endang/animals/reptiles_amphibians/.
Tucker, J. K., N. I. Filoramo, G. L. Paukstis, and F. J. Jansen. 1998. Response of red-eared slider, *Trachemys scripta elegans*, eggs to slightly differing water potentials. J. Herpetol. 32:124–128.
U.S. Fish and Wildlife Service. 2011. Species profile: Louisiana pine snake (*Pituophis ruthveni*). Available at: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C02C.

Herpetological Review, 2012, 43(2), 245–246.

Ghost Nets Haunt the Olive Ridley Turtle (*Lepidochelys olivacea*) near the Brazilian Islands of Fernando de Noronha and Atol das Rocas

Fernando de Noronha (3.8333°S, 32.4167°W) and Atol das Rocas (3.8666°S, 33.8000°W) are Brazilian offshore islands that host breeding populations of Green Turtles (*Chelonia mydas*) and provide benthic foraging habitat for aggregations of Green and Hawksbill Turtles (*Eretmochelys imbricata;* Marcovaldi and Marcovaldi 1999) and occasionally Loggerheads (*Caretta caretta*; Bellini and Sanches 1998). The fact that Olive Ridley Turtles (*Lepidochelys olivacea*) also forage in the vicinity of these offshore islands is evidenced by carcasses found stranded on the beach and animals entangled in ghost nets, i.e., abandoned, lost, or otherwise discarded fishing gear.

From 1996 to 2011, 20 Olive Ridley Turtles were recorded by the Brazilian sea turtle conservation program (Projeto TAMAR-ICMBio), including 17 at Fernando de Noronha and 3 at Atol das Rocas. Of these, 18 were entangled in ghost nets (16 still alive and 2 dead) and another two individuals were found dead, stranded on the beach. The three turtles recorded at Atol das Rocas were alive and entangled together in the same ghost net, as were four turtles at Fernando de Noronha; all other entanglements were of single individuals. All the nets consisted of multifilament nylon, with mesh sizes of 17–22 cm (stretched mesh). The origin of these nets is unknown, neither is it clear if the nets were used in high seas or coastal fisheries or by national or international ships. Indeed, neither the scale nor magnitude of fishing activity (industrial or artisanal) in the area, or the target species, have yet been determined. Ghost nets are a well-documented threat for marine fauna including sea turtles (Halpern et al. 2008; Macfadyen et al. 2009). In spite of the fact that the origin of the ghost nets is unknown, the influence of the ocean currents seems to be clear. Atol das Rocas and Fernando de Noronha are located where the South Equatorial Current (SEC) flows from east to west (Kikuchi 2000; Renner 2004) and all recorded entanglement was east of the islands. This could indicate that ghost nets were upstream of the location where the turtles were found.

The size of nesting Olive Ridleys in Brazil ranges from 62.5 to 83.0 cm curved carapace length (CCL; Silva et al. 2007). The following size data are available for 17 of 20 turtles: seven (41.2%) were probably adults, as they measured 61–80 cm CCL; three (17.6%) were not measured but were reported to be sub-adults (Guy Marcovaldi, pers. comm.); five (29.4%) ranged from 41–60 cm CCL; and two (11.8%) were 21–40 cm CCL. Thus, they ranged in size from juveniles to adults, but most were sub-adults and adults. Nearby, in the western and central South Atlantic, Sales et al. (2008) reported a similar size distribution for incidental captures of Olive Ridley Turtles by pelagic longline fisheries. In addition, post-nesting Olive Ridleys that were satellite-tracked from the Brazilian state of Sergipe were recorded in the vicinity of areas where entanglement was recorded (Silva et al. 2011). In the western Atlantic, the main nesting populations of Olive Ridley Turtles are located in Brazil (annual nest numbers have been increasing since 1991, Silva et al. 2007; more than 6700 clutches were laid in the 2010/2011 nesting season, Projeto Tamar/ICMBio, unpubl. data), Suriname (between 150 and 200 clutches per year; with a declining trend; Kelle et al. 2009), and French Guiana (between 1716 and 3257 clutches each year, with an increasing trend; Kelle et al. 2009). In the eastern Atlantic, nesting sites are located from between Guinea-Bissau (200–300 clutches each year, with no trend discernable; Barbosa et al. 1998) and Angola (120 clutches per year, with no trend evident; Weir et al. 2007).

Of the 20 Olive Ridley records reported here, 80% occurred between 2005 and 2011. This result may be correlated with an increase in fishing activity in the offshore waters of northeastern Brazil and at the west coast of Africa, the starting point of the SEC and where the potential fishery stocks are most likely to be found (i.e., the Benguela upwelling system; Japp and James 2003). This result could also be related to population increases observed in the two major nesting sites in the western Atlantic, Brazil (Silva et al. 2007) and French Guyana (Kelle et al. 2009).

As Fernando de Noronha Archipelago and Rocas Atoll have been monitored by Projeto TAMAR/ICMBio since 1984 and 1982, respectively (Marcovaldi and Marcovaldi 1999), the small number of *Lepidochelys olivacea* registered at both sites actually represents a low incidence of entanglement. Even in small numbers, as the occurrences were related to entanglement in ghost nets, it seems that turtles are likely to appear at these offshore islands only when something such as a ghost net takes them from their

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normal home range. The 18 entanglement events by ghost nets across 15 years do not seems to be a serious threat to this population, but collectively with bycatch in pelagic longline fisheries and satellite tracking data, they provide new evidence that the region plays an important ecological role for critical life stages (subadults and adults) of this species.

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Literature Cited

Barbosa, C., A. C. Broderick, and P. Catry. 1998. Marine turtles in the Orango National Park (Bijagós Archipelago, Guinea-Bissau). Mar. Turtle Newsl. 81:6–7.

Bellini, C., and T. M. Sanches. 1998. First record of a loggerhead turtle in the Fernando de Noronha Archipelago, Brazil. Mar. Turtle Newsl. 79:22.

Halpern, B. S., S. Walbridge, K. A. Selkoe, C. V. Kappell, F. Micheli, C. D'Agrosa, J. F. Bruno, K. S. Casey, C. Ebert, H. E. Fox, R. Fujita, D. Heinemann, H. S. Lenihan, E. M. P. Madin, M. T. Perry, E. R. Selig, M. Spalding, R. Steneck, and R. Watson. 2008. A global map of human impact on marine ecosystems. Science 319:948–952.

Japp, D. W., and A. James. 2003. Potential exploitable deepwater resources and exploratory fishing off the South African coast and the development of the deepwater fishery on the South Madagascar ridge. *In* Fisheries and Aquaculture Department (ed.), Deep Sea 2003: Conference on the Governance and Management of Deep Sea Fisheries, pp. 162–168. FAO, Rome.

Kelle, L., N. Gratiot, and B. Thoisy. 2009. Olive ridley turtle *Lepidochelys olivacea* in French Guiana: back from the brink of regional extipartion? Oryx 43:243–246.

Kikuchi, R. K. P. 2000. The Biological Reserve of Atol das Rocas. Mar. Pollution Bull. 41:119.

MacFadyen, G., T. Huntington, and R. Cappell. 2009. Abandoned, Lost or Otherwise Discarded Fishing Gear. FAO Fisheries and Aquaculture Technical Paper 185 523. Report for the United Nations Environment Programme and Food and Agriculture Organization of the United Nations, Rome.

Marcovaldi, M. Â., and G. G. dei Marcovaldi. 1999. Marine turtles of Brazil: the history and structure of Projeto TAMAR-IBAMA. Biol. Conserv. 91:35–41.

Renner, S. 2004. Plant dispersal across the tropical Atlantic by wind and sea currents. Int. J. Plant Sci. 165:S23–S33.

Sales, G., B. B. Giffoni, and P. C. R. Barata. 2008. Incidental catch of sea turtles by the Brazilian pelagic longline fishery. J. Mar. Biol. Assoc. U.K. 88:853–864.

Silva, A. C. C. D., J. C. Castilhos, G. Lopez, and P. C. R. Barata. 2007. Nesting biology and conservation of the olive ridley sea turtle (*Lepidochelys olivacea*) in Brazil, 1991/1992 to 2002/2003. J. Mar. Biol. Assoc. U.K. 87:1047–1056.

———., E. A. P. Santos, J. C. Castilhos, F. L. C. Oliveira, M. I. Weber, J. A. F. Batista, and T. Z. Serafini. 2011. Satellite-tracking reveals multiple foraging strategies and threats for olive ridley turtles in Brazil. Mar. Ecol. Prog. Ser. 443:237–247.

Weir, C. R., T. Ron, M. Morais, and A. D. C. Duarte. 2007. Nesting and at-sea distribution of marine turtles in Angola, West Africa, 2000–2006: occurrence, threats and conservation implications. Oryx 41:224–231.