



**EXECUTIVE SUMMARY OF THE  
NATIONAL ACTION PLAN FOR THE  
CONSERVATION OF SEA TURTLES  
IN BRAZIL**



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Five of the seven extant sea turtle species occur in Brazilian waters: *Caretta caretta* (Loggerhead Turtle), *Chelonia mydas* (Green Turtle), *Dermochelys coriacea* (Leatherback Turtle, Leathery Turtle, Trunkback Turtle), *Eretmochelys imbricata* (Hawksbill Turtle), and *Lepidochelys olivacea* (Olive Ridley Turtle, Pacific Ridley Turtle). These animals use the beaches along the continental coast and oceanic islands for nesting, feeding and development. Each turtle species have distinct feeding and behavioral habits, thus using different areas and environments (niches) throughout their life.

Besides having a fundamental importance for marine ecosystems' health, sea turtles are also important in cultural aspects of several Brazilian coastal communities. Here as in many other places

over the world these animals are associated with mysticism and symbolism, being part of people's life in commemorative and folkloric expressions. In some areas, sea turtles play a strategic social and economic role, since conservation activities towards them generate employment, income, development and tourism.

In the last decades with the increased impacts of industrial development and society demands for space and natural resources, a high number of human activities are directly and indirectly affecting the marine biota.

In several areas where sea turtles occur along the Brazilian coast, the expansion of urban and industrial activities have resulted in extensive coastline occupation and increased sources of pollution, both in coastal and oceanic regions. Also, the intensive fishing activities rise as one of the major threats to these species due to incidental capture and noncompliance of current laws.

Considering the threats to sea turtles, and based on the experience obtained over 30 years of existence of the Projeto TAMAR, the Instituto Chico Mendes de Conservação da Biodiversidade – ICMBio, supported by the MMA/ICMBio ordinance 316/2009, established a national action plan (NAP) defining the main strategies for the conservation and recovery of these species. The institutionalization of the action plan has the purpose of improving and optimizing ICMBio efforts and society initiatives, in a complementary way by the renewing of an effective collaboration among research entities, governmental and nongovernmental organizations, and local communities for the conservation of biodiversity.

## TAXONOMIC CLASSIFICATION

**Kingdom:** Animalia **Phylum:** Chordata **Class:** Reptilia **Order:** Testudines **Suborder:** Cryptodira

**Family:** Cheloniidae

**Species:**

- *Caretta caretta* (Loggerhead Turtle)
- *Chelonia mydas* (Green Turtle)
- *Eretmochelys imbricata* (Hawksbill Turtle)
- *Lepidochelys olivacea* (Olive Ridley Turtle, Pacific Ridley Turtle)

**Family:** Dermochelyidae

- *Dermochelys coriacea* (Leatherback Turtle, Leathery Turtle, Trunkback Turtle)

## BIOLOGICAL CHARACTERISTICS

During evolution, several morphological and physiological modifications allowed the survival of turtles and their adaptation to new environments. In sea turtles, the carapace became more flattened, lighter and hydrodynamic, the limbs were modified



into flippers, promoting a more efficient underwater movement. Sea turtles are lunged animals with a great ability of underwater diving. This results from the efficient oxygen distribution over the body, the low metabolic rates and the accessory respiratory system, which includes gas exchange through the cloacae and the pharynx. These animals possess developed vision, smelling and hearing senses and an excellent orientation capability, being highly migratory, with long and complex life cycles.

## DIET

Foraging grounds of neritic immature and adult *Caretta caretta* are mainly located at the continental shelf. In the earlier years they are epipelagic and live in oceanic zones, feeding mostly in the upper five meters of the water column. Their diet is mainly carnivorous all lifelong, feeding on mollusks, crustaceans, coelenterates and, in lower proportions, fish and algae.

*Chelonia mydas* spend most of its life in the coastal zones, also using estuaries of rivers and lakes. After the first years in the pelagic environment, juveniles and adults inhabit neritic areas associated with submerged banks of sea grass and algae. In the first years the diet is omnivorous, with a tendency to carnivory. After the pelagic phases, when the carapace length is about 30 and 40 cm, it becomes herbivorous, feeding mainly on macroalgae and sea grass.

Young and adult *Eretmochelys imbricata* feed mainly on hard substrates as coral reefs. The diet includes crustaceans, mollusks, bryozoans, coelenterates, sea urchins, sponges and algae.

*Dermochelys coriacea* forages from the ocean surface up to deep waters and its diet includes jelly zooplankton as coelenterates and salps.

*Lepidochelys olivacea* apparently feeds in a large variety of habitats, from pelagic environments to shallow coastal zones. Its diet comprises salps, fish, mollusks, crustaceans and algae.

## REPRODUCTION

The main nesting sites in the Brazilian coast are located in northern Rio de Janeiro (*C. caretta*), northern Espírito Santo (*C. caretta* and *D. coriacea*), northern Bahia (*C. caretta*, *E. imbricata* and *L. olivacea*), Sergipe (*L. olivacea*, *C. caretta* and *E. imbricata*), southern Rio Grande do Norte/Pipa (*E. imbricata*) and the oceanic islands Trindade, Atol das Rocas and Fernando de Noronha (*C. mydas*).

The nesting period varies according to the region and the species. In Brazil the nesting season, in general, extends from September to April in the continent and from December to June in the oceanic islands. Each female can nest more than once in the same season and reproductive cycles for each female can be annual, biannual, triennial, or irregular. The cycles also vary between species or between populations of the same species, increasing or decreasing in time, and are regulated by amount of stored energy, environmental conditions and the distance between feeding and breeding sites.

They have a long life cycle; depending on the species, it may take around 10 to 50 years to reach sexual maturity and return to the same beach they were born to breed.

Environmental temperature is a very important factor in sea turtles life cycle, influencing directly in sex determination, birth, hatchling development, activity inside the nest, eggs incubation time, hibernation and geographic distribution, among others. Sand temperature is particularly significant for sex determination of the embryos; higher temperatures determine a higher proportion of females. The thermal tolerance for embryo development is between 25° and 27° C, and 33° to 35° C. Eggs incubated at temperatures lower than 22° C or higher than 33° C for extended periods rarely hatch.



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## HABITAT AND DISTRIBUTION

Sea turtles are widely distributed among the oceans basins, occurring from the Arctic region to Tasmania. However, reproductive occurrences have been reported mainly concentrated in tropical and subtropical regions.

Species with occurrences reported in Brazil also display different distribution patterns. *C. caretta* occurs from Pará to Rio Grande do Sul, with females tagged by TAMAR or in Brazil found stranded in Uruguayan beaches. Telemetry studies have shown a migratory corridor between Bahia and foraging and resting areas in the north/northeastern coast of Brazil, mainly in Ceará. . Juveniles occur in high numbers at the Rio Grande rise (incidental capture data) and along the continental shelf and slope of Rio Grande do Sul (incidental capture and stranding records).

*Chelonia mydas* occurs along the entire Brazilian coast (strandings, sighting and incidental captures in fisheries). There are data of individuals tagged in Brazil recaptured in Senegal (female), Nicaragua (juvenile) and Trinidad and Tobago (juvenile).

Juvenile and adult *Eretmochelys imbricata* occur in coastal areas of several Brazilian states, with developmental and foraging areas known and studied in Atol das Rocas and Fernando de Noronha. Individuals tagged in Atol das Rocas and Fernando de Noronha have been recorded in Gabon and Senegal. Telemetry studies indicated that adult females from Bahia migrated to foraging areas located between Salvador and Abrolhos and to the northeast and northern coast of Brazil.

*Dermochelys coriacea* occur in several Brazilian states. The higher numbers of strandings occur in Rio Grande do Sul, while incidental captures records are higher near the Rio Grande rise, along the slope between Uruguay and Santa Catarina and oceanic waters off São Paulo. Gabon tagged females have been incidentally captured in the Brazilian coast and a female tagged in Espírito Santo have been found dead in Namibia, showing the wide distribution of this species in the Atlantic Ocean.

*Lepidochelys olivacea* individuals have been registered from Maranhão to Rio Grande do Sul and in the oceanic region along the northeastern coast of Brazil throughout the southern Brazil (incidental capture in longline fisheries). Monitored females found nesting in Sergipe showed coastal migrations from Espírito Santo to Pará and migratory movements through the equatorial Atlantic. Foraging sites suggested for this species are located in Pará, Rio Grande do Norte, Alagoas and Espírito Santo.



## PRESENCE IN BRAZILIAN MARINES PROTECTED AREAS

ÁREAS DE PROTEÇÃO AMBIENTAL: Piaçabuçu/AL, Lagoas de Guarajuba/BA, São Pedro e São Paulo/PE, Fernando de Noronha/PE e Atol das Rocas/RN; Recifes de Coral/ RN a AL, Litoral Norte/BA, Plataforma Continental do Litoral Norte/BA, Mangue Seco/BA, Ponta da Baleia/ Abrolhos/BA, Rio Capivara/BA, Bonfim-Guarairás/RN e Litoral Norte e Litoral Sul/ SE; Praia de Guanabara/ES.

ÁREA DE RELEVANTE INTERESE ECOLÓGICO: Queimada Grande e Queimada Pequena/SP.

ESTAÇÃO ECOLÓGICA: Tupinambás/SP.

PARQUE NACIONAL: Marinho de Abrolhos/BA e Marinho de Fernando de Noronha/PE.

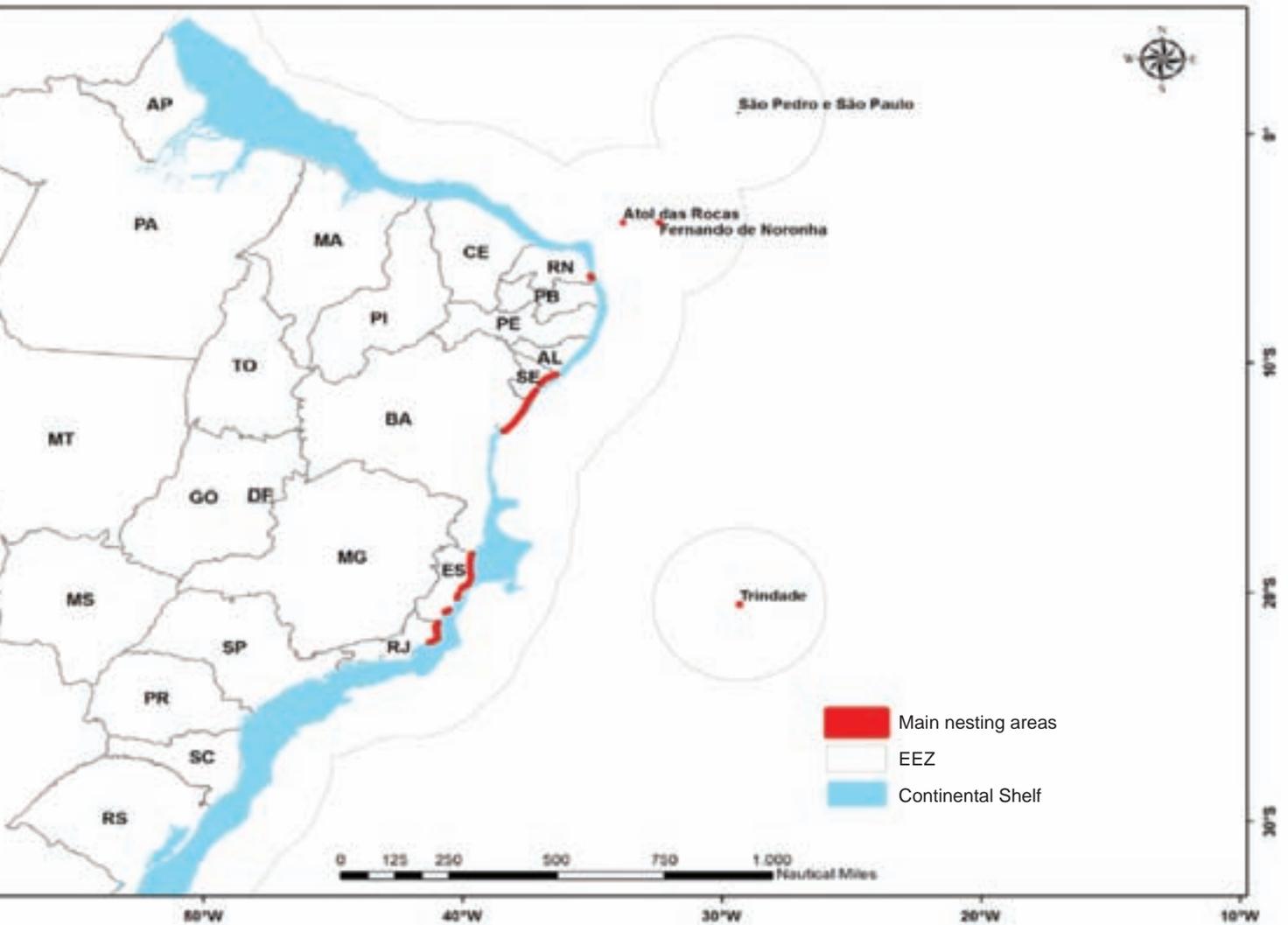
PARQUE ESTADUAL: Itaúnas/ES e Marinho do Parcel do Manuel Luís/MA.

RESERVA BIOLÓGICA: Comboios/ES, Atol das Rocas/RN, Ilha do Arvoredo/SC e Santa Isabel/SE.

RESERVA EXTRATIVISTA: Marinha de Corumbau/BA.



## DISTRIBUTION MAP



## MAIN THREATS

The seven extant sea turtles species are included in worldwide red lists of threatened species. Undoubtedly, human interference is the main cause of sea turtle populations collapse. Threats derived from human activities affect negatively all sea turtles' life stages (e.g. through habitat destruction, pollution, and mortality caused by intense coastal and pelagic fishing).

### • Fishing Activities

The intensification of fishing activities in the last decades is impacting marine ecosystems and causing high rates of incidental capture of sea turtles. This is considered one of the major threats for both juveniles and adult sea turtles over the world.

Gillnets, pelagic longlines and trawls used for the capture of fish and shrimp are the main fishing activities associated with sea turtles incidental captures. These fishing techniques cause sea turtles' death by drowning, since animals are unable to reach water surface to breath, or by severe injuries, including mutilation.





### • Coastal Development

The main factors associated to coastal development that negatively impact sea turtle populations are: beach sand movements (extraction of sand and landfills); photopollution; beach traffic unregulated use of the beaches: ports, anchorage, harbors and piers, hotels and condos.

### • Pollution and Diseases

There are different pollution sources that threat marine and terrestrial sea turtles habitats, including: sound, temperature, light, plastic objects, chemical products, industrial discharges and others.

Several health problems affect sea turtles, but none of them has concerned scientist as much as the fibropapilomatosis, which has been considered an increasing threat for the survival of sea turtles, specially the green turtle (*Chelonia mydas*). This is an infectious originated debilitating disease that can cause death, and is characterized by multiple benign tumor masses in the skin that commonly appear in the flippers, neck, head, inguinal and axillary region, and at the base of the tail. The tumors may affect locomotion, breathing, vision and the health condition of the animals.

### • Climate Change

Sea turtles are often seen as vulnerable to climate change due to the importance of the temperature in embryos sexual determination. Increasing temperature in 2° C can cause the feminization of the entire population. Also, since sea turtles species are highly migratory, changes in resource availability, ocean and wind currents can compromise their complex and long life cycle.

The rise in sea level, changes in currents, direction and intensity of winds and rainfall regime can also cause nesting habitat loss by the destruction and erosion of beaches.

### • Direct Use – Sea Turtles Meat Consumption

Although sea turtles are protected by law, sporadic cases of sea turtles consumption have been reported, mainly of individuals incidentally captured in fisheries.



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## CONSERVATION STATUS

The five sea turtles species with occurrence in Brazil appear in the Brazilian Official Redlist (Lista Oficial da Fauna Brasileira Ameaçada de Extinção, Instrução Normativa nº 3, 27 de maio de 2003, Ministry of the Environment). The conservation status was assessed recently (2010): *Caretta caretta* and *Lepidochelys olivacea* were listed as Endangered (EN); *Eretmochelys imbricata* and *Dermochelys coriacea* were listed as Critically Endangered (CR); and *Chelonia mydas* was listed as Vulnerable (VU).

Globally, sea turtles with occurrence in Brazil are listed under the International Union for the Conservation of Nature (IUCN) as: Endangered (EN) - *Chelonia mydas* and *Caretta caretta*; Vulnerable (VU) – *Lepidochelys olivacea*; and Critically Endangered (CR) – *Dermochelys coriacea* and *Eretmochelys imbricata*. All are indexed in the appendix I of the CITES.

The Projeto Tartaruga Marinha (today, Projeto TAMAR-ICMBio) was created in 1980. A sea turtle monitoring and data collection program was established in the main nesting sites of the five sea turtles with occurrence in Brazil. Before 1980, there were no quantitative data on species abundance along the Brazilian coast and oceanic islands. The first inventory of TAMAR in the Brazilian coast, based on beach surveys and fishermen interviews between 1980 and 1981, found a long history of exploitation and direct consumption of sea turtles eggs and meat. The most frequent statements described a considerably larger number of sea turtles in the past, and also the collection of almost all eggs and the killing of females. Statements obtained in some coastal communities during TAMAR's first years activities indicated that due to the collection of eggs, some coastal communities had never seen a baby sea turtle. In the beginning of the '80s there were still jewelry production factories producing jewels with turtle's carapace. Although some populations



have demonstrated signs of recovery and the past threats have ceased (egg collecting and female killing), this data should be interpreted with extreme caution. Sea turtles are animals with long life cycles and late sexual maturity; thus it is possible that current nesting numbers will not be maintained in the future.

Sea turtles conservation is a complex challenge and requires long-term knowledge about essential aspects of its basic biology, such as reproduction, migration and feeding habits.



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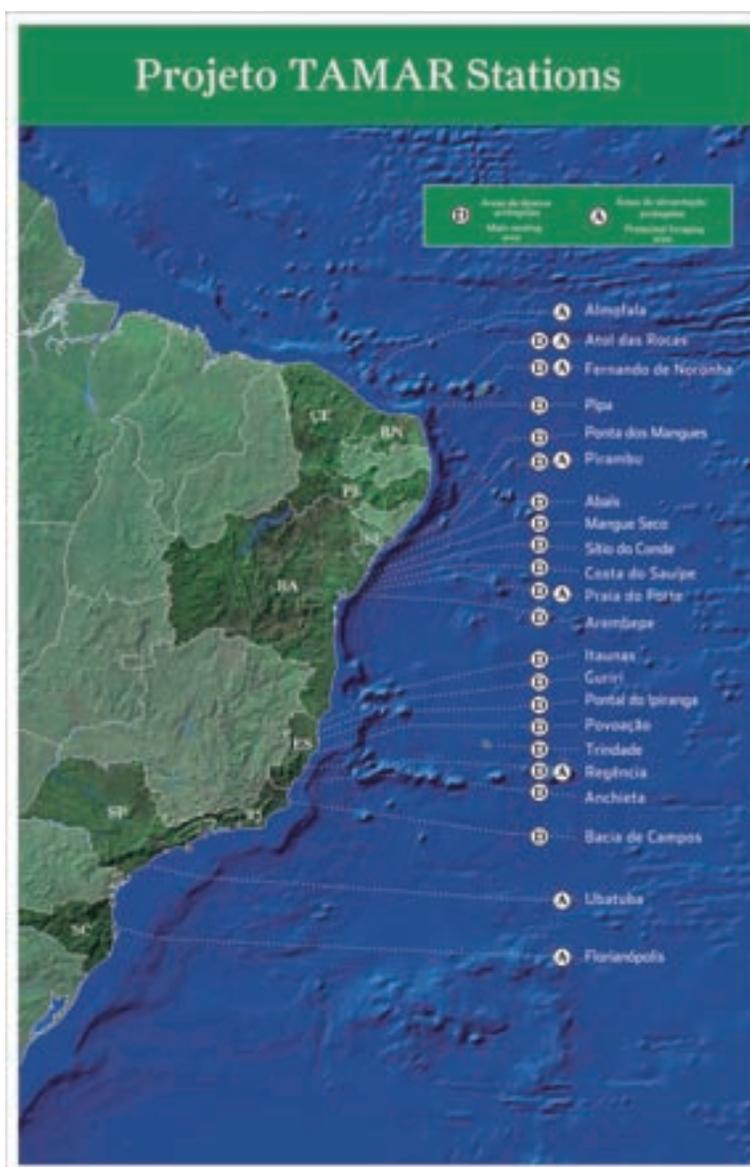
## PROJETO TAMAR – MISSION AND RESULTS

### Mission

Develop conservation actions and research in order to ensure the recovery and survival of the five species of sea turtles in Brazil, at healthy levels able to fulfill their ecological roles

### Results

- 23 stations along the Brazilian coast;
- 1,100 km of priority conservation areas monitored
- More than 20,000 nests protected annually of five sea turtle species;
- Around 1,200,000 hatchlings released every year of five sea turtle species;
- 1,610 tagged females of five species (2010/2011 nesting season);
- Near of 1,000 turtles of five species rescued alive from fishing nets, pond nets and corrals.
- SITAMAR – Integrate Information system. Database with 286,000 records collected in a standardized way, over 30 years of activities;
- 1,300 direct jobs generated by sea turtle conservation activities more than 80% are natives of local communities;
- 900 local people benefits from income-generating programs (e.g. artisanal and embroidery groups, etc.)
- Crew set consists of over 160 technical people, aided by 280 interns and trainees annually;
- 149 scientific publications
- More than 1,500,000 people attended the Visitors and Environmental Education Centers, educational campaigns and exhibitions;
- 300 children enrolled at nursery school in Praia do Forte





## STRATEGY OF THE INSTITUTO CHICO MENDES FOR THE CONSERVATION OF SEA TURTLES

For 30 years TAMAR has been developing strategies for the conservation of the five species of sea turtles. In 2005 an action plan was proposed. This plan served as a bench mark.

From November 23<sup>rd</sup> to 26<sup>th</sup> 2010, in Arembépe, Bahia TAMAR coordinated a planning workshop to update the original plan, considering the actual scenario of impacts and threats to the five sea turtle species.

This workshop was possible due to the knowledge and the experience obtained since the beginning of TAMAR and the partnerships with local communities and nongovernmental organizations. Eight goals and 73 actions were established. More than 30 researchers from different institutions attended the workshop, including a representative number of experts from TAMAR. To support TAMAR's mission of conservation and recovery of these species a specialist group was established for the implementation of the NAP in accordance to the Ordinance 316/2009 (MMA/ICMBio).

In December 2010, the Instituto Chico Mendes validated the decisions taken in the workshop, approving the NAP of Sea turtles as defined in the Ordinance 135, December 23<sup>rd</sup>, 2010.

### GOALS OF THE NAP

Goals (Five year period)	Number of Actions	Estimated Cost R\$
1. Monitoring of major fisheries that interact with sea turtles	8	6.450.000,00
2. Reduction of the incidental capture and mortality of sea turtles in fishing activities	12	1.175.000,00
3. Intensification of Sea Turtle's Incidental Capture issues within national and international forums of fisheries management.	6	325.000,00
4. Monitoring of the main breeding areas of sea turtles	9	21.560.000,00
5. Identification, protection and monitoring of main sea turtle foraging areas	7	12.650.000,00
6. Restriction and reduction of anthropogenic impacts in key areas of occurrence of sea turtles	7	305.000,00
7. Reduction of impacts caused by pollution	2	130.000,00
8. Increase scientific knowledge related to the conservation of sea turtles	20	1.855.000,00
<b>Total</b>	<b>71</b>	<b>44.450.000,00</b>



#### SUPPORT



#### PROBIO II

To know more about the NAP please visit:

<http://www.icmbio.gov.br/biodiversidade/fauna-brasileira/lista-planos-de-acao-nacionais>