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Options for Differential Management and Monitoring of Seabird Bycatch

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Agreement on the Conservation of Albatrosses and Petrels

Options for Differential Management and Monitoring of Seabird Bycatch

Abstract

At WCPFC-SC5 it was agreed to undertake further work to validate the spatial risk assessment (ERA) on seabirds to determine initial spatial zones for the differential management and monitoring of seabird bycatch. This paper considers some of the management options available to reduce seabird bycatch, including area or seasonal closures, application of bycatch mitigation measures and monitoring and data collection. Some recommendations are also provided on the type and level of monitoring that may be required to further validate the spatial risk assessment.

Introduction

At WCPFC5 the meeting accepted the recommendation of SC5 that ongoing research following from the spatial risk assessment presented in WCPFC-SC5-2009/EB-WP-6 should be conducted for review at SC6. WCPFC5 also accepted SC5's recommendation that data from the Regional Observer Programme (ROP) be used to validate the spatial risk assessment so that a recommendation could be brought before SC6 to determine initial spatial zones for the differential management and monitoring of seabird bycatch. This paper presents some of the managements options that are available for use in the differential management of seabird bycatch, as well as making recommendations on the type and level of monitoring that may be required to further validate the spatial risk assessment.

Management options of use in the differential management of seabird bycatch

A range of management options are available for use in the differential management of seabird bycatch and the merits and disadvantages of these are discussed below. The area of application for these management measures has not been specified, pending the results of work undertaken intersessionally to validate the spatial risk assessment presented in WCPFC-SC5-2009/EB-WP-6. It should be noted that the use of specific management options may be dependent on the species and/or area of application that they are targeting, for example night setting is a much less effective management option for an area in which diving petrels interact with fishing operations. These caveats are noted, where appropriate, in the following advice.

Area or seasonal closures

The use of area or seasonal closures can be a practical management option to reduce the incidence of seabird bycatch, by restricting fishing operations occurring in areas/times where they overlap with high seabird densities. This management measure has been used successfully by CCAMLR to significantly reduce seabird bycatch in their longline fishery. A good understanding of which species are at risk of capture, as well as knowledge of their seasonal distribution, is useful to define the spatial and temporal application of this measure. This information can be obtained from observer programmes and may also be available for some species from tracking studies (refer http://www.seabirdtracking.org/).

Application of bycatch mitigation measures

The adoption of bycatch mitigation measures that are known to be effective for the species identified in the ERA is another management option available. Recent research (Melvin *et al* 2010) has highlighted the importance of preventing seabird access to baited hooks through the use of measures such as branchline weighting, tori lines, night setting and underwater setting devices. Evidence is emerging that the use of appropriate configurations of weights on branchlines is currently the most effective means of reducing seabird access to baits, although it still needs to be used in conjunction with other measures, such as tori lines and night setting. As noted above, night setting is not by itself an effective mitigation measure for diving petrels. Further information on recent research carried out on the efficacy of seabird bycatch mitigation measures is provided in WCPFC-SC6-2010-WP-?, 'Review of Seabird Bycatch Mitigation Measures for Pelagic Longline Fishing Operations'.

Monitoring and collection of data

The formal monitoring of seabird bycatch is another tool that should be considered an essential component of the management response to the ERA. Monitoring is useful not only for identifying if a problem exists, but also for evaluating the effectiveness of the mitigation and management measures put in place to address the problem. Recent research by Melvin *et al*, 2010, *Shrink and defend: a comparison of two streamer line designs in the 2009 South Africa tuna fishery*, has found that when streamer lines are deployed, most seabird attacks occur beyond their aerial extent. The research also found that baits on unweighted branchlines were still accessible to White-chinned Petrels *Procellaria aequinoctialis* (WCPE) beyond 100 m astern and that it was in this area that most albatross mortality occurred, as a function of secondary attacks on baits returned to the surface by WCPE. The findings of Melvin *et al* clearly demonstrate the need for dedicated observer programmes that are appropriately structured to provide the data required to ensure informed management decisions are made.

Monitoring requirements

WCPFC SC has already made recommendations on the level and type of data collection that should occur (WCPFC Scientific Committee, 2006). WCPFC SC2 agreed "to identify areas of spatial and temporal overlap of seabird species and fishing effort (areas of high and low interaction rates for seabirds) so that CCMs can target mitigation measures in areas where

they will be most needed" (WCPFC Scientific Committee, 2006, p37). It agreed the following level of observer coverage should be instigated (WCPFC Scientific Committee, 2006, p37-38):

Coverage

To adequately characterize rare events, up to 100% observer coverage may be required statistically. But bearing in mind the practicalities involved, the programme should:

i. *Initially be spatially and temporally representative of each fishery operating in the Commission area. Given diminishing benefits of greater coverage, the programme should aim to observe 20% of the fishing effort over a two-year period. ... When areas of greater importance are found, the observer programme may be restructured to optimize coverage in these areas.*

2) Data to collect

a. *Cross-check the SPC observer manual and data sheets with other regional fisheries management organizations (RFMOs) and national programmes to ensure that all the necessary data collection details are included (to be addressed through the Statistics SWG recommendation on observer data (Statistics SWG report, paragraph 30 (a)).*

   Although these will be addressed through the Statistics SWG's recommendations, the data elements for observers on longliners required to ensure that the objectives of the Data Collection and Research Programme are met, should include:

   - *gear (e.g. branch line length, light sticks, bait type)*
   - *operational (e.g. time of set, position)*
   - *seabird catch (e.g. number and species caught)*
   - *seabird abundance estimate (e.g. number of seabirds around the vessel)*
   - *use of and effectiveness of mitigation measures (e.g. tori lines)*

b. *Ensure standardized data collection and clearly specify programme priorities for observer monitoring of seabird catches, interactions during hauling and setting, and mitigation measures.*

With regard to recommendation 2 a) above, examples of observer data forms that have been recently developed by the Indian Ocean Tuna Commission (IOTC) are provided in Annexes 1, 2 and 3.

References

Melvin EF, TJ Guy & LB Read. 2010. Shrink and defend: a comparison of two streamer line designs in the 2009 South Africa tuna fishery. SBWG-3 Doc 13 rev1. Seabird Bycatch Working Group Meeting 3, Mar del Plata, Argentina. http://www.acap.aq/meeting-documents/download-document/1379-doc-13-streamer-line-designs-sth-africa-tuna-fishery

WCPFC Scientific Committee. 2006. WCPFC-SC-2 Summary Report, Second regular session, 7-18 August 2006, Manila, Philippines. http://www.wcpfc.int/doc/sc2-summary-report-final

INDIAN OCEAN TUNA COMMISSION
FISHING EVENT LONGLINE

FORM 4-LL

REVISED June 2010

Observer name	IOTC Certification No.	Vessel name	IOTC No.	Date embarkation (*dd/mm/yyyy*)

SETTING OPERATION

Set No.	Setting speed (*knots*)	Line setter speed	Clip on time (*s*)	Total line length (*m*)	Total nb of hooks
Date start (*dd/mm/yyyy*)	Time start (*GMT*)	Latitude start N S	Longitude start E	Ratio hook type/size	
Date end (*dd/mm/yyyy*)	Time end (*GMT*)	Latitude end N S	Longitude end E	Total No. Steel wire leaders	
Bait species 1/ 2/ 3/	Bait ratios 1/ % 2/ % 3/ %	Bait dyed Y / N Color	Mainline weight attached Y / N	Weight used (*kg*)	No. Hooks / basket
		Avg branch line lengths (*cm*)	Branchline weight Y / N	Distance weight from hook (*cm*)	Weight used (*g*)
Light stick attached Y / N	Total No. of light sticks	No. Tori line deployed	Target species for the set	Comments	

HAULING OPERATION

Date start (*dd/mm/yyyy*)	Time start (*GMT*)	Latitude Start N S	Longitude start E	Offal management
Date end (*dd/mm/yyyy*)	Time end (*GMT*)	Latitude end N S	Longitude end E	Position of offal disposal
Number of hooks observed		Bird scaring device at hauler (*description*) Y / N		

WEATHER OBSERVATION

	Wind	Sea	Swell
Fishing event start			
Time			
Time			

RETAINED CATCH

Species	Process	No. fish	Total Processed weight	Species	Process	No. fish	Total Processed weight	Species	Process	No. fish	Total Processed weight

RELEASED AND DISCARDED CATCH PER SPECIES

Species	No.	Fate	Reason for discard	Tagged	Comments
				Y / N	
				Y / N	
				Y / N	
				Y / N	
				Y / N	
				Y / N	
				Y / N	
				Y / N	
				Y / N	
				Y / N	

DEPREDATION

Suspected depredation on bait	Suspected depredation on fish	Mitigation measures
Y / N	Y / N	

Predator species	Id reliabilty	No. Fish damaged / species

INCIDENTAL CATCHES OF SEABIRDS, TURTLES AND MAMMALS

Species	No.	Reason	Dehooker Line cutter	Release fate	Resuscita-tion	Sample retained	Length (*cm*)	Tag detail	Id photo	Comments
			Y / N	Alive / Dead	Y / N	Y / N			Y / N	
			Y / N	Alive / Dead	Y / N	Y / N			Y / N	
			Y / N	Alive / Dead	Y / N	Y / N			Y / N	
			Y / N	Alive / Dead	Y / N	Y / N			Y / N	
			Y / N	Alive / Dead	Y / N	Y / N			Y / N	

BIOLOGICAL DATA COLLECTION

Species	Length (*cm*)	Length type	Weight (*kg*)	Weight type	Sex	Maturity	Sample collected	Comments

TAG RECAPTURE DETAILS

Species	Tag No.	Length (*cm*)	Length type	Weight (*kg*)	Weight type	Sex	Sample collected	Finder	Comments

INDIAN OCEAN TUNA COMMISSION
PELAGIC LONGLINE GEAR AND OPERATION INFORMATION

FORM 2-LL

REVISED June 2010

Observer name	IOTC Certification No.	Vessel name	IOTC No.	Date embarkation (*dd/mm/yyyy*)

LONGLINE GEAR SPECIFICATIONS

OPERATIONAL EQUIPMENT

Longline type Branch line storage	Mainline Material Length *(m)* Diameter *(mm)*	Line Setter Y / N Make Model	Hauler Y / N Make Model
Branch line Material Diameter *(mm)*	No. Hooks / basket	Bait casting machine Y / N Make Model	
Leader Material Diameter *(mm)*	Hooks Type Size(s)	Refrigeration method	Fish storage method

TORI LINES DETAILS

Streamer line length *(m)*	No. Of Streamers	Distance between streamers *(m)*	Streamers reach surface if no wind or Swell
Attached height above water *(m)*	Streamers Paired or Single	Length of streamers *(m)* Min Max	
Towed object Y / N *If yes description:*			

Diagram

COMMENTS

IOTC Regional Observer Scheme

OBSERVER TRIP REPORT

Observer name :	
Nationality :	
IOTC Certification No. :	

Vessel name :	
IOTC Registration No. :	
Vessel type :	

Trip started :	
Trip ended :	

1. TRIP SUMMARY

A brief outline of the work carried out, including any specific tasks undertaken that are additional to those specific in the IOTC Scientific Observer Manual. It should include a brief summary from each section or highlights points that the observer would like the reader to take special note of.

Operational issue:

Observer tasks:

Observer logbooks/forms

2. SCIENTIFIC OBSERVER AND VESSEL DETAILS

2.1. Scientific Observer Details

Observer name:	**Nationality:**
Controlling organization:	**Contact address:**

BOARDING		**DISEMBARKATION**	
Date (dd/mm/yy)	**Time (GMT)**	**Date (dd/mm/yy)**	**Time (GMT)**
Location		**Location**	

Comments

2.2. Vessel details

Vessel name	**Radio CallSign**	**Flag State**	**Port of registration**

Vessel type	**Main fishing gear**	**Owner**	**Charterer**

Gross tonnage	**Length Over All (m)**	**Blast freezer capacity (m3)**	**Fish Storage capacity (m3)**

ELECTRONIC EQUIPMENT

Record details such as "make, model and power" of the electronic equipment used on the bridge for navigation, communication and general fishing operation. Also note the average "usage code" of the equipment during the trip.

Onboard acoustic equipment

Position fixing equipment

Vessel Monitoring System **PRESENT / ABSENT**

VMS unit and transmitter equipment type

Radars

Communication equipment

Plotters

Comments

Comments on any unique equipment that may have had a significant effect on fishing operations

3. CRUISE ITINERARY

Date of departure (dd/mm/yy) / /	**Port / Position of departure**		
Arrival on fishing ground ((dd/mm/yy) / /	**Start fishing (dd/mm/yy)** / /	**End fishing (dd/mm/yy)** / /	**Departure of fishing grounds (dd/mm/yy)** / /
Date of return (dd/mm/yy) / /	**Port / Position of return**		

Comments

4. FISHING OPERATIONS

4.1. Summary

Total number of days in the fishing area **Days**	**Total number of days fished** **Days**	**Days lost (weather, breakdown…)** **Days**	**Steaming / Searching days** **Days**
Target species	**Total number of sets/drifts**	**Number of hooks / panels**	**Number of hooks / panels lost**
Total number of sets / drifts observed / sampled		**Number of hooks / panels observed / sampled**	

Bait used *(type / species)*	**Bait ratio**
1/	**1/** **%**
2/	**2/** **%**
3/	**3/** **%**
Comments	

4.2. Gear Description

Longline

Longline type(s) used *(IOTC gear code)*	**Line Setter** **Y / N** Make Model	**Bait casting machine** **Y / N** Make Model	**Line Hauler** **Y / N** Make Model
Mainline Material Length (m) onboard Diameter (mm)	**Branch line storage** *(basket / tub / reel)*	**No. Hooks** *per basket / tub / reel*	**Hooks** Type(s) Size(s)
Branch line 1 Material (s) Diameter (mm)	**Branch line 2** Material (s) Diameter (mm)	**Branch line 3** Material (s) Diameter (mm)	**Branch line 4** Material (s) Diameter (mm)

Leader 1 Material Diameter (mm)	**Leader 2** Material Diameter (mm)	**Leader 3** Material Diameter (mm)	**Leader 4** Material Diameter (mm)
Refrigeration method		**Fish storage method**	
Comments *Comment on the set-up and use of the gear. Note differences in branch lines construction***.**			

Purse-seine

Max. Net length (m)	**Max. Net depth** (m)	**Power Block** Make Model		**No. of Buoys per type at embarkation** At sea
Stretched mesh size (mm)	**Supply Vessel(s)** **Y / N** Name(s)		**Purse Winch** Make Model	Onboard

Comments

Pole and Line

Maximum No. of operational poles	**Total volume of bait tanks** (m^3)	**Automatic poling** **Y / N**

Comments

Gillnet / Trammel nets

Total No. of Net Panels onboard	**Total Length of Net panels** (m)	**Stretched mesh size(s)** (mm)	**Hanging ratio**
Max. Deployable Net Length / Day (m)	**Net** Anchored Drifting	**Nets set on** Surface Sub-surface Bottom	**Net drum / hauler** **Y / N** Make Model
Comments *Record strategy of setting nets, and whether they actively encircle fish. Note if nets are set on surface or sub-surface and are anchored or drifting.*			

4.3. Retained Catch Details (all species) per calendar months

Year	**Month**	**Species**	**Square number (1°x1°)**	**Processing code**	**Processed weight (kg)**

Comments

4.4. Processing Details

Species	**Processing Code**	**Comments**

Comments

4.5. Fish discards

Year	**Month**	**Species**	**Square number (1°x1°)**	**Number or Weight (kg)**	**Reason**

Comments

5. SUMMARY OF METEOROLOGICAL DETAILS

Briefly describe the predominant weather and sea conditions during the trip. Note specifically adverse conditions that affected the fishing operations.

6. SUMMARY OF FISHING STRATEGY

Provide a brief description of the fishing methods and strategy. Include a description of the use of FADs and the use of electronic aids to locate or determine areas fished.

7. SUMMARY OF INCIDENTAL CATCHES

7.1. Mitigation Measures

Did the vessel operate south of 25°S?	Y / N
List of mitigation measures used	1/ 2/ 3/ …

If Tori lines were used:

What was the number of sets on where the Tori lines were deployed?	
What was the percentage of sets on which Tori lines were deployed?	%
Were the Tori lines constructed according to the guidelines recommended by IOTC?	

Comments
Comment of the construction, streamer length and material, aerial extent and effectiveness of the tori lines

7.2. Seabirds caught

Year	**Month**	**Species**	**Square number (1°x1°)**	**Fate**	**Comments**
				Dead: **Released alive:**	
				Dead: **Released alive:**	
				Dead: **Released alive:**	
				Dead: **Released alive:**	

7.3. Marine Mammals caught

Year	**Month**	**Species**	**Square number (1°x1°)**	**Fate**	**Comments**

				Dead: **Released alive:**	
				Dead: **Released alive:**	
				Dead: **Released alive:**	
				Dead: **Released alive:**	
				Dead: **Released alive:**	

7.4. Sea turtles caught

Year	**Month**	**Species**	**Square number (1°x1°)**	**Fate**	**Comments**
				Dead: **Released alive:**	
				Dead: **Released alive:**	
				Dead: **Released alive:**	
				Dead: **Released alive:**	
				Dead: **Released alive:**	

7.5. Depredation

Number of sets with observed depredation	
Percentage of sets with observed depredation	%
Percentage of catch per species damaged by depredation	%
Was fish loss attributed to predator but not directly observed?	Y / N

List of predator species observed	1/ 2/ 3/ …

Comments

7.6. Tag Recovery information

Tag No.	Species	Length (cm)	Length type	Weight (kg)	Weight type	Position of recovery	Finder details	Comments (eg. Full label on tag, tag type)
						Lat: N / S Long: E		
						Lat: N / S Long: E		
						Lat: N / S Long: E		
						Lat: N / S Long: E		

8. SUMMARY OF BIOLOGICAL DATA COLLECTED

8.1. Biological Data Collection summary

Species	Total No. individuals sampled	No measured	No weighted	No. Sexed	Maturity stage recorded	Otoliths collected	Other (specify)	Carcass retained

8.2. Biological Sample Storage Location

Sample type	Species	No. collected	Location to be sent/stored

8.3. Biological Sub-sampling Methodologies

Description of the sub-sampling methodology used during the trip

8.4. Tagging information

Species	Tag type	No. animals tagged	Comments

9. LOST FISHING GEAR

Include information on lost fishing gear, such as length of line lost, amount of net, and other gear such as floats

10. VESSEL SIGHTINGS

Was fishing/supply vessels sightings being recorded? **Y / N**

11. GENERAL COMMENTS

Provide a description and/or comment on fishing activities or incidences that are not routinely captured by the data sheets.