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5th Compliance Committee of the Southern Indian Ocean Fisheries Agreement (CC5)

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Protocol for documenting marine mammal interactions in deep-sea demersal longline fisheries *(Gasco Nicolas, Paul Tixier, Christophe Guinet)*

Relates to agenda item: 4.1 Working paper ☒ Info paper ☐

Delegation of [France-Overseas Territories]

Abstract

This paper presents the protocol to be used to document marine mammal interactions with longliner vessels operating in the SIOFA area and describes the key data to be collected by order of priority. The details of this protocol have been presented as an example in the document SC-04-INFO-06 (Whale depredation - Data collection guidelines).

This protocol requires the following information to be transmitted to the Secretariat, for each haul and each species of depredating whales (killer whales *Orcinus orca* and sperm whales *Physeter macrocephalus*) :

Priority (priority 1) data to be collected include:

1. Presence/absence data: Presence / Absence / Not observed;
2. When presence, photo-identification data: photographs of specific body parts (for killer whales: dorsal fin, saddle patch and eye patches; for sperm whales: tail flukes) visible when whales come to the surface.

Priority 2 data include:

1. Estimates of the number of individuals present around the vessel in the vicinity of the fishing gear.

Priority 3 data include:

1. Information about whether or not whales interact with the gear;
2. Estimate of the time of arrival of whales in the vicinity of the gear.

Recommendation

1. CC5 to consider and recommend for adoption by the MOP this protocol for documenting interactions between marine mammals and longliner vessels operating in the SIOFA Area.

Protocol for documenting whale interaction in deep-sea demersal longline fisheries

This document presents the data requirement for documenting whale interactions with longliner vessels operating in the SIOFA Area.

This protocol requires a minimum set of information for documenting all interactions with marine mammals which is simple to collect and report to the Secretariat.

1 Introduction

Marine mammal interactions with fisheries are a growing major world-wide issue with both substantial ecological and economic consequences. Most longline fisheries operating around the world, including many toothfish fisheries in the Southern Ocean, are seriously affected by these interactions i.e. marine mammals eating fish directly from fishing gear, known as “depredation”, causing losses of tens of millions dollars to the fishing industry annually (Tixier et al. 2021). Depredation can also have negative impacts on the conservation of recovering marine mammal populations as a result of incidental bycatch, lethal responses from illegal fishers, and increased dependence through artificial food provisioning (Guinet et al. 2015; Tixier et al. 2021). Finally, depredation can affect the management of fisheries and the fish stock assessment if depredated fish are disregarded when defining quotas (Tixier et al. 2020). Stocks that have also been under pressure from illegal fishing activity are even more so sensitive to the effects of depredation. Most depredation activity in the Southern Ocean is due to interactions with odontocetes (toothed whales), specifically sperm whales *Physeter macrocephalus* and killer whales *Orcinus orca*.

To address the depredation issue, the first international workshop dedicated to odontocete depredation on demersal longlines operating in high latitudes was organised by the Coalition of Legal Toothfish Operators (COLTO) in Punta Arenas, March 2016. The workshop concluded that the consistent collection of data on the occurrence of interactions and on the depredating whales is crucial for a better understanding of depredation and for solutions to be developed, both locally and globally. Yet, although efforts to develop a standardized framework to document depredation interactions across fisheries confronted to the issue was initiated through multiple papers (e.g. Gasco et al. 2016) and following instances of successful long-term implementations (e.g. toothfish fisheries in Crozet and Kerguelen EEZs), observers data on whale depredation is still lacking in specific regions, including in the SIOFA area. In some fisheries there is no information at all available on the magnitude and extent of the depredation problem other than verbatim reports from fishers and operators, while other fisheries have spent substantial time and resources in describing, assessing, mitigating and managing this issue.

Therefore, in order to increase the knowledge about depredation and the capacity to mitigate it, this paper describes, in a simplified way, the key data that should be collected from fishing vessels operating in SIOFA areas where depredation occurs. These data are sorted by order of priority depending on the range of questions each can allow to address.

2 Data collection

Priority 1

Presence

The consistent recording, for each haul and for each depredating species, of whether depredation occurs or not, is a critical information to: assess the extent of the issue, assess its impacts on the fishing activity, on fish stocks and on whale populations, and develop mitigation solutions (e.g. identify spatio-temporal patterns in the likelihood of vessels to be depredated, correlate with the behaviour of vessels, etc.).

For every haul and for each species:

Haul	Presence ?	Comment
1	Absent	
2	Present	
3	Present	Night time but clearly see them in projectors
4	Not observed	Night time, can't see them but can't say they are not present around.

Requirement: data mandatory and must be collected for every haul.

"Presence": Favourable conditions (visibility is at least several hundred meters with sufficient light) and observation by the observer (observer can be alerted by the crew when whales are sighted). The presence of whales is confirmed by direct observation of at least one individual at the surface in the vicinity of the vessel at least once during 1 haul. Note that presence can also be observed at night when killer whales come very close to the boat.

"Absence": Favourable conditions and no odontocete spotted at any time during the entire haul.

"Not observed" is used either if the observer did not have time to gather information (e.g. if line broke), or if conditions are too bad to observe (either weather conditions, or hauling at night).

Using this system allows to use collected data for presence/absence even if the observer did not record any numbers. The other advantage of this field is to remove empty fields that are always difficult to interpret as they can be either line observations without any odontocetes, or not observed at all, which is a common confusion for observers at sea.

Photos

Complementarily to presence/absence data, photo-identification (identification of whale individuals from photographs showing natural markings on the back or the fins of the animals - see paper SERAWG-03-XXX Killer whale photo-identification made easy for more information on how to easily conduct photo-identification) is an easy-to-implement yet very powerful technique. If consistently implemented, this will generate data that can be used to assess the abundance, the distribution and the movements of individuals as crucial information to understand, and therefore, to mitigate, the depredation issue.

For every haul and for each species:

Haul	Presence ?	Photos?	Comment
1	Absent	No	
2	Present	Yes	
3	Present	No	Night time: too dark for pictures
4	Not observed	No	Night time: too dark for pictures

Requirement: data mandatory and must be collected for every haul.

With this additional field, observers indicate whether they took pictures of whales for photo-identification purposes or not during the haul of the set.

Priority 2

Number of individuals

Together with fishery data (catch, effort, spatial, set and hauling variables), information on the number of individuals present during each interaction is essential to produce accurate depredation estimates than can be included for an estimation of depredation that can be included into stock assessments

For every haul and for each species:

Haul	Presence ?	minimum	maximum	comment
1	Absent	0	0	
2	Present	15	22	
3	Present	1		At least one but can't say with the dark
4	Not observed			

Requirement: data must be collected for every haul when present.

Providing exact counts of individuals from the surface may be difficult for observers as whales can dive for long periods of time. To account for uncertainty around counts, observers may fill in two fields:

- Minimum estimate of the number of individuals,
- Maximum estimate of the number of individuals.

Priority 3

Interaction with fishing gear

Knowing exactly when depredation occurs will increase the accuracy of the presence/absence data. By removing all the sets for which odontocetes were present but did not depredate any fish will limit bias when assessing the influence of factors influencing depredation.

For every haul and for each species:

Haul	Presence ?	Interaction with fishing gear?	Comment
1	Absent	No	
2	Present	Yes	Saw them diving close to the line
3	Present	Yes	Head of fish were observed
4	Not observed		

Requirement: data must be collected for every haul when present.

When Presence, interaction with fishing gear is taken into account if whales are diving close to the lines or directly observed with fish in their mouths.

Estimated Time of Arrival (ETA)

This information is used to assess the distance at which whales detect the ship in different places and can give information on natural foraging areas. It can also help assessing the impact of depredation on a line, if whales are present but only during a tenth of hauling time the impact is expected to be less important.

For every haul and for each species:

Haul	Presence ?	ETA	Comment
1	Absent	NA	Not applicable
2	Present	0:30	We were able to haul 30 minutes before they arrive
3	Present	0:00	Saw them in projectors even before first hook came on board
4	Not observed	NA	Not applicable

Requirement: data must be collected for every haul when present.

The Estimated Time Arrival here corresponds to the time between the first hook of the line hauled on board and the arrival of sperm whales / killer whales. If whales are already present when hauling starts then ETA is zero.