Update on sea turtle bycatch on deep set pelagic longlines in Uruguayan Waters

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Introduction

Deep set (>100m hook depth) pelagic longlines are considered to have substantially lower sea turtle bycatch rates than shallow set longlines (Polovina et al 2003, 2004, Beverly 2004). The Uruguayan pelagic longliners have exclusively used shallow longlines for the past 20 years. Between the years 2009-2011, the government of Uruguay granted experimental fishing permits to a Japanese company to assess the abundance and economic feasibility of targeting big eye tuna (*Thunnus obesus*) within the country's EEZ, where it has not been targeted over the last 15 years.

The goal of this study is to assess the turtle bycatch in deep set pelagic longlines operating within the Uruguayan EEZ, and compare the findings with previous research on local longline fleets operating in the region.

Materials & Methods

The Japanese boats operated with 100% observer coverage of the National Program of Observers Onboard the Tuna Fleet (PNOFA), managed by the National Direction of Aquatic Resources (DINARA).

During the falls and winters of 2009 to 2011, a total of 1.045 sets (2.424.175 hooks) were deployed, mostly within the Uruguayan EEZ (Figure 1).

The observers obtained information of the fishing gear and operative, recorded the whole capture and identified the species of each captured individual, including all sea turtles. Hook depth was measured using Time Depth Recorders (TDRs).

Results

The fishing gear was composed by a multi-braided mainline, with 8-12 hooks per basket, attached to secondary lines with a total length of 44-48m. Line setters were employed by all the boats, during all the sets.

Hook depth averaged 133m (range 75-210m, n=92) (Figure 2).

A total of 1,391 turtles were captured, in 483 (46,2%) of the sets. Most of the turtle captures corresponded to loggerheads (n=1,359), but leatherbacks (n=21), olive ridleys (n=9) and green turtles (n=2) were also captured (Table 1, Figure 1).

The average loggerhead CCL was 58,5 ± 6.4 cm (n=1.016) (Table 2).

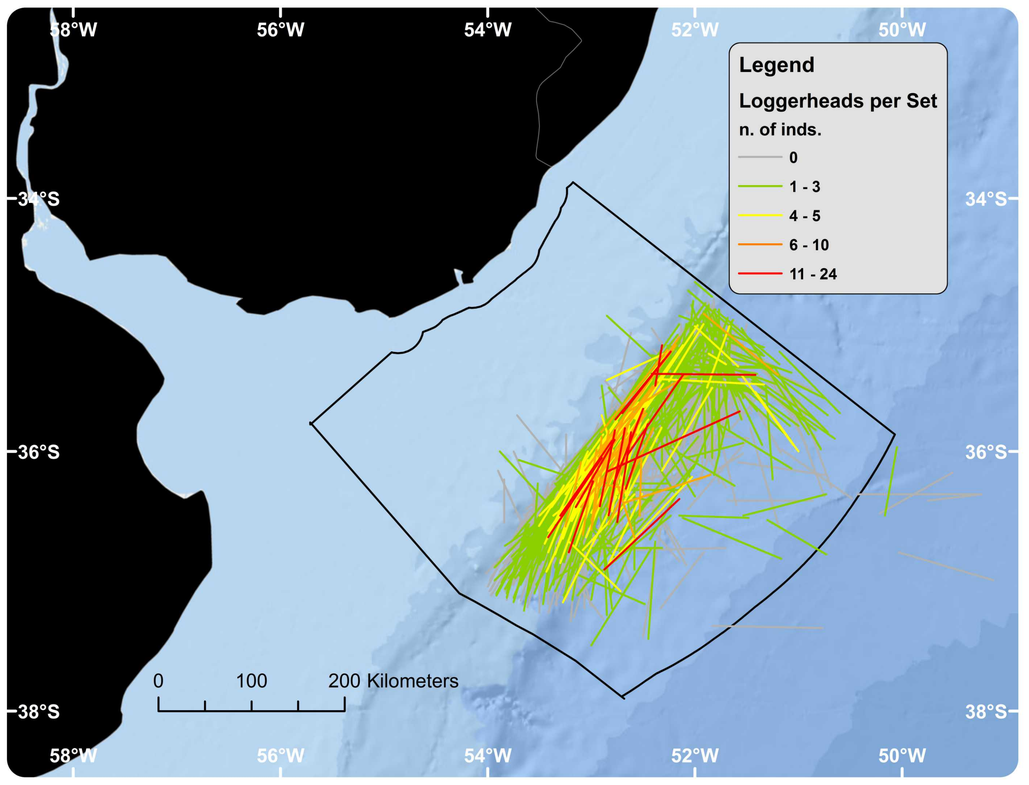

Figure 1. Observed fishing effort (sets), and loggerhead turtles captured in each set.

Table 1. Catch, CPUE and Frequence of Ocurrence.

Species	Catch (n of individuals)	CPUE (ind/1.000 hooks)	FO (% of sets)
C. caretta	1,359	0.561	45.2
D. coriacea	21	0.009	2.0
L. olivacea	9	0.004	0.6
C. mydas	2	0.001	0.2

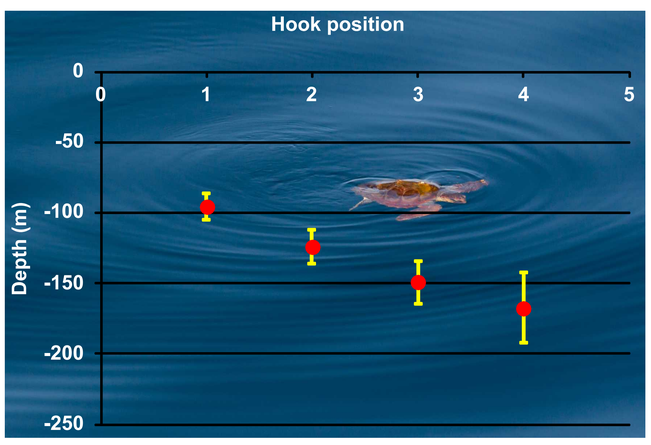

Figure 2. Fishing depth (mean, SD) of each hook position.

Discussion

The turtle's CPUE on deep set longlines was found to be similar to that of the shallow set longlines commonly used in the region (Table 2). The small difference is far from being 10 to 1 as proposed by Beverly (2004).

The difference may be due to the fact that deep set longline hooks always fish deeper than the depths usually attained by the traditional longlines employed by the local fleets (Figure 2).

For loggerheads, the average CCL was similar to that recorded in previous studies about shallow longline operating in the region (Table 2).

Our results evidence that deep set pelagic longlines can have seaturtle bycatch rates that are of concern.

Thus, the concept that replacing shallow longline sets with deep longline sets can substantially reduce the bycatch rate of seaturtles needs to be changed in light of our results.

Table 2. Review of loggerhead turtles CPUE in the study region.

CPUE	Effort (hooks)	Effort (sets)	Period	Source
0.56	2,424,175	1,045	2009-2011	This study
1.96	----	523	1998-2007	Pons et al. 2010
0.42	1,099,920	----	2001-2005	Sales et al. 2008
0.94	1,631,455	----	2005-2007	Giffoni et al. 2008
0.64	2,643,851	1,729	1998-2005	Lopez-Mendilaharsu et al. 2007

Table 3. Review of loggerhead turtle size in the study region.

mean CCL (cm)	S.D. (cm)	N	Period	Source
58.5	6.4	1.017	2009-2011	This study
58.2	7.3	410	2001-2005	Sales et al. 2008
58.9	----	1.730	2005-2007	Giffoni et al. 2008
57.1	6.4	1.166	1998-2005	Lopez-Mendilaharsu et al. 2007

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