

STATUS AND CONSERVATION OF SEA TURTLES IN THE REPUBLIC OF SEYCHELLES

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BACKGROUND

The Islands. The Republic of Seychelles comprises some 115 islands spread over an area of 1,300,000 km² in the western Indian Ocean, northeast of Madagascar. Geologically there are three types of islands: the granitic Seychelles clustered in the northeastern part of the country, the sand cay islands (including the Amirantes, Platte and Coetivy, Farquhar and Providence) spread across a wide swathe in the central and south east regions, and the more distant upraised limestone reef islands (including Aldabra, Assumption, Cosmoledo, and Astove) in the far southwest. More than 99% of the human population of 70,000 resides on only three islands in the granitic Seychelles--Mahe, Praslin and LaDigue.

The Turtles. Both nesting and foraging turtles occur at virtually every island. Green turtles (*Chelonia mydas*) nest primarily in the remote Aldabra and Cosmoledo island groups. Hawksbills (*Eretmochelys imbricata*) nest primarily in the granitic Seychelles, the Amirantes group, and at Platte and Coetivy. The hawksbill nesting populations of Seychelles are unique in that they are among the largest remaining in the world today, and consist of animals that nest almost exclusively in the daytime (a trait shared only with a few small populations of hawksbills in the western and central Indian Ocean).

Sea turtles are relatively more numerous in Seychelles than elsewhere, due largely to the fact that Seychelles was not inhabited until 1770; however, they are much reduced from historic levels (Mortimer, 1985; Frazier, 1984). Turtles have been legally protected for almost three decades at several sites in Seychelles including remote Aldabra atoll which is now a World Heritage Site, and in the granitic Seychelles at Ste. Anne Marine National Park, Curieuse Marine National Park, Cousin and Aride Islands.

Past Exploitation. The people of Seychelles view turtles as an integral part of their culture and economy. Turtles are featured as the motif for the Central Bank and on stamps and currency. Until 1968, large quantities of calipee from green turtles were exported to Europe from Seychelles for the production of turtle soup, and until recently, green turtle meat also featured prominently in the local diet in both fresh and salted ("kitouz") forms. People have slaughtered Seychelles' hawksbills for their shell for more than 200 years, historically exporting large quantities to Europe. In recent decades the primary market for raw hawksbill shell has been Japan, while the remainder has been used locally to fashion curios for the tourist trade. Traditionally Seychellois do not eat hawksbill meat since they consider it poisonous, as in fact, it occasionally is (see review in Mortimer, 1985; Ranaivoson *et al.*, 1994). In recent years, however, some people have acquired a taste for it.

CONSERVATION OF SEA TURTLES IN SEYCHELLES TODAY (EMPS PROJECT J1)

Phase I: Artisan Training and Compensation. In 1989 and 1990, the Government of Seychelles developed an Environmental Management Plan for Seychelles (EMPS). Among the 50 projects included in the plan was Project J1 focusing on the protection of endangered sea turtles. To qualify for GEF funding from the World Bank, one of the requirements was to initiate legislation outlawing the use of hawksbill shell in the local tourist trade. Prior to passing such a law, it was necessary to ensure that the curio artisans did not suffer undue economic hardship. To this end, the government devised and implemented the first phase of Project J1 entitled "Artisan Training & Compensation." The goal of this project, funded jointly by the Seychelles Government and the World Bank, was to compensate and to

retrain the artisans who made their living working hawksbill shell. In brief, 21 workshops employing 40 artisans were identified. Negotiations were conducted and the artisans agreed to be compensated at a rate that averaged about \$15,000 per artisan. The artisans also agreed to sell their remaining stocks of raw shell to the Seychelles Government. A total of 2.5 tonnes of raw hawksbill shell was purchased at a cost of approximately \$250,000 and placed in a locked container (Collie, 1995). In 1994, the "Wild Animals (Turtles) Protection Regulations of the Wild Animals and Birds Protection Act" were passed completely protecting sea turtles and banning all commercial trade in their products. Today, the ban on the sale of tortoiseshell products is well-enforced in the Seychelles.

Phase II: Turtle and Tortoise Conservation. In 1995, the senior author (JAM) was hired to conduct the second phase of the J1 Project entitled "Turtle & Tortoise Conservation." This project, funded jointly by the World Bank and the Government of Seychelles, allows for continuation and expansion of work begun by JAM in 1981 when a three-year-long turtle survey was conducted with funding from WWF International and the Seychelles Government (Mortimer, 1985). In the intervening years, turtle monitoring has continued in the Marine National Parks, at Cousin Island (Mortimer and Bresson, 1994) and at Aldabra Atoll (Mortimer, 1988). In 1987, with funding from the Smithsonian Institution and the Seychelles Islands Foundation, we (JAM and JC) initiated what is now an ongoing study of growth rates among juvenile green and hawksbill turtles at Aldabra. Educational materials for the school children of Seychelles were produced in 1986-87 in collaboration with the Seychelles Ministry of Education and WWF-International. Among the materials produced were booklets for school children (Mortimer, 1986a) and their teachers (Mortimer, 1986b) along with instructional videos ("Nesting on the Verge of Extinction" about the natural history and conservation of hawksbill turtles in Seychelles and "Turtles, Tortoises and Terrapins of Seychelles--their natural history and conservation" both produced in collaboration with the National Audio-Visual Centre of Seychelles).

Today, the "Turtle & Tortoise Conservation" Project J1 supports production of a Management Plan for Turtles and a wide range of activities that include the following:

- 1) Turtle Biology. Monitoring of turtle populations at nesting beaches and foraging grounds is being conducted throughout the country in collaboration with staff from the Marine Parks Authority and the Conservation Section of the Division of Environment, the Seychelles Islands Foundation (at Aldabra), BirdLife International (at Cousin and Frigate Islands), The Wildlife Trusts (at Aride Island) and also the owners and managers of some of the privately owned islands (especially Cousine, Bird and Denis Islands). The migratory patterns of both adult and juvenile animals in the western Indian Ocean are being examined through a combination of physical tagging and analysis of mtDNA (in collaboration with Dr. Craig Moritz at the University of Queensland). The long term growth rate study of juvenile turtles foraging at Aldabra continues and new growth rate studies have been initiated at other sites. Hundreds of blood samples have been collected from foraging animals and sent to the lab of Dr. Louis Guillette and Drew Crain at the University of Florida to determine sex ratios within foraging populations.
- 2) Turtle Habitats. We are identifying critical nesting and foraging habitats with the goal of providing special protection where it is needed.
- 3) Human Impacts. We are assessing levels of poaching, destruction of nesting and foraging habitat, and the impact of feral animals on nesting beaches, and recommending what measures are needed to address these problems.
- 4) Institutional Strengthening. The Seychellois personnel mentioned above in item "1)" are being trained through a combination of on-the-job-training and special full day workshops conducted by JAM entirely in the local language (Seychellois Kreol). Monitoring protocols have been standardized for all the study sites and booklets prepared to document them. The data bases are being computerized. Equipment procured through the project includes boats, a truck, computers and printers, turtle tags, etc.
- 5) Legislation and Judiciary. Recommendations for revision of legislation are being made. Steps have been taken to improve collaboration between the Division of Environment and the Attorney General's Office when prosecuting cases involving turtles. Special seminars are being given to sensitize key personnel including the Magistrates, the AG's Office, the Police, and the Coast Guard.
- 6) Public Awareness. We are conducting public awareness campaigns for the general public as well as more specialized programs aimed at school children. For the general public we utilize television, radio, newspapers, workshops, and public presentations. We find television, however, to be particularly effective, in part because there is only one TV station in the country, and in part because the management and staff of the Seychelles Broadcasting Corporation (SBC) are keenly interested in conservation issues. SBC willingly airs news items pertaining

to turtle biology and conservation issues, has hosted round-table discussions about turtle conservation, and recently produced an excellent one-hour-long documentary about turtle conservation expressly for the Seychellois audience.

To sensitize school children we are collaborating with the Ministry of Education which now has several Seychellois teachers who have been trained overseas as specialists in environmental education. Our program includes presentations in the schools, production of new teaching aids about turtles, and encouraging the use of materials produced in the past. During the coming nesting season we will work with the 15 branches of the Wildlife Clubs of Seychelles to generate enthusiasm for turtles among their young membership.

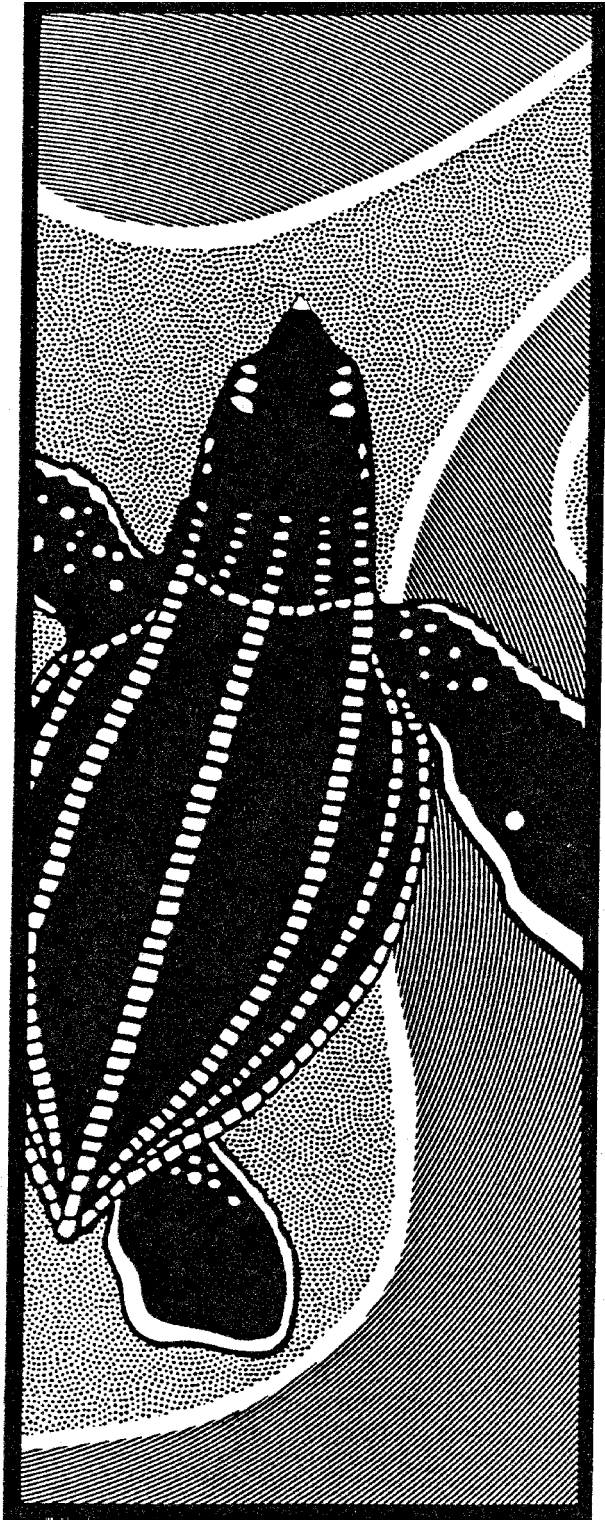
We believe that campaigns to promote public awareness are key to successful turtle conservation. During the past 15 years in Seychelles we have noted a major change in attitudes toward turtles (especially among young people). In our sensitization campaigns we try to instill an appreciation for the beauty of the living animals, an understanding of the complexity of their life cycles, as well as an awareness that live turtles can be a strong tourist attraction if marketed properly. And tourism is now the major source of badly needed foreign exchange in the Seychelles.

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NOAA Technical Memorandum NMFS-SEFSC-415



**PROCEEDINGS OF THE
SEVENTEENTH ANNUAL
SEA TURTLE
SYMPOSIUM**

**4-8 March 1997
Orlando, Florida, U.S.A.**

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December 1998

**U. S. Department of Commerce
National Oceanic and Atmospheric
Administration
National Marine Fisheries Service
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