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SHORT NOTE

The rime of the modern mariner: evidence for capture of yellow-nosed albatross from Amsterdam Island in Indian Ocean longline fisheries

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Abstract Commercial fisheries currently pose a serious threat at sea to the conservation of a number of pelagic seabirds. However, these interactions are complex, and reports on population-specific bycatch in the high seas are scarce. Here we report the case of an Indian yellow-nosed albatross *Thalassarche carteri* re-sighted on Amsterdam Island after an apparent capture by an Indonesian long-liner, as indicated by a message attached to the bird. This record demonstrates that Amsterdam birds may interact with long-liners indeed, at least during winter, and that such interactions are not systematically lethal. We suggest that bycatch sub-lethal effects should be investigated at colonies with high risks of individual capture at sea.

Keywords Seabird · Bycatch · *Thalassarche carteri* · Indian Ocean Tuna Commission · Non-breeding period · Sub-lethal effects

Introduction

Interactions between oceanic birds and human activities at sea may have fatal issues for the birds, as popularized in the poem *The Rime of the Ancient Mariner* (written by Samuel Taylor Coleridge in 1798) in which an albatross is killed by a sailor. Currently, at least 300,000 seabirds may be killed each year from interactions with industrial fisheries, making oceanic birds one of the most threatened bird groups today (Anderson et al. 2011; Croxall et al. 2012). Development of longline fishing in offshore areas has specifically been raised as a main threat to seabird conservation (Lewison et al. 2012), since flocking birds attending the long-liners may grab the baited hooks or get entangled in lines. Albatrosses (family Diomedeidae) are particularly vulnerable to such bycatch issues because they are very long-lived species with low fecundity and delayed sexual maturity (Lebreton and Véran 2013). Today, 17 of the 22 albatross species are threatened with extinction, with the main threat to most species being recognized as mortality in fisheries (Anderson et al. 2011; Croxall et al. 2012; Lewison et al. 2012).

However, it is generally not feasible to measure in situ the actual interactions with fishing vessels for seabirds of a given population (but see, e.g., Otley et al. 2007). Other approaches, including population models and individual-borne camera surveys, suggested that interactions with fishing vessels may not have systematically significant, direct detrimental effects on seabirds (e.g., Rolland et al. 2009; Sakamoto et al. 2009; Barbraud et al. 2011). Despite this figure, a recent review (Wilson et al. 2014) highlighted the paucity of reports on incidentally caught seabirds being released alive, thus potentially hampering perspectives about sub-lethal effects of bycatch on seabirds. Here we report the intriguing case of an Indian yellow-nosed albatross *Thalassarche carteri* re-sighted on a monitored colony in the southern Indian Ocean, after an apparent non-lethal capture by a longlining vessel.

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Materials and methods

Amsterdam Island is a small, uninhabited island situated in the subtropical region of the southern Indian Ocean (Fig. 1) and is a breeding location for three threatened albatross species. Among them, the endangered *T. carteri* is the most abundant on Amsterdam, with ~27,000 breeding pairs estimated in 2006 (Rolland et al. 2009) representing ~65 % of the global numbers for the species (BirdLife International 2015). The Pointe d'Entrecasteaux, situated in the southwestern part of Amsterdam, is a main breeding site of *T. carteri* on the island. The site has been designated as one of the study plots continuously surveyed in the framework of a long-term monitoring program on seabird populations since 1957 (Weimerskirch et al. 1985). As such it is regularly visited by fieldworkers (~10 times a year), especially during the breeding season of *T. carteri* (September–April). During the non-breeding season, these birds remain consistently at sea away from the colonies and seem to mainly redistribute off western and southern Australia for overwintering (Weimerskirch et al. 1985; Rolland et al. 2009).

Results and discussion

On December 29, 2011, while monitoring banded birds in the study plot of the albatross colony, we observed an adult bird sitting on an empty nest, fitted with a curious leg band (Fig. 2). The bird was captured and the band removed. The bird leg did not seem harmed by the ring, and the bird was apparently in good general condition. The band consisted of tightly sealed, soft-plastic tube, closed around the albatross leg with a clip of stainless metal. The waterproof, hollow translucid part contained a rolled paper, which we extracted. The paper was dry and in good condition, and had the following manuscript inscriptions: *HASLINDO. 08 JAKARTA/15-JULI-2011: F.G./ABDULLAH LUTHER*.

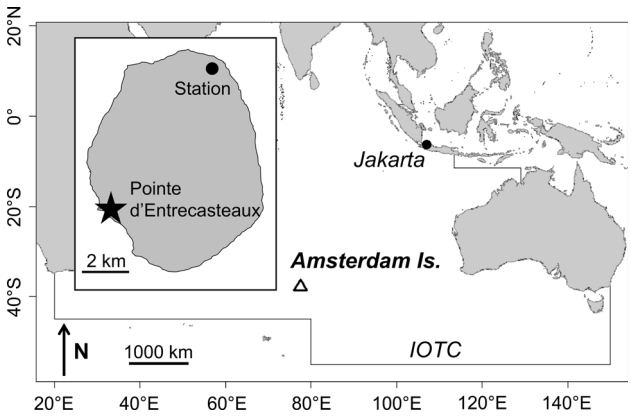

Fig. 1 Map of the Indian Ocean showing the location of Amsterdam Island, origin of the long-liner (Jakarta, Indonesia), boundaries of the Indian Ocean Tuna Commission (IOTC, *thin black line*), and the detailed situation of the Pointe d'Entrecasteaux colony on Amsterdam Island

Fig. 2 Photographs of the ring found on the albatross: **a** after removal, still closed, and **b** after opening, showing the message extracted from it (photographs taken by J. Demay)

We undertook investigations based on this message and found on the Indian Ocean Tuna Commission (IOTC) Web site (http://www.iotc.org/vessels/history/25925/2605) that *Haslindo* 8 is a registered longline fishing vessel of 50.9 m length, based in Jakarta, Indonesia, which deploys drifting longlines. The *Haslindo* 8 has been authorized to operate in the IOTC area during the year 2011. We therefore concluded that this albatross was captured at sea on July 15, 2011 (that is, during the non-breeding period preceding its recovery on Amsterdam), while in contact with the *Haslindo* 8, and was released at sea after being fitted with a message allowing potential future observers to identify the interaction. The name indicated on the paper is likely to be that of the mariner who wrote the message and may have handled the bird; however, the inscription *F. G.* remained unclear to us. We could gather no further information (such as geographical coordinates, capture conditions, or the motivations for attaching the message) about this event despite our requests to the IOTC and the PT. Sumber Haslindo Company (Jakarta), operating the *Haslindo* 8.

This individual record is coherent with the previous knowledge from band recoveries and geolocation tracking, indicating that yellow-nosed albatrosses from Amsterdam primarily exploit the IOTC area all year round (Weimerskirch et al. 1985; Delord et al. 2014). In this IOTC area, Indonesia has larger total catches than any other fishing State (22 % of all countries, as of the period 2008–2012)

and reported 1254 industrial tuna long-liners in 2012 (IOTC 2015). It is very unlikely that a wintering bird captured and marked at sea would be re-sighted at a breeding colony, as only a few hundred nests are monitored each year on Amsterdam over the tens of thousands of pairs breeding there (among other breeding localities for the species). This could suggest that on other colonies, some birds might also be witnesses to interactions with a specified fishing vessel; however, we have no data indicating that larger numbers of birds would similarly be fitted with ring and message at sea.

Colonies of *T. carteri* on Amsterdam Island have declined on average by 30 % from 1982 to 2006. Two main causes have been invoked for explaining this figure. First, the infection of the birds by two diseases, which severely affect local survival of the chicks and potentially of adults, was demonstrated (Weimerskirch 2004). Second, interactions with tuna longlining in subtropical waters were suspected of potentially affecting these bird populations (Weimerskirch and Jouventin 1998). Twenty years ago, *T. carteri* used to be the third most frequently killed albatross species in the Australian fishing zone, with 600 individuals captured in fisheries annually (comprising mainly adults in the winter months; Gales et al. 1998; Weimerskirch and Jouventin 1998). This species is also the third most frequently killed albatross by pelagic long-liners operating off the east coast of South Africa (Petersen et al. 2009). Our present record indicates that the adult yellow-nosed albatrosses interacting with long-liners in the IOTC zone during winter may well originate from Amsterdam Island. However, longline fishing pressure was not found to have statistically significant, direct detrimental effects on this population (Rolland et al. 2009), unlike other pressures. Wilson et al. (2014) highlighted the paucity of reports on incidentally caught seabirds being released alive compared with other marine organisms. Few seabirds are usually able to escape from pelagic longline fishing gear indeed (but see Huang and Liu 2010), and as a result sub-lethal effects of bycatch remain virtually undocumented for seabirds today (as opposed to crustaceans and mammals, Wilson et al. 2014). Indirect effects of incidental capture would thus need to be considered in future surveys of colonies with high risks of individual interaction with long-liners, in addition to the existing monitoring of fisheries-related items at seabird colonies (e.g., Nel and Nel 1999; Bugoni et al. 2010; Phillips et al. 2010). Impaired immune function caused by stress, and potentially magnifying individual susceptibility to subsequent infection (reviewed in Wilson et al. 2014) would be particularly concerning at Amsterdam, in the context of possibly severe disease outbreaks (Weimerskirch 2004).

Because of their extensive movements at sea and their tendency to attend fishing vessels, albatrosses have historically been used by shipwreck survivors from the southern islands to carry messages about their situation, hoping the birds would be caught in the fishing operations (in AMAPOF 1998). While there exist a number of reports about such captures of albatrosses by fishing vessels (e.g., Gales et al. 1998; Petersen et al. 2009; Huang and Liu 2010), our record provides an example that such interactions may not be systematically lethal for the birds. In the present case, the albatross was released alive at sea and found more than 5 months later on a nest. Disseminating such records contributes to understanding the complex outcomes of these interactions (e.g., Barbraud et al. 2011) more finely and to considering the potential sub-lethal effects of bycatch on seabirds in the future.

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