separate species, but they are noticeably different in appearance and behaviour. Historically, green turtles were exceedingly abundant but today, by comparison, many populations are depleted. Hunted extensively for meat, oil, shell, leather, curios and calipee (for soup), the green turtle has been described as the world's most commercially valuable reptile. Overall, nesting populations are now doing relatively well in the Western and Central Atlantic and parts of the Pacific, however face serious threats in South East Asia, the Eastern Indian Ocean and the Mediterranean.

Olive ridley

The olive ridley (*Lepidochelys olivacea*) is the world's most abundant marine turtle. The olive ridley is also the smallest of the marine turtle species, weighing between 35-50 kg and with a carapace measuring 60-72 cm long; Pacific ridleys are somewhat smaller than their Atlantic counterparts. The relatively broad carapace is high-domed, and they are olive or greyish green in colour. Many olive ridleys are solitary nesters, but on



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a few beaches around the world, females emerge from the ocean *en masse* to lay their eggs in spectacular natural events known as *arribadas* (Spanish for “the arrival”). The olive ridley will always be vulnerable because such a large proportion of its reproductive effort is concentrated in only a few locations. Human-caused or natural disturbances to nesting beaches and interesting areas, therefore, have huge repercussions on the entire population.

Kemp's ridley

The Kemp's ridley (*Lepidochelys kempii*) is a relatively small turtle weighing up to 54 kg and with a carapace up to 72 cm. It is restricted to the Gulf of Mexico and the US Atlantic seaboard. Kemp's ridleys are light olive-green. The Kemp's ridley is the most geographically restricted of the marine turtles and is one of only two species not distributed around the world. This species has undergone a major population decline in the last 60 years -



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from more than 40,000 females nesting *en masse* in an *arribada* in 1947, to an all-time low of only a few hundred females nesting solitarily in the mid-1980s. Until recently the Kemp's ridley was the world's most endangered marine turtle, but four decades of conservation efforts have averted their extinction, making this tale of survival one of the world's great marine conservation success stories.

Flatback

The flatback (*Natator depressus*) breeds and nests only in Australia, and is the second of the two marine turtle species with a restricted geographic range. It is a medium-sized turtle, weighing up to 90 kg, and has a flattened, olive-grey carapace measuring to 90 cm. Covered in a thinly keratinized skin rather than hard keratinized scutes, the carapace bleeds when scratched. Flatbacks are largely restricted to Australia's



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continental waters where they forage in shallow soft-bottom habitats for soft corals, jellyfish, and other soft-bodied prey such as sea cucumbers and sea pens. The restricted range means that the flatback is extremely vulnerable to habitat loss - especially of breeding sites. Increasing coastal development, particularly that associated with oil and gas facilities, is likely to heighten this pressure. Feral pig predation is suppressing nesting success by up to 90 per cent in some rookeries, but the major threat appears to be bycatch by the numerous fishing vessels operating in waters favoured by these turtles.

2.2 Conservation status of marine turtles globally

Marine turtles are an “ancient part of the world’s biodiversity, represented in fossil records as early as 100 million years ago” (IUCN 1995). Early records of these species in the 18th and 19th Centuries indicate their abundance in the millions. Yet many species are now in rapid decline through a wide range of human-induced impacts, and in urgent need of comprehensive and integrated conservation efforts. Because of their widespread public appeal, they also serve as charismatic ambassadors for marine and coastal conservation issues—nationally, regionally, and globally.

New technology and sophisticated research tools have significantly expanded marine turtle research in recent decades, providing a better understanding of their biology and behaviour, and strengthening the ability of scientists and managers to make informed decisions. Following the discovery of distinct genetic markers in nesting populations, biologists have since been able to identify the origins of turtles away from their natal beaches. Satellite transmitters have enabled scientists to track turtles in real time, revealing migration patterns and foraging habitat. Sophisticated data recorders capture behaviour, physiology, and environmental conditions, such as nest temperature and moisture. Electronic databases are powerful tools which allow data to be widely accessed and shared.

Despite significant advances, large gaps in knowledge remain: including dependable estimates of survival and mortality at different life history stages, as well as age to maturity. For the highly vulnerable leatherbacks, decisions on management and recovery are complicated by estimates to age of maturity ranging from 9-12 years to 29 years. Many tagging operations initiated several decades ago continue to yield valuable data, including records of individual greens, hawksbills, loggerheads and olive ridleys nesting for 25 years or more. However, because many marine turtles die as a result of human-induced threats, scientists are unable to determine if these long-lived animals are the rule, or the exception. Current research is yielding important information about turtles and their environmental needs, just as climate change is beginning to alter environmental parameters.

A summary of the protection afforded to marine turtles through two global environmental treaties, and their conservation status as determined by IUCN (International Union for the Conservation of Nature) can be found in the following table:

Table 1: Global conservation status and protection afforded to marine turtles through CITES and CMS listing.

| Marine turtle species | IUCN Red List (2009) www.iucn.org/redlist | CITES listing⁴ www.cites.org | CMS listing⁵ www.unep-wcmc.org/cms |
|--|---|---|---|
| Leatherback turtle (<i>Dermochelys coriacea</i>) | Critically Endangered | Appendix I | Appendix 1 & 2 |
| Hawksbill turtle (<i>Eretmochelys imbricata</i>) | Critically Endangered | Appendix I | Appendix 1 & 2 |
| Kemp's ridley turtle (<i>Lepidochelys kempii</i>) | Critically Endangered | Appendix I | Appendix 1 & 2 |
| Green turtle (<i>Chelonia mydas</i>) | Endangered | Appendix I | Appendix 1 & 2 |
| Loggerhead turtle (<i>Caretta caretta</i>) | Endangered | Appendix I | Appendix 1 & 2 |
| Olive ridley turtle (<i>Lepidochelys olivacea</i>) | Vulnerable | Appendix I | Appendix 1 & 2 |
| Flatback turtle (<i>Natator depressus</i>) | Data Deficient | Appendix I | Appendix 2 |

2.3. Main threats to marine turtles

2.3.1 Bycatch in fisheries

Bycatch in fisheries - in coastal waters and on the high seas - is the single greatest threat faced by most marine turtle populations today. This threat is increasing, as fishing activity expands and more efficient fishing gear is developed. Turtles are unintentionally captured, injured or killed in many kinds of gear, including trawls, fixed gear, pots and traps, gillnets, dredges, and longlines. Fisheries have a broader, but less obvious, indirect effect on turtles - by altering marine food webs, targeting turtle prey, such as whelks and crabs, and destroying bottom habitat.

Trawls, longlines and gill nets are three widely used types of gear that are especially lethal for marine turtles. Wide-mouthed trawl nets are known to catch all marine turtle species in coastal waters and may drown as many as 150,000 turtles each year. Longliners fishing for tuna, sharks and swordfish on the high seas, set 1.4 billion hooks or more each year and capture more than 200,000



⁴ Convention on International Trade in Endangered Species of Wild Fauna and Flora.

⁵ Convention on Migratory Species of Wild Animals.

loggerheads and 50,000 leatherbacks annually, with tens of thousands of turtles subsequently succumbing to injuries inflicted upon them in these fishing operations.

Better bycatch data collection and mandatory changes for longline fishing need to be adopted by the world's potentially powerful Regional Fishery Management Organisations (RFMOs) that manage high seas fisheries. Practical solutions need to be sensitive to artisanal fisherfolk's subsistence needs and should capitalize on their local knowledge. The voluntary adoption of turtle-friendly fishing practices by artisanal longliners in the Eastern Pacific is leading the way to a massive transformation of attitudes towards bycatch.

Until recently, efforts to reduce bycatch have largely focused on industrial fisheries and organised artisanal fleets such as those in the Eastern Tropical Pacific. Although bycatch in small, local artisanal fisheries was not considered a major problem, these fisheries are extensive and may have huge localized effects. Global estimates of the numbers of marine turtles killed as a result of artisanal fisheries are not available. Gillnets used extensively in artisanal and industrial fisheries are highly effective in incidentally catching turtles.

Identification of "hot spots" where turtles and fisheries overlap, such as in the productive areas where ocean currents converge, is critically important for long-term turtle conservation. Some fisheries are especially lethal because they operate in the vicinity of important nesting beaches (e.g. the gillnet fishery in Trinidad & Tobago, the shrimp trawlers off the shores of Orissa in India). On a global basis, areas of particular concern for longline bycatch are the Central and Southern Pacific, South Atlantic, and Mediterranean; while driftnets used to catch swordfish and other species have been identified as a major problem in the Southwest Atlantic and the waters off Brazil.

Research to reduce turtle bycatch has been underway since the early 1980s - when net inserts known as Turtle Excluder Devices (TEDs) were first developed to enable turtles to escape from trawl nets. TEDs are used in many areas of the world today, but not as widely or effectively as needed, even where there is adequate legislation requiring their use. The growing interest in reducing the incidental capture of protected species in longline fisheries has resulted in gear modifications and new handling techniques for captured turtles. Modifications to gill nets in Trinidad, and along Mexico's Pacific coast, have dramatically decreased the rates of marine turtle capture in small-scale fisheries. Time and area closures are also effective in reducing bycatch in gill nets and other fisheries.

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2.3.2 Direct exploitation

Tens of thousands of marine turtles are killed deliberately each year in the developing world as a source of protein and cash revenue. Poverty and cultural mores, coupled with weak (or non-existent) governance and enforcement, contribute to this problem. Exploitation is particularly serious in parts of Asia and the Western Pacific where tens of thousands of green turtles are killed for food each year. Along the Eastern Pacific coast of Mexico, despite complete protection, green turtles are still very much at risk from continuing exploitation. A voluminous, legal, commercial harvest of green and hawksbill turtles by the Wayuu community persists in the Caribbean shores of Colombia. And over 10,000 green turtles are harvested each year along the Miskito coast of Nicaragua. In the Pacific islands, increases in exploitation accompanied the decline in traditional taboos on turtle hunting, which has significantly reduced turtle populations. In West Africa eggs are collected and marine turtles are killed for food, medicine and use in voodoo ceremonies.



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Egg collection on many turtle nesting beaches is also a very serious threat, especially in SE Asia where a culture of legal egg collection leads to the removal of tens of thousands of eggs – a practice which has contributed to the local extinction of leatherbacks in Malaysia. Within the last several decades extensive egg collection and the killing of adult turtles in Indonesia has resulted in huge population declines throughout the archipelago. Despite protective legislation, many eggs produced each year in Central America are still collected for subsistence or commercial use. Hunting and egg collection continue throughout the Indian Ocean.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has prohibited all international commercial trade in marine turtles since they were listed on Appendix I of the Convention in 1981. Over a period of years, CITES has been a powerful tool in reducing international turtle commerce, but its restrictions have no legal effect on domestic trade. Some countries however have imposed more strict domestic measures, in response to the conservation status of the species, and the heightened awareness produced by the Appendix I listings.

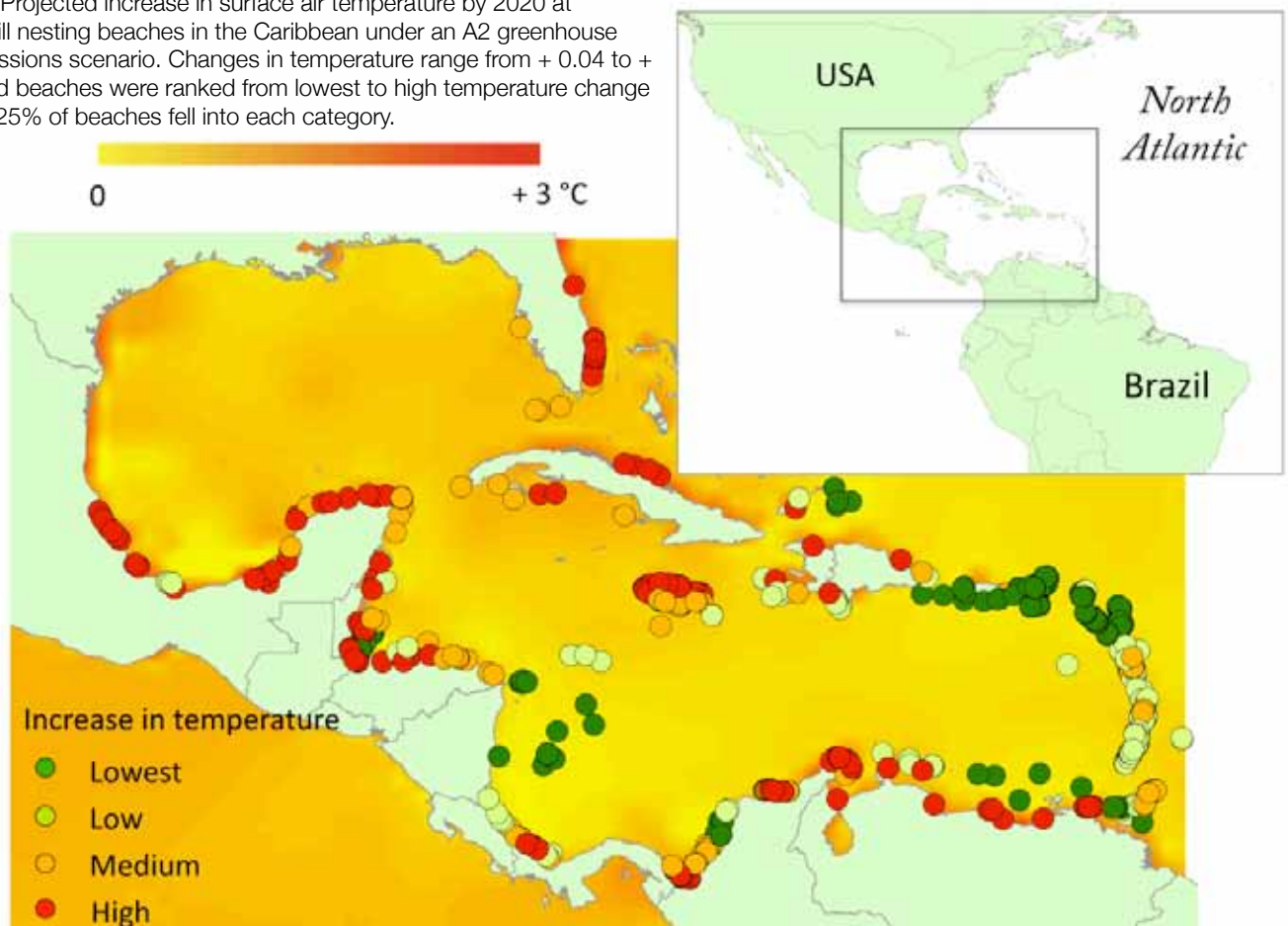
The participation of local communities, and the need to incorporate conservation in socio-economic development, are both critical to the success of marine turtle conservation in the developing world, because exploitation of turtles is often driven by a lack of economic alternatives. Programmes which can provide economic alternatives to exploitation and well being to communities demonstrate that turtles are ultimately more valuable alive than dead. Education and outreach are crucial to changing attitudes and instilling a conservation ethic that will be sustained over time.

2.3.3 Threats to habitat and climate change

Marine turtles are dependent on coastal and marine habitats, many of which are under threat from development and associated activities. Beach developments, piers, and artificial lighting all have a negative impact on nesting in many areas, with beachfront constructions, such as seawalls, preventing viable nesting. Offshore runoff, pollution, fishing, and commercial (as well as recreational) traffic, imperil seagrass beds and corals in near-shore habitat. Oil and gas development are also major threats in many areas. Nest predation by feral animals (e.g. pigs) is an important threat to many populations of turtles. Pressure on turtle habitats will increase as the planet's projected human population growth approaches nine billion by the mid 21st century. In the years to come, a warming globe, rising sea levels and the associated effects of climate change will present additional challenges.

In the last 150 years, the average temperature of the Earth has risen 0.76 ° C and this trend is expected to continue to increase at an ever faster rate. Climate change is affecting the physical and chemical characteristics of the oceans - as waters expand, ice covers recede, circulation patterns change, and the acidity of the oceans increases. Freshwater from melting glaciers, changes in salinity and oxygen, and changing ocean chemistry will affect marine habitats and biodiversity. These changes will result in shifts in range and abundance for algae, plankton, fish, and other species. It is impossible to predict how changes in major ocean currents, key habitats, and prey abundance and distribution will affect marine turtle distribution, foraging behaviour and reproductive fitness, but the potential for profound change is significant.

Map 1. Projected increase in surface air temperature by 2020 at hawksbill nesting beaches in the Caribbean under an A2 greenhouse gas emissions scenario. Changes in temperature range from + 0.04 to + 3 ° C and beaches were ranked from lowest to high temperature change so that 25% of beaches fell into each category.



Seagrass beds will be adversely impacted by increased temperatures, sea level rise, sedimentation, disturbance from storms, and flooding. Coral reefs are at risk from increased temperatures combined with reduced calcification associated with lower pH levels. The expansion of warmer ocean waters and more severe storms will erode nesting beaches while seasons of unusual rain or drought will alter incubation conditions and reduce hatchling production. Warmer temperatures will produce a preponderance of female offspring or may be fatal to embryos altogether. Warmer waters are expected to increase episodic marine events, such as red tide, and enhance the spread of disease.

WWF has taken a proactive role in Latin America and the Caribbean in addressing the effects of climate change on marine turtles, initially by convening a group of leading scientists to evaluate impacts; and design and test adaptation measures, including the reduction of non-climate stressors, to enhance the resilience of populations and the habitats on which they depend. Turtles are a flagship species group to promote coastal adaptation with relatively simple, hands-on measures. An adaptation tool-kit for marine turtle habitats for global distribution would benefit turtles and coastal communities alike.

An unusually high tidal wave floods the egg hatchery in a marine turtle conservation site. Such extreme events are becoming more frequent and intense with climate change. Adaptation to climate change needs to foresee setbacks free of infrastructure to allow beaches to shift inland.



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3. Developing WWF's Global Marine Turtle Strategy (2009-2020)

WWF is one of the world's largest conservation organizations; however, even with the help of its numerous partners, it has only finite resources and must focus its efforts. Since its establishment in 1961, WWF has used a variety of methods and strategies to prioritize its activities. In an effort to further focus its efforts and resources in coming years, WWF has now developed a Global Programme Framework to act as an outline strategy for its future work.

3.1 WWF Mission, Goals and Priorities

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's Mission underpins its conservation work and is the foundation for the Global Programme Framework. In order to realise its Mission, WWF will focus its global conservation programme around meta-goals and goals that address issues of biodiversity conservation and footprint (the impacts of people on the environment). To deliver on these meta-goals and goals, WWF will focus the greater part of its efforts in conserving priority ecoregions and species, and in addressing a set of priority global drivers that are impacting on biodiversity, as well as working to reduce the human footprint on Earth to sustainable levels.

Biodiversity Meta-Goal

By 2050, the integrity of the most outstanding natural places on earth is conserved, contributing to a more secure and sustainable future for all

- 2020 Biodiversity Goal – Places: Biodiversity is protected and well managed in the world's most outstanding natural places
- 2020 Biodiversity Goal – Species: Populations of the most ecologically, economically and culturally important species are restored and thriving in the wild

Footprint Meta-Goal

By 2050, humanity's global footprint stays within the earth's capacity to sustain life and the natural resources of our planet are shared equitably

- 2020 Footprint Goal: By 2020, humanity's global footprint falls below its 2000 level and continues its downward trend

3.2 Marine turtles and the Global Programme Framework

WWF has been working actively across the globe on marine turtle conservation since its founding in 1961, but particularly intensively since the inception of the organization's Species Programme in 2001. Over this time period, WWF programmes and offices around the world have made significant progress in marine turtle conservation.

A considerable number of projects have specifically focussed on marine turtle conservation. In addition, a large number of other projects throughout the WWF network indirectly supported marine turtle conservation through broader conservation interventions. With the recent adoption of the Global Programme Framework as the strategy to guide WWF's future work, it is important to note that marine turtles are among the list of 13 "Flagship" species, which are of special importance ecologically, economically and culturally; and on which WWF will focus its primary efforts in order to achieve wider conservation outcomes.

Marine turtles are arguably the most "global" of WWF's species priorities, present in almost all the marine and coastal Priority Places listed in the Global Programme Framework, and in virtually all of the world's oceans. They cross thousands of kilometres of ocean and rely on a wide range of very different coastal and marine ecosystems at different times during their life cycle. As a consequence, marine turtle conservation requires a comprehensive approach to protection of many important marine habitats, and to mitigation of key threats within those habitats. Marine turtles are thus a symbol of key global threats to coastal and marine biodiversity and to the importance of a marine conservation agenda in most parts of the world.

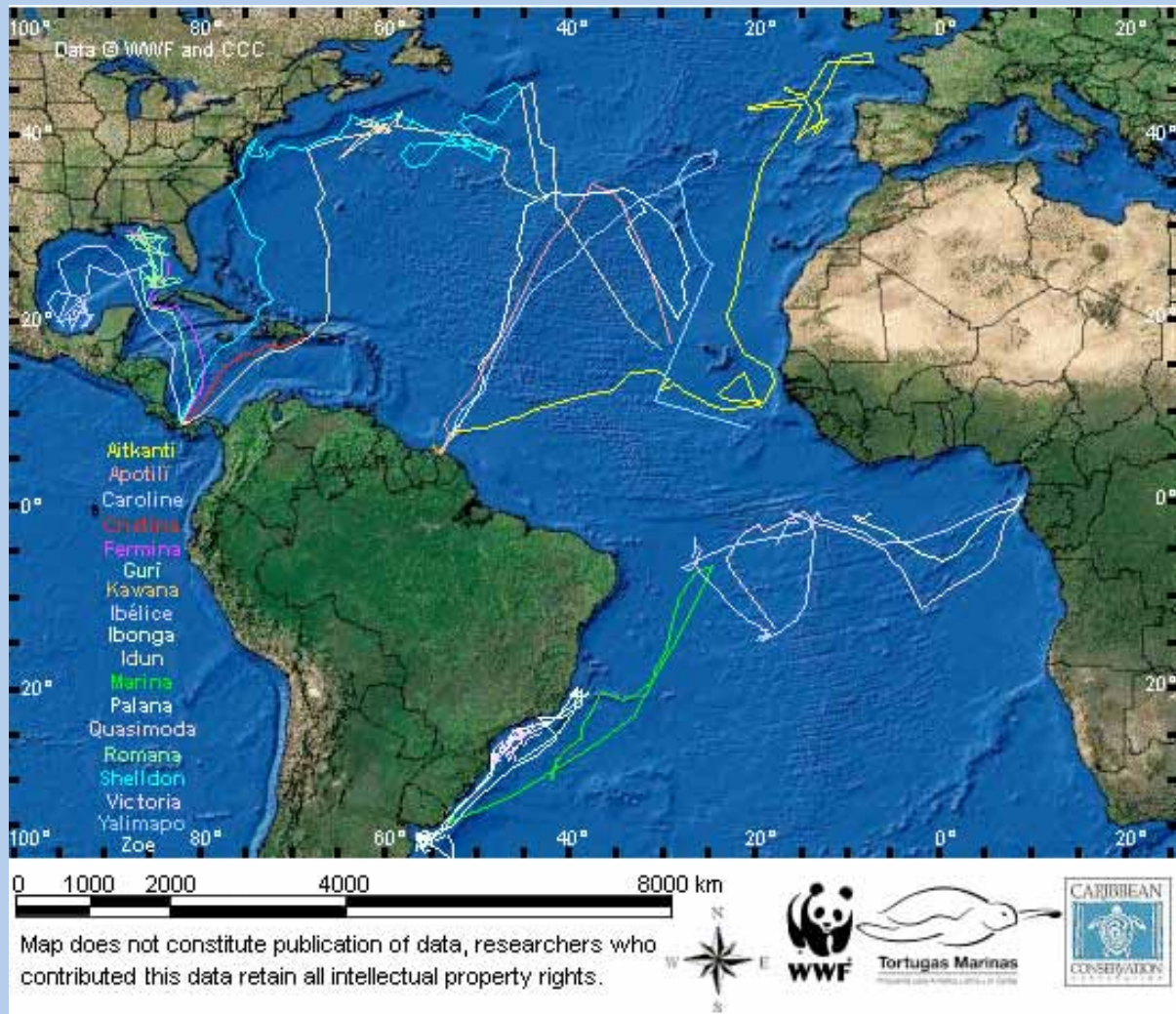
3.3 Achievements of WWF's marine turtle work

The breadth and variety of WWF programmes reflect an evolving conservation scenario – emerging from an initial focus on interventions on nesting beaches aimed at protecting female turtles and their eggs. While these programmes remain an essential part of the overall strategy, WWF's efforts have expanded to: reduce bycatch in fisheries; support and advocate international and intergovernmental policies to provide meaningful protection; generate community participation in conservation; and address climate change. Research and management, capacity building, public education and outreach have been key components of this work. WWF also assisted in the creation of what was to become the IUCN/SSC Marine Turtle Specialist Group. Partnerships are vital to WWF's conservation practice, and the organization values its relationships with governments, industry and other non-governmental organizations (NGOs) in the countries and regions where WWF works.

Recent highlights and achievements of the WWF Marine Turtle Conservation work around the globe include:

- The launch of the reports 'Linked Futures' and 'Money Talks'- These reports illustrate how marine turtle conservation programmes can, and do, reduce poverty and deliver a sustainable environment for future generations. The reports show that non-consumptive tourism use of marine turtles generates greater gross revenue than consumptive use of marine turtles for shell, meat, eggs and other products. Both reports are frequently used as a reference and lobbying tool to demonstrate that investments in marine turtle conservation are also investments in people and their livelihoods.
- Nearly 90 per cent reduction of bycatch mortality of marine turtles in over 100 vessels of the longline fisheries in the Eastern Pacific through WWF's Bycatch Programme. The introduction of circle hooks as alternative fishing technology has been proven to save turtles while not affecting fish catches. The Programme continues to facilitate a wide transformation process towards sustainable fisheries practices.
- The launch of the yearly 'WWF International Smart Gear Competition', designed to encourage innovative ideas for environmentally-friendly fishing gear. The competition is searching for new designs for fishing devices that reduce bycatch; real-world fishing solutions that allow fishermen to fish 'smarter' by better targeting their intended catch, while safeguarding marine turtles and other marine life often caught unintentionally.
- In 2007, a WWF survey discovered several marine turtle nesting sites on the beaches of Senegal, prompting calls from conservationists to improve protection of the endangered species. Thanks to the combined efforts of government bodies, local communities, and the WWF West African Marine Ecoregion (WAMER), the Joal Fadiouth Marine Protected Area was established. This is now the first fully operationalized community based Marine Protected Area in Senegal.
- The WWF Adaptation to Climate Change for Marine Turtles (ACT) project was started - to address how marine turtles are affected by climate change and the best ways to reduce their vulnerability to changing environmental conditions. This includes activities that would help turtle populations to be more resistant (the ability to withstand change), and resilient (the ability to recover after change), to climate change effects. The Adaptation Toolkit will be available soon, to be used by all WWF offices and external partners involved in climate change adaptation work.
- A multi-partner Trans-Atlantic Leatherback Conservation Initiative was started, in which more than 20 leatherbacks were fitted with a satellite-transmitter to analyse the migratory routes of the turtles. The partnership includes WWF-Latin America & the Caribbean, WWF-Gabon, and WWF-Guiana's. By analyzing and disseminating that information, measures will be recommended to reduce by-catch mortality in Atlantic fisheries.

Map 2. Movements of leatherback turtles in the Atlantic from satellite tagging data.



3.4. Opportunities for a WWF Global Marine Turtle Strategy

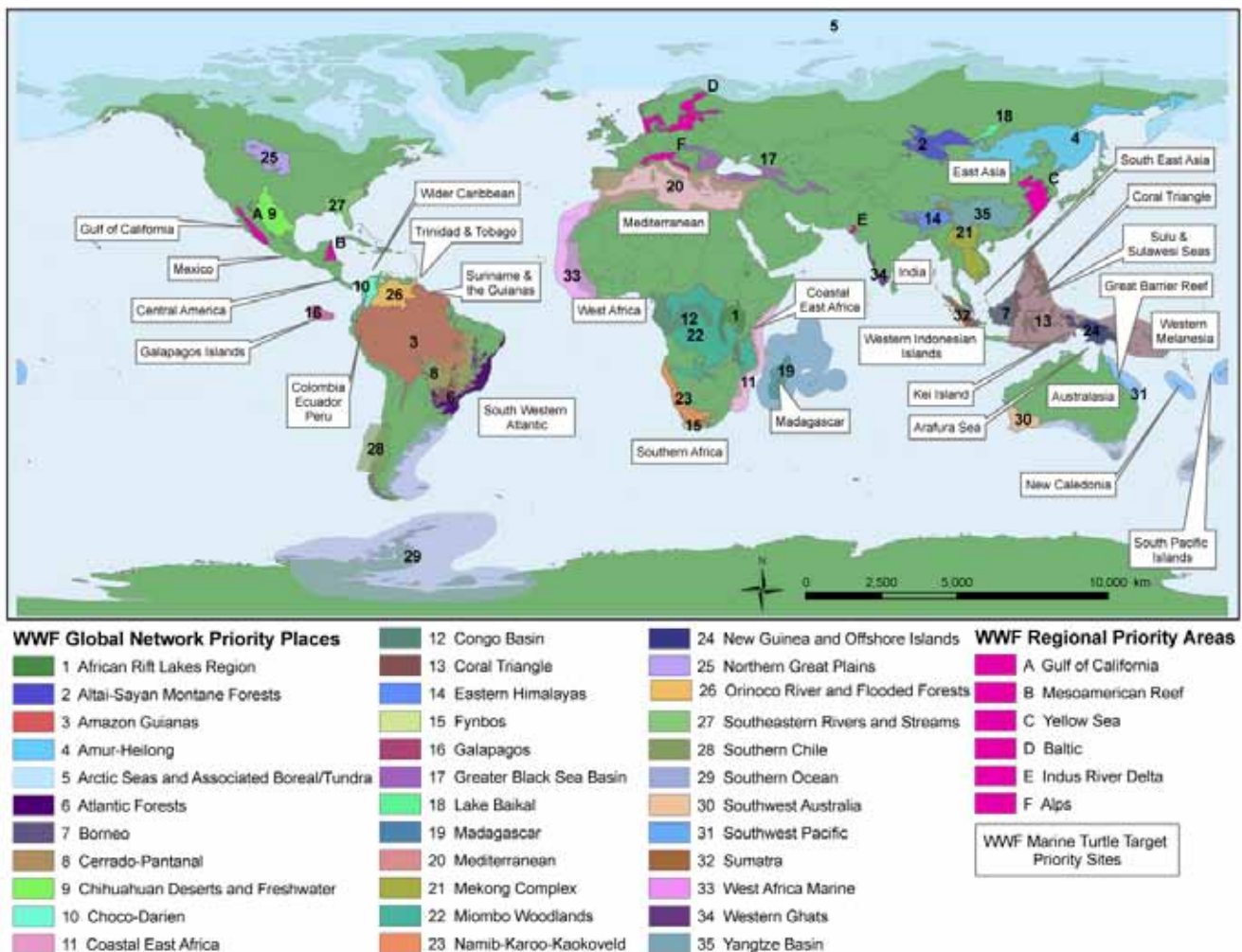
Given the geographic range of marine turtles, cross-country cooperation and coordination are vital for their conservation. With offices in more than 40 countries, WWF is well positioned as a global organization to address the challenges. WWF's current project portfolio includes a variety of marine turtle conservation projects, and many conservation programmes across the WWF Network include marine turtle modules or elements—including in many of the Global Programme Framework Priority Places and ecoregion programmes. Several of the large-scale, multi-country, WWF Network Initiatives include significant marine turtle components, such as the Coral Triangle, Coastal East Africa and Smart Fishing Network Initiatives. This breadth of interventions, at multiple scales, reinforces the need to plan WWF's work on marine turtles at a global scale.

Efforts have been made in the past to initiate a global marine turtle strategy, to assist with funding/project prioritization; however the programme structure at the time was more conducive to a regionalisation of efforts. Consequently, marine turtle conservation has previously been implemented mainly through regional marine turtle action plans. However, under the new Global Programme Framework, which includes Species Action Plans for the flagship species, there is the necessity to develop a global strategic approach to marine turtle conservation.

This Strategy aims to achieve coherent, global conservation outcomes for one of WWF's highest profile priority flagship species - by building on previous regional planning, and recognising the need for cross-regional and global synergies, as well as coordinated action. It encompasses prior and existing efforts to define detailed priorities and actions. While part of the conservation effort occurs in WWF Priority Places, the biology of the species and the geography of the most imminent threats dictate conservation action in other places too, in order to prevent their extinction. The Global Marine Turtle Strategy derives first and foremost from the conservation needs of the species in a comprehensive manner. The Strategy includes seeking synergies with Priority Place conservation programmes and WWF Network Initiatives as pertinent, in addition to independent action where it is most needed. Consequently, the implementation of the Strategy and detail of specific target nesting beaches and foraging sites will be through a combination of updated national and regional Marine Turtle Action Plans (as appropriate), Network Initiatives and work in Priority Places.

Building on many years of marine turtle conservation, this Global Marine Turtle Strategy aims to provide guidance both internally and externally by focusing on conservation priorities (species-specific and place-specific), and optimising opportunities for WWF interventions to deliver meaningful conservation outcomes. The Strategy aims to assist WWF donors to make more strategic and informed decisions for resource allocation; facilitate more productive fund-raising with external donors and partners; and, help deliver more meaningful conservation outcomes for these flagship species.

Map 8. Global distribution of WWF Network Priority Places, regional Priority Areas and Marine Turtle Target Priority Sites.



4. Selecting priority species and populations for WWF

4.1. WWF's niche in marine turtle conservation

WWF, as a global conservation organization with active marine turtle conservation projects and a history of supporting partner organizations in over 100 countries around the world, is well positioned to provide a coordinated multinational effort for marine turtle conservation. WWF has experience at the local level, and at national, regional, and international policy levels. A key strength of WWF lies in it being able to use field and policy work at all levels to inform and strengthen each other. This allows the development of an integrated cohesive approach needed for these highly migratory species.

WWF's strengths include:

- A trusted and well respected network of offices and expertise across the globe, in many priority turtle nesting and feeding areas
- Identification of priority areas, key threats and associated recovery objectives for marine turtle conservation across species' ranges
- Ability to work effectively at all levels, from local communities to international advocacy
- Credible and well-respected advocacy based on field experiences
- Multinational staff, with cultural sensitivity skills and local knowledge
- Experience and credibility at facilitating multi-stakeholder, integrated planning and implementation processes
- Ability to mobilize large communications and advocacy campaigns
- Ability and experience in working collaboratively with local and national governments;
- Ability to work constructively with industry partners
- Close relationship with TRAFFIC (the joined wildlife trade programme of WWF and IUCN) on wildlife trade

WWF firmly believes that marine turtle conservation must be relevant to local communities who regularly live and interact with marine turtles. Because of this, involving and building the capacity of local partners and communities is seen as a critical part of WWF's field and advocacy programmes wherever they operate.

4.2. Criteria for prioritizing species, populations and habitats

The approach taken in this Strategy is to conserve representative populations across the range of a particular species. This requires different actions to an approach that seeks to conserve only one representation of a species – where, for example, if the largest nesting population was maintained, this would ensure the continuation of the species. Representative population conservation implies consideration of genetic diversity and the species' ecological role across its entire range and lifecycle.

In determining priorities, the following considerations were used sequentially:

1. The risk of extinction of the species or population concerned, based on its current conservation status.
2. The biological importance of a population or area – e.g. a large nesting population either historically or currently, an important foraging ground, a genetically important nesting population, the viability of the population, known migration routes, etc.
3. Major identified threats – those that are most important for a population, species or area, of which the following were determined to be the most serious affecting marine turtles across their ranges -
 - Bycatch
 - Trade
 - Consumption (local)
 - Habitat destruction or degradation (nesting, foraging)
 - Climate change(Pollution, in the form of garbage and “ghost” fishing gear, was determined to be an issue affecting certain populations locally or regionally).
4. Synergies with other WWF programme priorities.
5. Consideration of WWF's niche in relation to that of other partners.
6. Use of marine turtles as flagship species for broader conservation outcomes.

This prioritisation process has led to no specific work on Kemp's ridley or flatback turtles being planned in the near future. In the case of Kemp's ridley turtles, despite their Critically Endangered status, this species is not currently considered a priority for WWF work largely because of their restricted geographic range and the success of current interventions by other stakeholders. It is not clear what added value would be achieved by WWF initiating work on this species. Thus, WWF has determined that while work on Kemp's ridley turtles is a priority for the governments of Mexico and the USA, and other NGO partners currently working on the species, it is not a priority for WWF to engage as well. In the case of flatback turtles, their Data Deficient status and restricted geographic range for both nesting and foraging were key factors in the analysis and conclusions. As with Kemp's ridleys, there was no clear added benefit identified for site-specific WWF action on flatback turtles. However, in both cases, it is anticipated that broader national or international and intergovernmental policy interventions intended for other species will benefit these species indirectly. This Strategy is a working document and, therefore, if either of these situations regarding these two turtle species changes, the Strategy could be reviewed in light of this.

4.3. Overarching global priority work

The issues in this section reflect global or concerted WWF efforts that are needed over and above species-specific and site-specific or regional actions.

Climate change

Climate change adaptation has been determined to be a high priority action that is necessary for all priority populations, requiring more development, attention and resources in most projects. Climate Change adaptation for marine turtles will include what WWF can implement, facilitate or advocate in order to help turtles and their habitats cope with the adverse effects of climate change. The particular suite of activities developed for any one population will depend on the particular vulnerabilities of that population.

International trade

Reducing or halting illegal international trade requires diligence and coordination at all levels – site level, national policy and legislation, local efforts to stop poaching, law enforcement, and international policy and regulations - such as under CITES. For this reason, there is a global objective in this Strategy regarding international trade, in order to link local enforcement with domestic and international regulations.

Bycatch mitigation in national waters and on the high seas

Because turtles are migratory, and cross national boundaries, as well as migrate across the high seas, it is essential that bycatch mitigation efforts are coordinated across their migratory ranges. This requires that a coordinated effort towards reducing the impacts of bycatch is made by RFMOs and their constituent member states. This objective aims to provide the consistency and coordination required to achieve global reductions in bycatch impacts in longline fisheries.

Livelihoods

WWF firmly believes that marine turtle conservation must be relevant to the local communities which regularly live and interact with marine turtles. The livelihoods of coastal communities where marine turtles nest are often linked to these animals and their habitats. However, there has not been an historical focus in conservation projects of systematically identifying community needs and benefits, and then addressing and monitoring the changes required. This objective aims to provide such a consistent approach particularly linked to WWF's Policy on Poverty and Conservation.

Additionally, there is a need, at local, national and international levels, to explore sustainable mechanisms of funding for priority marine turtle conservation sites and issues. While this is not the subject of a specific objective in this Strategy, potential and probable means of supporting long-term conservation and monitoring at priority sites, will be explored and implemented, where possible, at all relevant levels.

4.4 WWF's marine turtle conservation priorities at a glance

(In no particular order)

Atlantic Ocean

- Support policies across the Atlantic to reduce marine turtle mortality
- Address climate change at nesting sites through adaptation measures
- Expand protection for leatherbacks, hawksbills, loggerheads and green turtles in West Africa
- Maximize olive ridley hatchling production in Suriname and French Guiana
- Support efforts to compile international bycatch data and educate fishermen in the mitigation of marine turtle bycatch
- Reduce bycatch in artisanal and pelagic industrial fisheries, with an emphasis on foraging hot spots in the Mediterranean, South-western Atlantic and West Africa, as well as in the off-shore waters of key nesting sites in the Wider Caribbean
- Support international efforts to protect coral reef habitats and maximize resiliency
- Support the establishment of marine protected areas in critical marine turtle habitats
- Reduce hawksbill harvest and illegal trade in the Wider Caribbean

Pacific Ocean

- Support policies across the Pacific to reduce marine turtle mortality with a focus on leatherback distribution areas
- Address climate change adaptation at nesting sites
- Maximize leatherback and loggerhead hatchling production on priority beaches
- Protect leatherbacks, hawksbills, black turtles and loggerheads in the Eastern Pacific
- Identify and protect small populations of non-*arribada* olive ridleys - such as in the Arafura Sea
- Reduce bycatch by promoting the use of circle hooks and associated best-practice management practices in longline fisheries and support efforts to compile international bycatch data and educate fishermen
- Reduce bycatch in artisanal and pelagic industrial fisheries, with an emphasis on foraging hot spots in the Eastern and North Central Pacific
- Support international efforts to protect coral reef habitat and maximize resiliency
- Support the establishment of marine protected areas in critical habitats
- Reduce clandestine trade in hawksbills and green turtles in the Western Pacific
- Reduce excessive egg harvests throughout the region
- Reduce nest predation in key affected habitats throughout the region

Indian Ocean

- Support policies across the Indian Ocean to reduce marine turtle mortality
- Address climate change adaptation at nesting sites
- Maximize leatherback hatchling production on priority beaches, including South Africa
- Establish long-term protection for India's olive ridley *arribada* populations, their beaches and near-shore habitats
- Support efforts to compile international bycatch data and educate fishermen in the mitigation of marine turtle bycatch
- Reduce bycatch in artisanal and high seas industrial fisheries, including regional foraging hot spots in Sri Lanka and India
- Support the establishment of marine protected areas in critical habitats
- Support international efforts to protect coral reef habitat and maximize resiliency
- Reduce clandestine hawksbill and green trade in Western Indonesia and SE Asia, including excessive egg harvesting

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5. Global Marine Turtle Strategy: Vision, Goal and Objectives

This Global Marine Turtle Strategy outlines the Vision, Goal and Objectives for WWF's global marine turtle programme of work. It is the framework which will guide the implementation of the WWF marine turtle work. Detailed activities and indicators will be included in implementing programmes such as updated national and regional Marine Turtle Action Plans, Network Initiatives and work in Priority Places.

5.1. Vision

Marine turtle populations worldwide are protected and restored to levels where they are no longer at risk of extinction; fulfilling their ecological, cultural and socio-economic roles.

5.2. Goal and strategies

By 2020, marine turtles are recovering or stabilizing⁶ in selected representative populations.

The five strategies used to achieve the above-mentioned Goal are consistent across all WWF Species Action Plans or Strategies. Each objective in this Marine Turtle Strategic Plan can be grouped under one of these strategies. By showing how work on each specific objective relates to these strategies, it helps WWF roll-up its results from its work programmes on each flagship species to demonstrate its global impact against the 2050 meta-goals. The strategies are to:

- Further relevant policy and legislation in all sectors and at all levels
- Ensure the necessary extent, integrity and functioning of critical habitats (quantity, quality, management)
- Ensure adequate protection and biological management of populations, including guidance for local people involved with turtle conservation, and engagement with and influencing marketplace actors
- Generate mutually beneficial incentives for the co-existence of people and species
- Create awareness and influence adverse attitudes and behaviour

5.3. Objectives per species

Following the prioritization described in section 4, above, WWF has chosen to focus its conservation efforts on five out of the seven species of marine turtles. However, each of these five species faces its own combination of biological characteristics, distribution, status, and threats. Therefore the objectives will be categorized under higher level 'Species Objectives'. The objectives under each species objective highlight the main threats per species and the target sites prioritized to meet the species objective. They also reflect what WWF wants to achieve for the conservation of these marine turtles through conservation activities on the ground and policy and advocacy at local and national levels.

⁶ Population trends (as measured by proxies such as number of nesting females, number of nests, etc) increasing or, at least, not declining.

Where possible, the objectives are designed to be SMART (Specific, Measurable, Attainable, Realistic and Timebound), but for marine turtles many baseline data of both population trends and levels of threat are lacking or insufficient. In these cases, percentage reductions in threats will need to be measured against best possible estimates.

IUCN red list criteria (www.iucn.org/redlist) will be used to measure whether populations are stabilizing or recovering. However, IUCN assessments of conservation status based on population trends are normally conducted over three generations of data, and by 2020 these long-term data may not be available for many of the populations in the selected priority sites. Proxy measures of population - such as number of nests per season, annual hatchling production, annual egg production and annual egg harvest - converted into the number of nesting females, will need to be the basis of assessing progress against the Species Objectives for 2020.



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5.3.1. Leatherback turtles

Species Objective 1. By 2014, leatherback populations are stabilizing or increasing at 10 major nesting beaches, and major threats to leatherbacks in priority sites are measurably reduced.

Objective 1.1. By 2014, the bycatch of leatherbacks in selected fisheries is reduced on average by 50%⁷.

Target priority sites:

Western Pacific: Coral Triangle, Coral Seas

Eastern Pacific: Mexico, Central America, Colombia, Ecuador, Peru

Western Atlantic: Trinidad & Tobago, the Guiana's, South Western Atlantic

Eastern Atlantic: Central West Coast of Africa

Objective 1.2. By 2014, at least 10 sites, of globally important nesting habitats for leatherbacks are protected from inappropriate coastal development and effectively managed⁸.

Target priority sites:

Western Pacific: Western Melanesia

Eastern Pacific: Central America (Costa Rica and Mexico)

Western Indian Ocean: Southern Africa (east coast of South Africa and southern Mozambique)

Western Atlantic: Wider Caribbean (including the Guiana's, Trinidad & Tobago, and the Colombia-Central America coast)

Eastern Atlantic: Central West Coast Africa

Objective 1.3. By 2014, the local consumption of leatherback turtles and eggs is reduced to less than 50% of current levels at selected nesting beaches.

Target priority sites:

Eastern Pacific: Central America (Costa Rica)

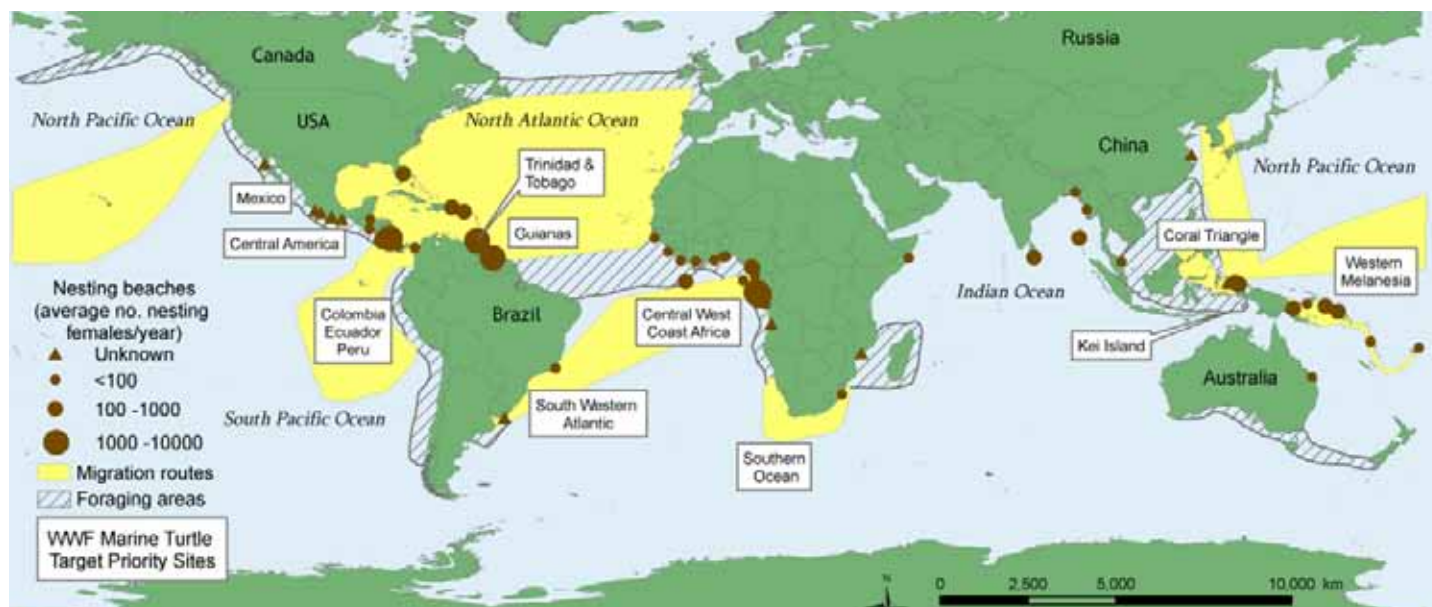
Western Pacific: Western Melanesia, Kei Island

Western Atlantic: Wider Caribbean (including the Guiana's and the Colombia-Central America coast)

⁷ Baseline data are lacking in many regions of the world. Notwithstanding, in these cases, we will be able to infer that we have reduced bycatch by indicating the % of vessels transformed to turtle friendly gear and practices. In other cases, there are baseline data and we will be able to measure the extent of the reduction either through direct data from WWF observers or indirectly from the % of vessels transformed to turtle friendly gear and practices.

⁸ Effectively managed as per agreed components of the WWF/ World Bank MPA Management Effectiveness guidelines.

Map 3. Global distribution of nesting, foraging and migration areas for leatherback sea turtles and WWF target priority sites for this species.



5.3.2 Hawksbill turtles

Species Objective 2. By 2014, hawksbill populations are stabilizing or increasing at 10 nesting beaches with long term monitoring schemes, and major threats to hawksbills in priority sites are measurably reduced.

Objective 2.1. By 2014, at least 10 globally important sites (nesting & feeding) are protected from inappropriate coastal development and effectively managed.

Target priority sites:

Western Pacific: Sulu Sulawesi Seas, Western Melanesia

Eastern Pacific: Central America

Western Atlantic: Wider Caribbean

Eastern Atlantic: West Africa (including Cape Verde and Guinea)

Western Indian Ocean: Madagascar

Objective 2.2. By 2014, the local consumption of hawksbill turtle eggs/meat at at least 10 priority sites is reduced to less than 10% of current levels.

Target priority sites:

Western Pacific: Western Melanesia, Sulu Sulawesi Seas

Western Indian Ocean: Coastal East Africa, Madagascar

Western Atlantic: Wider Caribbean

Eastern Atlantic: West Africa (Cape Verde and Guinea)

Objective 2.3. By 2014, the availability of commercially traded hawksbill products (shell, eggs) is reduced by at least 50 % in 8 domestic or international market sites.

Target priority sites:

Western Pacific: East Asia, South East Asia (Western Melanesia, Sulu Sulawesi Seas, and mainland South East Asia)

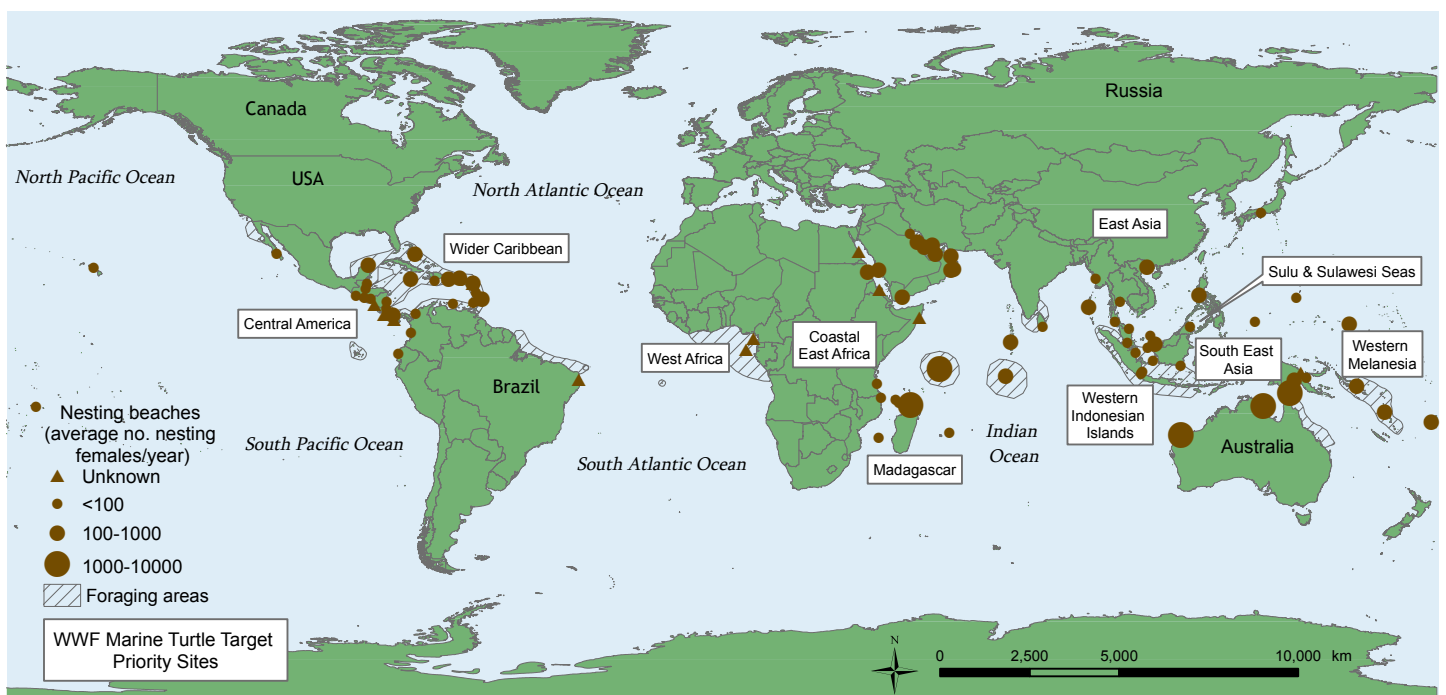
Western Indian Ocean: Coastal East Africa, Madagascar

Eastern Indian Ocean: mainland South East Asia countries, Indonesia islands of Java and Sumatra

Western Atlantic: Wider Caribbean (Cuba, Dominican Republic)

+ consumer countries

Map 4. Global distribution of nesting and foraging areas for hawksbill sea turtles and WWF target priority sites for this species. Migratory routes do not appear for this species as hawksbills are predominantly coastal and do not cross ocean basins.



5.3.3 Loggerhead turtles

Species Objective 3. By 2014, loggerhead populations are stabilizing or increasing at six major nesting beaches, and major threats to loggerheads in priority sites are measurably reduced.

Objective 3.1. By 2014, bycatch of loggerheads in selected longline and gillnet fisheries is reduced by on average by 50%, especially in foraging hotspots.

Target priority sites:

Western Pacific: Great Barrier Reef

Eastern Pacific: Peru, Gulf of California

Eastern Atlantic: the Mediterranean, West Africa

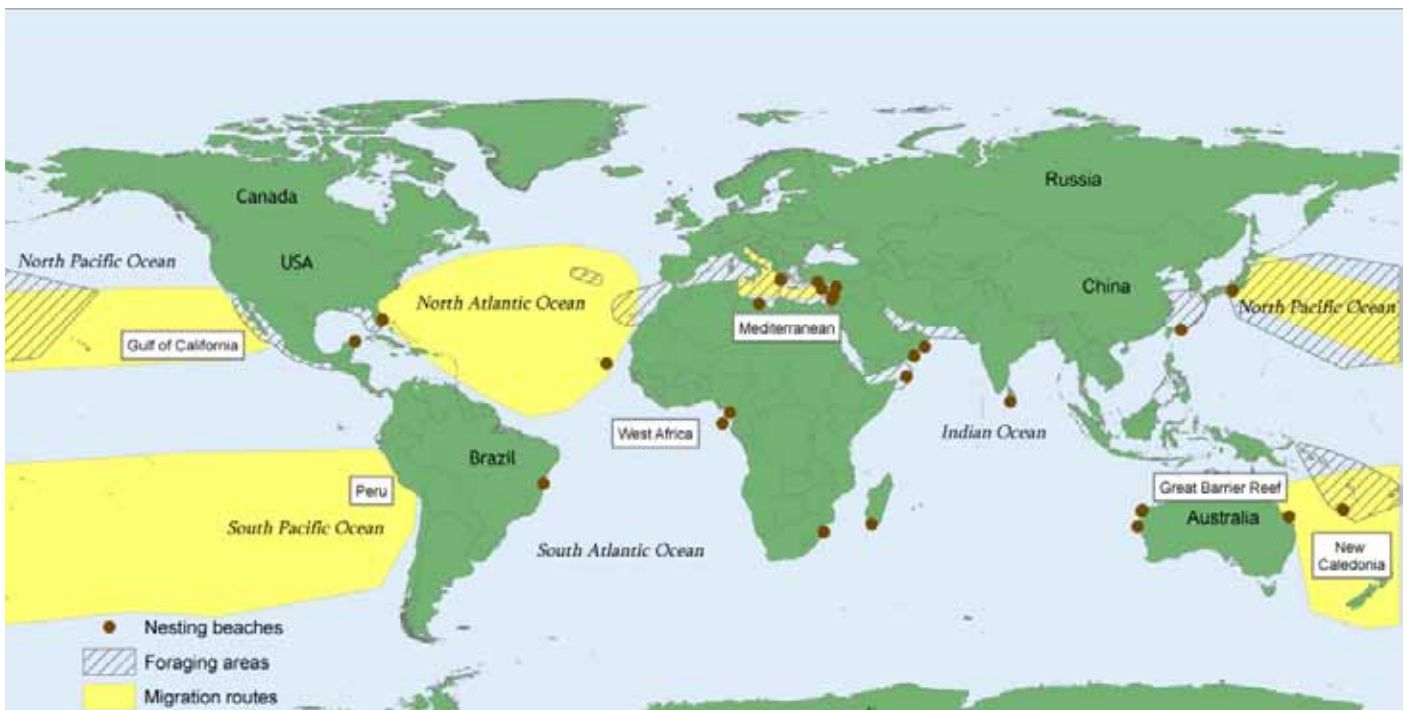
Objective 3.2. By 2014, six globally important nesting sites for loggerhead turtles are protected from inappropriate coastal development and effectively managed.

Target priority sites:

Western Pacific: Great Barrier Reef, New Caledonia

Eastern Atlantic: the Mediterranean, West Africa (Cape Verde)

Map 5. Global distribution of nesting, foraging and migration areas for loggerhead sea turtles and WWF target priority sites for this species.



5.3.4 Green Turtles

Species Objective 4. By 2014, green turtle populations are stabilizing or increasing at six major nesting beaches, and major threats to green turtles in priority sites are measurably reduced.

Objective 4.1. By 2014, bycatch of green turtles in selected fisheries (trawl, gillnets and longlines) is reduced by at least 30%.

Target priority sites:

Western Pacific: Coral Triangle, South Pacific Islands (Fiji, Vanuatu)

Eastern Atlantic: the Mediterranean, West Africa

Western Indian Ocean: Coastal East Africa

Objective 4.2. By 2014, at least eight globally important habitats (nesting & feeding) of green turtles are protected from inappropriate coastal development and effectively managed.

Target priority sites:

Western Pacific: Sulu Sulawesi Seas, South Pacific Islands (Fiji), Western Melanesia, Australasia

Eastern Pacific: Galapagos Islands (black turtles)

Western Indian Ocean: Coastal East Africa

Eastern Atlantic: the Mediterranean, West Africa

Objective 4.3. By 2014, the local consumption of green turtle eggs and meat is reduced to less than 50% of current levels.

Target priority sites:

Western Pacific: Sulu Sulawesi Seas, South Pacific Islands (Fiji, Vanuatu),

Western Melanesia

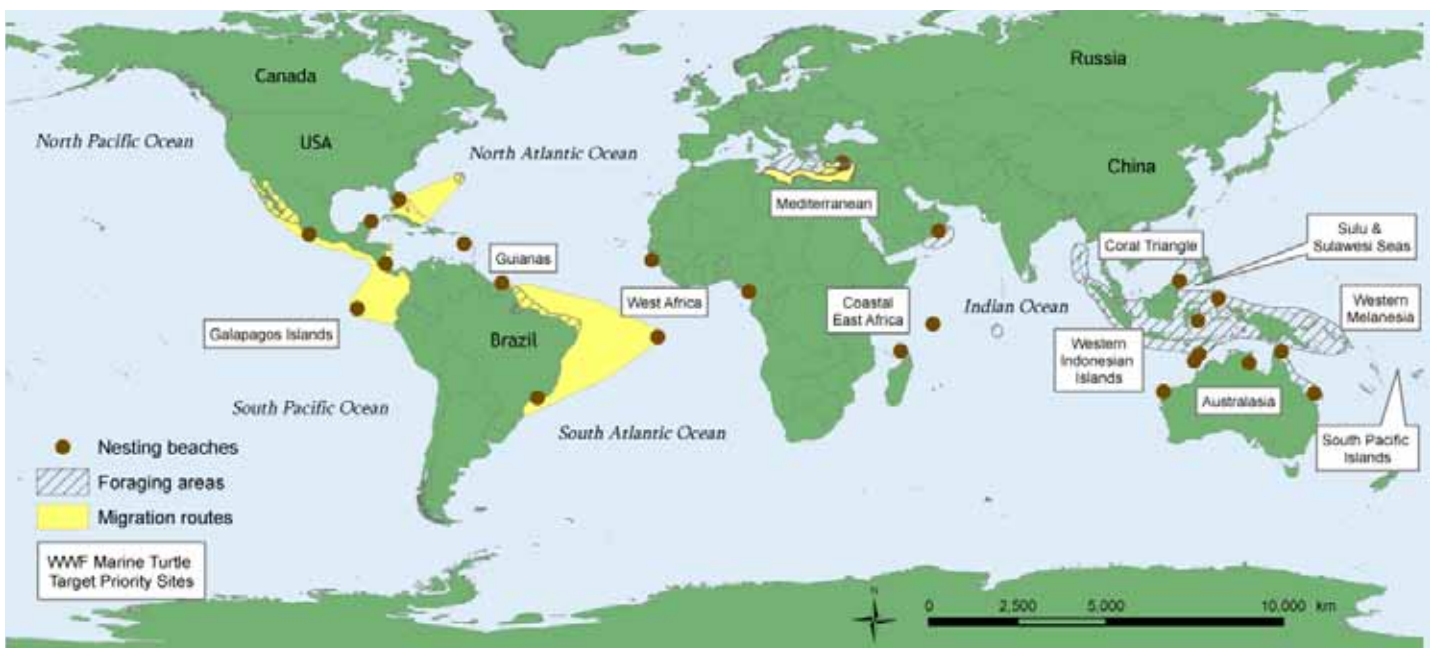
Western Indian Ocean: Coastal East Africa

Western Atlantic: the Guianas's

Eastern Atlantic: West Africa

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Map 6. Global distribution of nesting, foraging and migration areas for green sea turtles and WWF target priority sites for this species.



5.3.4 Green Turtles *continued*

Objective 4.4. By 2014, the availability of commercially traded green turtle meat, shell, eggs and other products is reduced by at least 50 % in 8 domestic or international market sites.

Target priority sites:

Western Pacific: Sulu Sulawesi Seas, Western Melanesia

Western Indian Ocean: Coastal East Africa

Eastern Indian Ocean: Western Indonesian islands (e.g. Java, Sumatra, and Bali)

Western Atlantic: the Guiana's + Consumer Countries

5.3.5 Olive ridley turtles

Species objective 5. By 2014, olive ridley turtle populations are stabilizing or increasing at three nesting beaches of global importance, and major threats to olive ridleys in priority sites are measurably reduced.

Objective 5.1. By 2014, bycatch of olive ridley turtles is reduced by at least 30%.

Target priority sites:

Western Pacific: Arafura Sea

Eastern Pacific: Mexico, Central America, Colombia, Ecuador, Peru

East Indian Ocean: India (Orissa)

Western Atlantic: Suriname & French Guiana

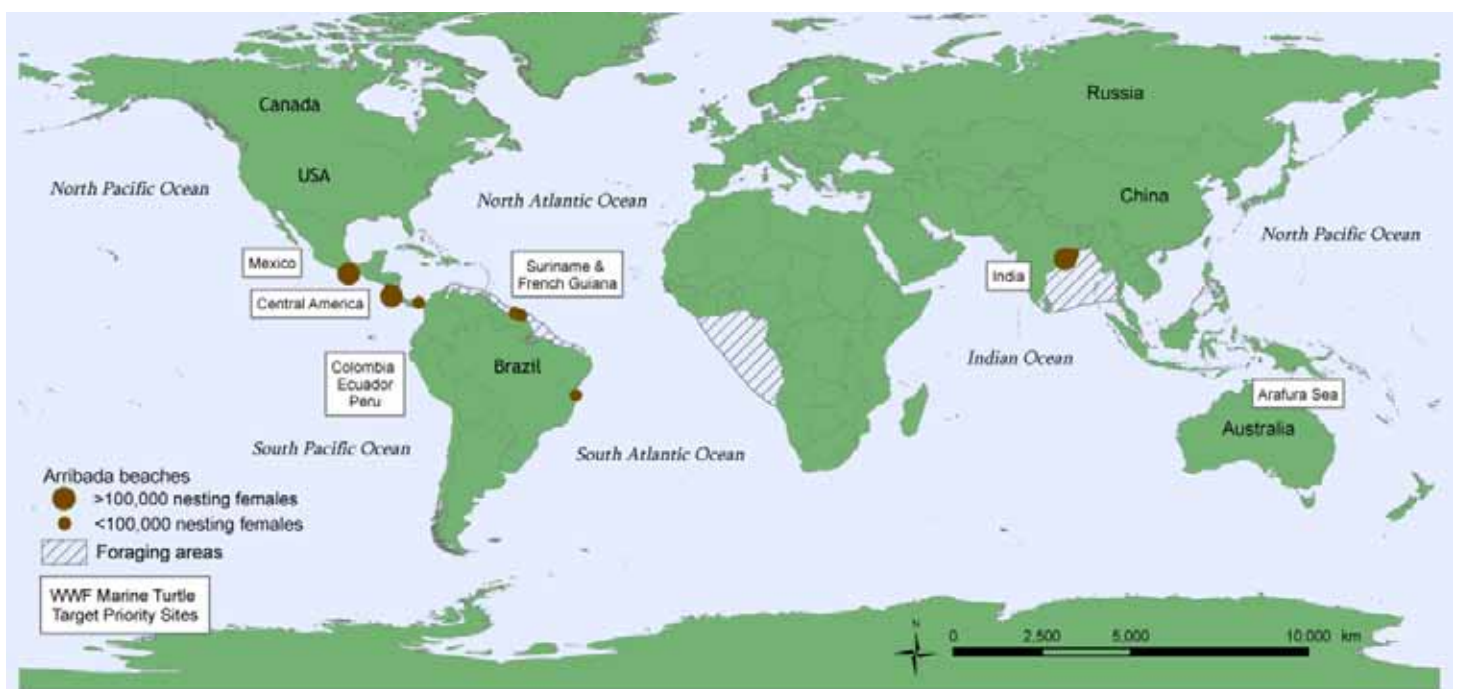
Objective 5.2. By 2014, at least three globally important nesting sites for olive ridley turtles are protected from inappropriate coastal development and unsustainable harvesting and egg collection.

Target priority sites:

East Indian Ocean: India (Orissa)

Western Atlantic: Suriname & French Guiana

Map 7. Global distribution of nesting, foraging and migration areas for olive ridley turtles and WWF target priority sites for this species.



5.4. Objectives for overarching issues

Some threats and their solutions require global or concerted WWF efforts rather than site-specific actions. Therefore this Strategy includes several overarching objectives that do not specify priority sites. However, when mentioning priority sites in these objectives we refer to the list of priority sites identified under the species-specific targets.

Overarching Objective 6. By 2020, adaptation measures significantly reduce the threats from climate change to marine turtles at identified priority sites⁹.

Objective 6.1 By 2014, climatic baselines of nesting habitat (sea level, sand temperature, and water tables) are established; adaptation measures to climate change are designed - based on vulnerability assessments; and implementation is ongoing at all nesting sites with WWF interventions.

Objective 6.2 By 2014, marine turtle nesting habitats are undergoing adaptation efforts in 10 priority sites, and adaptation is part of national legislation, strategies and/or local marine turtle conservation and management plans.

Objective 6.3 By 2014, as a first step towards designing adaptation responses, models for changes in oceanographic conditions under climate change scenarios which may affect foraging grounds of priority species have been collated and vulnerability assessed.

Overarching Objective 7. By 2020, the development and application of policies and legislation that benefit marine turtle conservation facilitated in all range states covered by our target sites and through at least five international marine turtle (or other relevant) instruments.

Objective 7.1 By 2014, marine turtle habitats are covered under climate change adaptation resolutions/guidelines in at least five international or intergovernmental instruments or agreements.¹⁰

Objective 7.2 By 2014, harvest and trade control measures for marine turtles more effectively target wildlife harvest for trade in a minimum of six countries in Asia and the Pacific, three in Latin America and the Caribbean and one in Africa.¹¹

Objective 7.3 By 2014, at least three RFMOs managing fishing activities that interact with marine turtles, have implemented management actions (through a management plan) that significantly reduce marine turtle bycatch to a level that does not harm the status of the population.¹²

Overarching Objective 8. By 2020, the livelihoods of people living in coastal areas are improved through economic development activities linked to marine turtle conservation.

Objective 8.1. By 2014, social well-being improved measurably through marine turtle conservation at six priority sites: two in Asia and the Pacific; two in Latin America and the Caribbean; and two in Africa.

⁹ A subset of the populations defined in first goal; those particularly likely to be affected by climate change.

¹⁰ e.g. IAC, SPAW, CPPS, IOSEA, MOU Abidjan, UNFCC.

¹¹ From TRAFFIC programme objectives on marine turtles.

¹² This RFMO work deals with longline fisheries, and is in addition to developing the more localized or regional solutions to bycatch in artisanal and industrial shrimp trawls and gill nets.

6. Strategy implementation

6.1. Indicators to measure progress

An outline of the monitoring needs and indicators used at this Global Strategy level is presented below. Detailed monitoring plans for site-specific work and components of the strategy will be developed within WWF Network Initiatives, Priority Place conservation plans, national strategies and any updated Regional Marine Turtle Action Plans (e.g. Latin America and the Caribbean), if relevant.

Table 2. Audiences for monitoring and information needs.

| Audience | Needs |
|--|--|
| WWF Project teams | Progress, adaptation based on evaluation, conservation tools & know-how, sharing of lessons learnt. |
| Project partners | Progress, adaptation based on evaluation, roll-out of conservation tools & know-how |
| Donors | Progress, significant outcomes and impact on the target species |
| Local communities, range state decision makers | Participation, credits, significant outcomes and impact, lessons/ knowledge, general information on projects' progress |
| WWF network, general public | Significant outcomes and impact, lessons/ knowledge, general information on projects' progress |

Table 3. Indicators and sources of information/ data to monitor progress.

| | Indicators | Methods/ Sources |
|--------------------|--|---|
| Goal | Marine turtle population trends | IUCN Red List assessments – regional and global |
| | Population estimates based on beach surveys | Beach nesting surveys extrapolated to population numbers |
| | Nesting numbers' trends | Beach surveys at selected sites |
| Species Objectives | # of critical habitats protected | GIS, inventories of critical sites |
| | # of critical habitats effectively managed | WWF/ World Bank Management Effectiveness scorecard |
| | # of States with appropriate policies, legislation | Inventory of relevant States with existing legislation compiled |

| | Indicators | Methods/ Sources |
|------------------------|---|---|
| Species Objectives | # of international marine turtle instruments or agreements with relevant climate change adaptation measures | Relevant resolutions passed in each international instrument. |
| | % of reduction of illegal take/ trade | Seizures at sea; Volume of product in market surveys; Number and volume of seizures in CITES database |
| | % of reduction in incidental catch of turtles in selected fisheries | Observer records (from the WWF Observer programmes) |
| | % uptake of circle hooks in relevant fisheries | Project records of hook exchanges, indicating number of vessels |
| | % of vessels applying best practice handling techniques and turtle friendly gear | Observer records (from the WWF Observer programmes), fleet/ skipper commitments |
| Overarching Objectives | # of relevant marine turtle international agreements with climate change adaptation measures | Agreement convention texts, and relevant resolutions and decisions |
| | # of benefits/ scale of benefits derived from non-consumptive use of marine turtles by local communities | Participatory appraisals to identify benefits relevant to each community (e.g. marine park entrance fees, employment and training options, development opportunities as identified by community, improvement in well-being) |
| | Perceived importance of marine turtle conservation to local people | Questionnaires pre- and post-projects |
| | # of sites with climate adaptation strategies implemented | Presence of adaptation strategies in local management plans, and associated budgets and actions |

6.2. Operational principles

During the implementation of this Global Strategy, the following principles will be adhered to:

- Pursue objectives through teamwork with partners and consultation with specialists
- Create alliances and/or coordinate with stakeholders as a requirement for undertaking the challenge of marine turtle conservation
- Capitalize on and leverage, existing strengths and projects of WWF

- Facilitate coordination within WWF's Marine Turtle Conservation Strategy in order to produce strong advocacy results
- Build synergies with and between WWF Network Initiatives and Priority Place programmes
- Take the needs of human communities into account
- Consider marine turtle conservation within the broader context of biodiversity conservation and sustainable development, in the context of socio-economic goals of critical sites at the local and national levels. Such contexts could include, for example, fishery management, traditional harvest, cultural practices and nutritional needs
- Support capacity building interventions at different levels of governance and the community to ensure that conservation and management activities on the ground are supported by policies and / or legislation at the national level
- Develop and institutionalize partnerships based on existing organizational mandates and available resources
- Base conservation on the best available scientific and traditional knowledge, and work with scientists as well as traditional leaders to address issues relating to conservation and sustainable development in general
- Intervene at all relevant levels, supporting and complementing local, national and international initiatives
- Contribute to or complement regional and international strategies with existing initiatives
- Track and monitor emerging critical issues, threats and progress made with indicators of success, achievement and performance, in order to update the milestones and outputs of the programme accordingly through a formal review process, and ensure that this Strategy is both dynamic and adaptive
- Local empowerment and phase out of WWF engagement is performed through culturally sensitive and responsible protocols

6.3. Marine turtle conservation partners

Wherever possible, WWF will work with stakeholders and partners in marine turtle conservation. These stakeholders include range state governments, management authorities, research and academic institutions, the private sector (e.g. the tourism industry, fishing companies), local communities and fisher folk, national and international NGOs, and intergovernmental organizations. Worldwide, many conservation NGOs invest in marine turtle conservation work. Many of these, such as The Nature Conservancy, Conservation International, Wildlife Conservation Society, and Caribbean Conservation Corporation are current or potential partners of WWF. Additionally, WWF works with a wide range of local partners at national and local scales.

In order to ensure sustainability, this Global Marine Turtle Strategy aims to explore ways of building new partnerships, as well as strengthening existing ones. Through a focus on bottom-up participation, capacity strengthening and lessons sharing, governments and local communities will be empowered to make their own informed decisions about protection and management of marine turtles and their critical habitats.

Protected area work will put emphasis on training and management systems that will last longer than the support provided by WWF. Wherever possible, field activities will involve local communities and efforts will be made to help people establish income-generating and livelihood improving activities and sustainable programmes.

In addition, the WWF Global Marine Turtle Strategy is crafted to stimulate donors and other organisations to complement WWF investments.

6.4. Programme coordination and review

Implementation of this Global Marine Turtle Strategy will be overseen by the WWF International Species Programme. The WWF Global Marine Turtle Strategy is a complicated Species Action Plan (SAP) as it involves a large number of countries, a large area (since the high seas must be included), and a great diversity of threats. The interventions involve leadership and coordination of work in the Western Hemisphere, Europe, Africa, Asia, and Oceania. WWF National Organizations have prioritized marine turtle work as the highest priority for concerted work and new funding and activity—and as such it has been agreed by all those WWF offices that are working on marine turtles, that international leadership and coordination are critical to the success of this strategy. If funding can be secured, a dedicated global coordinator/leader will be recruited. Such a coordinator would have a critical role to play in project and programme development, fundraising, monitoring and communication.

The five year species-specific objectives in this version of the Strategy are set for 2014. A review of progress and the then-current challenges will be undertaken in 2013, and the objectives for the remainder of this Strategy will be modified accordingly, and where relevant.

6.5 Budget for the Marine Turtle Global Strategy

The budget accompanying this global Strategy is broken into WWF financial years (FY) which run from July to June, and is divided into two parts:

The first part provides an estimation of expected costs needed to deliver on the overarching objectives as included in this strategy. These objectives require a global effort and therefore expenses need to be secured on a global level. Because climate change adaptation is a new global area of work for the marine turtle programme, costs have been included in full in this budget. The other objectives' field costs are usually incorporated in the site specific budgets, and therefore for these objectives, only the global policy, advocacy and communications are included in this budget. Costs for implementation of the species specific objectives are not included in this budget, but need to be developed through the programmes involved in the implementation of the objectives in this strategy. These will include Network Initiatives, up-dated Regional Marine Turtle Action Plans (where relevant), and national strategies (both National Organizations and Programme Offices). The second part of the budget includes costs needed for global coordination, communication

and facilitation. Implementation of the Strategy needs to be overseen by a coordinator. The coordinator will need a small operating budget to facilitate office running, travel and meetings.

Within the WWF network, funds will be sought for both the global and field programme budgets. Ideally this will be achieved through a relevant internal funding agreement. Matching funds from external donors and partners will be sought. If funds are secured for the implementation of species specific objectives, these will be directed to implementing programmes. These will then deliver technical and financial progress reports to the Marine Turtle coordinator and/or the donor in line with WWF Programmatic and organisational standards.

| Indicative budget for Global Overarching Objectives and Coordination costs (USD) | | | | | | |
|--|----------------|------------------|------------------|------------------|------------------|------------------|
| | FY10 | FY11 | FY12 | FY13 | FY14 | TOTAL |
| Delivery on overarching objectives | | | | | | |
| Objective 6. Climate change | 500,000 | 500,000 | 700,000 | 700,000 | 700,000 | 3,100,000 |
| 6.1 By 2014, climatic baselines of nesting habitat (sea level, sand temperature, and water tables) are established, adaptation measures to climate change are designed - based on vulnerability assessments - and implementation is ongoing at all nesting sites with WWF interventions | | | | | | |
| 6.2 By 2014 marine turtle nesting habitats are undergoing adaptation efforts in 10 priority sites, and adaptation is part of national legislation, strategies and/or local marine turtle conservation and management plans. | | | | | | |
| 6.3 By 2014, as a first step towards designing adaptation responses, models for changes in oceanographic conditions under climate change scenarios which may affect foraging grounds of priority species have been collated and vulnerability assessed | | | | | | |
| Objective 7. Policies | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 250,000 |
| 7.1 By 2014, marine turtle habitats are covered under climate change adaptation resolutions/guidelines in at least five international or intergovernmental marine turtle instruments or agreements | | | | | | |
| 7.2 By 2014, harvest and trade control measures for marine turtles more effectively target wildlife harvest for trade in a minimum of six countries | | | | | | |
| 7.3 By 2014, All RFMOs managing fishing activities that interact with marine turtles have implemented management actions (through a management plan) that significantly reduces marine turtle bycatch to a level that does not harm the status of the population. | | | | | | |
| Objective 8. Marine turtles and benefits to people | 100,000 | 250,000 | 250,000 | 250,000 | 250,000 | 1,100,000 |
| 8.1 By 2014, social well-being improved measurably through marine turtle conservation at five priority sites | | | | | | |
| Subtotal | 650,000 | 800,000 | 1,000,000 | 1,000,000 | 1,000,000 | 4,450,000 |
| Coordination Costs | | | | | | |
| Staff costs: coordinator (+ 20% communications) | 180,000 | 180,000 | 185,000 | 185,000 | 190,000 | 920,000 |
| Operating budget: office running, travel, meetings | 10,000 | 15,000 | 15,000 | 15,000 | 20,000 | 75,000 |
| Consultant/Grants | 10,000 | 15,000 | 15,000 | 15,000 | 15,000 | 70,000 |
| Subtotal | 200,000 | 210,000 | 215,000 | 215,000 | 225,000 | 1,065,000 |
| Administration fee (12.5%) | 106250 | 126250 | 151875 | 151875 | 153125 | 689375 |
| Total budget | 956,250 | 1,136,250 | 1,366,875 | 1,366,875 | 1,378,125 | 6,204,375 |

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