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An analysis of the role of local fishermen in the conservation of the loggerhead turtle (*Caretta caretta*) in Pontal do Ipiranga, Linhares, ES, Brazil

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ABSTRACT

The role of researchers and fishermen in the clutch management of loggerhead sea turtles was evaluated for 10 nesting seasons at Pontal do Ipiranga TAMAR station, Linhares, ES. The comparison of nests transferred by researchers and locals (*carebeiros*) showed that clutches transferred by researchers presented higher clutch size. Clutch size between nests transferred by *carebeiros* and left *in situ* did not show significant differences. Hatching success was significantly higher for clutches left *in situ* than for those transferred to other places in the beach or to hatcheries. The clutches transferred exclusively by researchers achieved a higher hatching success than those transferred partially or totally by *carebeiros*. The relocation time of clutches collected by *carebeiros* and handed to researchers affected hatching success. It is recommended that clutches be left *in situ*, provided they have adequate conditions for monitoring, but careful clutch translocation, independent of the interval elapsed after laying, may also constitute a viable technique for the conservation of sea turtles in the region.

1. Introduction

Conservation activities of sea turtles in Brazil began in 1980, with the creation of the Brazilian Sea Turtle Conservation Program – Projeto TAMAR-IBAMA. Initial surveys revealed that there were three main continental nesting sites of sea turtles, in Praia do Forte, state of Bahia (BA); Comboios, state of Espírito Santo (ES) and Pirambu, state of Sergipe. Since then, the Program has gradually expanded and currently covers 1100 monitored kilometers of coastline (Marcovaldi and Marcovaldi, 1999). All species of marine turtles are considered threatened in Brazil, and the loggerhead *Caretta caretta* is classified as vulnerable (Ministério do Meio Ambiente, 2003).

The second largest nesting site of the loggerhead turtle in Brazil is located in Espírito Santo northern coast (Baptistotte et al., 2003), between the municipal districts of Aracruz, ES (19°, 50′S) and Nova Viçosa, BA (17°, 55′S). There is a TAMAR station in Pontal do Ipiranga, located north of Comboios, in the central portion of the Doce River Coastal Plain (Fig. 1). The beaches monitored by this station are visited annually by more than 40 nesting loggerheads (Almeida, 2002). The Pontal do Ipiranga station, where activities are now carried out seasonally, was created in response to the occupation pressure following the 1990 human occupation of a previously uninhabited beach.

Since the beginning of the station's activities, the local fishermen, who were former predators of the turtles (locally

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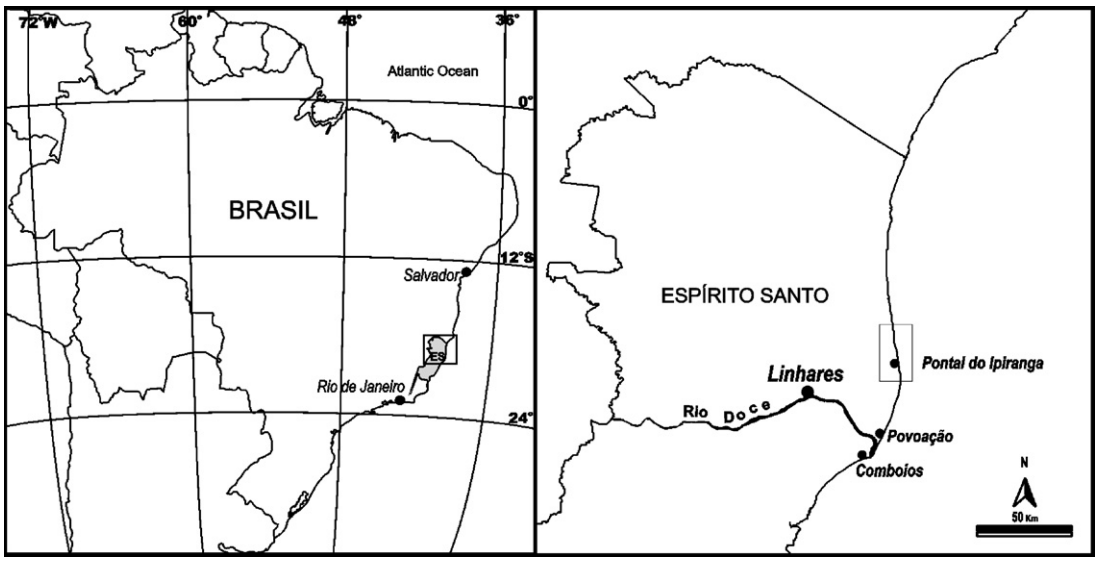

Fig. 1 – Location of the study area.

called *carebeiros*), have been involved in turtle conservation activities, being trained and contracted to protect the nests, to monitor the nests maintained *in situ* or to collect the clutches to be transferred to open air hatcheries. This study evaluates the participation of the *carebeiros* in the conservation of the sea turtles in Pontal do Ipiranga.

2. Materials and methods

2.1. Study area

The southern limit of the study area is located in the region of Degredo, in Linhares (19°22′S, 39°42′W), and the northern limit is situated at Barra Seca, at the municipal boundary of the district of São Mateus (19°09′S, 39°42′W) (Fig. 1).

2.2. Field work

Field work was carried out from 1988 to 1998. Every year, from October to January, 26 km of beach were monitored daily at dawn by *carebeiros*. Each *carebeiro* monitored about 5 km either on foot, by horse, or by bicycle (during low tide). Under normal circumstances, TAMAR'S research team travelled the whole extension nightly with a 4-wheel-drive vehicle to tag females and demarcate/transfer nests. The timing of the trips with the vehicle was accomplished according to tide schedule and height, as high tides did not allow the passage of the car. The jeep was used daily in the reproductive seasons of 1988/1989, 1989/1990, 1991/1992, 1992/1993, 1993/1994 and 1994/1995, almost daily (with some gaps) in the 1990/1991 season and only sporadically during the 1995/1996, 1996/1997 and 1997/1998 seasons.

2.3. Demarcation and transfer of the clutches

Once located, the nests were marked with a wood stake placed one meter away. This was usually done with the aid of a fine wooden probe. (The probing was gradually abandoned, but was largely adopted during the first years; however, it was not possible to assure which nest was probed in the study, although we can state that mostly nests were probed.) The nests deemed at risk of predation (by men or by animals), over washing or erosion by the tides were transferred to more protected locations on the beach or to hatcheries, which are located in the supra-coastal beach zone, enclosed with screen and fully exposed to sun and rain (daily beach patrolling allows to detect possible risks to the nests, such as the presence of predators and beach erosion, the main reasons to decide for a nest relocation). During transfer, the eggs of one clutch were initially placed in a styrofoam box, in layers, surrounded with sand to minimize rotation, with a thicker layer of sand on the top of the clutch. The box was then taken to the open air hatchery, where the eggs were removed and deposited in a chamber that resembles the depth and shape of the nest cavity dug by the female, approximately 50 cm deep and 30 cm in diameter. Once all the eggs were placed in the hatchery cavity, the hole was filled with sand and a partially buried screen was placed around the nest to avoid the dispersion of hatchlings after emergence.

When the patrol car was in use, clutches were delivered by the *carebeiros* to the researchers at the beach. During seasons where vehicle availability was sporadic or absent, the clutches were passed along among *carebeiros* in a "chain" system until they reached the hatchery. Sometimes, the *carebeiros* who operated near hatcheries buried the nests directly, without the researchers' participation.

2.4. Relocation period

The time interval between when the nest was laid and when the clutch was transferred was recorded. The relocation period was classified into four time intervals: Time A – Up to 6 h after oviposition; Time B – From 6 to 12 h after oviposition; Time C – From 12 to 24 h after oviposition; Time D – Over 24 h after oviposition. Both egg collector and depositor were recorded (as researcher or *carebeiro*) for each clutch.