Regional Marine Turtle Action Plan

Latin America and the Caribbean

Version: 21 May 2004

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Cover photograph: Green turtle - *Chelonia mydas* Photograph by Fran & Earle Keatley

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Executive Summary

The six species of marine turtles in Latin America and the Caribbean are threatened by extinction. These highly migratory, unique reptiles spend their life at the coast and off shore, combining terrestrial and aquatic habitat requirements that often span the political limits of several nations. Conservation efforts require a regional approach that attends to the main threats to these species: 1) habitat destruction, 2) overexploitation and 3) incidental capture in fisheries. The slow maturation and exceptional longevity of marine turtles implies that the impact of both, threats and conservation action, on population levels often take decades to be revealed. Thus, the conservation strategy needs a long-term vision and persistence.

WWF is committed to stop the decline in marine turtle populations and to secure both habitat and social conditions in Latin America and the Caribbean that enable their recovery. The Regional Marine Turtle Action Plan focuses on the mitigation of the threats mentioned above to the species and issues deemed prioritary. The specific objectives set for the next 10 years are 1. to save the critically endangered Pacific leatherbacks from extinction, 2.to secure the recovery of Western Atlantic leatherbacks, 3. to maintain hawksbill genetic diversity and secure their recovery, 4. to secure the recovery of the Eastern Pacific Green (Ch. mydas agasizzi) in the Eastern Pacific, 5. to promote non-extractive uses of marine turtles that improve the quality of life of coastal communities, and 6. to ensure that extractive uses are sustainable and permit the recovery of the species involved. The Regional Marine Turtle Action Plan is ambitious, target driven and maintains a long-term perspective in its approach. It is supported by the conservation expertise of the WWF network and contributes strategically to the global vision in which marine turtles worldwide are protected and restored to healthy levels reflecting their intrinsic values, role in ecosystem functioning and benefits to people.

Context and rationale of the LAC Marine Turtle Regional Action Plan

The Kemp's ridley turtle was once the most common turtle in the Gulf of Mexico, yet now it is critically endangered. The extent and dramatic nature of this decline is evident in old film footage of the 1947 *arribada* in which an esti-mated 40,000 females came ashore to nest in a single night. Given that there may well have been two to three times this number of females, which did not lay that evening, and perhaps an equal number of males far offshore, then the population 50 years ago numbered a few hundred thou-sand. In 1985, just 200 females nested on Rancho Nuevo. In recent years, Kemp's ridley has been undergoing exponential recovery on the nesting beach after more than two decades of protection and nearly ten years of Turtle Excluder Devices. Conservation does work.

What pressures could have produced such a collapse in population numbers? Why are leatherback turtles in the Pacific on the brink to extinction and what can be done about it? The Marine Turtle Action Plan addresses the causes of the population declines, and focuses on the mitigation of the most imminent current and future threats to marine turtles in Latin America and the Caribbean. The Program of initiatives is set out for the next 10 years. If this endeavor is successful, by the year 2013 marine turtle populations will live in a marine and coastal environment, in which their recovery is likely. The biology of these long-lived animals, however, conditions the return to historic population sizes to a process that may take many decades.

WWF directs its conservation efforts toward three global goals: protecting endangered spaces (ecoregions), addressing global threats, and saving endangered species. Marine turtles are among the species of special concern selected by WWF for special action at an international and network-wide level, and whose protection cannot be secured by habitat conservation alone. Their survival requires direct action. These species were selected for action not only because they require attention but also because they act as flagships for important conservation and environmental issues, as well as being charismatic ambassadors for their habitats and for the myriad of less well-known species in their ecosystems. The Marine Turtle Species Action Plan helps define the conservation issues concerned, and prioritize the areas and actions that WWF will focus on in the years to come. Its vision and goals are:

Marine Turtle Species Action Plan – A framework

Program Vision (100+ years)

"Marine turtles worldwide are protected and restored to healthy levels reflecting their intrinsic values, role in ecosystem functioning and benefits to people".

Long-term Goal (25+ years)

"The restoration of threatened marine turtle populations and their critical habitats."

Program Goal (10 years)

"The reduction of threats to selected populations of marine turtles from the loss and degradation of their critical habitats, and from the impacts of unsustainable use and accidental by-catch."

The regional action plans contribute jointly toward the vision of the Marine Turtle Species Action Plan. Given the commonalities observed between regions regarding threats to marine turtles, these threats are grouped under a relatively small number of general global objectives from which precise targets and milestones for Latin America and the Caribbean are derived:

Objective 1. Reducing the loss and degradation of critical marine turtle habitats.

Objective 2. Reducing the negative impact of by-catch on marine turtles.

Objective 3. Reducing unsustainable use and illegal trade in marine turtles and turtle products.

Marine turtles are a "species of special concern" or flag-ship group for WWF's Latin America and Caribbean Program. The LAC MTAP materializes a regional approach and will align all WWF initiatives toward marine turtle conservation in the region. This Regional Action Plan responds to urgent conservation priorities in the LAC region and sets out a Program toward the recovery of sea turtle populations in the Eastern Pacific, the Caribbean and the Central & Western Atlantic. The Marine Turtle Action Plan is ambitious, target driven and maintains a long-term perspective in its approach.

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Marine turtles: an unusual reptile

Most experts recognize seven species of marine turtles: the green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), Kemp's ridley turtle (*Lepidochelys kempii*), olive ridley turtle (*Lepidochelys olivacea*), leatherback turtle (*Dermochelys coriacea*), and flatback turtle (*Natator depressus*). Some scientists consider the Eastern Pacific Green (*Chelonia [mydas] agassizii*) an eighth species, although most experts regard it as a subspecies or as a regional population of the green turtle, which occurs mainly in the Eastern Pacific. Except for the flatback, each of these turtles occurs in the Latin American and Caribbean region.

The key characteristics of marine turtles are:

- they require several decades to reach sexual maturity;
- they are potentially long lived;
- they disperse and migrate over vast areas;
- they need a wide variety of environments to survive different life stages—ranging from beaches for nesting, tropical and subtropical coastal waters, seagrass meadows and coral reefs, to the meso- and epi-pelagic open ocean; and,
- they move within the territorial waters of several states as well as on the high seas.

Consequently, conservation actions for marine turtles must be sustained over decades, carried out over vast areas, be relevant to diverse marine and terrestrial environments, and involve international cooperation. The huge size of individual home ranges and the vast area requirements of marine turtles during their life cycle are unusual for existing reptiles. Their conservation requires an approach tailored to these particular biological characteristics.

There is growing appreciation of the ecological roles played by marine turtles, ranging from maintenance of healthy sea grass beds and coral reef systems, through providing food for marine and terrestrial predators, to control of jellyfish proliferation. It has been argued that a key ecological function of marine turtles is to bring the productivity of the marine ecosystem ashore. One turtle may on occasion produce close to a thousand eggs in a season. They deposit this productivity on land in the form of a high biomass of eggs rich in fats and protein. Only one in a thousand of these eggs may ultimately produce a reproducing adult turtle, and the remainder, as eggs or hatchlings, is available to provide nutrition for an extraordinary gamut of marine and littoral predators, including humans. This nutrient transport helps maintain stable dune systems that are critical to the reproductive success of the turtles.

Conservation status of marine turtles

All of the species of marine turtles in LAC are threatened by extinction. Three species (green, Olive Ridley and loggerhead) are classified as endangered by IUCN. The remaining three (leatherback, hawksbill and Kemp's ridley) are considered critically endangered. This threat of extinction is acknowledged in various international treaties that include LAC. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) list all marine turtle species under Appendix 1, which prohibits commercial trade in live specimens or any product thereof. All six species of marine turtles in the Wider Caribbean are listed under Annex II of the Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol) of the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, 1983 (Cartagena Convention). Annex II of the SPAW protocol, includes threatened, endangered, and endemic species of fauna. All marine turtle species of the American continent are considered as threatened in the preamble of the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC).

Table 1. Conservation status and distribution of marine turtle species in the western hemisphere.

Species	IUCN conservation status	Distribution of main nesting beaches	Estimated adult female population[1]
Leatherback (*Dermochelys coriacea*)	Critically endangered	Atlantic: Surinam and French Guyane. Pacific: Mexico (Michoacan, Guerrero and Oaxaca), Costa Rica (Playa Grande, Playa Langosta), Nicaragua, Panama and Guatemala.	2.300 in the Pacific. No estimate available for the Atlantic. A total of 34.000 females were estimated in 1994.
Loggerhead (*Caretta caretta*)	Endangered	Atlantic: northeastern Florida, Gulf of Mexico (USA), Quintana Roo (Mexico) and Bahía (Brasil). Pacific: *no nesting records*	60.000
Green turtle (*Chelonia mydas*)	Endangered	Atlantic: Western Atlantic coast from northern USA, through Central America to southern Brasil. The most important nesting aggregation is in Tortuguero (Costa Rica). Pacific (*Ch. mydas agassizii*): distributed along	203.000

[1] *The abundance of marine turtles is nearly impossible to estimate due to their migratory habits. It is possible to estimate the number of breeding females, but data for many beaches are lacking and the estimates may generate confusion due to uncertainties with reference to the number of nesting events of a single female in a season. This table shows an estimate of the number of reproductive females in the world.*

		the coast down to northern Chile, with important nesting in Galapagos and Mexico (Michoacán e Islas Revillagigedo)	
Hawksbill (*Eretmochelys imbricata*)	Critically endangered	Pacific: occurrence and nesting rare. Individuals found in waters from USA to Peru[2]. Atlantic: from Nova Scotia to Brasil. Numerically important nesting sites are Yucatan (Mexico) and Cuba.	8.000
Kemp´s ridley (*Lepidochelys kempii*)	Critically endangered	Only in the Atlantic: Gulf of Mexico, with the highest concentration in Rancho Nuevo (México).	1.700
Olive ridley (*Lepidochelys olivacea*)	Endangered	Atlantic: along the Antilles and the northern coast of South America (the Guyanas and Brasil). Absent in the Gulf of Mexico and the Caribbean. Pacific: many important nesting sites are found along this coast, noticeably in Mexico (Escobilla), Costa Rica (Ostional, Nancite), Nicaragua, Panama and Guatemala up to southern Peru.	800.000

In view of the different ecological and threat scenarios of the Atlantic and Pacific oceans in LAC, these basins are considered separately in this document. Populations of marine turtles cannot be easily distinguished in the field. Without genetic analysis, it is impossible to determine to which nesting population an untagged marine turtle belongs, because individuals from separate nesting beaches mix in feeding areas and the high seas. Therefore, the term "population" has to be used loosely or to distinguish Atlantic from Pacific populations, which do not mix.

Caribbean hawksbill (*Eretmochelys imbricata*). The most tropical of all marine turtle species, the Caribbean hawksbill is threatened by legal and illegal directed take for food and international trade of its scutes. Legal international trade is banned by CITES. The down-listing proposals submitted to CITES in recent years by Cuba are of concern to WWF for a reopening of international trade would probably impact the species severely. There is growing momentum in the direction of regional management of this species, despite slow progress and important challenges. A CITES-sponsored regional dialogue among range states is underway. Southern Cuba is probably the most important feeding ground, while the northern Yucatan coast of Mexico is likely the major nesting area. However, the preservation of the rich mosaic of genetically distinct subpopulations in the Caribbean requires inclusion of many, scattered nesting areas and of mixed stocks at their feeding grounds in the conservation plan of this species[3].

Atlantic green (*Chelonia mydas*). The Atlantic green is one of the more abundant (relatively speaking), fecund, and heavily exploited species. In Nicaragua nearly 10,000 green turtles are exploited annually for subsistence and local markets. It is estimated that meat from *Chelonia mydas* provides 70 percent of the animal protein to Miskitos of Nicaragua. The Nicaraguan rise, where extensive sea grass beds exist, is the major feeding ground for this species in the Caribbean. Legal and illegal harvest is commonplace

[2] *There are no records of marine turtle nesting in Peru.*

[3] *Hawksbills in the Caribbean are made up of numerous genetically distinct nesting/breeding populations. Genetic evidence and satellite tracking have shown that immature hawksbills and adults from different nesting/breeding populations frequently migrate across the Caribbean basin to foraging grounds throughout the region. Given this knowledge about the status and behaviour of these populations, it is not precautionary to take hawksbills from a foraging population unless sufficient knowledge of the stock composition and individual stocks' conservation status are available. This reflects the commonly held principle in fisheries management that a mixed stock fishery should be managed within the limits of the MSY of the most vulnerable stock. If such management is not put into place, the more vulnerable stocks may be driven to commercial and/or biological extinction. Genetically distinct populations, even if less abundant, are a fundamental component of biodiversity and should also benefit from conservation efforts. Given the present level of hawksbill abundance, and current knowledge and status of the species, these foraging aggregations should not be harvested for commercial use. Also, the mixed origin of turtles in the foraging stocks, from a large number of countries, necessitates a regional, multilateral conservation and management plan.*

throughout the region. Costa Rica effectively protects what is likely the most important nesting beach remaining. Historically more significant (larger) nesting populations in the Caymans and Bermuda are long extinct due to overharvesting. Greens are also found off the coast of South America.

Atlantic olive ridley (*Lepidochelys olivacea*). *Lepidochelys olivacea*, the population that once nested in very large numbers throughout the Guyanas, is probably critically endangered. The most important remaining nesting area for *L. olivacea* in the western Atlantic is now around Cayenne Island, French Guiana. A few hundred nests are also found in northern Brazil. Shrimp trawlers as well as gill-netters are endangering olive ridleys in all three Guyanas (in Suriname and Guyana TEDs are mandatory, but few shrimpers use them).

Atlantic leatherback (*Dermochelys coriacea*). The largest concentration of nesting *Dermochelys coriacea* in the world occurs on the beaches of Suriname and French Guiana. This nesting population seems robust but is declining. The major recognized threat is incidental capture of breeding adults and nesting females in coastal gill nets. There is uncertainty as to the level of threat resulting from high-seas fisheries, although some Atlantic long-line bycatch studies are being conducted. Satellite tracking has been used with the Atlantic leatherback; after nesting, some tagged animals crossed the Atlantic and approached African waters, while others are believed to travel south off the coast of Uruguay and Argentina. Some adult females are known to have reached the Canadian coast after tagging in Costa Rica.

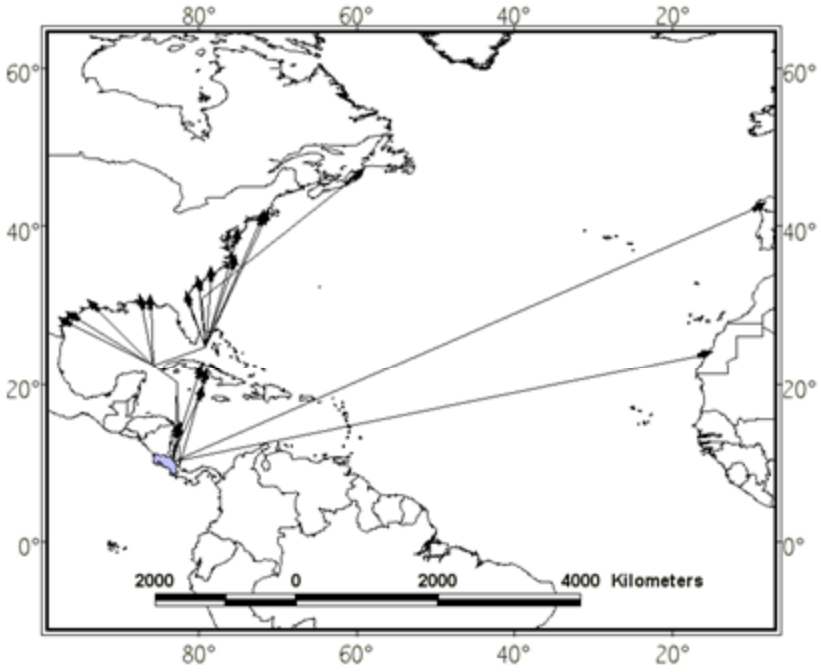

Figure 1: Recapture data of leatherback turtles (*Dermochelys coriacea*) tagged during nesting in Costa Rica and hypothetical, minimum distance covered during migration (data courtesy of Asociación ANAI, Caribbean Conservation Corporation and Endangered Wildlife Trust).

Atlantic loggerhead (*Caretta caretta*). Loggerheads nest predominantly on Brazilian beaches, with about 5,000 nests per year. They move widely—across the Atlantic to the coast of Africa and southern Europe. Loggerheads hatched in Japan are known to travel across the Pacific to feed along the coast of Baja California.

Atlantic Kemp's ridley (*Lepidochelys kempii*). Kemp's ridley turtles nest only on Ranco Nuevo beaches in the Gulf of Mexico and have the most limited range of any marine turtle species in the world. After two decades of joint action between the governments of Mexico and the United States, as well as the broad adoption of TEDs in the U.S. shrimp fleet, the species appears to be rebounding, though it still remains at a fraction of its estimated population size in the 1940s.

Pacific leatherback (*Dermochelys coriacea*). The Pacific leatherback's numbers have crashed over the past 20 years and there are only 3,500 adult females remaining according to one recent estimate. This is less than 95% of previous population estimates. Human-induced mortality must approach zero if this population is to keep from becoming extinct, according to models recently published in the journal Nature. Excellent survivorship in all life-stages is essential for recovery. The most important nesting beaches are found in Mexico and Costa Rica, with other important beaches in Nicaragua and possibly Panama and Guatemala. Major threats are believed to be swordfish and tuna long-lining in the Eastern Pacific Ocean and the illegal harvest of eggs and females on beaches. There may be also a directed fishery in Peru.

Pacific hawksbill (*Eretmochelys imbricata*). This population is probably the least known of genetically distinct hawksbill stocks. Its numbers are low, nesting is very disperse along the mesoamerican coast, no research on this population or conservation efforts are currently underway. There is bycatch in coastal lobster fisheries in Mexico. This population may be the most endangered of hawksbill populations (A. Abreu pers. Comm.).

Pacific olive ridley (*Lepidochelys olivacea*). Pacific olive ridleys nest all at the same time and in large numbers—a phenomenon known as "arribadas"—in southern Mexico and Central America. They have historically been harvested commercially in Mexico for their leather and meat. Since it became illegal to harvest eggs and turtles in Mexico in 1990, the number of nesting females has increased rapidly—from 150,000 in 1990 to 700,000 in 1994. New legislation in Mexico appears to open the door again for subsistence taking of eggs and meat. A scheme of sustainable egg harvest exists in Ostional beach, Costa Rica, a site with great potential for ecotourism. Threats from coastal fisheries, particularly gill netting and shrimp trawling, remain high. In 1999, hundreds of these turtles were found dead on Ecuadorian and Colombian coasts. The deaths were thought to be caused by various factors including colder water temperatures, toxic algae blooms, and increased bycatch by shrimp boats not using TEDs.

Eastern Pacific green (known in Mexico as the black turtle, *Chelonia [mydas] agassizii*). Eastern Pacific green turtles have been experiencing rapid declines in Mexico due to illegal and indiscriminate harvesting primarily in their foraging grounds in the Gulf of California. Incidental capture in fishing gear is also a likely threat. In addition to nesting sites in Mexico, there is a major nesting population centered around the Galápagos Islands. It is thought that this population is in better shape, but no consistent monitoring has been carried out for several years.

Threats to marine turtle populations

The causes of decline and the present and future threats to marine turtles are diverse. Three realms, however, have been recognized as main threats to marine turtles worldwide: habitat destruction and alteration, overexploitation for meat, hides, eggs and shells, and incidental capture in fisheries. The Marine Turtle Action Plan focuses its Program on these three realms, but acknowledges that pollution, climate change and disease are additional, important threats to these species, that require attention by the conservation community.

Human induced mortality toll in marine turtles

Currently, human induced mortality is having a greater impact on marine turtle populations than natural mortality. Necropsies of 107 turtles found dead in beaches of the Costa Rican Pacific revealed that the death of 81% was caused by hooks, entanglement in nylon lines and fishing nets, ventral incisions for meat and eggs, fractures and head trauma, in some cases by propellers of boat engines. The remainder 19% died from natural causes, mainly predation by crocodiles, coyotes and sharks.

C.M. Orrego (2002)

Under natural conditions, turtles suffer high hatchling, post-hatchling and juvenile mortality, but those that survive the early days grow into long-lived animals with delayed sexual maturity and very low adult mortality. Unfortunately, conditions nowadays are far from "natural" and turtles suffer mortality at all stages of their life cycle, leading to increasingly regular population crashes. In the days of Columbus, the Caribbean Sea was described as being "thick with them [green turtles], and they were of the very largest, so numerous that it seemed that the ships would run aground". This is a rare sight today. The number of female leatherbacks nesting on the Pacific beaches of Mexico has declined more than tenfold in less than a decade; the number of nesting loggerheads in eastern Australia has declined by 50 to 80 per cent since the mid-1970s; Kemp's ridley nearly went extinct. The list goes on, and makes depressing reading.

The causes of the population declines are many and varied, but have their roots in two basic characteristics of turtle biology which render populations particularly vulnerable to the pressures described above: (1) reproduction is highly localized in beaches allowing easy access to eggs and nesting females, and rendering this critical habitat vulnerable to alteration through coastal development, and (2) their slow maturation hides the effect of overexploitation for decades.

Turtle populations can be destroyed from the "bottom up" by over-exploitation of the eggs, and destruction of nesting sites. For example, as far as we know, green turtles take 30 to 50 years to reach sexual maturity and remain reproductive for about 20 years. Adults are the visible component of a turtle population; their numbers are maintained by the gradual maturation of juvenile and sub-adult turtles. This will continue to happen, even if no eggs are laid or if all the eggs are collected. It will be many decades before the number of adults begins to decline, but over time the reservoir of juveniles and sub-adults will become progressively depleted until there are no more recruits. These "last adults" will, in theory, survive for another 20 years during which time the situation may not seem too serious. In reality, however, the population is on the verge of extinction because once these adults die there will be no hatchlings, juveniles or sub-adults to replace them. If juvenile and adults are being killed, e.g. as bycatch, then this will simply happen more quickly.

1. Threat: Loss of Habitat

The construction of seawalls, hotels, marinas and the entire infrastructure associated with coastal tourism and commerce has destroyed large areas of turtle nesting beaches around the world. Tourist developments in X´Cacel, Mexico, and in Florida are but one example of nesting site degradation in the region. Turtle reproductive behavior evolved in an environment of deserted, intact beaches. Nowadays, light and noise pollution frequently deter or interrupt many females from successful laying. At night, newly hatched turtles locate the water's edge by orientating themselves towards the bright horizon, but house and street lights can disorient hatchlings so that they actually crawl away from the sea. Adult turtles are reported as displaying symptoms of acute physiological stress in some areas of very heavy coastal traffic, such as the Adriatic. This traffic and lights along the coast may deter females altogether from coming ashore.

2. Threat: Overexploitation for meat, eggs, shells and hides

Turtles generally make good eating. Although the leatherback is less frequently consumed, and in some areas the flesh of other species is considered unpalatable (e.g. Kemp's ridley turtles in Mexico) or even poisonous (e.g. hawksbill turtles in parts of the Indo-Pacific), there is a long history of human consumption. The high yield of good quality meat, combined with the ease with which turtles can be caught, has made them particularly desirable food items in coastal communities around the world. The green turtle quickly became a dietary staple of colonial mariners and plantation owners in the Caribbean from the late 16th century onwards; estimates suggest that tens of thousands were consumed annually in Grand Cayman, Jamaica and other parts of the West Indies. As air-breathing reptiles, turtles can survive prolonged transportation by boat and overland, and they can also be kept without food in holding enclosures for some time. As a result, from the mid-18th century onwards turtle soup was produced in London from animals shipped from the Caribbean, and this international trade continued (albeit at a much reduced scale) well into the 20th century. Green turtles in the Mediterranean were almost extirpated by exploitation of nesting females in the 1940s. Many other nesting populations around the world were heavily depleted as consumption pressures increased in parallel with coastal development, human population increase, and breakdown of cultural restraint on the taking of turtles.

Turtle eggs are also easy to collect and highly nutritious. As a result, the arrival of nesting females is traditionally regarded as a predictable bounty, providing a welcome change of diet. This allure is further enhanced by the aphrodisiac properties, which are frequently attributed to turtle eggs, so much so that they are traded illegally.

A common pressure on sea turtle populations in the region is intentional, and by-and-large illegal, capture of turtles along both coasts of Latin America. The turtles are often slaughtered on the boats, the eggs and/or meat are removed and the carcass disposed off before coming ashore. Annually, more than 80,000 turtles, mainly greens and hawksbills, are still captured off the coasts of Central America.

Turtles have also been hunted for their shells, which are used in jewelry within the region (e.g. Chacón, 2002) and in the Far East, where wholesale illegal trade is rampant (TRAFFIC Southeast Asia 2004, van

Dijk & Shepherd 2004)[4]. Four stocks of accumulated hawksbill shell are known to exist in the Caribbean: one in the Bahamas, two in Jamaica and one controlled by the government of Cuba (TRAFFIC North America, 2001). In addition, their hides are cured for leather, an industry that contributed to the decline of olive ridleys in Mexico in the 70s and 80s. There are recent reports of turtle-leather cowboy boots being freely available in Tijuana, Mexico, and of rooms full of confiscated boots on the US border. Though trade in marine turtles is illegal under CITES, they are still stuffed, varnished, mounted and sold openly as tourist curios in Mexico and parts of the Caribbean.

International trade in turtle products was formerly a major cause of population depletion. Since all species of marine turtles were listed on Appendix I of CITES, trade between Party states has decreased. However, illegal trade and hunting for international markets outside the CITES framework remains of concern, and local consumption continues. The trade with sea turtles and their products in Central America was recently studied by Chacón (2002). Marine turtles are still being consumed and traded intensively in this region, both for subsistence (mainly meat and medicine) and commercially on a large scale (mainly eggs, medicine and hawksbill shell products). International trade goes beyond Central America to Colombia (San Andrés), Cayman Islands, Venezuela and Mexico.

Monitoring trade in turtle products

Most countries have national laws restricting turtle fishing and egg collecting and many are members of CITES. Many tropical and subtropical countries allow the collection of turtle eggs under a controlled scheme, but enforcement of control measures is often unsatisfying (e.g. TRAFFIC North America, 2001). Abuses often occur: in Mexico, poachers removed 500,000 olive ridley eggs from a beach in Oaxaca in 1996[5]. Hawksbill shell products continue to be sold in violation of domestic legislation in airport shops (in the Dominican Republic and Mexico) and other markets catering to tourists (Dominican Republic, Jamaica, and Mexico) (TRAFFIC North America, 2001).

TRAFFIC, the wildlife trade monitoring arm of WWF and IUCN, documents the extent of the illegal international trade and is working to bring violations of international treaties to the attention of government authorities. Such violations appear to be widespread: there is still a substantial underground trade in tortoiseshell, leather boots, whole turtles, meat and eggs, as shown by seizures of illegal shipments [6,.7,8,9]. As the trade in sea turtle eggs appears to be on the increase, TRAFFIC is increasing its efforts to collect and disseminate information on its extent, so that more effective protection and management can be implemented. TRAFFIC is also working with governments on improving protection species threatened by trade, even where that trade is largely internal and legal.

TRAFFIC North America (2001) recently completed a trade review and legal analysis of the fisheries and primarily commercial trade of marine turtles in the Bahamas, Cuba, Dominican Republic, Haiti, Jamaica, Mexico, Puerto Rico, Turks and Caicos Islands, British Virgin Islands, and U.S. Virgin Islands. The study has confirmed that demand for turtle meat and eggs remains strong in the region, and the use of marine turtles continues in all areas surveyed, despite fully protective legislation in 5 of the 11 nations/territories reviewed. Past overexploitation devastated nesting populations in the Cayman Islands, and they remain on the verge of extinction in that territory. Overexploitation has also depleted certain marine turtle populations in the British Virgin Islands and Jamaica. In some countries, such as the Dominican Republic, overexploitation is thought to be the primary threat today to marine turtles found within their territories.

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[4] The shell of hawksbill turtles is called bekko in Japan. A TRAFFIC report about trade of marine turtle products in the Southern Caribbean is due for publication in 2004.
[5] TRAFFIC Bulletin 16 (3).
[6] Raymakers, C. 1998. Imports of Indonesian Products into the European Union 1990-1995. TRAFFIC Europe/WWF.
[7] TRAFFIC Bulletin 17 (3)
[8] TRAFFIC North America 1999: 2(2)
[9] Le Dien Duc and Broad, S. 1995: TRAFFIC Bulletin 15(2)

WWF and sustainable use of marine turtles

WWF supports the sustainable utilization of wildlife, when such utilization is truly sustainable, does not threaten other species or populations, provides real benefits to local people, and provides incentives and benefits for the conservation of the species. We evaluate all situations on a case-by-case basis. Sometimes non-consumptive sustainable utilization can provide greater economic benefits for local communities than consumptive use. WWF opposes a resumption of international commercial trade in marine turtles, or their products, until it can be shown that: the species in question has sufficiently recovered to sustain trade; governments have sufficient capacity and commitment to enable enforcement and implementation of national and international laws; other populations will not be put at risk; any trade will primarily benefit local communities and enhance species conservation; and such trade will not negatively affect the recovery of populations to fulfill their ecological roles in their ecosystem, and maintain their demographic health and genetic diversity. In some instances, small-scale subsistence use of marine turtles may still allow for a recovery of the species. However, in the light of the endangered status of marine turtles and the history of overexploitation, it is not precautionary to promote consumptive uses of these species at this point.

3. Threat: Incidental Capture in Fisheries

An unknown quantity of turtles are killed as “bycatch” (i.e. incidentally), particularly in trawling nets. Some estimates are as high as 200,000 to 300,000 turtles caught annually. Decline was set in motion by decades of egg collecting and the killing of females; then it was continued by trawler mortality. This is probably one of the major causes of decline in the Kemp’s ridley turtle, which is particularly vulnerable because it feeds in the rich shrimping grounds of the Gulf of Mexico (see p.17 section on Turtle and shrimp fishing). Longlines for tuna and swordfish are responsible for killing leatherback and loggerhead turtles, which are attracted to the baited hooks. More than 250,000 loggerhead and 60,000 leatherback turtles are estimated to be inadvertently snared each year by commercial longline fishing alone, with up to tens of thousands dying, according to the first global assessment of the problem (Lewison *et al.* 2004). The four "primary hotspots" for longline fishing are in the central and southern Pacific Ocean, the southern Atlantic and the Mediterranean Sea. The turtles either become snared or tangled in the line and are then unable to reach the surface and drown (or in some cases lose a limb). Turtles that have swallowed hooks are likely to die as well from throat injuries, despite being de-hooked and released. This problem is particularly acute because these two species feed on planktonic organisms that are found in highest concentrations along oceanic fronts, areas that also support the highest densities of pelagic fish and consequently coincide with high fishing pressure. A minimum of 2.000 leatherbacks are killed annually by the combined swordfish fishing operations of Chile and Peru using gillnets (Eckert 1997). An estimate suggests that in the order of four to five thousand marine turtles are caught as bycatch by the artisanal fisheries fleet of Peru every year (pers.comm. Michael Valqui WWF-Peru).

Conservation strategies and solutions

The approach selected by WWF to tackle the challenges of marine turtle conservation has the following key elements (Kemf et al. 2000):

1. Carry out long-term conservation action
2. Develop regional conservation and management Programs
3. Reduce accidental capture in fisheries
4. Enforce pertinent international treaties, laws and agreements
5. Protect marine turtle habitat
6. Support development of sound ecotourism based on marine turtles
7. Develop guidelines for best practices
8. Support sea turtle research
9. Promote public awareness and education

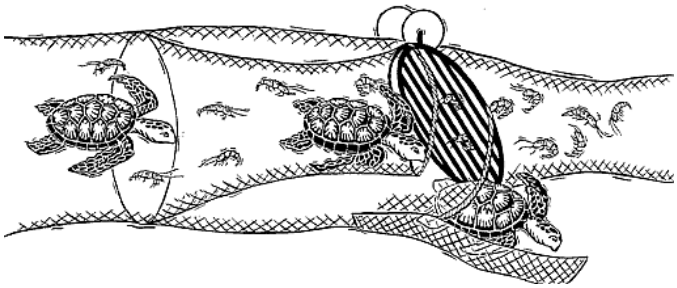
Conservation actions in the Northern Caribbean

TRAFFIC has identified eight major areas of action to conserve marine turtles in the Northern Caribbean: (1) filling information gaps and increasing information exchange; (2) expanding public education and awareness; (3) building national and regional cooperation; (4) increasing participation in international and regional conventions; (5) strengthening national legislation; (6) supporting training and capacity building; (7) enforcing laws that affect local and tourist markets; and (8) documenting and monitoring existing stocks of marine turtle products in the region.

TRAFFIC North America (2001)

These elements guide the approach of the LAC Marine Turtle Action Plan. The core is to maintain a regional perspective on conservation interventions. In the past 30 years, biologists have started to explore the mysteries of turtle migrations by tagging adult and immature turtles and more recently by using satellite technology. From these studies, it become apparent that regional approaches to turtle conservation are needed. Unilateral conservation programs by governments cannot completely protect marine turtles, given that the animals disperse and migrate over vast distances, and routinely live successively in the territories of numerous sovereign nations, as well as on the high seas. It is widely acknowledged that cooperation among range countries is critical to ensure the conservation of marine turtles in the region (TRAFFIC North America, 2001).

Turtle Excluder Device (TED) in a shrimp net



While WWF continues to support national efforts to conserve sea turtles, it is increasingly focusing on regional approaches to conservation. The design of effective management and conservation strategies—particularly on a regional scale—is challenged by a number of factors, including gaps in the knowledge about marine turtle life history patterns and the actual conservation status of some of these turtle populations; a lack of understanding of current levels of exploitation and trade and the effects these are having on particular species or populations; and the unregulated and unmanaged nature of turtle catches and trade (TRAFFIC North America, 2001).

International agreements: a conservation tool

Among the key conservation tools available with regional conservation impact are the international agreements. WWF participates actively in international fora pertaining to the conservation of endangered species. The LAC Marine Turtle Action Plan includes active involvement in the options offered by international agreements relevant to marine turtle conservation in the region. The currently most pertinent agreements are the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES), the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC), and the Protocol concerning Specially Protected Areas and Wildlife (SPAW). These are briefly outlined below.

International trade in turtle products was formerly a major cause of population depletion. Since all species of marine turtles were listed on Appendix I of CITES, trade between Party states has decreased. In the Northern Caribbean, for example, the shell and curio trades appear to have been greatly reduced since the entry into force of CITES and related national legislation during the course of the last 25 years; an indicator of this is the seemingly common current practice found in several areas visited of discarding the carapace after removing the meat (TRAFFIC North America, 2001). WWF opposes a resumption of international trade in marine turtles, until it can be shown that such trade will not negatively affect the recovery of populations to fulfill their ecological roles, and the maintenance of their demographic health and genetic diversity. However, illegal trade and hunting for international markets outside the CITES framework remains of concern, and local consumption continues.

The Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC) is the only major international treaty dedicated exclusively to sea turtles and their habitats, formally setting standards for their conservation. The IAC recognizes that sea turtles migrate and that they are resources shared by the peoples of many nations. Hence, the IAC has been vigorously supported by many members of the international community of sea turtle biologists and conservationists, particularly specialists from Latin America. The IAC entered into force in 2001. The measures proposed in the IAC promote regional management plans and accords. Its stated objective is “to promote the protection, conservation and recovery of sea turtle populations and of the habitats on which they depend, based on the best available scientific evidence, taking into account the environmental, socio-economic and cultural characteristics of the Parties”.

In the same vein, the Protocol concerning Specially Protected Areas and Wildlife (SPAW) to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (known also as the Cartagena Convention) is complementary to the IAC. All six species of Caribbean sea turtles are listed in Annex II of the SPAW Protocol.

This group of species is ideally matched to the aims expressed by the Convention on the Conservation of Migratory Species of Wild Animals (also known as the Bonn Convention or CMS). The text of the CMS includes many of the concepts fundamental to regional conservation of migratory marine animals and their habitats. All species of sea turtles occurring in LAC are listed in both Appendix I and Appendix II of the Bonn Convention. There are seven LAC parties to CMS: Panama, France (French Guiana), Peru, Bolivia, Chile, Argentina, Uruguay and Paraguay.

Conservation priorities

Prioritization of conservation efforts and sites for action takes into account the level of threat to the species concerned and the opportunities for synergy with ecoregions.

The **priority species** for conservation efforts in the LAC region are:

- Hawksbills: Atlantic population (conservation focus in the Caribbean) and the Eastern Pacific population, which is likely to be genetically unique.
- Leatherbacks: while the Eastern Pacific leatherback population is in greatest danger of extinction and as such deserves immediate attention, parallel efforts will focus on the reduction of threats to the Atlantic population to prevent a similar decline.
- Eastern Pacific Green (*Ch. mydas agassizii*): efforts will be undertaken toward the mitigation of threats to the populations of this subspecies in the Eastern Pacific.

In contrast to the growing population of the critically endangered Kemp ridleys, for which conservation measures are in place, the critically endangered hawksbills and leatherbacks show thus far no sign of a region wide recovery. Non-priority marine turtle species will benefit in some cases, as a by-product of threat mitigation to the species targeted by the Action Plan (e.g. bycatch reduction). Species, which are locally abundant, such as greens and olive ridleys, may be preferred as target species for the establishment of on-the-ground models for sustainable, subsistence uses of marine turtles.

Loggerheads (*Caretta caretta*) are not a priority species for WWF in LAC. The species occurs both along the Atlantic and the Pacific coast. Loggerheads of Australian origin are highly threatened and travel as far as the cold waters of southern Peru and northern Chile, where they coincide with the presence of fisheries fleets (Alfaro-Shigueto *et al.* 2004). The species benefits from bycatch mitigation measures along the Pacific coast, as outlined in this action plan. This species illustrates the complementary nature of the LAC Regional Action Plan and WWF´s Asia-Pacific Regional Action Plan for marine turtles.

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The division of LAC into **subregions** illustrates the issues, species involved and where there is a level of capacity, on the part of WWF or its partners, on which to base a major component of the action plan (Table 1). These are: Caribbean Sea, Western Atlantic (Venezuela, Trinidad, Suriname, Guyana, French Guiana, Brazil, Uruguay and Argentina), and Eastern Pacific Ocean (from Mexico to Chile).

Table 2. Subregions in LAC, indicating species of interest (bold face), key threats and partners for implementation of the Action Plan.

Subregion	*Principal nesting/foraging species/populations*	*Key Threat/Issue*	*WWF Presence*
Caribbean	**Hawksbill**, green	International trade, overexploitation, habitat destruction	WWF-Mexico, WWF-Central America, WWF-Colombia, FUDENA - Venezuela, WWF-Canada Project Office in Cuba, TRAFFIC-Mexico
Western Atlantic	**Leatherback**, olive ridley	bycatch, overexploitation	FUDENA - Venezuela, Guianas Regional Project Office, WWF-Brazil, Fundación Vida Silvestre – Argentina, TRAFFIC – South America
Eastern Pacific	**Leatherback**, **black**, olive ridley, **hawksbill,** loggerhead	bycatch, overexploitation	WWF-Mexico, WWF-Central America, WWF-Colombia, WWF-Peru, TRAFFIC-Mexico and TRAFFIC – South America

The program benefits from linking the MTAP with WWF´s conservation efforts in the following LAC *focal ecoregions*: (1) Gulf of California and (2) the Galapagos Islands in the Eastern Pacific, (3) Mesoamerican Reef and (4) Greater Antillean Marine in the Caribbean, (5) the Guyana Shield and (6) the South Western Atlantic Coast. Other relevant marine ecoregions in LAC include the Panama Bight, Humboldt Current, Southern Caribbean Sea and Northeast Brazilian Coast Marine Ecosystem. Such ongoing efforts can be used to draw greater attention to marine turtle conservation. Nonetheless, because turtles are highly migratory species, their conservation needs to be addressed at a scale beyond ecoregion conservation planning.

Overview of WWF's past/current involvement

Since it was founded in 1961, WWF has supported numerous sea turtle conservation efforts worldwide. Much of the early work involved mapping the distribution of nesting beaches, with surveys in more than 40 countries. Other projects focused on survival of eggs and hatchlings, establishment of protected areas, research into sea turtle biology, ecology and behaviour, monitoring the trade in turtle products, investigating the threats from fisheries, and sponsoring international conferences and workshops on sea turtle conservation. In 1999, WWF co-funded production of a state-of-the-art publication, Research and Management Techniques for the Conservation of Sea Turtles, prepared by the IUCN/SSC Marine Turtle Specialist Group. WWF´s conservation efforts in LAC are summarized in Table 3.

Table 3. Previous and current conservation efforts by WWF in the priority subregions of LAC.

REGION AND NATIONS	WWF INTERVENTIONS
Caribbean	Co-sponsoring a meeting in November 1999: *Marine Turtle Conservation in the Wider Caribbean: a Dialogue for Regional Management*.
	Measures to develop a network of protected areas within the MesoAmerican Caribbean reef Ecoregion to protect critical habitat for hawksbill and green turtles.
	Support to the Anguilla National Trust to manage their sea turtle conservation Program.
	Funds for surveys of Kemp's ridley turtles in Mexico, and the only known major green turtle rookery in the eastern Caribbean on Aves Island, Venezuela.
	In Costa Rica, WWF is supporting the ANAI Association, a local NGO, to protect Gandoca beach and its leatherback, green and hawksbill turtle rookeries. The President of ANAI, Didiher Chacón, is a conservation leader holding a WWF Russel Train postgraduate scholarship.
	Funds to strengthen protection of nesting green and leatherback turtles in the Tortuguero National Park, Costa Rica.
	Support to a study by the Costa Rican Environmental Law Centre, which was followed-up by a Regional Marine Turtle Conservation Workshop held in Tortuguero, Costa Rica, in 1998.
	Funds to veteran turtle biologist Dr Archie Carr and his colleague Anne Meylan to undertake research into hawksbill ecology in Panama and the Leeward and Windward Islands.
Central-Western Atlantic	
Venezuela	FUDENA, a WWF associate, has worked for two decades on sea turtle conservation on the Isla de Aves and in the Laguna de Tacarigua National Park.
Guyana Shield Ecoregion	Support to conservation projects in Suriname, Guiana and French Guyane, since the 1960´s, key nesting sites for leatherbacks and olive ridleys in the western Atlantic.
Brazil	Support to Projecto TAMAR, currently focused on Fernando de Noronha Island.
Eastern Pacific	
	In 1967, WWF supported work in the Pacific coast of Honduras and Mexico to assess the status of marine turtles.
Mexico	A long-term WWF project to save the turtles of Michoacan with the cooperation of the Mexican Fisheries Department, the Mexican Navy, and students and faculty of the University of Michoacan.
Honduras	In 1987, WWF supported a study of the status of Pacific olive ridleys in the Gulf of Fonseca, Honduras. The Gulf of Fonseca is the focus for the ongoing Central American Environment Program (Programa Ambiental Centroamericano – PROARCA), where WWF is a partner organization, working with the three governments (Honduras, Nicaragua and El Salvador) to secure a network of ten protected areas.
Costa Rica	In 1982 WWF supported a research and monitoring project at Nancite Beach in the Santa Rosa National Park which hosts one of the greatest olive ridley arribadas in the world. In 1990, WWF joined a National Science Foundation study of the factors that trigger the great *arribadas* at Nancite.
	WWF has supported the Regional Wildlife Management Program through scholarships, thesis grants and funds for capacity-building outreach courses. This involved training ecologists in turtle research and management techniques.
	In 1985, WWF co-sponsored the first Symposium on the Marine Turtles of the American Pacific and, in association with the University of Costa Rica, initiated funding of an international Program to monitor sea turtle movements on Latin America's Pacific coast.
Galápagos Ecoregion	In 1970, with WWF support, Peter Pritchard visited the Galapagos Islands (Ecuador) to determine the status of the Eastern Pacific green turtle (sometimes called black turtles, *Chelonia mydas agassizi*) and their rookeries. WWF subsequently assisted with control of feral pigs on Santiago and with a long-term green turtle monitoring Program implemented by scientists from the Charles Darwin Research Station.
Ecuador	In 1989, WWF assisted Ecuador's Fundación Natura to make an undercover investigation of clandestine turtle fisheries and processing plants.
Peru	WWF has worked towards the reduction of the illegal sea turtle consumption and collaborated with the drafting of a national strategy for marine turtle conservation.

The LAC Marine Turtle Program and Action Plan

LAC MARINE TURTLE PROGRAM

VISION (100 + years): *Marine turtles flourish in the marine environment providing multiple benefits to coastal communities throughout Latin America and the Caribbean.*

GOAL (25 + years): *Recovery of key populations of marine turtles in the Eastern Pacific and Western Atlantic oceans*

Program General Objective (3-15 years)

The significant reduction of threats to selected populations of marine turtles from the loss and degradation of their critical habitats, and from the impacts of unsustainable use and accidental by-catch.

Specific Objectives (10 years):

1. to save the critically endangered Pacific leatherbacks from extinction,
2. to secure the recovery of Western Atlantic leatherbacks
3. to maintain hawksbill genetic diversity and secure their recovery,
4. to secure the recovery of the Eastern Pacific Green (*Ch. mydas agasizzi*)
5. to promote non-extractive uses of marine turtles that improve the quality of life of coastal communities, and
6. to ensure that extractive uses are sustainable and permit the recovery of the species involved.

Strategic principles of the LAC Marine Turtle Program

Edward E. Clark

1. Outcomes of the Program take into account the needs of **humans and wildlife in a partnership** of shared benefits.
2. The underlying theme of the Program´s efforts to stop overexploitation is **"A turtle is worth more alive than dead"** [10]. It is the logical link between conservation and benefits to coastal communities, a key component in the Program´s vision. In addition, this message is the umbrella of the communications strategy of the Program.
3. The Program will base its conservation actions on available **scientific knowledge** and work with scientists to improve knowledge where it is lacking.
4. Program interventions are guided by the highest priority, geographical, biological and political **conservation needs of the marine turtles**, rather than by complete geographical coverage of LAC with regard to participation of nations in the Program.
5. The LAC Program envisions a **team of collaborators**, to cover the following areas of expertise: Leatherbacks, Hawksbills, Habitat protection, Overexploitation, Bycatch, Tourism, Communications, Information Management.
6. A series of ***Conservation models***, case-study learning experiences with strong conservation impact, will feedback on the working strategies and act as seeds in the generation of models

[10] *See Troëng & Drews (2004).*

and/or lessons for widespread application in the region. The thematic fields for the *Conservation models* are:

6.1 An alternative to extractive uses of marine turtles: community based ecotourism, in which marine turtles are the flagship species. Two cases are envisioned: (1) an ecotourism scheme run by an indigenous community, and (2) underwater observation of marine turtles as an international attraction which benefits a coastal community or a country as a whole.
6.2 Country level implementation of measures to reduce bycatch of marine turtles.
6.3 Establishment of a turtle protection time-area closure for fisheries in international waters.
6.4 Marine turtle habitat protection: linking nesting and feeding sites through international cooperation.

7. The LAC Program envisions a **horizontal transfer of best practices** through peer encounters and networking.
8. The program acknowledges that the challenge of marine turtle conservation implies a joint effort between all stakeholders, including Governments, communities, environmentalists, industries, other interest groups and key individuals. The LAC Regional Action Plan foresees **alliances and coordination with key players** in the conservation arena.
9. In as much as marine turtles that occur in LAC waters travel to other regions (e.g. North-American Atlantic, Europe and West-Africa, East-Asia and Oceania), the Program seeks **synergies** with marine turtle conservation opportunities and initiatives **outside LAC**.
10. The Program includes **various levels of intervention** through policy and field approaches: international agreements, national legislation, advocacy with stakeholders (government, industry, natural resource managers, communities) and communications to the general public.
11. The Program is a **dynamic process** that responds to emerging threats and pertinent opportunities as they arise, through periodic review of targets and required outputs.
12. The **success indicator** of the LAC Regional Action Plan in reaching its goal is a positive trend in the nesting population of adult, female marine turtles in all species of the region, at key monitoring sites. Such trend may take between 15 – 25 years to be revealed, depending on the species concerned and the impact of WWF´s conservation measures. This indicator of state, however, is not specific to WWF´s performance, for it is subject to the collective impact of all conservation efforts in the region. **Achievement indicators** measure changes in pressure on, or threats to, turtles. These indicators, the choice for the monitoring of the impact of the LAC Marine Turtle Action Plan, more closely reflect the result of WWF´s interventions and are amenable to a qualitative analysis of the relative contribution of WWF to changes in pressures. **Performance indicators** show the compliance of WWF and partners with planned responses to a given problem.

1st Three-year period of LAC Marine Turtle Action Plan

Verifiable outputs and budget for the first three-year period of the Action Plan are shown in Table 4. Interventions toward accomplishing the Specific Objectives are based on tools listed to mitigate the current threats on marine turtle populations in Table 5.

Threats listed in Table 4 for each specific objective are addressed through interventions based on conservation tools listed respectively in Table 5. Although the interventions contribute to the broad targets shown in Table 5, these are designed specifically to achieve the outputs required to meet the objectives of the three-year action plan. The design and choice of interventions follow the strategic principles outlined above and will favor those that, as a by-product, provide conservation benefits to non-priority marine turtle species. Interventions and yearly targets of the LAC Marine Turtle Action Plan are included in one-year work plans, which are not part of this document.

Mitigation of threats, as outlined in Table 5, illustrates the role of marine turtles as flagship species for habitat conservation, consolidation of best fisheries practices and linking conservation efforts with community benefits.

Table 4. Outputs and budget for the first three-year period of the LAC Marine Turtle Action Plan implementation, starting FY05.

OBJECTIVE	THREATS INVOLVED	OUTPUTS	TIME-FRAME	BUDGET*
1. to save the critically endangered Pacific leatherbacks from extinction[1]	Bycatch and over-exploitation	75% of nests protected along Pacific coast of LAC	3 years	$ 66.000
		Rapid assessment of relative by-catch impact on leatherbacks of the various fleets in the Pacific carried out		$ 5.500
		Experiment on the effectiveness of circular hooks in long-lines carried out in the Pacific		$ 55.000
		Long-line fleets use circular hooks in at least three countries (e.g. Ecuador, Costa Rica, Mexico)		$ 330.000
		Time-area closures established in at least two hot-spots of leatherback bycatch		$ 22.000
		Fisheries fleets trained in post-capture techniques to reduce mortality in at least three countries		$ 100.000
			TOTAL	$ 578.500
2. to secure the recovery of Western Atlantic leatherbacks	Bycatch and over-exploitation	Migratory routes of leatherbacks in the Atlantic are documented.	3 years	$ 90.000
		Rapid assessment of relative by-catch impact on leatherbacks of the various fleets in the Atlantic carried out.		$ 5.500
		Hot-spots of bycatch of leatherbacks along Atlantic coast are identified.		$ 55.000
		Long-line fleets use circular hooks in at least one country (Brazil, Uruguay or Argentina)		$ 110.000
		Time-area closures established in at least two hot-spots of leatherback bycatch		$ 22.000
		Fisheries fleets trained in post-capture techniques to reduce mortality in at least two countries		$ 66.000
			TOTAL	$ 348.500
3. to maintain hawksbill genetic diversity and secure their recovery	Over-exploitation, habitat destruction	Regional, Caribbean-wide recovery plan drafted, socialized and adopted by key nations in the Caribbean.	3 years	$ 200.000
		Legal take of hawksbills in the Caribbean stopped in at least two nations.		$ 44.000
		Law enforcement improved in at least three Caribbean nations.		$ 180.000
		Conservation model “Hawksbills as an underwater attraction for eco-tourism” established in two sites in the Caribbean.		$ 120.000
		Tourists educated about the illegality of acquiring hawksbill products in the Caribbean.		$ 55.000
		Diagnostic of conservation needs for hawksbills in the Pacific carried out.		$ 33.000
		Diagnostic of habitat protection requirements for hawksbills carried out in the Caribbean.		$ 80.000
		At least two critical hawksbill habitats protected as a new MPA.		$ 70.000
			TOTAL	$ 772.000

4.	to secure the recovery of the Eastern Pacific Green (*Ch. mydas agasizzi*) in the Eastern Pacific	Over-exploitation, bycatch	"Hot spots" of direct catch for meat consumption identified. "Hot spots" of bycatch of Eastern Pacific Greens identified. Direct catch of Eastern Pacific Greens reduced by at least 25% in the region. Bycatch of Eastern Pacific Greens reduced by at least 50%.	3 years TOTAL	$ 5.500 $ 5.500 $ 110.000 $ 110.000 $ 231.000
5.	to promote non-extractive uses of marine turtles that improve the quality of life of coastal communities	Over-exploitation, habitat destruction	Awareness campaign "A turtle is worth more alive than dead" reaches 10 countries in LAC Ecotourism scheme run by an indigenous community up-and-running Beach protection / tourism scheme at leatherback nesting site run by local community up-and-running	3 years TOTAL	$ 190.000 $ 55.000 $ 55.000 $ 290.000
6.	to ensure that extractive uses are sustainable and permit the recovery of the species involved.	Over-exploitation	- *this objective will be tackled during the second three-year period, after the foundation for non-extractive use promotion has been built.*[11] -		
				GRAND TOTAL*	**$ 2.240.000**

* Budget values are tentative and subject to change.

Table 5. Overview of targets for threat mitigation, tools and achievement indicators in LAC.

TARGET	TOOLS	ACHIEVEMENT INDICATORS[12]
1. HABITAT Achieve protection of sufficient nesting beaches, foraging grounds, and inter-nesting areas in LAC, so that they meet the ecological requirements of marine turtles.	Habitat and population status map Legislation MPAs Guidelines for best practices for tourism and urban development Awareness & education Species strategies Conservation model IAC Ecoregion Conservation Plans Ocean & coasts targets of LAC Marine Program	% of the critical habitat under protection
2. OVEREXPLOITATION Reduce illegal exploitation and trade of eggs and turtles and limit legal take to sustainable levels in the three LAC subregions.	Nest protection Awareness & education *"A turtle is worth more alive than dead"* campaign Law enforcement Incentives to alternative, non extractive use Conservation model Guidelines for sustainability Development of use and trade level Indicators. CITES, IAC Species strategies Ecoregion Conservation Plans Wildlife trade targets of Species Program & TRAFFIC	% reduction of illegal take/trade levels Sustainable use initiatives have a peer reviewed management plan in place and adequate enforcement of control measures.

[11] *Information on the status of individual populations of marine turtles in the region is not sufficient to determine what would be a sustainable level of use. At present it is unlikely that any populations could support sustained use at any significant level.*

[12] *The baselines for these indicators will be obtained from pertinent outputs (e.g. diagnostics and situation assessments) listed in Table 4.*

3. BYCATCH Reduce incidental capture of marine turtles in the three LAC subregions.	IAC, ICTA Research on bycatch hot spots and migration patterns Awareness & education Peer meetings MPAs and time-area closures Guidelines for best practices in fisheries Turtle-friendly technology Conservation model Species strategies Ecoregion Conservation Plans Fisheries targets of LAC Marine Program	% reduction of incidental capture in the Pacific % reduction of incidental capture in the Atlantic

Alignment and opportunities for synergy with WWF´s Target Driven Programs (TDPs)

The Regional Action Plan is aligned with and delivers to the following TDPs:

- *Species*
  - The Species Action Plan Target focuses on the flagship species of global concern, which include marine turtles (leatherback, hawksbill, green, loggerhead, olive ridley, Kemp's ridley).
  - TARGET 1 : Flagship species
    - By 2010, populations of key species of global concern are stabilized or increased and their critical habitats safeguarded.
    - Milestone 1.1 *Accomplishment of targets and milestones for individual species for which there are Species Action Plans and/or Species Programmes with approved Targets and Milestones.*
    - Milestone 1.2 *By 2004, Action Plans for WWF Network programmes will be adopted for all flagship species.*
  - TARGET 2 : Trade
    - By 2010, at least 10 species of global concern are no longer endangered by over-exploitation.
    - Milestone 2.2 *By 2003, law enforcement actions to eliminate illegal trade in at least five species of global concern (e.g. tigers, elephants, rhinos, sturgeon, marine turtles) are significantly enhanced*
    - Milestone 2.4 *By 2004, gaps and inadequacies in national laws and regulations to control wildlife trade are identified and resolved in priority market and range countries for at least three species of global concern (e.g. Asian elephant, tiger, marine turtles).*

- *Endangered Seas*
  - TARGET 1: Protected areas
    - The establishment and implementation of a network of effectively managed, ecologically representative MPAs covering at least 10% of the world's seas by the year 2020.
    - Milestone 1.1 *Establishment: The area of the world's seas encompassed within areas for the protection of ecosystems is doubled by 2006 from the current value of 0.95%, and representative MPA networks to be established within three G200 ecoregions by 2004*.
    - Milestone 1.5 *Illegal activity: Legislation against an activity which damages marine habitats or species in the majority of focal G200 ecoregions is enacted by 2008.*
  - TARGET 2: Sustainable Fisheries
    - Milestone 2.1 – Market incentives: certification of fisheries in three key-product areas by 2004, e.g. salmon, tunas, shrimp and whitefish and the certification of fisheries in ten G200 ecoregions[13].
    - Milestone 2.3 – Management: fisheries replenishment/no-take zones, or zones in which there are no damaging fishing practices or unsustainable by-catches are established in all focal marine G200 ecoregions by 2006 and in five by 2004.
    - Milestone 2.5 – Illegal activity: measures are adopted and implemented by three regional fisheries bodies, that reduce of incidence of illegal, unregulated and unreported fishing by 2008.

[13] *Both tuna and shrimp fisheries are currently undergoing technological improvements to reduce by-catch.*

In addition, the Regional Marine Turtle Action Plan seeks alignment with pertinent Ecoregion Conservation Plans (see *Conservation Priorities*), and opportunities for synergy with the other initiatives within the WWF network that deliver to the above-mentioned TDPs and other pertinent programs (e.g. fisheries, wildlife trade).

Criteria for the selection of subjects of conservation actions and eligibility of proposals

The selection of specific areas, sites, issues and turtle populations for WWF interventions will take place during the implementation of the action plan, unless already specified herein. This selection will follow as guiding criteria:

(1) the specific objectives of the Program,
(2) the priorities outlined in *Conservation priorities* above,
(3) the potential for long term conservation impact on the greatest number of turtles
(4) the opportunities for synergy with ecoregional conservation efforts and other WWF Target Driven Programs, and
(5) other opportunities with high conservation impact arising during the implementation of the Regional Action Plan.

These criteria will serve to prioritize among proposals presented unrequested to the LAC Marine Turtle Program, which were considered eligible upon submission. The following criteria will be used to decide if a given proposal is eligible to be considered for support by the LAC Marine Turtle Program:

1. Contribution to AMTP Targets and Relevant WWF Priorities. Interventions will only be supported if they make a demonstrable contribution to LAC MTP targets and to WWF's global, regional, sub-regional and ecoregional objectives and targets.
2. Feasibility and Techniques. Interventions will not be supported if they are deemed infeasible, technically inappropriate, unsustainable, or where the political and social climate means conservation action is unlikely to be successful. The techniques, tools, logistical arrangements and budgets need to be appropriate.
3. WWF Policy and Procedures. The intervention must not contradict current WWF policies and operating procedures, and must follow adopted technical guidelines.

Unrequested and solicited proposals will be reviewed initially by the LAC Marine Turtle Coordinator, in consultation with technical advisors if deemed necessary. If clarification or any corrections are required, the author may be asked to revise the proposal. The Coordinator will request the endorsement of the Director of the LAC Marine Program, before approving a proposal for funding.

Program Implementation and partners

The LAC Marine Turtle Program will be coordinated by the full-time dedication of the LAC Regional Marine Turtle Coordinator, supported by the part-time dedication of an assistant. The Coordinator will implement interventions with a regional character, such as advocacy at international fora & treaties, whereas Program Offices and National Offices in LAC (Table 1) are expected to implement national initiatives with support by the Coordinator, as appropriate. Other partners include scientists, NGOs and government agencies in the region, that may be invited proactively by the Coordinator to become involved in the Program´s implementation, or may present proposals for financial and/or technical support to the LAC Marine Turtle Program. Consultants will be hired as appropriate to carry out specific modules of the Action Plan. A basic implementation schedule is shown in Table 6.

Table 6. Basic Implementation Schedule for the first 10 years of the LAC Marine Turtle Program

FISCAL YEAR (FY)	IMPLEMENTATION STEPS
04	- Design and launching of fundraising strategy for the LAC Marine Turtle Program - Design of one-year (FY05) concepts for each specific objective
05-07	- Implementation of first year of the three-year work plan (this document) - Yearly revision of progress, tools and outputs for the design of the following year. - FY07 Revision of specific objectives of the Program for the design of the second three-year period of the Action Plan.
08-10	- Implementation of second three-year period, with yearly revisions of progress, tools and outputs, and a revision of specific objectives of the Program in FY10 for the design of the third three-year period of the Action Plan.
11-13	- Implementation of third three-year period, with yearly revisions of progress, tools and outputs.
12	- Evaluation of progress toward general objective, goal and vision of LAC Marine Turtle Program - Design of specific objectives for the second 10-year period of the Program. - Design of one-year concepts for each specific objective

Monitoring of progress

Evaluation of project performance is monitored annually by the Director of the LAC Marine Program with respect to outputs listed in Table 4 and Achievement Indicators listed in Table 5. Specific targets for each year are presented in separate, one-year work plans. The LAC Marine Turtle Coordinator presents progress reports every six-months to the Director of the LAC Marine Program.

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The elaboration of this document is a step that follows previous workshops toward prioritizing and aligning WWF activities in marine turtle conservation. The alma mater *of this action plan has been extracted from the report* "A WWF MARINE TURTLE ACTION PLAN FOR LATIN AMERICA AND THE CARIBBEAN" Summary Report, Workshop 5-7 July 2000, Santa Marta, Colombia.

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