

## A Clarification on the Activities of Projeto TAMAR, Brazil

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Recently Vogt (1994) published a number of opinions about temperature-controlled sex determination (TSD) as a tool for turtle conservation. In addition to the comments made by Mrosovsky and Godfrey (1995) relating to biological aspects and conservation strategies, there are other points in Vogt's note which require clarification, in particular, assertions about the marine turtle project, TAMAR, which has been running since 1979 in Brazil.

As is routine for conservation programs on marine turtles in Latin America, a priority for TAMAR is to increase hatching success and recruitment. Where nest predation is high because of human exploitation of eggs, the usual tool for turtle conservation is the transplanting of eggs from beaches to protected hatcheries. At TAMAR we are well aware that, when compared to natural nests, this form of manipulation *may* result in a reduction in hatching success, as well as alterations in the "natural" sex ratio and behavior of hatchlings. However, in areas where virtually no nest survive to hatching, the transplanting of eggs to hatcheries is the most viable, cost-effective conservation alternative, at least in the short term.

In order to reduce undesirable effects of manipulation, TAMAR hatcheries are located in the ecological beach zone in which most nesting occurs, and eggs are transplanted to the respective hatcheries within six hours of oviposition. Once removed from their natural nests, eggs are handled with the greatest possible care and transplanted into artificial nests made to resemble natural nests as closely as possible.

It must be emphasized that transplanting eggs is *not* the ultimate priority of TAMAR, but rather we are working to leave intact as many nests as possible where they are originally constructed by the nesting female. On beaches where nest predation is minimal, the policy is to leave all nests intact, except those clearly in danger of being flooded by high tides. Of the more than 8000 nests monitored and

protected annually by TAMAR personnel on both continental and oceanic island beaches, approximately 70% are left *in situ*. However, on continental beaches alone, where predation is higher, in 1994 only 31.5% of protected nests (890 of 2826) were left *in situ*.

Contrary to Vogt's (1994) contention, we do *not* intentionally incubate eggs at 31°C (or at any other specific temperature); all transplanted eggs incubate at temperatures and conditions that are for all intents and purposes "natural," given the location of the hatcheries. At any rate, there is no deliberate manipulation of incubation temperature in any of the TAMAR hatcheries.

Whether 31 °C is "low" for sea turtles in Brazil, as Vogt (1994) suggests, is unknown; studies of TSD are just beginning in collaboration with Dr. N. Mrosovsky. It is important to realize that five species of marine turtles nest in Brazil (*Caretta caretta*, *Chelonia mydas*, *Eretmochelys imbricata*, *Lepidochelys olivacea*, and *Dermochelys coriacea*), some of them over hundreds of km of coast, so there are likely to be differences in the pivotal temperature among species and nesting areas. All of these nesting areas in Brazil are characterized by tropical climates, as is the general case for most major areas of marine turtle nesting.

The reference to TAMAR as "a multimillion dollar project" (Vogt, 1994) is true only if one considers the total flux of monies involved in this project over its 16 years of continuous operation. In this respect it is essential to appreciate that the strategy of TAMAR is to use marine turtles as flagship species and, in this way, stimulate a nation-wide awareness and support for biological conservation. In addition to marine turtle conservation, other TAMAR priorities include identifying, designing, and administering coastal protected areas; carrying out conservation activities for diverse marine and coastal species needing protection or management; designing and executing programs on environmental education; training students and rural people in aspects of marine turtle and natural resource conservation; and designing and executing programs focused on rural community participation and development, while providing relevant and viable alternatives for livelihood. These activities are carried out by approximately 250 employees in 23 TAMAR bases, spread along 3000 km of Brazilian seaboard, with intensive monitoring of 1000 km of coast.

A synopsis of Projeto TAMAR was presented in 1992 during the IV Encontro Brasileiro de Herpetólogos and subsequently published (Baptistotte, 1994). One of TAMAR's consistent priorities has been to develop collaborative arrangements with national and international organizations, investigators, and conservationists, and this policy continues to prevail.

#### **Literature Cited**

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