DRAFT EXECUTIVE SUMMARY: SEABIRDS

Indian Ocean Tuna Commission
Commission des Thons de l'Océan Indien
iotc ctoi

Status of seabirds in the Indian Ocean

TABLE 1. IUCN threat status for all seabird species reported as caught in fisheries within the IOTC area of competence.

Common name	Scientific name	IUCN threat status[1]
Albatross		
Atlantic Yellow-nosed Albatross	*Thalassarche chlororynchos*	Endangered
Black-browed albatross	*Thalassarche melanophrys*	Near Threatened
Indian yellow-nosed albatross	*Thalassarche car teri*	Endangered
Shy albatross	*Thalassarche cauta*	Near Threatened
Sooty albatross	*Phoebetria fusca*	Endangered
Light-mantled albatross	*Phoebetria palpebrata*	Near Threatened
Amsterdam albatross	*Diomedea amsterdamensis*	Critically Endangered
Tristan albatross	*Diomedea dabbenena*	Critically Endangered
Wandering albatross	*Diomedia exulans*	Vulnerable
White-capped albatross	*Thalassarche steadi*	Near Threatened
Grey-headed albatross	*Thalassarche chrysostoma*	Endangered
Petrels		
Cape/Pintado petrel	*Daption capense*	Least Concern
Great-winged petrel	*Pterodroma macroptera*	Least Concern
Grey petrel	*Procellaria cinerea*	Near Threatened
Southern giant petrel	*Macronectes giganteus*	Least Concern
Northern giant-petrel	*Macronectes halli*	Least Concern
White-chinned petrel	*Procellaria aequinoctialis*	Vulnerable
Others		
Cape gannet	*Morus capensis*	Vulnerable
Flesh-footed shearwater	*Puffinus carneipes*	Least Concern

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No assessment has been undertaken by the IOTC WPEB for seabirds due to the lack of data being submitted by CPCs. However, the current International Union for Conservation of Nature (IUCN) threat status for each of the seabird species reported as caught in IOTC fisheries to date is provided in Table 1. It is important to note that a number of international global environmental accords (e.g. Convention on Migratory Species (CMS), the Agreement on the Conservation of Albatrosses and Petrels (ACAP), Convention on Biological Diversity (CBD)), as well as numerous fisheries agreements obligate States to provide protection for these species. While the status of seabirds is affected by a range of factors such as degradation of nesting habitats and targeted harvesting of eggs, for albatrosses and large petrels, fisheries bycatch is generally considered to be the primary threat. The level of mortality of seabirds due to fishing gear in the Indian Ocean is poorly known, although where there has been rigorous assessment of impacts in areas south of 25 degrees (e.g. in South Africa), very high seabird incidental catches rates have been recorded in the absence of a suite of proven incidental catches mitigation measures.

Outlook. Resolution 12/06 *On Reducing the Incidental Bycatch of Seabirds in Longline Fisheries* includes an evaluation requirement (para. 8) by the Scientific Committee in time for the 2016 meeting of the Commission. The level of compliance with 12/06 and the frequency of use of each of the 3 measures (because vessels can chose two out of three possible options) are currently unknown. Methods to evaluate the effectiveness of the incidental catches mitigation measures prescribed in Res 12/06 need to be developed. Observer reports and logbook data should be

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[1] The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

analysed to support assessments of the effectiveness of mitigation measures used and relative impacts on seabird mortality rates. Information regarding seabird interactions reported in National Reports should be stratified by season, broad area, and in the form of catch per unit effort. Unless IOTC CPCs become compliant with the data collection, Regional Observer Scheme and reporting requirements for seabirds, the WPEB will continue to be unable to address this issue. The following should be noted:

- The available evidence indicates considerable risk from longline fishing to the status of seabirds in the Indian Ocean, where the best practice seabird incidental catches mitigation measures outlined in Resolution 12/06 are not implemented.

- CPCs that have not fully implemented the provisions of the IOTC Regional Observer Scheme outlined in paragraph 2 of Resolution 11/04 shall report seabird incidental catches through logbooks, including details of species, if possible.

- Appropriate mechanisms should be developed by the Compliance Committee to assess levels of compliance by CPCs with the Regional Observer Scheme requirements and the mandatory measures described in Res 12/06.

APPENDIX I

SUPPORTING INFORMATION

(Information collated from reports of the Working Party on Ecosystems and Bycatch and other sources as cited)

CONSERVATION AND MANAGEMENT MEASURES

Seabirds in the Indian Ocean are currently subject to a number of Conservation and Management Measures adopted by the Commission:

- Resolution 15/01 *on the recording of catch and effort data by fishing vessels in the IOTC area of competence* requires numbers of seabirds to be recorded for longline and gillnets fleets.
- Resolution 15/02 *mandatory statistical reporting requirements for IOTC CPCs* requires data on seabirds to be reported as specified in Resolution 12/06. Forms for reporting logbook data on discards according to standard IOTC reporting procedures are located at: **www.iotc.org/data/requested-statistics-and-submission-forms**
- Resolution 12/06 *On reducing the incidental bycatch of seabirds in longline fisheries*, came into force on 1 July, 2014, and requires all longline vessels in the area south of 25 degrees South latitude, to use simultaneously at least two of the following three mitigation measures:
  - Night setting with minimum deck lighting
  - Bird-scaring lines (Tori Lines)
  - Line weighting.
- Resolution 11/04 *on a Regional Observer Scheme* (commenced on 1 July 2010) requires data on seabird interactions to be recorded by observers and reported to the IOTC within 150 days. The Regional Observer Scheme (ROS) aims to collect scientific observer data on catch and incidental catches on, at least, 5% of the fishing operations of vessels over 24m and vessel under 24m fishing outside their EEZ. The requirement under Resolution 11/04, in conjunction with the reporting requirements under Resolution 12/06, means that all CPCs should be reporting seabird interactions as part of their annual report to the Scientific Committee.

RESOLUTION 12/06 ON REDUCING BYCATCH OF SEABIRDS IN LONGLINE FISHERIES

1. CPCs shall record data on seabird incidental bycatch by species, notably through scientific observers in accordance with Resolution 11/04 and report these annually.
2. CPCs that have not fully implemented the provisions of the IOTC Regional Observer Scheme outlined in paragraph 2 of Resolution 11/04 shall report seabird incidental bycatch through logbooks, including details of species, if possible.
3. CPCs shall provide to the Commission, as part of their annual reports, information on how they are implementing this measure.

RESOLUTION 11/04 ON A REGIONAL OBSERVER SCHEME

10. Observers shall:

a) Record and report fishing activities, verify positions of the vessel;

b) Observe and estimate catches as far as possible with a view to identifying catch composition and monitoring discards, by-catches and size frequency;

c) Record the gear type, mesh size and attachments employed by the master;

d) Collect information to enable the cross-checking of entries made to the logbooks (species composition and quantities, live and processed weight and location, where available); and

e) Carry out such scientific work (for example, collecting samples), as requested by the IOTC Scientific Committee..

RESOLUTION 15/02 MANDATORY STATISTICAL REPORTING REQUIREMENTS FOR IOTC CONTRACTING PARTIES AND COOPERATING NON-CONTRACTING PARTIES (CPCS)

Para. 3. Concerning cetaceans, seabirds and marine turtles data should be provided as stated in Resolutions 13/04 *on Conservation of Cetaceans*, Resolution 12/06 *on reduction the incidental bycatch of seabirds in longline fisheries* and Resolution 12/04 *on the conservation of marine turtles* (or any subsequent superseding resolutions).

CONSERVATION AND MANAGEMENT MEASURES IN OTHER REGIONS

Evidence from areas where seabird incidental catches was formerly high but has been substantially reduced (e.g. Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) and South Africa) has shown that it is important to employ, simultaneously, a suite of mitigation measures. Research conducted in South Africa by Japanese and US researchers (Melvin et al. 2010) showed that bird scaring lines (BSL, also known as tori or streamer lines) displace seabird attacks on baits, but only as far astern as the BSL extends. If bait is sufficiently close to the surface behind the aerial extent of the BSL, the rate of attack by seabirds on baited hooks, and hence risk of incidental catches, remains high. This research shows clearly that appropriate sink rates must be used in tandem with BSLs and that unweighted branch lines or those with small weights placed well away from the hook pose the highest risks to

seabirds. To date, the research also suggests no negative effect of line-weighting on target catches (Melvin et al. 2010, Gianuca et al., 2013, Jiménez et al 2013, Robertson et al. 2013). In addition, experience from CCAMLR and elsewhere has indicated a number of additional factors contribute to successful reduction of seabird incidental catches (FAO 2008, Waugh et al. 2008). These include research to optimise the effectiveness of mitigation measures and their ease of implementation, the use of onboard observer programs to collect seabird incidental catches data and evaluate the effectiveness of incidental catches mitigation measures, training of both fishermen and observers in relation to the problem and its solutions, and ongoing review of the effectiveness of these activities. Mitigation measures recommended by ACAP (Agreement on the Conservation of Albatrosses and Petrels) as effective include weighted branch lines that ensure that baits quickly sink below the reach of diving seabirds, night setting, and appropriate deployment of well designed BSLs.

Reduction of seabird incidental catches may even bring benefits to fishing operations, for example by reducing the loss of bait to seabirds. Research in Brazil showed a reduction of 60% of the capture of seabirds and higher catch rates (20–30%) of target species when effective mitigation measures were applied (Mancini et al. 2009). However, more detailed economic assessments across a diversity of regions, fishing gears and seasons are required to get a fuller picture of economic benefits.

The International Commission for the Conservation of Atlantic Tunas (ICCAT) established a conservation measure for seabirds at the November 2011 meeting of the Commission. In keeping with scientific advice given to the ICCAT, which is harmonious with the advice from the WPEB 2011, the measure requires the use of only three technologies to reduce risk to seabirds, namely bird scaring lines, line weighting and night setting. In areas of high incidental catches (or incidental catches risk), currently defined in the South Atlantic as of 25˚S, longline fishing vessels are required to use two of the three measures, consistent with IOTC Resolution 12/06.

INDICATORS – FOR SEABIRD SPECIES KNOWN OR LIKELY TO BE VULNERABLE TO MORTALITY FROM FISHING OPERATIONS IN THE IOTC AREA OF COMPETENCE.

Seabirds are species that derive their sustenance primarily from the ocean and which spend the bulk of their time (when not on land at breeding sites) at sea. Eighteen species of seabirds known to interact with longline fisheries for tuna and tuna-like species in the Indian Ocean are listed in **Table 1**. However, not all reports identify birds to species level and, overall, information on seabird incidental catches in the IOTC area remains very limited (Gauffier 2007, IOTC–2011–SC13–R). Due to gaps in tracking and observer data, it is likely that there are other species at vulnerable to incidental catches which are not identified in this Executive Summary.

Worldwide, 15 of the 22 species of albatross are listed by the IUCN as globally threatened, with incidental catches in fisheries identified as the key threat to the majority of these species (Robertson & Gales 1998). Impacts of longline fisheries on seabird populations have been demonstrated (e.g. Weimerskirch & Jouventin 1987, Croxall et al. 1990, Weimerskirch et al. 1997, Tuck et al. 2001, Nel et al. 2003). In general, other IOTC gear types (including purse seine, bait boats, troll lines, and gillnets) are considered to have lower incidental catch of seabirds, however data remain limited. The Convention on Migratory Species (CMS) has recently completed a global review of incidental catches levels in gillnet fisheries (Waugh et al. 2013), and the findings of this report are relevant to seabird incidental catches in gillnet fisheries operating in the IOTC. A complementary study estimated that at least 400,000 birds die in gillnets each year (Žydelis et al. 2013), highlighting the importance of further investigation of the impact of IOTC gillnet fisheries on seabirds.

Range and stock structure

Eleven seabird families occur within the IOTC area of competence as breeding species. They are typically referred to as penguins (Spheniscidae), albatrosses (Diomedeidae), petrels and allies (Procellariidae), storm-petrels (Hydrobatidae), diving-petrels (Pelecanoididae), tropicbirds (Phaethonidae), gannets and boobies (Sulidae), cormorants (Phalocrocoracidae), frigatebirds (Fregatidae), skuas (Stercorariidae), gulls and terns (Laridae). Of these, the Order Procellariiformes (albatrosses and petrels) are most susceptible to being caught as incidental catches in longline fisheries (Wooller et al. 1992, Brothers et al. 1999), and therefore are most susceptible to direct interactions with IOTC fisheries.

The southern Indian Ocean is of global importance in relation to albatross distribution: seven of the 18 species of southern hemisphere albatrosses have breeding colonies on Indian Ocean islands[2]. In addition, all but one[3] of the 18 southern hemisphere albatrosses forage in the Indian Ocean at some stage in their life cycle. The Indian Ocean is particularly important for Amsterdam albatross (*Diomedea amsterdamensis* – Critically Endangered) and Indian yellow-nosed albatross (*Thalassarche carteri* – Endangered), which are endemic to the southern Indian Ocean, white-

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[2] Amsterdam, black-browed, grey-headed, Indian yellow-nosed, light-mantled, sooty and wandering albatrosses

[3] Atlantic yellow-nosed albatross (*Thalassarche chlororhynchos*)

capped albatross (*Thalassarche steadi* – endemic to New Zealand), shy albatross (*T. cauta* – endemic to Tasmania, and which forage in the area of overlap between IOTC and WCPFC), wandering albatross (*D. exulans* – 74% global breeding pairs), sooty albatross (*Phoebetria fusca* – 39% global breeding pairs), light-mantled sooty albatross (*P. palpebrata* – 32% global breeding pairs), grey-headed albatross (*T. chrysotoma* – 20% global breeding pairs) and northern and southern giant-petrel (*Macronectes halli* and *M. giganteus* – 26% and 30% global breeding pairs, respectively).

In the absence of data from observer programs reporting seabird incidental catches, risk of incidental catches has been identified through analysis of the overlap between albatross and petrel distribution and IOTC longline fishing effort, based on data from the Global Procellariiform Tracking Database (ACAP 2007). A summary map indicating distribution is shown in Figure 1 and the overlap between seabird distribution and IOTC longline fishing effort is shown in Table 2. The 2007 analysis of tracking data indicated that albatrosses breeding on Southern Indian Ocean islands spent 70–100% of their foraging time within areas overlapping with IOTC longline fishing effort. The analysis identified the proximity of the Critically Endangered Amsterdam albatross and Endangered Indian yellow-nosed albatross to high levels of pelagic longline effort. Wandering, shy, grey-headed and sooty albatrosses and white-chinned petrels showed a high overlap with IOTC longline effort. Data on distribution during the non-breeding season was lacking for many species, including black-browed albatrosses and white-capped albatrosses (known from incidental catches data to be amongst the species most frequently caught).

In 2009 and 2010, new tracking data were presented to the Working Party on Ecosystems and incidental catches (WPEB) which filled a number of gaps from the 2007 analysis, particularly for sooty albatross, and for distributions of juveniles of wandering, sooty and Amsterdam albatrosses, white-chinned and northern giant petrels (Delord & Weimerskirch 2009, 2010). This analysis indicated substantial overlap with IOTC longline fisheries.

Longevity, maturity, breeding season

Seabirds are long-lived, with natural adult mortality typically very low. Seabirds are characterised as being late to mature and slow to reproduce; some do not start to breed before they are ten years old. Most lay a single egg each year, with some albatross species only breeding every second year. These traits make any increase in human-induced adult mortality potentially damaging for population viability, as even small increases in mortality can result in population decreases.
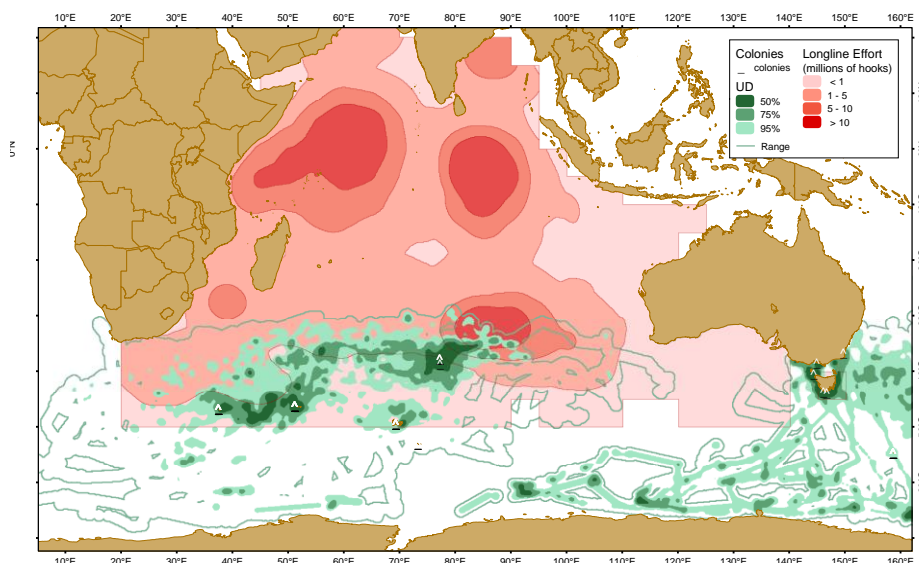
Fig. 1. Distribution of breeding albatrosses, petrels and shearwaters in the Indian Ocean (see Table 2 for a list of species included), and overlap with IOTC longline fishing effort for all gear types and fleets (average annual number of hooks set per 5° grid square from 2002 to 2005).

TABLE 2. Overlap between the distribution of breeding and non-breeding albatrosses, petrels and shearwaters and IOTC fishing effort* (Distributions derived from tracking data held in the Global Procellariiform Tracking Database.

Species/Population – Breeding	Global Population (%)	Overlap (%)
Amsterdam albatross (Amsterdam)	100	100
Antipodean (Gibson's) albatross		
Auckland Islands	59	1
Black-browed albatross		1
Iles Kerguelen	1	88
Macquarie Island	<1	1
Heard & McDonald	<1	
Iles Crozet	<1	

Species/Population	Global Population (%)	Overlap (%)	
Buller's Albatross		2	
Solander Islands	15	1	
Snares Islands	27	2	
Grey-headed albatross		7	
Prince Edward Islands	7	70	
Iles Crozet	6		
Iles Kerguelen	7		
Indian yellow-nosed albatross			
Ile Amsterdam	70	100	
Ile St. Paul	<1		
Iles Crozet	12		
Iles Kerguelen	<1		
Prince Edward Island	17		
Light-mantled albatross	39		
Shy albatross			
Tasmania	100	67	
Sooty albatross			
Iles Crozet	17	87	
Ile Amsterdam	3		
Ile St. Paul	<1		
Iles Kerguelen	<1		
Prince Edward Island	21		
Wandering albatross		75	
Iles Crozet	26	93	
Iles Kerguelen	14	96	
Prince Edward Islands	34	95	
Northern giant petrel	26		
Southern giant petrel	9		
White-chinned Petrel			
Iles Crozet	?	60	
Iles Kerguelen	?		
Prince Edward Island	?		
Short-tailed shearwater			
Australia	?	3	
Species/Population – Non-breeding	**Global Population (%)**	**Overlap (%)**	
Amsterdam albatross (Amsterdam)	100	98	
Antipodean (Gibson's) albatross		9	
Antipodes Islands	41	3	
Auckland Islands	59	13	
Black-browed albatross			
South Georgia (GLS data)	16	3	
Heard & McDonald Islands	<1		
Iles Crozet	<1		
Iles Kerguelen	1		
Buller's albatross		13	
Solander Islands	15	9	
Snares Islands	27	15	
Grey-headed albatross			
South Georgia (GLS data)	58	16	
Iles Crozet	6		
Iles Kerguelen	7		
Prince Edward Island	7		
Indian yellow-nosed albatross			
Light-mantled albatross			
Northern royal albatross		3	
Chatham Islands	99	3	
Taiaroa Head	1	1	
Shy albatross			
Tasmania	100	72	
Sooty albatross			
Southern royal albatross			
Wandering albatross		59	
White-capped albatross			
Northern giant petrel			
Southern giant petrel			
White-chinned petrel			

| Westland petrel | | | |
| Short-tailed shearwater | | | |

*Fishing data are based on the average annual number of hooks set per 5° grid square from 2002 to 2005. Overlap is expressed as the percentage of time spent in grid squares with longline effort, and is given for each breeding site as well the species' global population where sufficient data exists. Shaded squares represent species/colonies for which no tracking data were available).

Availability of information on the interactions between seabirds and fisheries for tuna and tuna-like species in the Indian Ocean

Longline vessels fishing in southern waters

The interaction between seabirds and IOTC fisheries is likely to be significant only in Southern waters (south of 25° degrees South), an area where most of the effort is exerted by longliners. Incidental catches are, for this reason, likely to be of importance only for longline fleets having vessels operating in these areas. The main fleets reporting longline fishing effort since 1955 in this area are those of Japan (accounting for 61%) and Taiwan,China (accounting for 34%) (**Fig. 1**). Nevertheless, this is based on reported effort which is highly incomplete (see paper ref: IOTC-2015-SC18-08, Apendix B for estimates of the level of under-reporting by longline fleets).
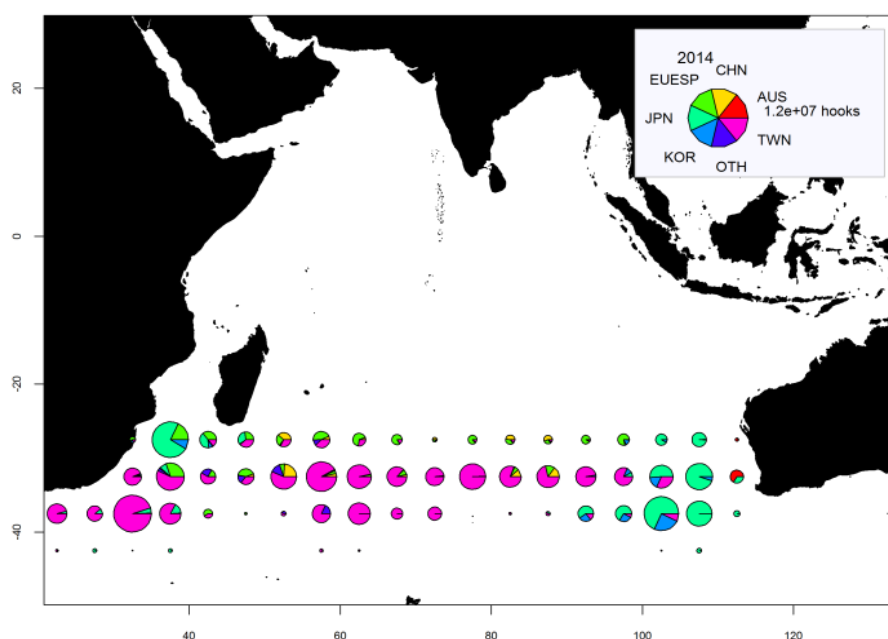

Fig. 2 Reported longline effort for fleets operating south of 25° south in 2014. (CHN = China, AUS = Australia, TWN = Taiwan,China, KOR = Rep. of Kora, JPN = Japan, EUESP = EU,Spain, OTH = Other fleets).

Bycatch data reported to the IOTC Secretariat

Globally it is recognised that onboard observer programs are vital for collecting data on catches of non-target species, particularly those species which are discarded at sea. More specifically, observers need to observe hooks during setting and monitor hooks during the hauling process to adequately assess seabird incidental catches and evaluate the effectiveness of mitigation measures in use. Levels of observer coverage levels are currently <1%, although coverage levels significantly in excess of 5% are likely to be needed to accurately monitor seabird incidental catches levels in IOTC fisheries.

IOTC CPCs are required to collect data on interactions with seabirds either through logbooks[4] or onboard observers[5] (Resolution 12/06) to better understand the nature and extent of the interactions between fisheries for tuna and tuna-like species in the Indian Ocean and seabirds. While ad hoc pieces of information from a number of sources have been collated as far as possible for this document, it is noted that data presented in various documents such as Working Party papers and National Reports are not considered to be formal data submissions to the IOTC. Formal submissions of data in an electronic and standardized format using the available IOTC templates will considerably improve the quality of data obtained and the type of regional analyses that these data can be used for. Information reported to the IOTC Secretariat on the interactions of seabirds with longline gear is presented in **Table 3**. This table highlights which

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[4] www.iotc.org/data/requested-statistics-and-submission-forms

[5] www.iotc.org/science/regional-observer-scheme-science

CPCs have provided some form of information to the IOTC on interactions of seabirds with longline gear, while Appendix II provides a summary of the observer data and discard data on seabird interactions that has been officially reported to the IOTC Secretariat.

TABLE 3. Contracting Parties and Cooperating Non-Contracting Parties reporting seabird interactions with longline gear to the IOTC (2008–2014)

	2008	2009	2010	2011	2012	2013	2014	Sources/notes
CPCs								
Australia	green	green	green	green	green	green	green	Observer data:IOTC-2015-SC18-NR01 Reported observer data
Belize	green	green	green	red	red	red	red	National Report 2011
China	red	red	green	green	green	green	green	Observer data submitted. Observers noted *"some interaction around haul"*.
Taiwan,China	green	green	green	green	green	green	green	Observer data: Report for SC16 (2008-2011) letter to the Secretariat (2013-2014)
Comoros	blue	blue	blue	blue	blue	blue	blue	No reported longline activity
European Union*	(ESP)	(ESP)	(ESP)	(ESP)	(ESP) (FRA)	(ESP) (PRT) (UK)	(FRA) (PRT)	ESP,PRT&UK: Observer data (IOTC-2014-SC17-NR06) EU,FRA; EU,PRT 2014: reported observer data
Eritrea	blue	blue	blue	blue	blue	blue	blue	No reported longline activity
Guinea	blue	blue	blue	blue	blue	blue	blue	No reported longline activity
India	red	red	red	green	red	green	green	*"no reported instances of sea bird interaction"* IOTC-2015-SC18-NR09
Indonesia	blue	blue	green	green	green	red	green	Observer data: IOTC-2015-SC18-NR10
Iran, Islamic Republic of	red	red	red	red	blue	blue	blue	No reported longline activity since 2012
Japan	red	red	green	green	green	green	green	Observer data: submitted data (2010-2012) and IOTC-2014-SC17-NR12; Discard form 2014
Kenya	red	red	red	blue	blue	blue	blue	No reported longline activity since 2010
Korea, Republic of	red	green	green	red	green	green	green	Observer data (2009-2011): IOTC-2014-SC17-NR14 and discard forms (2012-2014)
Madagascar	red	blue	red	red	red	red	red	No reported longline activity in 2009
Malaysia	red	red	red	green	green	green	green	*"no report of seabird interaction";* IOTC-2015-SC18-NR16
Maldives, Republic of	blue	blue	blue	green	green	red	red	Discard report
Mauritius	green	green	green	green	green	green	green	*"No interaction with seabirds was recorded"* IOTC-2015-SC18-NR18
Mozambique	blue	blue	blue	green	green	blue	red	Letter to IOTC Secretariat reporting nil interactions (2011-2012). Observer data reported in 2012. No reported fleet activity 2008-20010 & 2013
Oman, Sultanate of	red	blue	blue	blue	red	red	red	No reported longline activity 2009-2011
Pakistan	blue	blue	blue	blue	blue	blue	blue	No reported longline activity

Country								Notes
Philippines	Green	Green	Green	Red	Green	Red	Red	IOTC-2013-SC16-NR
Seychelles	Red	Red	Red	Green	Red	Green	Red	*"The logbook has been upgraded to record interactions and to date no interaction have been reported"*. IOTC-2014-SC17-NR23
Sierra Leone	Blue	Blue	Blue	Blue	Blue	Blue	Blue	No reported longline activity
Somalia	Blue	Blue	Blue	Blue	Blue	Blue	Blue	No reported longline activity
Sri Lanka	Red	Red	Red	Red	Red	Green	Green	Survey data: IOTC-2014-WPEB10-30 Reported observer data
Sudan	Blue	Blue	Blue	Blue	Blue	Blue	Blue	No reported longline activity
Tanzania	Blue	Blue	Red	Red	Red	Green	Red	No reported longline activity 2008-2009 *"There was no incidence of sea bird interaction"*: IOTC-2014-SC17-NR28
Thailand	Red	Red	Red	Green	Red	Red	Red	IOTC-2012-SC15-NR28_Rev_2
United Kingdom (OT)	Green	Green	Green	Blue	Blue	Blue	Blue	No reported longline activity since 2010
Vanuatu	Blue	Red	Red	Blue	Red	Red	Blue	No reported longline activity 2008,2011,2014
Yemen	Blue	Blue	Blue	Blue	Blue	Blue	Blue	No reported longline activity
Cooperating Non-contracting Parties								
Djibouti	Blue	Blue	Blue	Blue	Blue	Blue	Blue	No reported longline activity
Senegal	Blue	Blue	Blue	Blue	Blue	Blue	Blue	No reported longline activity
South Africa	Green	Green	Green	Green	Green	Green	Green	Discard forms (includes foreign fleets)

*Reporting countries in brackets

Green = CPC reported level of seabird interactions; Red = CPC did not report level of seabird interactions; Blue = CPC did not report active longline vessels

Longline

Observer data from longline fisheries occurring north of 20˚S is very sparse (Gauffier 2007). While seabird incidental catches rates in tropical areas are generally assumed to be low, a number of threatened seabirds forage in these northern waters. Due to their small population sizes, incidental catches at significant levels could be occurring but not, or almost never being observed.

Other gears

The impact of purse seine fishing on tropical seabird species, including larids (gulls, terns and skimmers) and sulids (gannets and boobies), is generally considered to be low, but data remain sparse and there are anecdotal observations which suggest that these interactions might merit closer investigation. However, no observation of incidental catch of seabird in the purse-seine fishery has been made in the Indian Ocean since the beginning of the fishery 25 years ago. The scale and impacts of gillnet fishing impacts on seabirds in the IOTC convention area is unknown. Outside the convention area, gillnet fishing has been recorded as catching high numbers of diving seabird species, including shearwaters and cormorants (e.g. Berkenbusch & Abraham 2007). The large coastal gillnet fisheries in the northern part of the IOTC clearly merit closer investigation, and should be considered a priority, as should the impact of lost or discarded gillnets (ghost fishing) on seabirds. See reference above to recent global reviews of seabird incidental catches in gillnet fisheries.

Indirect impacts of fisheries

Many tropical seabird species forage in association with tunas, which drive prey to the surface and thereby bring them within reach of the seabirds. The depletion of tuna stocks could therefore have impacts on these dependent species. More widely, the potential 'cascade' effects of reduced shark and tuna abundances on the ecosystem is largely unknown. Although these kinds of impacts are difficult to predict, there are some examples that suggest meso-predator release has occurred in the Convention area (e.g. Romanov & Levesque 2009)

ASSESSMENT

A number of comprehensive assessments of the status of Indian Ocean seabirds are available, in addition to the IUCN threat status:

- Modelling work on Crozet wandering albatrosses and impact of longline fisheries in the IOTC zone (Tuck et al. 2011).
- ACAP Species assessment for: Amsterdam Albatross, Indian Yellow-nosed Albatross, Northern Royal Albatross, Southern Royal Albatross, Shy Albatross, Sooty Albatross, Wandering Albatross, Northern Giant Petrel, Southern Giant Petrel, Grey Petrel, Spectacled Petrel, White-chinned Petrel (http://www.acap.aq/acap-species).

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APPENDIX II

OFFICIALLY REPORTED DATA

TABLE 4. Seabird interactions with longline gear by fleet (numbers of birds) based on observer data reported to the IOTC Secretariat[6]

CPC	2010	2011	2012	2013	2014	2015	Coverage level (%)*
Australia	0	0	0		0		4.39
China	0		0	0			0.63
EU(France)	0	0	0	0	0		2.93
EU(Portugal)		0	0	22	0	0	8.14
Japan	11	201	28				2.75
Korea	76		16	6	2		5.28
Sri Lanka					0	0	<1.00
Mozambique			0				0.07
South Africa		195	97	93	109(11)		0.28

*estimated mean annual observer coverage
**Observer data from South Africa is based on foreign vessels, except for numbers in brackets for a South African flagged vessel

TABLE 5. Seabird interactions with longline gear by fleet and gear (numbers of birds) based on discard data reported to the IOTC Secretariat[7]

CPC	2008	2009	2010	2011	2012	2013	2014
Japan	116						
Korea					106	48	2
Taiwan, China	18	156	428	12	42	87	47
South Africa (Foreign flag)	157 (1)	455	157	382	125	258	106 (147)

*Discard data from South Africa is for South African vessels, except for numbers in brackets for foreign flagged vessels

[6] www.iotc.org/science/regional-observer-scheme-science

[7] www.iotc.org/data/requested-statistics-and-submission-forms