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Olive ridley arribada on Gahirmatha beach, Odisha, India, with the nearby Maipura river delta in the background. See pages 1-2. Photo: M. Muralidharan.

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Loggerhead Turtle Captured in the Rio de la Plata is Found 10 Years Later Nesting in Espírito Santo, Brazil

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An adult female loggerhead turtle (*Caretta caretta* Linnaeus, 1758) bearing a uniquely numbered flipper tag XXZ 684 (Inconel 681 style Tag, National Band and Tag Co.) was found in October 2013 nesting at southeastern Brazil (Fig. 1). The turtle was initially tagged on the right front flipper after being incidentally captured on 03 February 2004 by a Uruguayan trawler operating in the Common Argentinean-Uruguayan Fishing Area (ZCPAU) (Fig.2). At that time, Karumbé was conducting a bycatch monitoring program in that fishery ("Onboard Tagging and Data Collection Program - PROMACODA", Laporta *et al.* 2012), where trained fishermen volunteered to collect data and samples from incidentally captured sea turtles and tag them before release. The turtle was released 29 nautical miles south of Montevideo, Uruguay (35.3800°W, 55.9500°S), after the fishermen allowed it to fully recover onboard for 5 hours. The PROMACODA project provided evidence that the Uruguayan coastal pair bottom-trawl fishery interacts frequently with sea turtles, and generated data from about 99 loggerhead turtles that were incidentally captured between April 2002 and June 2005. This participatory project involved fishermen and researchers with the aim of increasing the knowledge about the biology of sea turtles while helping to mitigate the bycatch (Laporta, *et al.* 2012).

The same turtle was observed nesting on 15 October 2013 at Comboios beach, state of Espírito Santo, Brazil (19.6768°S, 39.8959°W) during the regular monitoring program of Fundação Projeto TAMAR according to the National Plan of Conservation of Sea Turtles of Centro TAMAR/ICMBio (Brazilian Program for Conservation of Sea Turtles). The minimum distance between the tagging location at the feeding area and the recapture at the nesting beach is 2,400 kilometers. The loggerhead sea turtle is the most common nesting species found along the southern coast of Brazil (Marcovaldi & Laurent 1996). The highest density of loggerhead nests in Espírito Santo state, Brazil, is found around the Doce River mouth during the breeding season, which runs from the end of August to the end of February and peaks between October and December (Barreto *et al.* 2019).

The tag was in bad condition and thus was removed. A new tag was applied on the trailing edge of each front flipper (BR 78089 and BR 78090 - Inconel Tags, National Band and Tag Co.). When recaptured in Brazil the turtle measured 107.0 cm curved carapace length, front nuchal notch to caudal tip (CCLn-t). The measurement taken when the turtle was originally tagged almost ten years before was 82.0 cm CCLn-t, so based on the size distribution of nesting



Figure 1. Tag XXZ 684 found on a loggerhead turtle on 15 October 2013, while nesting on Comboios beach, Brazil.



Figure 2. *Besugo I* crew, releasing tagged loggerheads in Uruguayan waters on 03 February 2004.

females in Comboios (83.0-120.0 cm, Baptistotte *et al.* 2003) this turtle was likely immature when it was captured and first tagged. The curved carapace length growth of this female was 2.5 cm/year, which is faster than that reported by Lenz *et al.* (2016), who estimated a mean annual growth rate of 2.1 cm/year for *C. caretta* in the western South Atlantic Ocean. Both projects use the measurement methods outlined by Bolten (1999).

This is the first record of a juvenile turtle tagged in the Rio de la Plata that was later found nesting in Brazil. However, there are several previous recaptures of adult loggerhead turtles that were found in coastal waters of Uruguay after nesting in Brazil. The first record of this connection, reported by Almeida *et al.* (2000), was a loggerhead turtle tagged while nesting at Pontal de Ipiranga beach, Espírito Santo in November 1991, that was found stranded dead in Punta del Diablo, Uruguay nearly seven and a half years later in April 1999. Afterwards, Laporta & Lopez (2003) reported that a nesting female loggerhead tagged in October 1995 in Arembepe, Bahia, Brazil, was recaptured almost six and a half years later (March 2002) by a Uruguayan bottom trawler operating in the ZCPAU. Coincidentally, this second recapture record sparked the beginnings of what turned out to be the PROMACODA, initially run through Karumbé (2002-2007), and thereafter by CICMAR. Since 2010, five other adult female loggerheads were incidentally captured by Uruguayan coastal bottom trawlers after being tagged while nesting in Brazilian beaches (unpublished data).

Laporta & Lopez (2003) suggest that some Brazilian loggerhead sea turtles may migrate to Uruguayan waters to feed. Although these data are relatively sparse, Almeida *et al.* (2000) suggest that adult sea turtles from Espírito Santo can migrate long distances.

Increased fishing activity in recent years is considered a major threat to SW Atlantic loggerhead turtles, directly affecting the population of juveniles (Sales *et al.* 2008), and subadults and adults feeding on the continental shelf of Rio Grande (Monteiro *et al.* 2016) and Uruguay (Laporta *et al.* 2012). According to Giffoni *et al.* (2014), loggerhead is the most captured sea turtle species by the Brazilian and Uruguayan pelagic longline fleets, and the bycatch rate of both fleets is among those higher worldwide (Pons *et al.* 2010). This strongly suggests that regional and international cooperation can contribute greatly towards the success of sea turtle conservation.

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