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Status and Distribution of the Olive Ridley Turtle, *Lepidochelys olivacea*, in the Western Atlantic Ocean

Maria Ângela Marcovaldi
Fundação Pró-TAMAR
Brazil

Identity and Description

The generic name *Lepidochelys* was introduced by Fitzinger (1843). The specific name *olivacea* was first used by Eschscholtz (1829), but in conjunction with the genus *Chelonia*. Soon thereafter the binomial *Caretta olivacea* was published (Rüppell 1835), and there were subsequent modifications as well (summarized by Márquez, 1990). Today two species are recognized, *L. olivacea* and *L. kempii*. *L. olivacea* is rare in the Western Atlantic, but large populations inhabit the Indo-Pacific; hence, the common literature misnomer 'Pacific ridley' (see Eckert, 1995). The preferred English name is olive ridley. In Spanish it is known as golfina; in French, tortue olivâtre; in Portuguese, tartaruga oliva.

The olive ridley is one of the smallest of the marine turtles, rarely exceeding 45 kg, with average weights around 35 kg (Schulz, 1975). The basic morphological differences between *L. olivacea* and *L. kempii* include a smaller head in the olive ridley and differences in jaw structure. The carapace of the olive ridley is distinctive in having a variable and often uneven number of lateral scutes, between 6 and 10 pairs. The genus is unique in having four pairs of pores in the inframarginal scutes of the plastron (Pritchard and Mortimer, 1999). The function of these pores is unknown.

Adults are generally olive colored; hatchlings are uniformly dark brown. Hatchlings average 42 mm in carapace length and typically weigh 16-19 g. The costal and vertebral scutes are keeled in hatchlings. Carapace scutes are slightly imbricate (overlapping) in hatchlings and young juveniles, but non-overlapping in adults. For a more in-depth review of the description and/or ecology of this species, the reader is referred to Pritchard (1969), Schulz (1975), Reichart (1989, 1993), Eckert (1995), Pritchard and Plotkin (1995), and Pritchard and Mortimer (1999).

Ecology and Reproduction

Olive ridley turtles are distributed in all tropical and subtropical ocean basins. On a global scale, the olive ridley is probably the most abundant species of marine turtle, with some nesting beaches receiving more than half a million turtles during a nesting season (up to 800,000 on Gahirmatha beach, in Orissa, India — Anonymous, 1994; more than 700,000 on Playa Escobilla on the Pacific coast of Mexico - Márquez et al., 1996). Ironically, it is also the least abundant marine turtle in the Western Atlantic region.

Olive ridleys exist in distinct populations in primarily coastal habitats, but captures far offshore indicate that at least some individuals may be pelagic. The species is carnivorous, generally eating crustaceans and invertebrates, and prefers foraging areas that are near biologically rich bays and estuaries (Reichart, 1993). Migrations and movements are known to exist (based on tag returns) along the coasts of Venezuela, the Guianas, and Brazil, but very little is known about the behavior of the species at sea, including migratory paths. There are no reliable data on age to sexual reproduction or maximal longevity (Reichart, 1993).

Olive ridleys lay 2-3 nests per year, and often nest in consecutive years. In Suriname, clutch size ranges from 30-168 eggs (average: 116) (Schulz, 1975). Some populations in the Indo-Pacific nest *en masse*, a phenomenon which used to occur in Suriname but has not be witnessed for over 20 years in the Western Atlantic. During these events, known as "arribadas", from tens to hundreds of thousands of turtles emerge from the ocean to nest on the same beach over a period of a few days. The stimuli which precipitate the beginning of an arribada may include environmental factors such as wind speed and direction and phases of the tide and moon, and gravid females apparently can delay nesting for sev-

eral weeks, despite the presence of fully shelled eggs. Arribada nesting continues during daylight hours also, in contrast to most other marine turtle species that prefer to lay their eggs under the cover of darkness.

The arribada behavior is not fully understood. It has been suggested that this is a form of predator saturation which may increase the likelihood of survival of the hatchlings produced (Pritchard, 1969). Evidence from Pacific Costa Rica suggests that, on average, a nest laid during an arribada is less likely to suffer predation than a nest laid by a solitary female (Eckrich and Owens, 1995). However, gains made in terms of predation rates may be negated by losses in hatching rates: typically, the hatching success of nests laid during arribadas is terribly small; for example, only around 5% of the eggs laid on Nancite beach, in Costa Rica actually produce viable hatchling (Cornelius, 1986). This is thought to be due largely to turtles digging into previously laid nests, and the high levels of bacteria and other microorganisms present in the sand.

After the arribada, individual turtles migrate to other areas independently, rather than in flotillas or groups. This is based on data collected while tracking individual turtles with satellite transmitters, following nesting during an arribada in Costa Rica (Plotkin et al., 1995).

Distribution and Trends

In the western Atlantic there are only three countries in which significant numbers of olive ridley nests (totaling about 1,400-1,600 nests) are made each year:

- Suriname: Principally Eilanti beach, and secondarily Matapica beach
- French Guiana: Ya:lima:po beach and others, both east and west of Cayenne
- Brazil: the beaches of Pirambu, Abaís, and Ponta dos Mangues in the state of Sergipe, in northern Brazil

There are few, if any, records of olive ridley nests outside these areas in the western Atlantic. Incidental capture of olive ridley turtles has been recorded mostly near the Guianas and in northern Brazil, although there are records of animals caught in the waters of Venezuela, Trinidad and Tobago, and Brazil (Schulz, 1975; Marcovaldi et al., in press).

Suriname: In Suriname, the local name for olive ridley is *warana*. The yearly total of *warana* nests laid each year in Suriname has been declining (see "Threats") for the past 30 years from a high of 3300 in 1968 to fewer than 200 in 1999 (Figure 1). The principal nesting beach for olive ridleys in Suriname is Eilanti beach, close to the border with French Guiana. Small-scale arribadas were seen in the late 1960s and 1970s on Eilanti beach, but have not occurred since.

French Guiana: The local name for olive ridley in French Guiana is *tortue olivâtre*. Until recently the focus of monitoring in French Guiana was Ya:lima:po beach, which is frequented by enormous numbers of leatherback turtles each year (Girondot and Fretey, 1996). There are numerous beaches in the western half of the country, from the border with Suriname to Cayenne, and some with as many as 25 olive ridley nests laid per night; an estimated 500 nests were laid in 1999 (Johan Chevalier, pers. comm.). East of Cayenne to the border with Brazil, the beaches were regularly monitored for the first time in 1999; an estimated 500 nests were encountered in this region (Jean-Christophe Vié, pers. comm.).

Due to the lack of consistent data, it is not known if these relatively large numbers of nests are the result of (i) true population increases, (ii) displacement of females from Suriname, or (iii) the increased monitoring and reporting effort. Indeed, all these factors may be at play in this situation. Certainly regular monitoring is needed in French Guiana in order to better characterize the status of the population.

Brazil: In Sergipe, on the northern coast of Brazil, regular monitoring was begun in 1982 at Pirambu beach, the principal nesting site of olive ridleys in Brazil. Since 1989, nests have been protected in three areas in Sergipe: Abaís, Pirambu, and Ponta dos Mangues. Despite fluctuations in the annual numbers of nests, the overall pattern seems to be steady, with a yearly mean of 200-400 nests (Figure 2). There is no evidence that arribadas previously existed in Sergipe. Indeed, the lack of a common name for this species in Brazil suggests that its relative scarcity has been long-term.

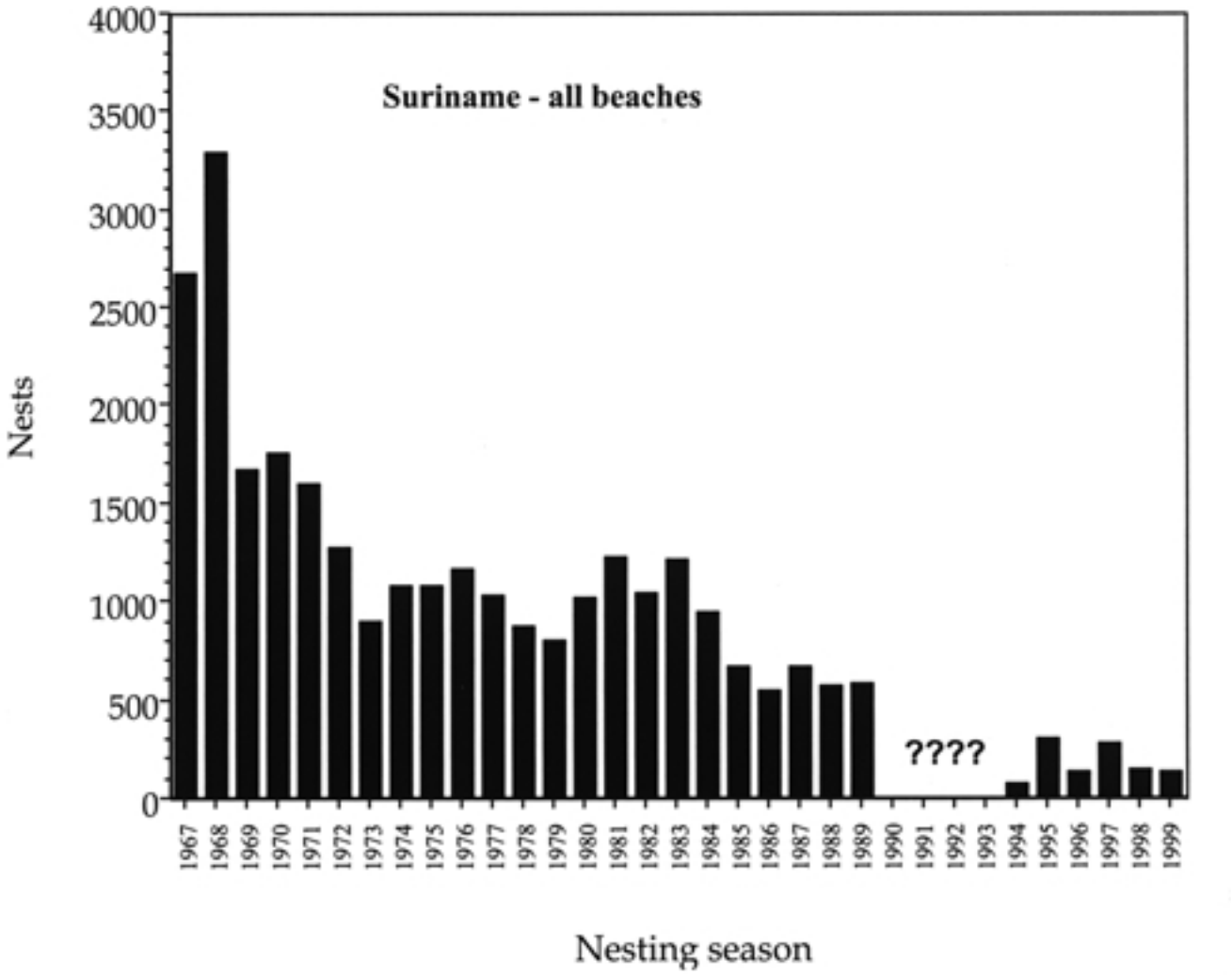

Figure 1. Annual number of olive ridley nests laid per nesting season, in all of Suriname. Data are not available for 1990-1993. Source: Reichart (1993) and Kris Mohadin, STINASU/ LBB, Suriname (pers. comm.).

Threats

The principle threat to olive ridleys is incidental capture by both artisanal and industrial fisheries, with the largest number of incidental captures occurring off the coast of the Guianas. Indeed, Reichart and Fretey (1993) wrote that incidental capture is the "largest unaddressed problem in turtle conservation" in these countries. Other threats include natural erosion cycles, habitat destruction, predation by jaguars, and poaching.

Conservation Status

Olive ridleys are classified as Endangered by the World Conservation Union (IUCN) (Baillie and Groombridge, 1996). They are included in Annex II of the SPAW Protocol [Protocol concerning Specially Protected Areas and Wildlife] to the Cartagena Convention, Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and Appendices I and II of the Convention on the Conservation of Migratory Species (the Bonn Convention). Since Japan ratified CITES with a reservation on *Lepidochelys olivacea,* the import of olive ridley products (mostly skins, and all of them originating from Pacific populations) into that country continued until 1992 when the reservation was withdrawn. No nation currently holds a CITES exemption for this species (Eckert, 1995).

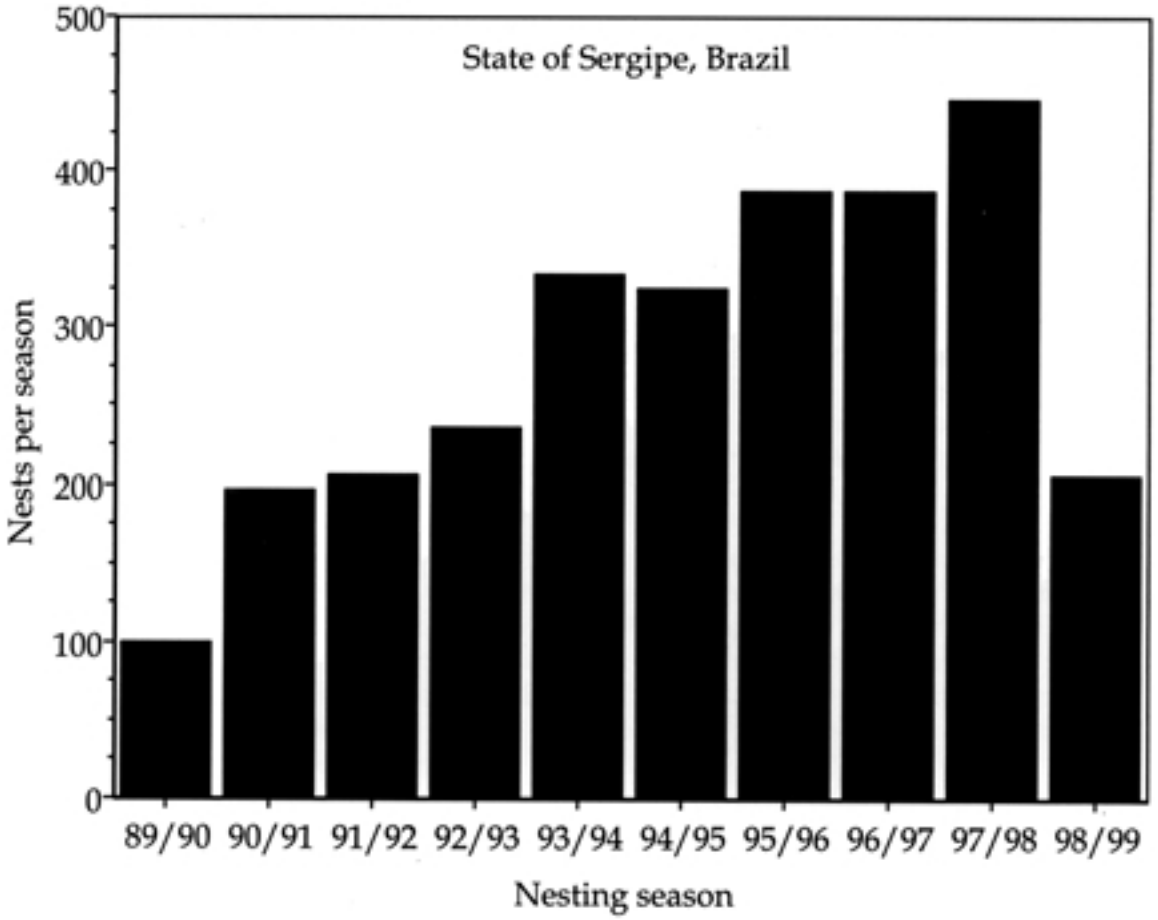

Figure 2. Annual numbers of olive ridley nests laid per nesting season in the state of Sergipe, in Brazil. The monitoring effort was reduced in the 1998/99 nesting season. Scattered nesting of this species also occurs in the states of Bahia and Espirito Santo, but in low numbers (<50 per year). Source: Projeto TAMAR-IBAMA.

Conclusions

The overall situation of olive ridleys in the western Atlantic is mixed. In Suriname, historically the primary nesting ground for the Western Atlantic population, the numbers of nests laid per year have declined more than 90% in the last three decades. The good news is that increased attention to monitoring in French Guiana and Brazil has resulted in a surprising number of reported nests, perhaps 1000 or more in French Guiana alone. Whether these females represent displaced members of the Suriname population or an indigenous but previously unknown population in French Guiana is unknown. In Brazil, the population is small but apparently stable.

Reasons for the dramatic decline of the Surinam population are unknown. All nests laid by olive ridleys are excluded from the legal egg harvest program in Suriname (Reichart, 1993). The natural erosion cycle of Eilanti Beach is probably one cause of the decline, and in recent years it is likely that at-sea mortality due to incidental capture has undermined all other conservation initiatives aimed at this depleted population. Incidental catch and associated mortality is a serious problem that must be addressed if we hope to stabilize populations of *L. olivacea* in the Western Atlantic Region.

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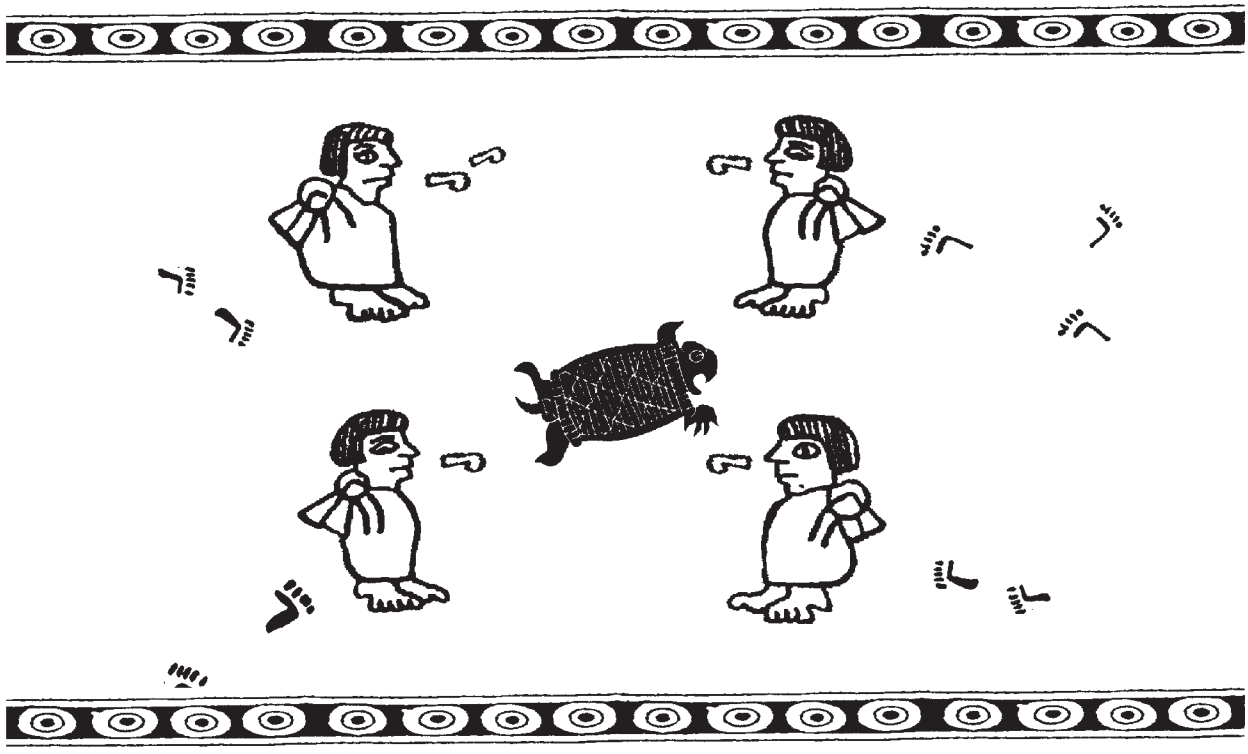
Santo Domingo, Dominican Republic
16-18 November 1999

PROCEEDINGS



Karen L. Eckert
F. Alberto Abreu Grobois
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About the cover

The designs for the cover were extracted from various Mexican pre-Columbian codices. The human figures, footprints, and the speech symbols were taken from the *Códice Boturini*, also known as *Tira de la Peregrinación*, which depicts the migration of the Mexicas (ancient Aztecs) towards the Valley of Mexico. The turtle figure in the center comes from an ancient Mayan codex. We felt that this symbolism, taken from pre-Colombian art, well reflected the nature and purposes of the people attending the workshop — bringing together many people, traveling from far and wide, to dialogue about marine turtles.