

SEA TURTLE FEEDING GROUNDS OF BRAZIL

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The main sea turtle nesting sites in Brazil have been protected since 1980 by TAMAR (Brazilian Sea Turtle Conservation Program), a federal government initiative of IBAMA (Brazilian Institute for the Environment), co-managed by Fundação Pró-TAMAR, a non-governmental organization. Since then, TAMAR has also collected information on dead and stranded turtles found along the Brazilian coastline. Of the seven species of sea turtle existing in the world, five are found in Brazil: loggerhead (*Caretta caretta*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*) and olive ridley (*Lepidochelys olivacea*) (Marcovaldi and Marcovaldi 1987). Following the establishment of conservation and re-search stations at the main nesting areas, TAMAR began in 1991 to work in the main feeding grounds, where the levels of incidental capture is high (Marcovaldi 1991). Initial efforts to increase at-sea protection of marine turtles found in feeding areas were at Ubatuba and afterwards in Almofala and Pontal do Peba (Figure 1). In addition, some of the nesting beaches also support regular numbers of turtles that feed, mate, and rest in the nearby coastal waters. All stations collect information on dead and stranded turtles found along the beaches.

As was done with data from nesting turtles, a database has been created to organize and standardize the collection of information in the feeding grounds. Date, time of occurrence, condition of turtle (alive, dead or drowned), curved carapace length and width, species, sex (when possible), tag

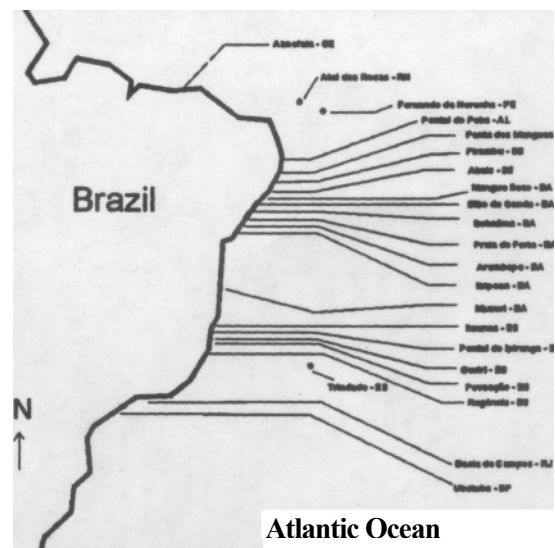


Figure 1. Location of TAMAR stations in Brazil

number and the final outcome (dead, released at sea, or held in recovery tanks) are all recorded. Important notes are also recorded through key words in a specific field of the database. Data recording goes through the following steps: a field notebook, a regional database and the national database where all the information is gathered and kept. Detailed information has been gathered on the fishing methods that most often capture marine turtles in Brazilian coastal waters where TAMAR is working, and is now being de-scribed and compiled in a manual (Fundação Pró-TAMAR, in prep.).

Fishing methods are mostly artisanal, the most common being: floating weirs, set nets and fish traps. This census will help to identify the main threats to the turtles in their feeding grounds and also aid the development of appropriate management and conservation strategies necessary to address their impacts.

The overall results obtained so far reveal specific characteristics of each area, which enables TAMAR to

Table 1. Number of dead turtles recorded by TAMAR along the Brazilian coastline since 1980.

| SPECIES | NUMBER |
|-------------------------------|-------------|
| <i>Chelonia mydas</i> | 959 |
| <i>Eretmochelys imbricata</i> | 45 |
| <i>Caretta caretta</i> | 154 |
| <i>Lepidochelys olivacea</i> | 202 |
| <i>Dermochelys coriacea</i> | 10 |
| Non identified | 1530 |
| TOTAL | 2894 |

apply specific methodologies for their management. Depending on the physical and cultural characteristics of the feeding grounds, the work is divided into two major strategies. First, environmental education is undertaken at sites with high levels of capture, with the aim to alert the local fishermen of the threats of some fishing techniques to sea turtles and the marine environment. Through the campaign "Not everything caught by the fishing net is fish," techniques of reviving captured turtles that are unconscious are taught to the fishermen and the coastal communities in general. The campaign involves informal conversation, video presentations (a special 5 minutes animation video was made for this purpose), and distribution of leaflets and posters. Hiring the people involved in fisheries activities to work for the protection of turtles checking the nets for turtles and orienting other fisherman about better spots for placing nets, as well as creating new ecologically sound economic alternatives are all part of the program. The TAMAR Program intends to revive and maintain the cultural identity of the coastal areas by employing techniques that directly involve the coastal communities, such as promoting festivals and parties with the sea turtle image as the theme. This strategy is used mainly at the Ubatuba and Almofala stations (Figure 1). The second strategy that began in 1987 is in water re-search studies on behavior and growth parameters of marine turtles, and takes place at sites with good diving conditions. Researchers capture sea turtles through free diving, tag the individuals, and take notes on weight and curved carapace length and width (Bellini and Sanches 1996). Tags used are Inconel (

and are placed one on each of the front flippers, at the trailing edge proximal to the first scale. After which, turtles are immediately released to the sea. As the capture of turtles using free diving is a specialized skill, currently TAMAR is undertaking to train its in-terns and permanent staff in these techniques. This occurs mainly in Fernando de Noronha and Atol das Rocas (Figure 1).

Of 6561 records, only 44.1% correspond to dead and stranded individuals. In the majority of the cases, the cause of death could not be identified, due to advanced decomposition, which could indicate that these deaths occurred off shore or in harbors away from TAMAR stations. Table 1 presents data on dead turtles found along the coast by species. In Alagoas State (Pontal do Peba- AL) (Figure 1), most turtles were already far too decomposed to enable the identification of the species or cause of death.

In Bahia (BA) and Espírito Santo (ES) States set nets are a common fishing device that capture sea turtles,

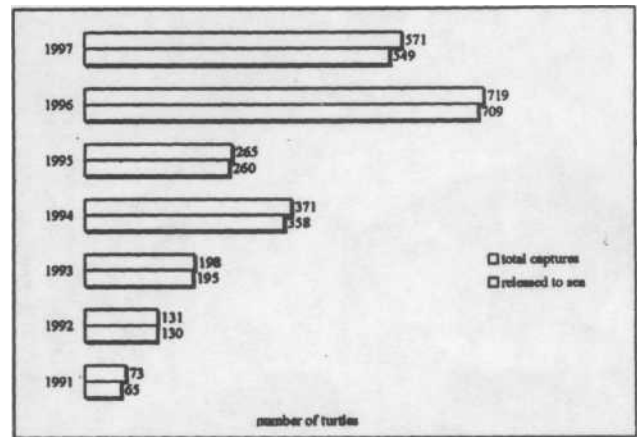


Figure 2. Number of turtles captured on fishing devices and safely released to the sea by TAMAR

and in Sergipe State (SE) semi-industrial shrimp trawlers are common.

The records of turtles captured in fishing devices are mainly from the fishing communities of Ubatuba (87.3%) and Almofala (6.7%), where most of the turtles were safely released to the sea (98.5% at Ubatuba and 98.7% at Almofala). In Ubatuba, most of the turtles captured (98.3%) were *Chelonia mydas*, where carapace measurements suggest a population of juveniles and sub adults (Table 2). Floating weirs are the fishing devices that more often capture sea turtles in the area (79.6%). At Almofala the greatest majority of individuals were also *Chelonia mydas* (92.5%), and carapace measurements suggest a population of juveniles to adults (Table 2). Fish traps are the fishing devices that more often capture sea turtles in this area

Table 2. Records of green turtle (*Chelonia mydas*) captures in Ubatuba and Almofala Stations; CCL - curved carapace length CCW = curved carapace width, weight in kg.

| Station | Max CCL | Min CCL | N | Max CCW | Min CCW | N | Max weight | Min weight | N |
|----------|---------|---------|------|---------|---------|------|------------|------------|------|
| Ubatuba | 96,0 | 27,0 | 2141 | 91,5 | 21,0 | 1944 | 2,4 | 83,0 | 2019 |
| Almofala | 120,0 | 27,0 | 170 | 113,0 | 21,0 | 170 | - | - | - |

(91.2%).

In Atol das Rocas and Fernando de Noronha (Figure 1), 1127 captures of sea turtles were recorded during underwater studies, being 770 captured at the first station and 357 at the latter one. The species most frequently captured were *Eretmochelys imbricate** and *Chelonia mydas* in both places (Table 3).

Because individuals are tagged before release, upon recapture data on growth rates and behavior are obtained.

Table 3. Records of sea turtle captures in Fernando de Noronha and Atol das Rocas Stations; CCL = curved carapace length (In cm), CCW = curved carapace width (in cm), weight in kg.

| Station | Max CCL | Min CCL | N | Max CCW | Min CCW | N | Max Weight | Min Weight | N |
|-----------------------|---------|---------|-----|---------|---------|-----|------------|------------|-----|
| F.Noronha | | | | | | | | | |
| <i>E.imbricata</i> | 84,0 | 30,5 | 395 | 68,0 | 26,0 | 287 | 42,0 | 1,5 | 277 |
| <i>C.mydas</i> | 81,0 | 32,0 | 73 | 73,0 | 26,5 | 36 | 31,0 | 3,8 | 40 |
| Atol das Rocas | | | | | | | | | |
| <i>E.imbricata</i> | 86,5 | 35,0 | 153 | 75,0 | 32,0 | 133 | 51,0 | 6,5 | 29 |
| <i>C.mydas</i> | 85,0 | 33,5 | 160 | 75,0 | 30,0 | 151 | 22,0 | 4,5 | 22 |

When capture happens away from the beach, researchers only tag and measure the turtles, without weighting them. At Atol das Rocas, the same methodology is also used for adult individuals that reproduce in the area, which are not weighted due to their dimensions (Table 4). The only species nesting there is *Chelonia mydas*.

The number of turtles saved and released at sea is increasing annually at TAMAR stations (Figure 2). Through

Table 4. Biometric parameters of *C. mydas* captured at Atol das Rocas using free diving.

| | Max CCL | Min CCL | N | Max CCW | Min CCW | N |
|----------------|---------|---------|-----|---------|---------|-----|
| Males | 84,0 | 30,5 | 395 | 68,0 | 26,0 | 287 |
| Females | 81,0 | 32,0 | 73 | 73,0 | 26,5 | 36 |

these research and conservation activities, TAMAR is gaining a better understanding of sea turtles at different life history stages, and is working to protect them as well as their habitats. All work is carried out with due consideration of the environmental, social, economic and cultural conditions of the local communities.

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