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Preliminary Data and Observations from an Increasing Olive Ridley Population in Sergipe, Brazil

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In the western Atlantic, olive ridleys (*Lepidochelys olivacea*) have a relatively limited distribution and nest primarily in Suriname/French Guiana and on mainland Brazil (Fretey 1999). Olive ridley nesting in Suriname has greatly declined over the past 40 years and recent reports from French Guiana indicate more nests than earlier recorded, but the population trend remains uncertain (Hoekert *et al*. 1996; Marcovaldi 2001). The major nesting areas for olive ridleys in Brazil occur in the States of Sergipe (da Silva *et al*. 2003) and Bahia (Marcovaldi & Laurent 1996); no indication of arribadas in Brazil is found in the oral accounts of older fishermen or in historical records. When TAMAR, the Brazilian sea turtle program, began working in this region in 1982, nearly 100% of the nests were being collected for human consumption in Sergipe, which supports the densest olive ridley nesting in Brazil (Figure 1). Concurrent with TAMAR´s intensive monitoring and conservation work there has been a rapid increase in this population over the past two decades promoting the area to a status of regional importance (Castilhos pers. observ.) With the significant increase in the annual number of nests and a subsequent increase in monitoring effort, we believe that an update is warranted. Here we report some data on renesting intervals, distance between consecutive nests, average weight of females and weight loss between nesting events, carapace length as well as some observations on nesting behavior from the 2004/2005 nesting season in the State of Sergipe.

Figure 1. Areas monitored for olive ridley nesting in Sergipe, Brazil.

The coastline of Sergipe is composed of high energy beaches with an open, rock-free offshore approach. Beaches are backed by coastal sand dunes and in some areas lagoons are located relatively close to the dunes; several major rivers discharge on this coastline. Nesting takes place during the Brazilian summer from September to March; loggerheads (*Caretta caretta*), hawksbills (*Eretmochelys imbricata*) and green turtles, (*Chelonia mydas*) also nest on these beaches, but almost 90% of the nests are laid by olive ridleys. TAMAR maintains three stations in Sergipe at Ponta dos Mangues, covering 36 km, Pirambu, covering 53 km, and Abais, covering 36 km (Figure 1). The most intensely monitored area of the 135 km total is in Pirambu. Night patrols, conducted at low tide or during falling tide between 1 October 2004 and 15 March 2005, covered only the northern 26 km, with most effort concentrated on 12 km of beach and extended to the remaining 14 km if tidal conditions permitted. Females encountered were measured for curved carapace length (CCL) from the middle of the nuchal notch to the posterior tip of the supracaudals and tagged with inconel tags on the front flippers. Females were weighed with a Filizola digital balance, which had a maximum capacity of 500 kg. The beach was marked by stakes at every kilometer and the location of the nest noted.

Of the 226 ridleys encountered during the night patrols, the renesting interval of 18 olive ridleys was noted. The renesting interval was between 19 and 40 days (Table 1). In the literature, the renesting interval for ridleys lies between 14 to 75 days and appears to be governed by environmental factors (Plotkin *et al*. 1997; Pritchard 1969; Schulz 1975). Using 14 days as the minimum renesting interval in olive ridleys, some of the intervals recorded i.e. 27, 29, and 40 days (Table 1), may potentially include one or more missed nesting events. The mean distance between consecutive nests of these females was estimated to be 5 km (SD = 2.7, range = 1-11 km, n = 18). The mean weight of these females after egg deposition, the first time they were encountered, was 41.3 kg (SD = 4.7, range = 33.8-56 kg, n = 18; Table 1). On the subsequent nesting encounter their mean weight was 39.5 kg (SD = 3.9, range = 33.8-52 kg, n = 18; Table 1). These values are higher than mean female weights recorded in Suriname after nesting (mean = 35.7 kg, n = 14; Pritchard 1969) and greater than or similar to female weights from Mexico (mean = 39.25 kg, n = 136) depending on whether mean weight from the first or second encounter is compared, but lower than weights recorded for females in India (mean = 49.5 kg, n = 108; Marquez 1990). Nesting females had lost body weight on their subsequent nesting event (n = 16) aparte from two females who indicated no weight loss; mean weight loss was 1.8 kg (SD = 1.1, range = 0-4 kg, n = 18; Table 1) and may reflect reduced feeding at the nesting beach.

Date of first encounter	*Weight (kg) at first encounter*	*Date of second encounter*	*Weight (kg) at second encounter*	*Difference in weight (kg)*	*Renesting interval (days)*	*CCL (cm)*
20-Nov-04	56.0	11-Dec-04	52.0	4.0	21	78.5
14-Jan-05	44.4	12-Feb-05	41.2	3.2	29	73.5
01-Dec-04	43.2	21-Dec-04	41.6	1.6	20	73.0
02-Dec-04	40.4	22-Dec-04	37.8	2.6	20	69.0
21-Dec-04	44.0	09-Jan-05	42.6	1.4	19	73.0
25-Dec-04	37.8	14-Jan-05	37.0	0.8	20	69.5
03-Jan-05	39.4	30-Jan-05	37.2	2.2	27	68.0
19-Nov-04	40.0	10-Dec-04	37.8	2.2	21	71.0
29-Nov-04	39.6	20-Dec-04	38.7	0.9	21	69.0
07-Dec-04	37.8	30-Dec-04	36.2	1.6	23	71.0
19-Nov-04	40.8	11-Dec-04	38.6	2.2	22	72.5
10-Jan-05	37.8	01-Feb-05	37.2	0.6	22	70.5
12-Jan-05	46.0	21-Feb-05	43.4	2.6	40	73.3
23-Jan-05	41.2	11-Feb-05	38.4	2.8	19	70.5
15-Jan-05	37.8	05-Feb-05	37.8	0.0	21	70.5
01-Feb-05	42.8	21-Feb-05	41	1.8	20	71.5
07-Mar-05	33.8	29-Mar-05	33.8	0.0	22	68.0
02-Mar-05	40.6	29-Mar-05	38.6	2.0	27	69.8

Table 1. Weights of olive ridleys after nesting, weight loss between nesting events, renesting interval, and curved carapace measurements.

Although most of the nesting has been found to take place at night, on some days turtles were found to nest in the afternoon, as early as 1550 hours. Observations indicate that early nesting occurred on very windy days. It is hypothesized that this may be a strategy to prevent predation of the shallow olive ridley nests because all evidence of nesting on the sand surface was estimated to disappear within 15 to 20 minutes; the crab-eating fox (Cerdocyon thous) is the main nest predator in this region. In Mexico, sand blowing in the wind has been suggested to deter predators from accessing the beach (J. Seminoff, pers.comm.). However, this requires quantitative evaluation as several other factors may contribute to early nesting. Nevertheless, it is interesting to note that ridley arribadas in Rancho Nuevo, Mexico, and Eilanti, Suriname, have also been observed to take place during periods of strong wind, and were even delayed until the wind had picked up (J. Seminoff pers. comm.; Pritchard in press; Schulz 1975). No correlation between wind speed or temperature and arribada timing was found by Cornelius (1991) in Costa Rica.

With the loss of arribadas in Suriname, monitoring of this increasing olive ridley population in Brazil will provide important information on olive ridleys in the Atlantic. The major threat to this population is from shrimp trawlers in these waters because coastal Sergipe is an important shrimping area (da Silva pers. comm.). An adult female with fully developed eggs that stranded on the beach during the nesting season was found to have shrimps in its esophagus suggesting a potential overlap in feeding and fishing areas (Castilhos pers. comm.). Therefore, the continued survival of this population depends in part on mitigating olive ridley bycatch in these waters.

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CORNELIUS, S. 1991. *Lepidochelys olivacea*. In: D.H. Janzen (Ed.). Historia Naturel de Costa Rica, UCR, San Jose. pp. 407-410.

DA SILVA, A.C.C.D., J.C. CASTILHOS, D.A.S. ROCHA, F.L.C. OLIVEIRA, M.I. WEBER & P.C.R. BARATA. 2003 Nesting biology and conservation of the olive ridley sea turtle (*Lepidochelys olivacea*) in the state of Sergipe, Brazil. In: J.A. Seminoff (Compiler). Proceedings of the Twenty-Second Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFSC-503. pp. 89.

FRETEY, J. 1999. Répartition des tortues du genre *Lepidochelys* Fitzinger, 1843. I. L'Atlantique Ouest. Biogeographica 75: 97-117.

HOEKERT, W.E.J., A.D. SCHOUTEN, L.H.G VAN TIENEN & M. WEIJERMAN. 1996. Is the Surinam olive ridley on the eve of extinction? First census data for olive ridleys, green turtles and leatherbacks since 1989. Marine Turtle Newsletter 75:1-4.

MARCOVALDI, M.Â. 2001. Status and distribution of the olive ridley turtle, *Lepidochelys olivacea*, in the Western Atlantic Ocean. In: K.L. Eckert and F. A. Abreu-Grobois (editors). Proceedings of the Regional Meeting: Marine Turtle Conservation in the Wider Caribbean Region. Santo Domingo, 16-18 November 1999. WIDECAST, IUCN-MTSG, WWF and UNEP-CEP. pp 52-56.

MARCOVALDI, M.Â., & A. LAURENT. 1996. A six season study of marine turtle nesting at Praia do Forte, Bahia, Brazil, with implications for conservation and management. Chelonian Conservation and Biology 2: 55-59.

MARQUEZ, R.M. 1990. Sea Turtles of the World. FAO Species Catalogue, FAO Fisheries Synopsis, Rome, 11: 81 pp.

PLOTKIN P.T., D.C. ROSTAL, R.A. BYLES, & D.W. OWENS. 1997. Reproductive and developmental synchrony in female *Lepidochelys olivacea*. Journal of Herpetology 1:17-22.

PRITCHARD, P.C.H. 1969. Sea turtles of the Guianas. Bulletin of the Florida State Museum, Biological Sciences 13: 85-140.

PRITCHARD, P.C.H. In press. Tales from the Thèbaïde. Krieger Press, Malabar, Florida.

SCHULZ, J.P. 1975. Sea turtles nesting in Surinam. Zoologische Verhandelingen (Leiden) 143: 3-172.