

Helping the People Help the Turtles: The Work of Projeto TAMAR-IBAMA in Almofala, Brazil

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The conservation project TAMAR-IBAMA has been protecting marine turtles in Brazil since 1980 (Marcovaldi 1991; Marcovaldi & Marcovaldi 1999). The first priorities were seen to be in the nesting areas where the main concerns were capture of female turtles, collection of their eggs and increasing development of coastal regions. After making significant inroads towards successful conservation at the nesting beaches (Marcovaldi et al. 1995), Projeto TAMAR launched its efforts in two feeding areas where the accidental capture by artisanal fishing is high: Almofala, Ceará, and Ubatuba, São Paulo. This paper concentrates on the history and success of the work in Almofala.

In order to reduce mortality of marine turtles accidentally captured in fisheries, TAMAR established a Field Station in 1992 in Almofala (02 50'S and 40 09'W) in the state of Ceara.

Almofala is a settlement of the indigenous Tremembé people, with a population of around 5,000, mostly living from artisanal fisheries which involve the use of traditional fishing weirs, gill nets, fish traps, line fishing and lobster pots. Although some incidental catch of marine turtles occurs in all methods, most are caught in fish weirs which are large non selective traps, and most being juvenile green turtles (*Chelonia mydas*; also known locally as Aruanã), which are abundant in the Almofala region (Lum et al. 1998, Lima et al. 1999, Lima 1999) In addition, leatherback (*Dermochelys coriacea*), olive ridley (*Lepidochelys olivacea*), hawksbill (*Eretmochelys imbricata*), and loggerhead turtles (*Caretta caretta*) have also been occasionally captured in the weirs (Marcovaldi et al. in press)

With the establishment of the TAMAR field station in Almofala, detailed data on recent capture statistics have been compiled (Lima 1999) and details of these and other research activities will be published elsewhere. In addition, over the 8 year span of this project, there have been many other activities in the community implemented by TAMAR-IBAMA. These activities can be roughly divided into education/awareness efforts and the creation of alternative economic activities, both of which serve to increase acceptance of sea turtle conservation at the local level, and also to increase involvement of community members in the TAMAR programme. This paper summaries these efforts which have been described in more detail in a recent technical report (Lima 2000).

Educational Activities

Direct contact with fishermen: As part of the day to day monitoring of incidental catch and the undertaking of research initiatives, a large number of fishermen are contacted directly, and this interaction is an avenue to exchange information and ideas, including direct information

regarding marine turtles and the needs of the community. In 1999, 1,684 contacts were made and each individual fishermen who participated in the monitoring program (total = 15) was entered into a raffle for two bicycles (the most common means of local transportation). This annual incentive for the fishermen helps to stimulate good will and support for the following season.

Environmental seminars with teachers: In order to discuss the environmental problems of Almofala with teachers, TAMAR organises an annual "Seminar of Environmental Education for School Teachers and Local Leaders". This brings together teachers and local leaders, where ecological, health and educational issues are discussed. Solutions are sought to problems in these areas. In 1999, a total of 30 teachers were involved in activities held over 3 days.

Presentations and activities with schoolchildren: The organisation and elaboration of environmental educational units developed by TAMAR are already integrated into the general educational programme in schools. By encouraging the study of the biology of local animals, familiarisation with local environments, both marine and terrestrial through guided nature walks and direct interaction with local habitats, we attempt to seed a conservation ethos in children and teenagers. The direct participation of school teachers, together with technicians from TAMAR, helping, organising and setting up the units, is very important in the development and success of these activities. It facilitates an important feeling of participation and shared responsibility for the activities being developed.

Aruanã museum and exhibition tank: Nearly always, environmental education activities developed are complemented with visits to our on-site Aruanã (Turtle) Museum, which hosts a wide range of educational tools (leaflets, books, posters, video). There are also small tanks, which hold both marine turtle hatchlings from other nesting sites in Ceará, as well as injured and recuperating turtles rescued from fisheries. Interaction with live turtles provides an opportunity to establish a link between conservation activities and intended results.

Environmental week: Together with teachers from local schools, TAMAR organises an Environmental Week. Several activities take place such as: fairs; games; planting of trees; an anti-litter campaign involving a street-march; showing of environmental videos, posters and photographs in the streets. The massive participation of all local schools shows the strength of the response to TAMAR's efforts: nearly 789 schoolchildren participated in 1999.

Public exhibitions: To promote the conservation activities of TAMAR, an exhibition stand with posters, pictures, turtle shells and other educational materials was put together, and taken to the International Airport in the state capital at Fortaleza. This stand was open 12 hours a day for 5 months with 3 trained persons answering questions from some 20,000 visitors about protection of marine turtles, environmental education and social activities developed by TAMAR in the state of Ceará. A second exhibition stand was organised in a shopping mall in Fortaleza which was visited by approximately 50 000 members of the public. Two additional photographic exhibitions in shopping malls were attended by more than 30 000 visitors.

Science fairs and field visits for students in tertiary education: In 1999, TAMAR participated in the organization and orientation of ten school teams from various locations in Ceará in a total of nine Science Fairs promoted by public and private schools in Fortaleza. TAMAR also hosted

visits by groups of university students studying fisheries, biology, geography and veterinary medicine.

Production of local turtle newsletter: "Jornal Aruanã" is now circulated in schools, community centers and others areas of Almofala and environs. Published twice per year, with 50 copies of each issue distributed locally, the journal covers a variety of subjects concerning the community, with information about environmental, educational and health issues of the region. Schools, medical doctors and presidents of non-governmental associations have participated actively in the organisation and preparation of this newsletter.

Supporting cultural events: TAMAR actively participates in socio-cultural events that are important to the community, creating a strong bond between TAMAR and the community. These include: Christmas parties organized at the Community Association, and festivities at Easter, Mother's and Children's Day, with over 940 persons participating in total in 1999. Promoting appreciation of local culture, an annual dancing festival is organised where a special dance, the "Quadrilha das Tartarugas" (Turtle Square Dance) is performed by 25 local couples and watched by over 1000 other participants.

Training of students: Each year two university biology students are trained in conservation biology and other activities undertaken by TAMAR by participating in an intern program, lasting up to 6 months.

Creating economic alternatives

Proposed alternative economic activities are driven by the output of meetings between TAMAR and the Community Association, which was established in 1993 and has 120 members. The overall idea is that efforts will be better targeted towards producing solutions to problems, through the development of partnership with federal, state and municipal government agencies and representatives and local experts. Current activities include:

Assistance in the production of artificial reefs (marambaias): These are commonly found in Almofala and are used to aggregate midwater and demersal fishes. They are traditionally built with mangrove wood by the community. In order to increase the fishing yield, reduce fishing effort directed at marine turtles and help preserve mangrove, TAMAR has helped to build artificial reefs marambaias using scrap tires, metal structures and air compressors confiscated by IBAMA.

Co-ordination of the community vegetable garden: As an alternative source of income, and wholesome food, TAMAR has developed a community vegetable garden, administered by the Community Association of Almofala, which has helped to increase local household earnings. The garden surplus production complements the meals of 120 children of the local nursery. The rest of the production is sold for the community, the proceeds of which are reinvested to maintain the garden. Through this programme, local children have classes on how to make and care for their own vegetable gardens at home.

Development of embroidery and lace-making groups: TAMAR promotes the culture of lace making, supporting a mini course for locals. Its purpose was to rescue the art as previously it was

not being passed orally from generation to generation. There are also embroidery and sewing groups which receive support from TAMAR. Artisans sell their goods at the community centre of Almofala and other crafts markets in the region.

Additional community support activities

TAMAR is also involved in additional community participation activities such as providing ongoing support for a kindergarten for 120 children, organising training workshops for recycling paper, dancing and crafts for teenagers. TAMAR and the Community Association of Almofala have participated in projects regarding sanitation and also the opening of a local Health Post.

Conclusions

All the activities presented here have been accomplished in the past 8 years. During this time, I believe that these activities and interactions are changing the way the local community views itself in relation to its surroundings. One aim is to instil a growing environmental awareness ethic so that marine turtles are no longer thought of as an easy source of food, but more as an integral part of the wider ecosystem that should be conserved not only for the present day but also future generations. I am confident that the next 8 years and beyond will be just as fruitful and rewarding, in terms of sea turtle conservation and community participation in the community of Almofala.

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