



**DRAFT NATIONAL PLAN OF ACTION
FOR REDUCING THE
INCIDENTAL CATCH OF SEABIRDS IN
NAMIBIAN FISHERIES**

May 2017



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Executive summary

The Namibian National Plan of Action to combat the incidental capture and killing of seabirds in Namibian fisheries (NPOA-Seabirds) is a voluntary undertaking aimed at reducing the mortality of seabirds associated with these fisheries to insignificant levels. The Namibian NPOA-Seabirds has been developed within the context of global efforts to reduce incidental mortalities of seabirds and closely follows the framework provided for in the FAO's International Plan of Action (IPOA-Seabirds, adopted by the FAO Conference in 1999). The NPOA-Seabirds provides a view on the historical developments and international agreements that has brought about growing international awareness of the negative impacts of seabird bycatch on the populations of affected seabirds. Thirteen species of seabirds that forage in the Benguela ecosystem are killed in significant numbers by longline fisheries and potentially by the trawl fishery. This NPOA sets out procedures and practices to be followed in implementing the national program, expounding on six key elements that form the basis of this plan: assessment, prescription of mitigation measures, compliance, research and development, education, training and publicity and data collection and reporting. Critical to its success, the NPOA calls for the establishment of BCC technical Ecosystem and Bycatch Working Group (EBWG) that will oversee the implementation of the NPOA-Seabirds, in support of FAO's IPOA-seabirds. The core functions of the EBWG will be to:

- a) facilitate the training of observers to collect required bycatch information;
- b) assess seabird bycatch and develop mitigation measures where necessary;
- c) cooperate with regional and international fisheries bodies in research and development of bycatch reduction measures; and
- d) develop a compliance monitoring programme through the MFMR Inspectorate.

The NPOA-Seabirds stipulates that the current observer training program should be expanded to include training of observers not only in the identification of seabirds, but also in their conservation status, the extent of seabird bycatch on a global scale and the possible mitigation measures. The observers that are onboard fishing vessels would then collect more comprehensive and reliable seabird bycatch information in addition to the data they are already collecting. An equally important development envisaged is that all prescribed mitigation measures will be incorporated into fisheries and resource management plans, legislation, as well as regulations and permit conditions. In addition to activities to be undertaken by various role players including the EBWG and the management of the Ministry, this document provides a time frame for the successful implementation of the NPOA-Seabirds.

Annex 1 provides the complete text of the FAO International Plan of Action, including a note on technical and operational bycatch reduction measures currently in use or under development in various fisheries around the world. Annex 2 provides a list of affected seabird species in the Benguela Current, inclusive of their known conservation status as determined by the International Union for the Conservation of Nature (IUCN).

1. Introduction

In recent years, various countries around the world have adopted measures to combat the incidental capture and mortality of seabirds in longline and trawl fisheries where they occur. These efforts have sprung from a growing international concern over both the economic and ecological effects of the incidental capture of seabirds in both longline and trawl fisheries conducted in many areas of the globe.

It is generally considered that, in addition to the threat of diminished biodiversity, the incidental catch of seabirds may negatively impact on fishing efficiency and profitability for the fishing industry. It is also noted that the use of irresponsible fishing techniques may jeopardize the long-term sustainability of fisheries. In view of growing international pressure and aversion to controversial fishing practices some longline fisheries continue to operate under threat of loss of markets and accreditation, with some facing severe penalties, including closure, because of the incidental catch of endangered seabird species.

Several countries and international fisheries organizations have over the past decade responded to the need to adopt mitigation measures to reduce the incidental catch of seabirds in commercial longline fisheries. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) adopted mitigation measures in 1992 for its 23 member states to reduce the incidental catch of seabirds. Australia, Japan and New Zealand were the first countries to have studied and embarked upon seabird bycatch reduction programs since 1994. These countries spearheaded an initiative under the auspices of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) that led to the adoption in 1995 of a recommendation that outlines, amongst others, a policy for mitigating the incidental mortality of seabirds by longline fishing. All member states have since made bird scaring lines mandatory in their fisheries. Several other countries have followed suit and the United States of America has also adopted regulatory measures for its groundfish longline fishery and halibut fishery in 1997 and 1998 respectively.

Against the background of an international awareness of the potential negative impacts that the incidental capture of seabirds may have on seabird populations, the 22nd Session of the Committee on Fisheries (COFI) of the Food and Agriculture Organization of the United Nations (FAO) in March 1997 considered a proposal to develop Guidelines leading to a Plan of Action aiming at the reduction of incidental catch of seabirds. The International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds) has been developed under the auspices of the FAO through a series of meetings of notably COFI and the Seabird Technical Working Group in 1998. The IPOA-Seabirds was endorsed by the 23rd Session of COFI (February 1999), commended by an FAO Fisheries Ministerial (March 1999) and endorsed first by the FAO Council (June 1999) and then by the FAO Conference (November 1999).

The IPOA-Seabirds is meant to provide broad guidelines to states for the preparation of their National Plan of Action for reducing the incidental catch of seabirds in longline fisheries (NPOA-Seabirds) that is defined as "a plan that a State designs, implements and monitors to reduce the incidental catch of seabirds in longline fisheries". States are encouraged to assess voluntarily the extent of seabird bycatch in their fisheries and to develop national plans of action to reduce seabird bycatch in fisheries where a bycatch problem has been identified.

The IPOA-Seabirds, a voluntary measure, applies both to states in whose waters commercial fisheries are being conducted, by their own or foreign vessels, and to those that conduct commercial fisheries on the high seas and in the exclusive economic zones (EEZs) of other States.

At the 27th Session of the FAO Committee on Fisheries in 2007, considerable attention was focused on the IPOA-Seabirds in relation to the ecosystem approach to fisheries. COFI specifically:

- reported that, best practice technical guidelines to support the elaboration of NPOA's for seabirds should be developed through continuing joint work between FAO and relevant bodies and organizations or an expert consultation;
- agreed that FAO should, in cooperation with relevant bodies, develop best practice guidelines to assist countries and RFMOs in implementation of the IPOA-Seabirds; and
- agreed that the guidelines should be extended to other relevant fishing gears.

In response to the directions and recommendations from COFI, FAO held an Expert Consultation in September 2008, (Bergen, Norway) to develop guidelines to; (1) assist countries in preparing and implementing more effective NPOA-S, (2) provide RFMOs with guidance on implementing IPOA-Seabirds within a regional framework and (3) to address the incidental catch of seabirds in other relevant gears (e.g. trawl and gillnet). Following on from the 28th Session of COFI in 2009, FAO published the guidelines in the FAO Technical Guidelines for Responsible Fisheries (FAO 2009).

2. Purpose

The purpose of the Namibia NPOA-Seabirds is to provide a national framework and action plan for the reduction of seabird bycatch in longline and trawl fisheries leading to a reduction of negative impacts of these operations on seabird populations to a biologically insignificant level. Hence, this NPOA – elaborated upon within the context of the FAO's IPOA-Seabirds, has been prepared to reflect the recently adopted FAO Best Practice Technical Guidelines (BPTG) to reduce incidental catch of seabirds in capture fisheries – and as such sets out procedures and practices to be followed in implementing the following key elements:

- a reduction in seabird bycatch in longline and trawl fisheries (BPTG 2);
- assessment of seabird bycatch (BPTG 3);
- prescription and evaluation of mitigation measures (BPTG 4);
- research, demonstration and development of mitigation measures (BPTG 5);
- education, training and dissemination of information to interested and affected parties (BPTG 6);
- observer coverage and the role of Fisheries Observer Agency (BPTG 7);
- catch reduction objectives (BPTG 8);
- ongoing monitoring and evaluation of seabird mortalities (BPTG 9); and
- reporting on the implementation of NPOA-Seabirds (BPTG 10).

The numbers in parentheses cross-references the relevant element of the Best Practice Technical Guidelines. See Figure 1 for a schematic outline of the decision-making process and framework for IPOA-Seabirds.

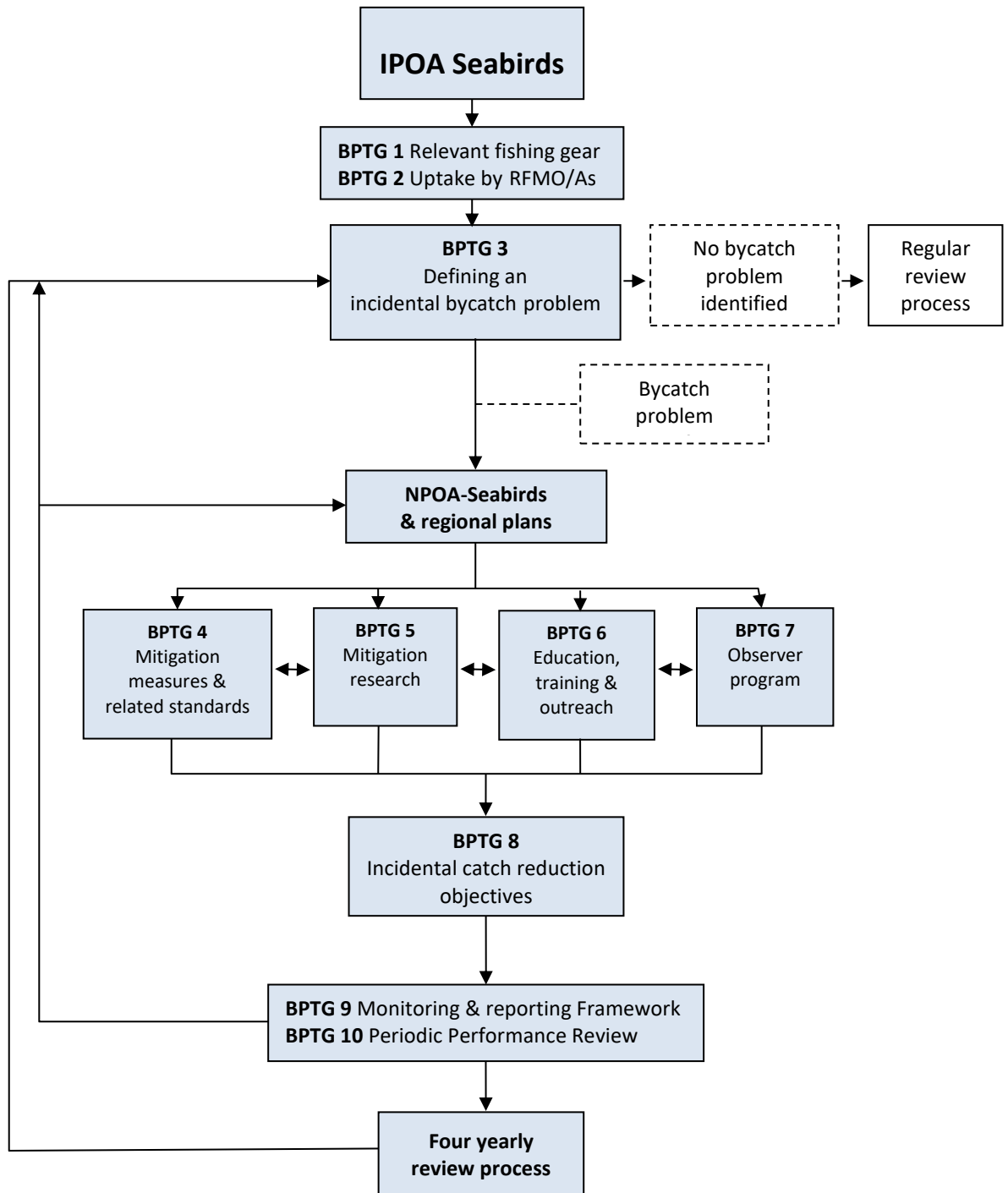


Figure 1: Framework for IPOA/NPOA – Seabirds and regional plans

3. Background

3.1 International obligations and responsibilities

Article 5 of the United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks of 1995, to which Namibia is a party, calls on coastal member States and States fishing the high seas to “...minimise... catch of non-target species, both fish and non-fish species... and impacts on associated or dependent species, in particular endangered species, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost-effective fishing gear and techniques”. Namibia has made excellent progress in coming back from a history of over-exploitation and mismanagement to re-build stocks and to provide an enabling environment for the responsible and sustainable exploitation of its resources. However, it has as yet to give the required attention to sound management of non-target species.

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) is the principal global legal instrument governing the management of our oceans. With 150 ratifications, this agreement has been widely accepted as customary international law. Although UNCLOS does not explicitly refer to an ecosystem approach to fisheries in its text, it does require states to consider the effect of fishing activities on “species associated with or dependent upon harvested species with a view to maintaining or restoring population of such associated or dependent species above levels at which reproduction may become seriously threatened” (Article 61, paragraph 4). Namibia ratified UNCLOS in 1983.

Namibia is also party to the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) and is an active member of the Commission. The Convention and its Commission regulates the sustainable exploitation and conservation of marine living resources in the Southern Ocean. In view of the problem of seabird mortality in longline fisheries in the Southern Ocean, the Commission has made the use of bird scaring lines by Member States operating in the fisheries mandatory. Namibia's membership of the United Nations Food and Agriculture Organization makes it party to the FAO Code of Conduct for Responsible Fisheries, adopted by the 28th Session of the FAO Conference in October 1995. The Code, accepted on a voluntary basis, includes principles and standards of behaviour for responsible management practices within the resource environment. Particularly relevant to the issue of seabirds is the general principle outlined in Article 6.6 stating that fishing gear should be developed and applied “... in order to maintain biodiversity and to conserve the population structure and aquatic ecosystems...”. In the same article, it is further explained that “States and users of aquatic ecosystems should minimise waste, catch of non-target species, both fish and non-fish species, and impacts on associated or dependent species”. These principles contained in the FAO Code is in line with Namibian resource management and conservation objectives and forms the basis of our endeavour to manage our marine resources in an efficient and responsible way.

Namibia is also a member of ICCAT, SEAFO and is planning to become a member of ACAP. These organizations have set objectives and directives which Namibia as member country is obliged to follow.

Prior to 2005, no formal seabird bycatch assessments had been conducted with respect to Namibian longline or trawl fisheries. Insufficient data existed on the impact of the longline and trawl fishery on the mortality of individual seabird populations as well as the differences in bycatch problems between

different fisheries (in terms of species present and at risk, geographical location, etc.). In the absence of scientifically valid assessments, no regulations could be developed to address suspected seabird bycatch in Namibian longline or trawl fisheries. However, in 2005, a project was initiated by the BCLME as a collaboration between South Africa, Namibia and Angola, entitled *Bycatch of Threatened Seabirds, Sharks and Turtles on Longline Fisheries in the Benguela Large Marine Ecosystem (BCLME): An Integrated Approach*, which aimed to assess and reduce the bycatch of threatened seabirds, sharks and turtles on longline fisheries in the BCLME (Petersen et al. 2007). One of the specific project objectives was to assess the scale of the impact of longline fishing on the threatened seabirds, sharks and turtles within the BCLME, including an assessment of the major determining factors of bycatch so as to make practical management recommendations. To this end, a detailed assessment was made of all existing information on the bycatch of not only seabirds, but also sharks and turtles in longline fisheries, which included a description of the size, geographical distribution and fishing technique of the various longline fisheries, a detailed description of the potential bycatch species and their biology in relation to their vulnerability to incidental mortality (e.g. diving depth, pelagic habits etc.) and preliminary management recommendations. This information was gleaned from existing observer reports, at sea data collection and published data. The key results are provided below.

3.2. Institutional and legal framework

The Ministry of Fisheries and Marine Resources (MFMR) has sole responsibility in terms of the Marine Resources Act (2000) for the management and development of fisheries and marine resources in the territorial waters and the 200 Nautical Mile Exclusive Economic Zone (EEZ) of Namibia. Management of the marine resources is based on the allocation of fishing rights, quotas and licences. Other management measures include the setting of Total Allowable Catches (TACs) for the main fisheries and the seal harvest, limitation of fishing effort, fishing seasons, closed areas and gear restrictions. Fisheries observers who are under management of the Fisheries Observer Agency (FOA) are placed on most vessels to monitor compliance of fishing vessels with fisheries legislation. Their duties commonly include monitoring bycatch rates, checking gear specifications, checking on illegal dumping, compiling data on catches and operations and collecting biological data on request.

The Directorate of operations within the Ministry enumerates Fisheries Inspectors and is responsible for monitoring, control and surveillance of all fishing and or harvesting activities along the coast and EEZ. While inspectors monitor catch landings in port, all catch data at sea are to be entered into log sheets by vessel captains. Fishery biologists and marine scientists within the Directorate Resource Management regularly conduct research and stock assessments on commercially exploited fish stocks as well as research aimed at the conservation of threatened guano-producing seabird populations. A Marine Resources Advisory Council (MRAC) established in terms of fisheries law provides advice to the Minister on fisheries policy, management and development issues. The Marine Resources Act (2000), which came into effect on 27th December 2000, replaced the Seabirds and Seals Protection Act, 1973 and the Sea Fisheries Act, 1992. All seabirds within the Namibian EEZ are protected by this Act, broadly defined under the term "marine resources". Seabird bycatch is also loosely defined under the term "bycatch" which is: "any marine resource harvested in an attempt to harvest a different marine resource". In terms of section 47 (2) and (3), the Minister is empowered to "prescribe measures for the conservation of marine resources, for the control of harvesting of such resources and for the protection of the marine

environment” and may thus determine the place and time in which harvesting operations may be conducted as well as the methods and gear to be used. In terms of section 61(1) (k), the Minister may also make regulations “establishing permitted levels of bycatches...” for different marine resources.

The Regulations relating to the exploitation of marine resources, gazetted in 2001, explicitly prohibit the killing, disturbing or removal of seabirds unless sanctioned in terms of a right, exploratory right or exemption under section 62(1)(a) of the Marine Resources Act (2000). The Regulations (2001) list most of the seabird groups affected by mortality in longlining and trawl fisheries e.g. *Diomedidae* (albatrosses), *Procellariidae* (petrels) and *Sulidae* (gannets). The Regulations further require in section 18 (2) and (3) that any seabirds or marine mammals that are caught or harmed incidentally during harvesting be returned to the sea and that the incident be reported in writing to the inspectorate office at the port of entry. The details required in this report include information about the harvesting, the species and number of marine resources harvested or killed, and the circumstances under which the harvesting or killing occurred. Thus, in terms of the Act and Regulations, the killing of seabirds is illegal and the incidental capture or killing of seabirds during activities such as longline or trawl fishing needs to be recorded and reported to the fisheries authorities. However, none of the fishing companies comply with the above regulation with regard to reporting of seabird and marine mammal mortalities and neither is this regulation enforced by MFMR or the FOA. It is also noted with concern that the collection of biological and fishing data and the placement of observers on vessels have primarily focused on commercial fish resources. Data collected through logbooks and formal observations exclude information on seabird interactions and bycatch.

It is clear that in terms of the legal and management instruments at its disposal, Namibia is in a favourable position to address effectively the problem of seabird bycatch and to implement measures to reduce seabird mortalities in all fisheries. Namibia's position is further strengthened by a provision in its Marine Resources Act (2000) under section 34(1) – (3) granting powers to the Minister to give effect to fisheries and international agreements to which it is party to and which is consistent with the relevant rules of international law as reflected in the UN Convention on the Law of the Sea (10 Dec 1982) and its Implementation Agreement. This, in effect, enables Namibia to align its mitigation measures to those of other countries and to benefit from technical and financial assistance from more experienced partners in those international organizations in which Namibia holds membership. Namibia is a party to several international conventions and agreements whose policies and resolutions, with regard to the conservation and protection of seabirds and non-target species, places a responsibility on its authorities to act in compliance.

In response to a global need to reduce the bycatch of seabirds in targeted fisheries, and ultimately to improve the conservation status of threatened seabirds, BirdLife International and the Royal Society for the Protection of Birds formed the Albatross Task Force (ATF) in 2006. Its brief is to gather bycatch data in collaboration with the fishing industry and management agencies, and to provide education, awareness and training. It is also instrumental in developing and implementing mitigation measures. Following negotiations with MFMR, the Namibia Nature Foundation and the Global Seabird Programme, the ATF extended operations to include Namibia in April 2008.

3.3. The Bycatch Problem

Seabirds are generally long lived with delayed maturity and limited reproductive capability. As a result, they are particularly vulnerable to even small increases in adult mortality. Their incidental mortality or bycatch in fisheries, both longline and trawl, poses a serious conservation concern globally. Seabirds are attracted in large numbers to longline and trawl fishing operations because of the availability of bait on hooked lines deployed by the longline vessels and discarded fish offal behind trawlers. Thousands of birds are killed each year when scavenging as they are incidentally hooked on the lines or collide with trawl warps, are dragged underneath the water and drowned. This is complicated by the fact that, in many cases, bycatch events are rare and this further confuses perceptions regarding the need for conservation. For example, for every seabird taken, hundreds, if not thousands, of target fish are caught. In many cases, the majority of sets are made with no capture of seabirds. Hundreds of seabirds feeding on fish offal typically surround the vessel exacerbate the problem further by creating the impression to individual fishers that seabird bycatch is insignificant. However, small numbers caught by individual vessels add up when considered for the entire fleet or the region and it is then that the immense population declines are evident.

The highly variable and productive Benguela Large Current Marine Ecosystem (BCLME) along the west coasts of South Africa, Namibia and Angola is considered an important foraging area for 15 species of albatross and petrels that are currently threatened with extinction (a list of species is provided in Annex 2.). Albatrosses are the most vulnerable to fisheries mortality worldwide and 15 of the 22 species are presently threatened with extinction, four of which commonly forage in the Benguela Current off Namibia. The Benguela Current is also home to a number of endemic seabirds, most notably the Cape Gannet (*Morus capensis*), which is also impacted by fisheries operations. The threat status of these species is ascribed mainly to the effects of their incidental capture in longlining and trawling.

In Namibian waters, the five migrant pelagic seabird species most vulnerable to fisheries interactions are the Black-browed, *Thalassarche melanophrys*, Shy/White-capped, *T. cauta/steadii*¹, Atlantic Yellow-nosed, *T. chlororhynchus*, albatrosses and the White-chinned Petrel *Procellaria aequinoctialis*. Seabird abundance is the highest along the continental shelf and decreases in a northerly direction (Table 1). The Cape Gannet is an endemic to the region with only six breeding sites worldwide, including three in Namibia. The Namibian population has declined in the past decade and the recruitment of young birds appears to be insufficient to sustain the population; it is considered locally endangered (Kemper in press).

Table 1: Seabird abundance in Namibia (adapted from Crawford et al. 1991)

Species	Southern Namibia		Northern Namibia	
	Winter	Summer	Winter	Summer
Shy Type Albatross	26,900	13,400	3,100	1,600
Black-browed Albatross	33,500	8,400	4,500	1,100
Yellow-nosed Albatross	8,500	6,000	1,100	800
Giant Petrel spp	1,600	800	200	100

¹ There is some contention on this species split. ACAP recognizes two species Shy Albatross *T. cauta* from Australia and White-capped Albatross *T. steadi* from New Zealand. Both occur in the BCLME and are indistinguishable in the field. Genetic evidence suggests that White-capped is the more common species in the region where 90% of birds caught in South Africa originate from New Zealand (P. Ryan *pers comm.*). For the purpose of the NPOA-Seabirds the descriptor Shy Type Albatross will be used to cover both species.

White-chinned Petrel	145,300	58,100	14,700	5,900
Cory's Shearwater	-	50,000	-	5,000
Great Shearwater	28,200		800	
Sooty Shearwater	208,000	104,000	14,200	7,100

Mortality caused by incidental capture in longline fisheries is considered the single most critical conservation problem currently facing seabirds. Globally, a number of key longline fisheries have been identified in which incidental catches of seabirds occur. These are tuna, swordfish and billfish in EEZs and on the high seas, Patagonian toothfish and hake in the Southern Ocean, and a range of demersal targets species in the Northern Hemisphere. An initiative by the FAO to address fisheries bycatch issues (including seabird bycatch) resulted in the adoption of the FAO Code of Conduct for Responsible Fisheries in 1995. Article 7.6.9 specifically calls on States to “take appropriate measures to minimize waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species” and to “promote, to the extent practicable, the development and use of selective, environmentally safe and cost-effective gear and techniques.”. The FAO Code of conduct continues to provide policy guidance to various international fisheries organizations and countries around the world to ensure a move towards reducing the incidental capture of seabirds in longline fisheries and, by extension, ensure the continued survival and protection of affected seabird populations. Recent research conducted in South Africa suggests that the number of seabirds accidentally killed by the demersal (hake) trawl fishery is of the same order of magnitude as estimated for the longline fisheries there (Petersen, 2008 and Watkins, et al. 2008). Globally midwater trawling has been shown to have a significant seabird interaction rate. Namibia has an active midwater trawl fishery. This fishery needs to be assessed and if a seabird bycatch problem is identified then mitigation is suggested to be extended to this sector as well.[There is currently research underway on the pelagic longline vessels by FAO and Common Oceans]

The following fishery descriptions and their associated bycatch levels are taken from Petersen et al. (2007)

3.3.1. Pelagic longline fishery

Fishery characteristics

Fishing effort data exist for 2002 to 2004 and range between 2.5 and 3.5 million (average 2.9 million) hooks or an average of 1 620 sets per annum (Fig. 1). There are currently 10 vessels in this fishery. Vessels active in this fishery are typically freezer vessels with a length range between 20 and 55 m (average 28 m) that undertake trips between 30 and 35 days long. Although fishing takes place throughout the year, the main catches of bigeye tuna, occurs from June to December. Sharks are caught throughout the year. The large pelagic longline fleet operates off the entire coast of Namibia, mostly along the continental shelf, but also in international waters beyond the Namibian EEZ.

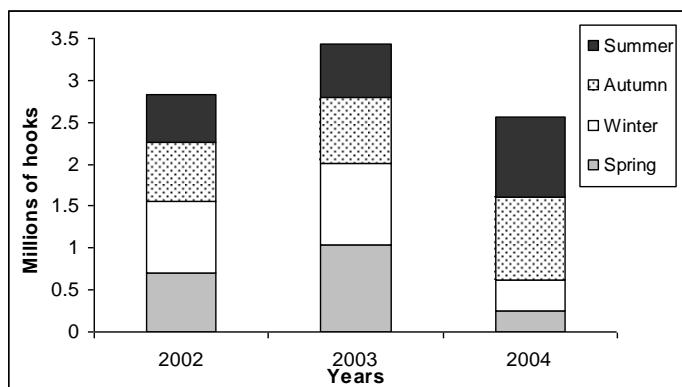


Figure 2: Number of hooks set per season and year set by Namibian pelagic longline vessels, 2002 to 2004-

Bycatch levels

Limited observer data are available on bycatch rates in this fishery. However, a 38-day trip by a trained observer in October/November 2004 on-board a vessel targeting tuna, swordfish and sharks recorded 7 seabird mortalities (6 Yellow-nosed Albatrosses and 1 Cape Gannet) at a rate of 0.6 birds per 1 000 hooks. On a second trip conducted in June 2006, where 15 sets or 30 770 hooks were observed, three birds were caught (0.1 bird per 1 000 hooks), one of which was dead (an adult Shy Albatross). The two live Atlantic Yellow-nosed Albatrosses were caught on the haul and released.

The most commonly caught albatrosses are Shy, Black-browed and Atlantic Yellow-nosed Albatrosses. Species frequenting the vessel included Black-browed, Yellow-nosed and Shy Albatrosses, White-chinned Petrels and sub-Antarctic Skuas (Table 2).

Table 2: Average daily numbers of seabirds frequenting a pelagic longliner fishing off Namibia in June 2006

Species	Scientific name	North of 25°	South of 25°
Shy Albatross adult	<i>Thalassarche cauta</i>	1	3
Shy Albatross sub-adult	<i>Thalassarche cauta</i>	0	2
Black-browed Albatross adult	<i>Thalassarche melanophris</i>	3	12
Black-browed Albatross sub-adult	<i>Thalassarche melanophris</i>	2	4
Yellow-nosed Albatross adult	<i>Thalassarche chlororhynchos</i>	11	10
Yellow-nosed Albatross sub-adult	<i>Thalassarche chlororhynchos</i>	2	2
Wandering Albatross	<i>Diomedea spp.</i>	1	2
White-chinned Petrel	<i>Procellaria aequinoctialis</i>	7	10
Sub-Antarctic Skua	<i>Catharacta antarctica</i>	1	3

While limited bycatch data are available for this fishery, what has been collected supports anecdotal evidence and fishermen interviews that bycatch levels in this fishery are moderate. With an annual fishing effort of around 2.9 million hooks per year and a reported average seabird bycatch rate of 0.07 birds per 1 000 hooks it is estimated that approximately 200 birds are caught by this fishery each year (Petersen *et al.* 2007). Further observer data are required to develop a more robust bycatch estimate with associated errors (see Section 5.2 - Observer Coverage).

3.3.2. Demersal longline fishery

Fishery characteristics

Approximately 12-13 wet fish vessels operate out of both Walvis Bay and Lüderitz, depending on the availability of fish. This fleet has decreased from around 25 vessels over the last 15 years. This fishery sets an average of 62,801,718 hooks per year (Fig. 3). Note that the data set for 2004 and 2009 is incomplete and no data are available for 2005. The 2000 to 2003 data includes fishing during October which later became a closed season and is not included in the 2006 to 2008 data. About 6,043 sets, 12% of all sets, were set between 06h00 and 19h00 during daylight hours. Most of the sets are completed by 04h00 in the morning with the completion of hauling activity peaking around midday.

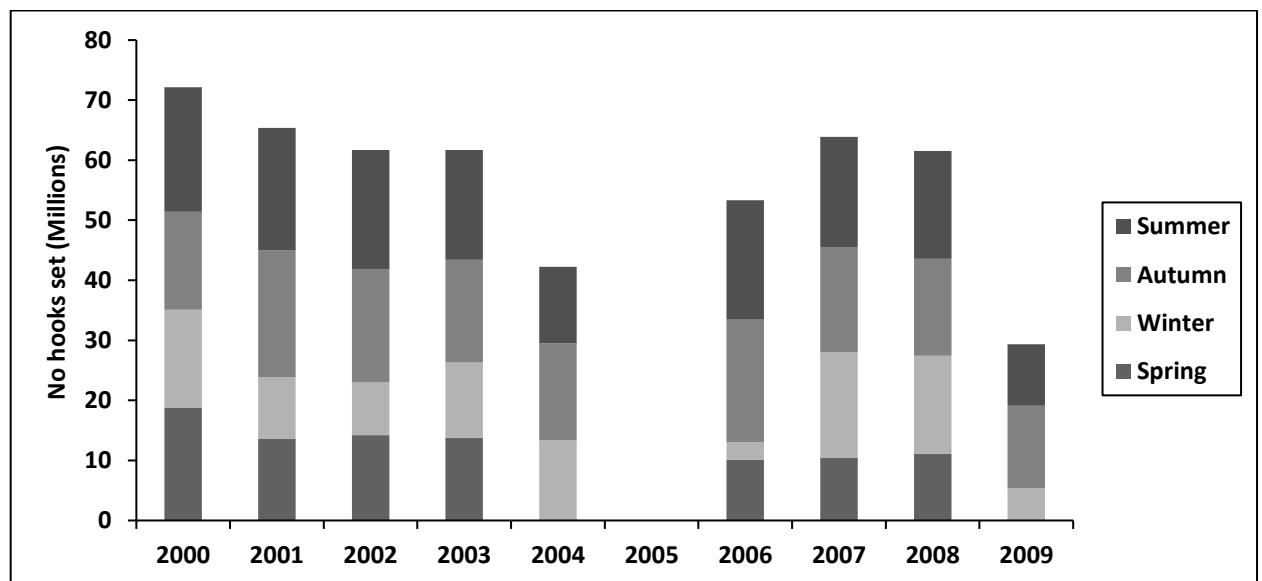


Figure 3: Number of hooks set per season and year by Namibian demersal longline vessels, 2000 to 2009

Observers were not required to collect information regarding seabird mortalities. However, of 13 observers interviewed, 12 reported that they felt seabird bycatch was unacceptably high and resulting in population decreases. Estimations of seabird bycatch ranged from none to 10 albatrosses and 20 gannets caught per day and averaged at 7 seabirds per trip. MFMR is currently busy with logsheet redesign to include some seabird data collections.

Six interviews with the industry (skippers, shore skippers and managers) were conducted in Walvis Bay in 2004 and 2006. Results from these interviews revealed an estimate of ± 19 birds (mainly petrels) caught per trip (average of 8 sets per trip). Since an average of 152,000 hooks (19,000 hooks per set X 8 day trip)

are set per trip, this equals to an approximate catch rate of 0.125 birds per 1,000 hooks. In general, skippers are not aware of the issue and therefore they do not report seabird mortality in their logbooks.

A specialised Birdlife International Albatross Task Force observer collected data from hake longliners operating out of Lüderitz in November 2006. Twenty-one sets or 456 000 hooks were observed. Sixty-three White-chinned petrels were caught at a rate of 0.14 birds per 1 000 hooks. Further assessment trips were conducted from Walvis Bay in June 2007 and July 2009. No birds were caught in June 2007, but in July 2009 101 birds were caught (47 albatrosses). Anecdotal data from two observers in Luderitz indicated that 50 and 40 birds were caught on two demersal longline vessels respectively in July 2009. Because the total effort in this fishery is on average 62.8 million hooks per year (average of 19,000 hooks per set), it is estimated that approximately 26,000 birds are caught by this fishery each year (Petersen et al. 2007, ATF unpublished data). These data are based on a very small sample size and should be considered as indicative of the potential scale of the problem rather than a robust estimate of the impact this fishery has on seabird populations. Significantly more observer data are required to derive a more robust annual bycatch estimate for this fishery.

Higher-than-expected catch rates in this fishery may be the result of gear configuration and operational trends. At present, many vessels active in the fishery utilize 3 - 5 kg weights spaced at 96 m intervals with only the occasional heavier weight placed in-between. It has been shown in the South African fishery that 6 kg weights spaced at 100 m intervals result in a sink rate that is insufficient to reduce seabird bycatch adequately (Petersen et al. 2008). Conflicting studies show that reduced spacing between weights and increased mass (8 kg) has no effect on sink rate (Peterson et al. 2008), but Robertson (2000) and Robertson et al. (2007) found that shortening the spacing and increasing the mass resulted in a faster line sink rate. This work highlights the importance of using the optimal weight (stone) mass in conjunction with spacing to achieve the desired line sink rate of 0.3 m/s^{-1} thereby substantially reducing the time that baited hooks are available to the birds.

Of further concern is the increasing effort observed in the Namibian demersal longline fishery. The average number of hooks per set increased from 16 500 hooks per set in 2001 to 19,000 hooks per set in 2003 and up to 22,000 hooks in 2007 and has decreased slightly to around 20,000 hooks per set in 2009 (Fig 3). This increase in effort increases the likelihood of catching more birds per set. As target catch CPUE decreases it is possible that effort may increase and further exacerbate seabird bycatch in Namibian waters.

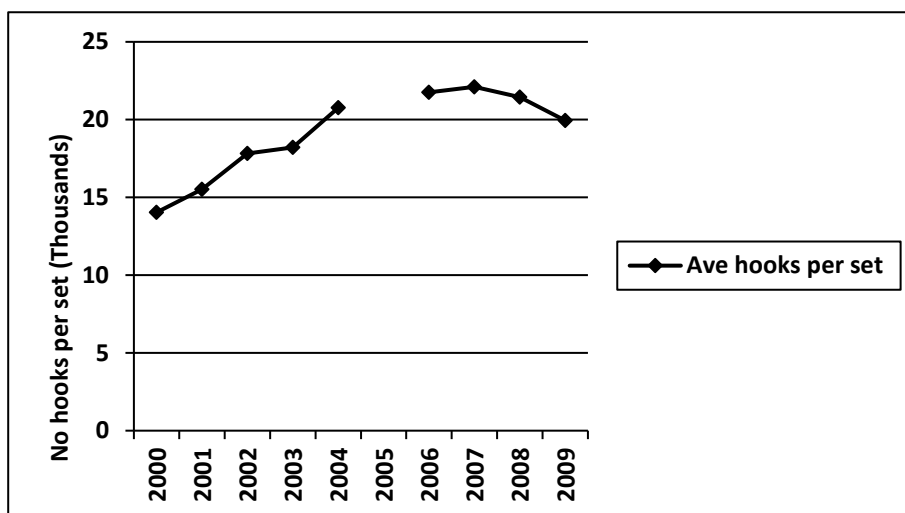


Figure 4: Average number of hooks per set

3.3.3. Demersal trawl fishery

A similar suite of seabirds is caught by trawl fisheries through entanglement with gear off Namibia. In the South African demersal trawl fishery, an estimated 18,000 birds are killed per year. Of the birds killed 39% were Shy Albatrosses, 29% Black-browed Albatrosses, 14% Cape Gannets and 9% White-chinned Petrels (Watkins et al 2006 and Watkins et al. 2008). The Namibian hake trawl fishery is operationally similar to South Africa, the suite of seabirds and their abundance is almost identical, and so it is likely to have a similar magnitude of impact.

The mortality of fish species caused by several fisheries is likely to increase the impact of these already vulnerable species. Baseline data on the impact of trawl operations on seabirds are lacking for Namibia, but are being collected by Birdlife International's Albatross Task Force (see page 11) and a preliminary estimate for 2007 - 2008 is given in table 3.

Table 3: Summary of seabird mortality recorded in the trawl fishery in 2007 - 2008

	Dragged Under and Drowned	Recovered from Warp	Recovered from Net	Total	Bycatch rate (Birds / hour)
Shy Type Albatross	1	2		3	0.138
Yellow-nosed Albatross	3	1		4	0.184
White-chinned Petrel	2		2	4	0.184
Cape Gannet			2	2	0.092
Unidentified Skua	1			1	0.046
Total				14	0.64

These data were gathered from 130 trawl observations. Although the sample size was too small to provide a robust annual mortality estimate, a bycatch rate of 0.64 seabirds per hour, as suggested by the data, in

this trawl fishery is a serious threat to albatross and petrel populations foraging in Namibian waters. The species that were observed killed in this fishery included the endangered Atlantic Yellow-nosed Albatross, *T. chlororhynchos*, near threatened Shy Type Albatross, *T. cauta/steady*, and the vulnerable white-chinned petrel, *P. aequinoctialis*.

During 2009, comparative tests were conducted comparing seabird interactions during demersal trawl operations while deploying a bird scaring line and without a bird scaring line. Results from the 73 trawls observed during these tests show clearly that bird scaring lines are an effective mitigation measures in the Namibian hake trawl fishery (Table 3). Annex 3 is a progress report of preliminary results of BLI ATF research on the effectiveness of bird scaring lines in the Namibian hake trawl fishery.

Table 4: Observer effort and interaction rates with and without tori lines

Tori Deployed	Line	Offal Discard	Total Observed	Minutes	Total Interactions	Minutes/ Interaction	Interactions/ Minute
Yes		Yes	685		0	0	0
Yes		No	431		0	0	0
Total with Tori Lines			1116		0	0	0
No		Yes	820		164	5	0.2
No		No	1175		22	53	0.02
Total Without Tori Lines			1995		186	11	0.09

3.3.4. Midwater trawl fishery

Namibia has an active pelagic trawl fishery targeting mainly Horse Mackerel. This fishery is dominated by a collaboration of Namibian and Russian companies. Operations are mainly through factory vessels reducing catches to fish meal and frozen horse mackerel at sea. While these vessels are required to carry FOA observers there is no data available on any non-target bycatch. It is suspected that this fishery has a potentially significant seabird bycatch through net entanglement. Net entanglement is a problem that is globally common to this type of fishing operation.

3.3.5 Purse seine fishery

This was once the backbone of the Namibian fishing industry targeting sardines, this fishery has largely collapsed. While there are still purse seine operations, going on they are small-scale and operate inshore. It is unlikely that this fishery has any significant impact on pelagic bird populations.

3.3.6 Fish offal oil

As much attention as is given to the dangers of fisheries (the trawlers and longline) on seabirds, should be given to the effects of fish offal on seabirds. All fisheries types that dump offal at sea affect seabirds, especially mid-water trawl fishery as they target horse mackerel and these fish species are known to be rich in fish oils. The advantage of this fish offal is that it serves as a food source to the seabirds and other marine species. The oil from the offal that is discarded by fishing vessels at sea drifts on the water surface and seabirds gets soaked in this oil. These oils also make their feathers heavy when soaked and it becomes difficult for the bird to take off as they need strong winds for that, hence they spend too much time in cold water as their waterproof layer is lost due to the oil. The oil disturbs the waterproof layer that prevents water penetration through the feathers to the skin of the birds and causing hypothermia and then death.

On the 13th October 2016, four soaked Cape gannets were found on Ichaboe island. During the period of 18th-27th September 2016, 72 soaked Cape gannets were observed, of which 7 died and on another occasion 56 soaked gannets were observed of which 4 died because of hypothermia. All this happened over an 11-day period. Fish offal could also affect other species but were mostly observed as affecting gannets which breed and roost on islands in Namibia. The most affected island is Ichaboe, on the other islands soaked gannets are hardly found (MFMR, 2017). Figure 5 below shows the number of soaked gannets found at Ichaboe Island over 3.5 years. The number is very low compared to the direct bycatch through fishing hooks and fishing gear but it can be reduced too.²

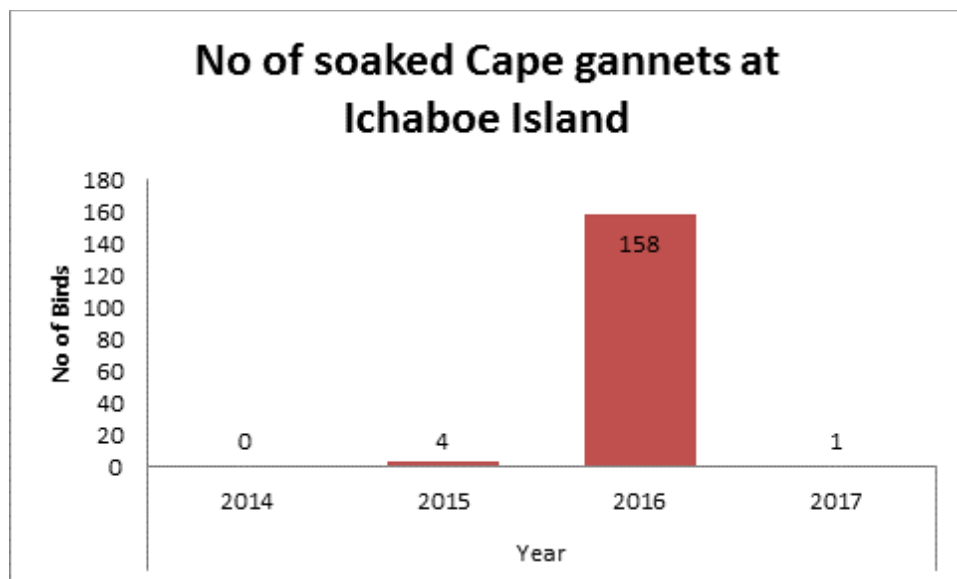


Figure 5: The number of soaked gannets found at Ichaboe Island over 3.5 years³.

3.4. Mitigation measures

3.4.1 Demersal Longline fisheries

² Ministry of Fisheries. 2017. Unpublished data from Seabird & Offshore Islands Section.

³ *Ibid*

Mitigation measures of incidental seabird mortality in Namibian hake demersal longline fisheries are covered under gazetted regulation No. 270 of 19 November 2015:(5788) and amended No. 68 of 15 April 2016:(5990) Regulations to reduce incidental by-catch of seabirds in the hake demersal longline vessels of the Marine Resources Act, 2000. Under these regulations, "bird scaring line" is defined as long lines attached to a high point on the stern of a vessel to which streamers⁴ are attached which interferes with birds attempting to reach the baited longline below. The deployment of the bird scaring lines and its design are regulated as indicated below:

Deployment of bird scaring lines

- 1) A person may not engage a longline vessel in fishing operations without deployment of at least one bird scaring line on each line set during fishing operations at all times and the line must be;
 - a. deployed immediately after the first longline anchor enters the water and before any hooks are set;
 - b. deployed in such a manner that it flies above the hook line;
 - c. retrieved only after the last hook has been set; and
 - d. attached to the stern of the vessel above and outside of the hook line setting station at least eight metres above the sea surface.
- 2) If a vessel operator attaches a second bird scaring line, the lines must be attached to the starboard corner and the stern port side of the vessel respectively.
- 3) A towed device capable of maintaining tension on the top line must be attached to the seaward end of the bird scaring line.
- 4) A person may not engage in fishing activities without a spare set of two bird scaring lines carried on board a vessel at all times as to be deployed in the event of loss or damage to an already deployed line.
- 5) No fishing activities may take place without at least one bird scaring line deployed in a manner compliant with these regulations.
- 6) No person may allow a Longline vessel to leave port without a functional bird scaring line manufactured in terms of the requirements referred to in regulations 3 and 4.
- 7) As from 30 November 2015 after the end of the grace period no person may allow a longline vessel to sail without a full set of bird scaring lines nor fish without at least one bird scaring line deployed as per these regulations.

Bird scaring line design

All bird scaring lines must comply with the following requirements;

⁴ A strands of brightly coloured line attached to bird scaring lines at regular spaced intervals

- a. the topline must be a minimum of 150 metres long consisting of braided cord with a minimum diameter of six millimetres;
- b. the topline must have an additional length of a minimum of two metres to a maximum of four metres for the purpose of attachment;
- c. the topline above the water must be a strong line of high visibility yellow or orange; and
- d. a towed device capable of maintaining tension must be attached to the end of the topline to the seaward end of the bird scaring line by means of a large 80 gram barrel swivel.

3.4.2 Demersal trawl

Mitigation measures of incidental seabird mortality in Namibia demersal hake trawl fisheries are covered under gazette regulation No. 269 of 19 November 2015 (5788) and amended No. 68 of 15 April 2016:(5990): Regulations to reduce incidental by-catch of seabirds in the hake demersal trawl vessels of the Marine Resources Act, 2000. Under these regulations, "bird scaring line" is defined as long lines attached to a high point on the stern of a vessel to which streamers are attached which interferes with birds attempting to reach the baited longline below. The deployment of the bird scaring lines and its design are regulated as indicated below.

Deployment of bird scaring lines

- 1) A person may not engage in fishing operations without deployment of two bird scaring lines at all times when the trawl doors enter the water and the winches start hauling.
- 2) A person may not allow a trawler to leave port without two functional bird scaring lines manufactured in terms of the requirements referred to in regulations 3 and 4.
- 3) Bird scaring lines must be;
 - a. deployed immediately after the trawl doors enter the water;
 - b. retrieved immediately before the winches start hauling or if the vessel comes to a stop;
 - c. (c) attached to the vessel above and outside the trawl warps at least eight metres above the surface in calm weather conditions;
 - d. attached to a towed device on the topline; and
 - e. attached to the star board side and the port side of the vessel respectively.
- 4) A spare set of two bird scaring lines must be carried on board a vessel at all times to be deployed in the event of loss or damage to an already deployed line.
- 5) Bird scaring lines may be deployed and retrieved from the fishing deck by the use of an additional rope which is attached from the aft deck to the top line between the first and second set of streamers.
- 6) A person may not discard offal from the vessel during the shooting of gear from the period when the net enters the water up until the doors are deployed.
- 7) In the event of breakage of a bird scaring line during fishing operations, the remaining functional line must be deployed by the person in charge of the vessel on the side where offal discard takes place.
- 8) All broken or damaged bird scaring lines must be retained by the vessel operator and available for presentation to fisheries inspectors or fisheries observers on request.

9) The vessel operator being the owner, the lessee, the charterer or the master must replace all broken or damaged bird scaring lines as soon as the vessel docks and before it sails again.

10) As from 30 November 2015, a person may not sail a trawl vessel without two full sets of bird scaring lines nor fish without one set of two lines deployed as in accordance with these regulations.

Bird scaring line design

1) All bird scaring lines must comply with the following requirements set out in subregulation (2) and regulation 4.

2) The topline must;

- a. be a minimum of 30 metres long consisting of kermantle rope with a minimum diameter of 9 to 12 millimeters;
- b. have an additional length of a minimum of two metres to a maximum of four metres for the purpose of attachment;
- c. be a strong line of high visibility yellow or orange above the water; and
- d. be attached to a towed device capable of maintaining tension at the end of the topline to the seaward end of the bird scaring line by means of a large 80 gram barrel swivel.

Streamer lines

1) Streamers attached to bird scaring lines must be:

- a. made from high visibility yellow plastic hose 10 to 16 millimetres in diameter; and
- b. long enough to reach the water in calm weather conditions.

2) A minimum of six paired streamers must be securely attached to the bird scaring line at two metre intervals with the first streamer no further than two metres from the vessel stern and the last no less than 10 metres from the towed device point of attachment.

3.4.3 Midwater trawl

Midwater trawl operations are mainly through factory vessels reducing catches to fish meal at sea. While these vessels are required to carry FOA observers there is no data available on incidental bycatch of seabirds. It is suspected that this fishery has a potentially significant seabird bycatch through net entanglement. Net entanglement is a problem that is globally common to this type of fishing operation. An assessment of impact of this fishery on seabirds must be carried out and it can ultimately lead to the gazetting of regulations for this fishery. Although there is no data on seabird mortality for midwater trawl, Gannets, Shearwaters and Albatrosses are the mostly likely birds to be affected.

Midwater vessel fishing with Dutch fishing method need to be assessed in relation to its impacts on seabirds and discussion between ATF and the industry with regards to mitigation measures need to take place

3.4.4 Purse seine fisheries

Since the relationships between small pelagic and target seabird species (Sardine), currently mitigation measures are geared towards sardine stock recovery. Since 1990 acoustic surveys have been conducted in Namibian waters to determine the biomass of sardine in the northern Benguela. An “economic TAC” of between 15 000 t to 25 000 t has been allowed since 2004 and has in most years been caught. The TAC for 2014 has been set at 25 000 t with an additional 5 000 t in reserve to be allocated at the discretion of the Minister. Currently the stock remains in a critical state with no indication of recovery. Although there is no data on seabirds’ mortality in this fishery, Gannets, Shearwaters and Albatrosses are the mostly likely birds to be affected. Discussion between ATF and the industry with regards to mitigation measures needs to take place.

3.4.5 Fish offal oil

Seabird mortality from fish offal oil is very low compared to the direct bycatch through fishing hooks and fishing gear but it can also be reduced. To mitigate the effects of fish offal oil on seabirds, discarding of offal should be done only at night since most of the seabirds feed during the day and less active at night (MFMR 2017)

4. NPOA assessment

The BCC, through its Ecosystem and Bycatch Working Group (MFMR, ATF etc), and in collaboration with a suitably qualified organisation if the MFMR does not have the capacity available, will conduct national assessments of incidental seabird mortalities in longline and trawl fisheries within two years of the adoption of the NPOA-Seabirds. The purpose of these assessments is to determine the nature and extent of seabird interactions with longline fishing operations within each longline fishery and seabird interactions with trawl fishing operations within each trawl fishery.

The scientific assessment will address the following:

- estimated total annual, species-specific seabird catch and catch-per-unit effort (i.e. number/1 000 hooks set/species/fishery, incidents/mortalities/hrs trawled/species);
- fishing effort data (seasons, species, catch, number of sets, number of hooks/year/fishery);
- fishing areas (by season and geographic location);
- longline fishing fleet and fishing techniques data;
- trawl fishing fleet and fishing techniques data;
- status of seabird populations in the fishing areas; and
- measures used that might mitigate or exacerbate seabird bycatch rates.

A seabird bycatch assessment per fishery is proposed to be conducted within four years of the adoption of the NPOA-Seabirds. If this assessment determines that a seabird bycatch problem exists within a particular fishery, a mitigation program will be developed within one year of the assessment. Full implementation should be done within two years. If an assessment determines that a seabird bycatch problem does not exist, and in cases where changes (expansion or reduction) to existing longline and/or trawl fisheries occur or in the event of the development of a new fishery, periodic assessments will be

conducted. In the case of a new fishery a seabird bycatch assessment will be conducted covering the first year of operation

5. Namibia's NPOA-Seabirds

5.1 Development and implementation

Namibia's fisheries management system recognizes that there are substantial differences in the way that each relevant fishery operates, with special reference to differences in species targeted, gear type and configuration, bait, season, vessel characteristics, etc. It further notes that there are several technical and operational mitigation measures already in use or under development in some fisheries, particularly the longline fisheries, where incidental catch of seabirds occurs. Namibia would therefore strive to cooperate through the FAO with regional and sub-regional fisheries organizations to identify, develop and adopt mitigation measures to reduce the incidental catch of seabirds in longline and trawl

. Further assessments of seabird bycatch in all relevant fisheries will be completed within a period of two years by MFMR or in collaboration with a suitable organisation. Upon completion and depending on the results of the assessment period, this measure will either become a condition of the fishery or be abolished. Furthermore, should the assessment show significant bycatch levels, a seabird bycatch reduction program including the adoption of further mitigation measures (such as deployment of mitigation devices, adequate line weighting, night setting, offal management etc.) will be developed within one year of the assessment and implemented within two years. Should an initial assessment indicate a severe bycatch problem in a particular fishery, the minister, through the provisions of the Marine Resources Act 2000 (MRA) may impose emergency operational mitigation measures to reduce incidental capture. These measures would become specific permit conditions and compliance would be enforced by the MFMR Inspectorate.

In all relevant fisheries where an assessment indicates that no seabird bycatch problem exists, a re-assessment will be made after three years.

5.2. Role of the Fisheries Observer Agency

Namibia has a legal stipulation that any fishing vessel operating under a Namibian licence, on the high seas or in the Namibian EEZ is required to carry at least one FOA observer. The functions of an observer are to observe, collect data and report on all catches and operations of a fishing vessel (MRA 2000). This requirement provides a potentially powerful tool in conducting seabird bycatch estimates and promoting compliance with any seabird bycatch mitigation regulations that might be promulgated. A proper assessment of the impact of longline fishing will require reliable and verifiable information. The activities of fisheries observers exclude the monitoring of seabird bycatch, due to a lack of specialized training, practical tools such as data collection protocols and data sheets, human resources and the absence of appropriate regulations and directives. The FOA should be approached to collaborate on seabird bycatch assessments. This collaboration will require that the agency provides sufficient observers for training in

seabird bycatch observation protocols and the identification of seabirds at sea, thus, facilitating the collection of more detailed and reliable data onboard longline and trawl vessels. Frequent observer training courses will be run in consultation with the national fisheries observer agencies. Training of people in key positions to be able to teach these courses (the train-the-trainers principle) will also be critical to ensure maximum outreach and long-term sustainability. The fisheries observer agency will further coordinate the placement of all additional scientific observers on board fishing vessels on a permanent basis and facilitate the dissemination of data collected to the Ecosystem and Bycatch Working Group or relevant scientists. This will allow for more informed management decisions. ATF is currently training some observers and have designed a form of seabird data collection.

5.3. Establishment and role of Ecosystem and Bycatch Working Group

This NPOA calls for the establishment of a BCC technical Ecosystem and Bycatch Working Group (EBWG), comprised of staff from the MFMR's Directorate of Resource Management (a seabird expert, an ecosystem analyst, and demersal and pelagic fishery scientists), the Directorate of Policy, Planning and Economics (a policy analyst), and the Inspectorate (a senior fisheries inspector), as well as a member from the Fisheries Observer Agency (who will act as coordinator for observers) and other interested and affected parties such as an industry representative and NGO participation. The function of the BCC EBWG will be the coordination and implementation of Namibia's NPOA's on bycatch species.

The responsibilities of the EBWG towards the NPOA - Seabirds may include, but is not limited to, the following:

- promoting and coordinating the implementation of the NPOA-Seabirds nationally, as well as in regional and international fisheries organizations;
- facilitating effective training of at-sea data collectors to monitor and gather scientific data on seabird bycatch onboard fishing vessels;
- devising the relevant biologist(s) on conducting seabird assessments for all longline, trawl and purseine fisheries;
- assisting the development and implementation of seabird data collection for FOA observers;
- assisting in the development of national seabird bycatch reduction programs and reviewing of regional and international mitigation measures for possible adaptation and adoption;
- Facilitating the participation of interested and affected parties (public and industry) in the implementation of the NPOA-Seabirds;
- collaborating with regional and international fisheries organizations (including the FAO) in research, training and the production of information and promotional material, with the objective to reduce the incidental catch of seabirds in longline fisheries;
- assisting in the drafting of the NPOA-Seabirds Implementation Report, which will form part of the biennial report to ATF and FAO on Code of Conduct for Responsible Fisheries;
- assisting in the review and assessment of the effectiveness of seabird bycatch reduction programs;

- formulating appropriate mitigation measures and advising management via annual reports to the Fisheries Advisory Council on seabird bycatch monitoring and assessment; and
- developing an appropriate compliance monitoring programme in collaboration with relevant stakeholders.

5.4. Prescription of mitigation measures

In order to reduce seabird mortality to acceptable levels, the MFMR will adopt an approach whereby each relevant fishery (which has been assessed and found to have a seabird bycatch problem) is regulated by a set of fishery-specific prescribed mitigation measures. Mitigation measures are prescribed for demersal hake longline and demersal hake trawl fishery. ACAP best practices are recommended for Midwater trawlers and purse seiners as there are currently no regulations in these fisheries.

MFMR, in its prescription of mitigation measures or devices, will be guided by criteria of efficiency (i.e. whether the prescribed methods significantly contribute to a reduction in seabird mortalities) and cost-effectiveness of measures to be implemented by the fishing industry. If an initial assessment (prior to completion of formal assessment) determines that a severe seabird bycatch problem exists in any particular fishery, the Minister reserves the right to impose interim seabird bycatch mitigation measures, as he/she deems appropriate and practicable. These mitigation measures may include those listed in the FAO technical note on suggested measures (Annex 1) or any other specifically designed measure. Some precautionary mitigation measures (box 1) should be introduced as a matter of urgency and remain in force until a full assessment has been conducted.

5.5. Compliance

If a fishery has been found to have a significant level of seabird bycatch a suite of appropriate regulations to manage this bycatch must be developed under the auspices of the Ecosystem and Bycatch Working Group (EBWG) and promulgated by the minister. Compliance monitoring of these regulations rests with the MFMR Inspectorate. While FOA observers are not compliance officers they do have a reporting function and must be able to collect information on the use, or lack of use of mitigation measures and to understand the effectiveness of measures in achieving set targets for seabird bycatch reduction. Collecting this data will, by necessity, involve reporting on the use of mandatory mitigation measures. MFMR will establish mechanisms to receive and process FOA data quickly and address any non-compliance matters arising. A compliance report showing violations must be processed within two weeks of the report being submitted to MFMR. Feedback must be given to the FOA on any action taken by MFMR on the report once the incident has been finalized.

Punitive measures for non-compliance will be stipulated in the regulations pertaining to bycatch issues. These measures will include but are not limited to:

- a. fines;
- b. mandatory deployment of additional mitigation measures;
- c. suspension and/or withdrawal of fishing licences; and
- d. setting of precautionary bycatch limits which may, if exceeded, result in the vessel being recalled to port for a full investigation and may lead to mandatory deployment of additional mitigation measures or in extreme cases a suspension or cancellation of the fishing licence.

Punitive measures must be reviewed every second year and adjusted to realistically reflect activities and trends in the industry.

5.6. Research and development

Following guidance by the FAO's IPOA-Seabirds, the ministry will work in consultation with the fishing industry and in close cooperation with relevant regional and international organizations (particularly the ATF) to conduct research and to develop fishery-specific seabird mitigation measures. Specifically, the ATF in collaboration with the Ministry will undertake to:

- conduct research on seabird bycatch;
- develop practical and effective seabird deterrent devices and evaluate the effectiveness of mitigation measures, taking due cognizance of best practice and lessons learned from other countries with similar fisheries and seabird assemblages;
- evaluate and improve technologies and practices that reduce incidental capture of seabirds; and
- report the findings to the BCC EWG.

Given the high costs of research into the development of technologies and at-sea trials, it may be much more expedient to cooperate closely with other countries and organizations involved in the development of mitigation measures. Namibia may need to source funding for these projects from donor organizations. Research in respect to seabird bycatch reduction should not only be aimed at developing and improving technical and operational mitigation measures, but should also deal with relevant aspects of biology and conservation of affected seabird populations.

5.7. Bycatch reduction objectives

There are three primary methods for establishing incidental mortality goals:

- 1) an incidental catch rate expressed, for example, as seabirds killed per 1,000 hooks or other unit of effort; and
- 2) number of seabirds caught, either at a species specific or generic seabird level; and
- 3) bycatch target is expressed number of seabirds killed per 1000 hooks per fleet.

Typically, seabird incidental catch is reported as the number of birds killed per unit effort. While this may be appropriate as a measure of fishery performance, as it relates seabird mortality to fishing effort in a manner that is both transparent and meaningful to fisheries management authorities, effort-based bycatch objectives can be flawed if they do not account for incidental catch levels in relation to fishing effort (FAO 2009). Thus, it is important also to assess total seabird bycatch numbers per fishery, and to set targets to reduce the overall numbers of birds killed as well as to reduce the bycatch rate. The international goal for by catch is 0.05 birds per 1000 hooks.

Through the cyclical review process established under the formation of the Ecosystem and Bycatch Working Group once mitigation measures have been identified and adopted the SBWG will establish bycatch reduction objectives with a clearly stated timeframe that will lead to on-going reductions in seabird mortality. The evaluation of the success of these targets will become part of the annual review process outlined in Table 5.

5.8. Education, Training and Awareness

The level of awareness among fishers and the general public regarding the problem of seabird mortality is extremely low, specifically regarding the conservation aspects of the bycatch problem and the economic benefits related to increased fishing efficiency. The Ministry recognises that engaging the fishing industry in seeking solutions to this problem increases ownership and voluntary implementation. Therefore, the Ministry through the appropriate NGOs will develop appropriate programs to raise awareness among fishermen, fishing industry representatives and the general public concerning the need to reduce the incidental capture of seabirds in pelagic longline fisheries. Such programs will include consultative workshops and multi-stakeholder fora that will seek to find compromises that are acceptable to all interest groups. The FAO's IPOA-Seabirds provides a set of measures that could be adopted by states to raise awareness among stakeholders (fishermen, general public etc) on the problem of seabird bycatch in longline fisheries (Annex 1).

The Ministry through the appropriate NGOs will give priority to the following (non-exhaustive) activities in respect of training, publicity and education which will involve the following:

- 1) facilitate a series of workshops with the fishing industry, where the NPOA-Seabirds, IPOA-Seabirds and information on seabird bycatch could be disseminated and discussed. Guidelines, information and training will be provided through presentations, videos, posters, brochures etc. and will focus on conservation aspects of seabird mortality as well as the economic benefits to the industry of reduction of bait loss to seabirds;
- 2) train fisheries observers and fishers in seabird identification, aspects of the biology and conservation of affected seabird species, the use of various mitigation measures and the collection of reliable data on seabird bycatch during fishing operations; and
- 3) produce multimedia material (videos, brochures, posters, visual guides) for dissemination of information on seabird conservation status, bycatch mitigation measures and monitoring activities etc. to industry, general public and other stakeholders.

5.9. Data collection

A programme will be designed by MFMR to collect statistically reliable and comprehensive data that can be used to assess the level of seabird mortality in demersal hake longline and hake demersal trawl fisheries and to evaluate the effectiveness of prescribed mitigation measures. Namibia will make use of its fisheries observers (although not limited to) to obtain the required information and it is thus critical that these fisheries observers are properly trained and equipped with the necessary skills and material to carry out their job.

Namibia has a target of maximum coverage i.e. all vessels should have at least one observer onboard when at sea. Observations made and data collected on seabird mortality must be sufficient to allow for statistically valid estimates of overall catch rates. In addition to the collection of such specific information of birds caught (alive or dead) e.g. species, age class, sex and condition, the collection of fishing data such as numbers of sets and numbers of hooks per set deployed, number of observed hooks, setting and hauling time and speeds, fishing positions, total number of hook per fishery etc is also needed, total number of trawl/ hours observed. Recording the use of prescribed and other mitigation measures in place is required in assessing the usefulness and impact of mitigation measures on seabird catch rates.

5.10. Reporting

The Ecosystem and Bycatch Working Group (EBWG), to be established by the BCC, will prepare an annual report on the status of seabird mortality for each relevant fishery, including criteria used in assessment, research efforts and recommendations on mitigation measures (if necessary). This report will be presented to the senior management of the MFMR, via the Marine Resources Advisory Council, for consideration and action. Finally, the annual bycatch reports will be compiled into an NPOA-Seabirds Implementation Report and drafted into the country's biennial status report to ATF and the FAO on its implementation of the Code of Conduct for Responsible Fisheries.

Table 5: Table of organisational Roles for NPOA-Seabirds Activities

Strategy	Activity	Implementation Time-line	Responsible entity	Priority
1 Data collection	Collect reliable and comprehensive data through:			
	Training onboard observers in: <ul style="list-style-type: none"> Seabird identification (which includes the biology & conservation status of affected spp.) Mechanics and practical use of mitigation measures 	Continuous	1. Directorate Resource Management (DRM) 2. FOA 3. EBWG 4. Appropriate partner organization (ATF)	High
	Upgrading existing logsheets to include seabird species caught as bycatch	by 2019	1. DRM 2. FOA 3. EBWG	High
2 Research	Ensure that bycatch of seabirds in fisheries is reduced through:			
	Annual assessment of seabird bycatch onboard longliners and trawlers	Continuous	1. DRM 2. Appropriate partner organization (ATF)	High
	Identify a suite of best practice mitigation measures all fisheries		1. DRM 2. FOA 3. Appropriate partner organization (ATF)	High

	Identify the sink rate of longline gear to complement prescription of mitigation measures (by means of Time Depth Recorders – TDRs)	done	<ol style="list-style-type: none"> 1. DRM 2. FOA 3. Appropriate partner organization (ATF) 	High
3 Management measures	Ensure that bycatch of seabirds in fisheries is reduced through:			
	<ul style="list-style-type: none"> • Investigate the possibility of best practice mitigation measures that include the use of bird-scaring lines and in all fisheries 	<ul style="list-style-type: none"> • Immediately 	<ol style="list-style-type: none"> 1. MFMR 2. EBWG 3. Appropriate partner organization (ATF) 	Medium
	Monitor compliance to bycatch reduction measures	Ongoing (annual review)	<ol style="list-style-type: none"> 1. Inspectorate 2. FOA 	High
4 Reporting	Results of mitigation trials to be openly discussed with all affected stakeholders in a workshop setting	During annual review	<ol style="list-style-type: none"> 1. DRM 2. FOA 3. Fishing industry (FI) 4. EBWG 5. Appropriate partner organization(ATF) 	High
	Compile annual national implementation report on seabird bycatch	Annually	<ol style="list-style-type: none"> 1. DRM 2. EBWG 3. Appropriate partner organization(ATF) 	High

5 Capacity building	Initiate the establishment of an Ecosystem and Bycatch Working Group	Immediately	1. BCC	High
	Train people in key positions to teach these courses on mitigation measures and the general scale of the problem (the train-the-trainers principle) to ensure maximum outreach and long-term sustainability of this initiative	Ongoing	1. Appropriate partner organization(ATF) 2. UNAM 3. FOA	Medium

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Annex 1: FAO's International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries

Introduction

1. Seabirds are being incidentally caught in various commercial longline fisheries in the world, and concerns are arising about the impacts of this incidental catch. Incidental catch of seabirds may also have an adverse impact on fishing productivity and profitability. Governments, non-governmental organizations, and commercial fishery associations are petitioning for measures to reduce the mortality of seabirds in longline fisheries in which seabirds are incidentally taken.

2. Key longline fisheries in which incidental catch of seabirds are known to occur are: tuna, swordfish and billfish in some particular parts of oceans; Patagonian toothfish in the Southern Ocean, and halibut, black cod, Pacific cod, Greenland halibut, cod, haddock, tusk and ling in the northern oceans (Pacific and Atlantic). The species of seabirds most frequently taken are albatrosses and petrels in the Southern Ocean, northern fulmars in the North Atlantic and albatrosses, gulls and fulmars in the North Pacific fisheries.

3. Responding to the need to reduce the incidental catch of seabirds in commercial fisheries in the Southern Ocean, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) adopted mitigation measures in 1992 for its 23 member countries to reduce incidental catch of seabirds.

4. Under the auspices of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), Australia, Japan and New Zealand have studied and taken seabird mitigation measures in their southern bluefin tuna longline fishery since 1994, and in 1995 CCSBT adopted a recommendation relating to ecologically related species, including the incidental mortality of seabirds by longline fishing. The recommendation stipulates a policy on data and information collection, mitigation measures, as well as education and information dissemination. All member nations of CCSBT have made the use of bird scaring lines (tori poles) mandatory in their fisheries.

5. The United States of America also adopted, by regulation, measures for reducing incidental catch of seabirds for its groundfish longline fisheries in the Bering Sea/Aleutian Islands and Gulf of Alaska in 1997, and for its halibut fishery in 1998. The United States is currently developing measures to mitigate the incidental catch of seabirds in the Hawaiian pelagic longline fisheries. Several other countries with longline fisheries have likewise adopted similar mitigation measures.

Origin

6. Noting an increased awareness about the incidental catch of seabirds in longline fisheries and its potential negative impacts on seabird populations, a proposal was made at the Twenty-second Session of the Committee on Fisheries (COFI) in March 1997 that FAO organize

an expert consultation, using extra-budgetary funds, to develop Guidelines leading to a Plan of Action to be submitted at the next Session of COFI aiming at a reduction in such incidental catch.

7. The *International Plan of Action for reducing incidental catch of seabirds in longline fisheries* (IPOA-Seabirds) has been developed through the meeting of a Technical Working Group in Tokyo 25-27 March 1998¹ and the Consultation on the Management of Fishing Capacity, Shark Fisheries and Incidental Catch of Seabirds in Longline Fisheries held 26-30 October 1998 and its preparatory meeting held in Rome 22-24 July 1998².

Nature and Scope

8. IPOA-Seabirds is voluntary. It has been elaborated within the framework of the Code of Conduct for Responsible Fisheries as envisaged by Article 2 (d). The provisions of Article 3 of the Code of Conduct apply to the interpretation and application of this document and its relationship with other international instruments. All concerned States³ are encouraged to implement it.

9. The IPOA-Seabirds applies to States in the waters of which longline fisheries are being conducted by their own or foreign vessels and to States that conduct longline fisheries on the high seas and in the exclusive economic zones (EEZ) of other States.

Objective

10. Taking into account in particular the objectives of articles 7.6.9 and 8.5 of the Code of Conduct, the objective of the IPOA-Seabirds is to reduce the incidental catch of seabirds in longline fisheries where this occurs.

Implementation

11. In implementing the IPOA-Seabirds States should carry out a set of activities. This should be done as appropriate in conjunction with relevant international organizations. The exact configuration of this set of activities will be based on an assessment of the incidental catch of seabirds in longline fisheries.

12. States with longline fisheries should conduct an assessment of these fisheries to determine if a problem exists with respect to incidental catch of seabirds. If a problem exists, States should adopt a National Plan of Action for reducing the incidental catch of seabirds in longline fisheries (NPOA-Seabirds). (See the attached "Technical note on developing a National Plan of Action for reducing the incidental catch of seabirds in longline fisheries".) When developing the NPOA-Seabirds experience acquired in regional management organizations should be taken into account as appropriate. FAO should provide a list of experts and a mechanism of technical assistance to countries for use in connection with development of NPOA-Seabirds.

13. States which determine that an NPOA-Seabirds is not necessary should review that decision on a regular basis, particularly taking into account changes in their fisheries, such as the expansion of existing fisheries and/or the development of new longline fisheries. If, based on a subsequent assessment, States determine that a problem exists, they should follow the procedures outlined in paragraph 12, and implement an NPOA-Seabirds within two years.
14. The assessment should be included as a part of each relevant State's NPOA-Seabirds.
15. Each State is responsible for the design, implementation and monitoring of its NPOA-Seabirds.
16. States recognize that each longline fishery is unique and the identification of appropriate mitigation measures can only be achieved through on-the-spot assessment of the concerned fisheries. Technical and operational mitigation measures are presently in use or under development in some longline fisheries where incidental catch of seabirds occurs. Measures developed by different States are listed in a Technical Note attached to this document. This list does not prejudice the right of States to decide to use any of these or other suitable measures that may be developed. A more comprehensive description and discussion of the mitigation measures currently used or under development can be found in FAO Fisheries Circular No. 937.
17. States should start the implementation of the NPOA-Seabirds no later than the COFI Session in 2001.
18. In implementing their NPOA-Seabirds States should regularly, at least every four years, assess their implementation for the purpose of identifying cost-effective strategies for increasing the effectiveness of the NPOA-Seabirds.
19. States, within the framework of their respective competencies and consistent with international law, should strive to cooperate through regional and subregional fisheries organizations or arrangements, and other forms of cooperation, to reduce the incidental catch of seabirds in longline fisheries.
20. In implementing the IPOA-Seabirds States recognize that cooperation among States, which have important longline fisheries, is essential to reduce the incidental catch of seabirds given the global nature of the issue. States should strive to collaborate through FAO and through bilateral and multilateral arrangements in research, training and the production of information and promotional material.
21. States should report on the progress of the assessment, development and implementation of their NPOA-Seabirds as part of their biennial reporting to FAO on the Code of Conduct for Responsible Fisheries.

Role of FAO

22. FAO will, as and to the extent directed by its Conference, and as part of its Regular Programme activities support States in the implementation of the IPOA-Seabirds.

23. FAO will, as and to the extent directed by its Conference, support development and implementation of NPOA-Seabirds through specific, in-country technical assistance projects with Regular Programme funds and by use of extra-budgetary funds made available to the Organization for this purpose.

24. FAO will, through COFI, report biennially on the state of progress in the implementation of the IPOA-Seabirds.

Technical note on developing a National Plan of Action for reducing the incidental catch of seabirds in longline fisheries (NPOA-Seabirds)

This is not an exclusive or necessarily all-encompassing list but provides guidance for preparation of the NPOA-Seabirds.

The NPOA-Seabirds is a plan that a State designs, implements and monitors to reduce the incidental catch of seabirds in longline fisheries.

I. Assessment

1. The purpose of the assessment is to determine the extent and nature of a State's incidental catch of seabirds in longline fisheries where it occurs.

2. The assessment may include, but is not limited to, the collection and analysis of the

- Criteria used to evaluate the need for an NPOA-Seabirds.
- Fishing fleet data (numbers of vessels by size).
- Fishing techniques data (demersal, pelagic, methods).
- Fishing areas.
- Fishing effort by longline fishery (seasons, species, catch, number of hooks/year/fishery).
- Status of seabird populations in the fishing areas, if known.
- Total annual catch of seabirds (numbers per 1000 hooks set/species/longline fishery).
- Existing mitigation measures in use and their effectiveness in reducing incidental catch of seabirds.
- Incidental catch of seabirds monitoring (observer program, etc.).
- Statement of conclusions and decision to develop and implement an NPOA- SEABIRDS.

The NPOA-Seabirds may contain the following elements:

1. Prescription of mitigation measures

- The NPOA-Seabirds should prescribe appropriate mitigation methods. These should have a proven efficiency, and be cost-effective for the fishing industry. If effectiveness of mitigation measures can be improved by combining different mitigation measures or devices, it is likely that each State will find it advantageous to implement a number of different measures that reflect the need and particular circumstances of their specific longline fishery.

2. Research and development

- The NPOA-Seabirds should contain plans for research and development, including those aiming: (i) to develop the most practical and effective seabird deterrent device; (ii) to improve other technologies and practices which reduce the incidental capture of seabirds; and (iii) undertake specific research to evaluate the effectiveness of mitigation measures used in the longline fisheries, where this problem occurs.

3. Education, training and publicity

- The NPOA-Seabirds should prescribe means to raise awareness among fishers, fishing associations and other relevant groups about the need to reduce the incidental catch of seabirds in longline fisheries where this occurs; National and International Plans of Action and other information on the incidental catch of seabirds in longline fisheries; and to promote the implementation of the NPOA-Seabirds among national industry, research and its own administration.
- Provide information about technical or financial assistance for reducing the incidental catch of seabirds.
- Preferably design and implementation of outreach programmes for fishers, fisheries managers, gear technologists, maritime architects, shipbuilders, and conservationists and other interested members of the public should be described in the plan. These programmes should aim at improving the understanding of the problem resulting from incidental catch of seabirds and the use of mitigation measures. The outreach programme may include educational curricula, and guidelines disseminated through videos, handbooks, brochures and posters. The programme should focus on both the conservation aspects of this issue and on the economic benefits of expected increased fishing efficiency *inter alia* by eliminating bait loss to seabirds.

4. Data Collection

- Data collection programmes should collect reliable data to determine the incidental catch of seabirds in longline fisheries and the effectiveness of mitigation measures. Such programmes may make use of onboard observers.

Technical note on some optional technical and operational measures for reducing the incidental catch of seabirds

I. Introduction

To reduce the incidental catch of seabirds, it is essential to reduce the number of encounters between seabirds and baited hooks. It should be noted that, if used in combination, the options could improve mitigation effectiveness.

For each of the measures, the effectiveness and the cost involved for fishers are briefly presented. In this presentation, "effectiveness" is defined as to what extent the measures reduce incidental catch of seabirds; "cost" is defined as the initial cost or investment and any ongoing operational costs.

Other technical options are currently under development and fishers and researchers in the field may develop new mitigation measures, so the list of measures is likely to increase over time.

If effectiveness of mitigation measures can be improved by combining different mitigation measures or devices, each State may find it advantageous to implement different measures that are more suitable for their conditions and reflect the needs of their specific longline fisheries.

The list below should not be considered mandatory or exhaustive and FAO shall maintain a data base of measures that are in use or under development.

II. Technical measures

1. Increase the sink rate of baits

a. Weighting the longline gear

Concept: Increase the sinking speed of baited hooks and reduce their exposure time to seabirds.

Effectiveness: Studies have shown that appropriate line-weighting can be highly effective in avoiding bait loss to birds.

Cost: The cost is the initial purchase of the weighting material (either heavier gear or weights) and any ongoing replacement of weights lost during fishing.

b. Thawing bait

Concept: Overcome buoyancy problems in bait by thawing and/or puncturing swim bladders.

Effectiveness: Rate of incidental catch of seabirds is reduced when thawed baits are used. It has also been shown that bait fish with deflated swim bladders sink more quickly than those with inflated swim bladders did.

Cost: Possible costs include bait thawing rack, or extra weight to compensate flotation resulting from the air bladder.

c. *Line-setting machine*

Concept: Increase line sinking rate by removing line tension during gear deployment.

Effectiveness: Although no quantitative assessments have been done, this practice would result in the line sinking more rapidly thereby reducing availability of baited hooks to seabirds.

Cost: For some fisheries, initial costs may include purchase of a line-setting device.

2. Below-the-water setting chute, capsule, or funnel

Concept: Prevent access by seabirds to baited hooks by setting line under water.

Effectiveness: Underwater setting devices are still under development but could have high effectiveness.

Cost: Initial cost would include purchase of the underwater setting device.

3. Bird-scaring line positioned over or in the area where baited hooks enter the water

Concept: Prevent seabirds access to baited hooks where they enter the water. The bird scaring line is designed to discourage birds from taking baited hooks by preventing their access to baited hooks. Design specifications may vary by vessel, fishing operation, and location and are critical to its effectiveness. Streamer lines and towing buoys are examples of these techniques.

Effectiveness: A number of studies and anecdotal observations have demonstrated significant effectiveness of these devices when properly designed and used.

Cost: Low initial cost for the purchase and installation of bird scaring line.

4. Bait casting machine

Concept: Places bait in area protected by a bird scaring line and outside the turbulence caused by the propeller and the ships wake.

Effectiveness: Deployment of bait under the protection zone of the bird-scaring line reduces the availability of baited hooks to seabirds. The extent to which bait loss is reduced by the use of bait casting machines, used either without a bird-scaring line or in such a manner that baits are not protected by a bird-scaring line, is yet to be determined.

Cost: High, initial costs may include purchase of a bait-casting device.

5. Bird scaring curtain

Concept: To deter seabirds from taking baited hooks during the haul by using a bird scaring

curtain.

Effectiveness: Anecdotal evidence indicates that the bird-scaring curtain can effectively discourage birds from seizing baits in the hauling area.

Cost: Low, cost for materials.

6. Artificial baits or lures

Concept: Reduce palatability or availability of baits.

Effectiveness: New baits are still under development and effectiveness has yet to be resolved.

Cost: Currently unknown

7. Hook modification

Concept: Utilize hook types that reduce the probability of birds getting caught when they attack a baited hook.

Effectiveness: Hook size might affect the species composition of incidentally caught seabirds. The effect of modification of hooks is, however, poorly understood.

Cost: Unknown.

8. Acoustic deterrent

Concept: Deterring birds from the longline using acoustic signals, such as high frequency, high volume, distress call, etc.

Effectiveness: Low probability of being effective as background noises are loud and habituation to noises is common among seabirds.

Cost: Unknown

9. Water cannon

Concept: Concealing baited hooks by using high pressure water.

Effectiveness: There is no definite conclusion about the effectiveness of this method.

Cost: Unknown.

10. Magnetic deterrent

Concept: Perturbing the magnetic receptors of the birds by creating magnetic fields.

Effectiveness: No indication of effect in practical experiments.

Cost: Unknown.

III. Operational Measures

1. Reduce visibility of bait (Night setting)

Concept: Set during hours of darkness and reduce illumination of baited hooks in the water.

Effectiveness: This method is generally recognized as being highly effective. However, effectiveness can vary between fishing grounds and also seasonally according to the seabird species. Effectiveness of this measure may be reduced around the full moon.

Cost: A restriction of line setting to the hours of darkness may affect fishing capacity, especially for smaller longliners. Small costs may be incurred to make vessel lighting appropriate. Such restriction can also entail investing in costly technology for maximizing fishing efficiency in a shorter period of time.

2. Reduce the attractiveness of the vessels to seabirds

Concept: Reducing the attractiveness of vessels to seabirds will reduce the potential for seabirds being incidentally caught. Materials (e.g. fish discards, garbage) discharged from vessels should be at a time or in a way that makes them least available to birds or least likely to cause them harm. This includes avoidance of the dumping of discarded fish, offal, fish heads, etc. with embedded hooks. If dumping offal is unavoidable, it should be done on the opposite side of the vessel to where lines are being set or in such a manner that birds are not attracted to the vessel (e.g. at night).

Effectiveness: The issue of offal discharge is a complex one, and there have been conflicting results regarding effects of various procedures in the studies done to date.

Cost: Low; in some situations costs may be associated with providing for offal containment or reconfiguration of offal discharge systems on the vessel.

3. Area and seasonal closures

Concept: Reduce incidental catch of seabirds when concentrations of breeding or foraging seabirds can be avoided.

Effectiveness: Area and seasonal closures could be effective (such as in high density foraging areas or during the period of chick care when parental duties limit the distances adults can fly from breeding sites) although displacement of fishing fleet to other seabird areas needs to be considered.

Cost: Unknown, but a restriction on fishing by area or season may affect fishing capacity.

4. Give preferential licensing to vessels that use mitigation measures that do not require compliance monitoring

Concept: Incentive provided for effective use of mitigation measures that do not require compliance monitoring.

Effectiveness: May be highly effective in stimulating the use of mitigation measures and development of fishing systems that reduce incidental catch of seabirds.

Cost: Unknown.

5. Release live birds

Concept: If despite the precautions, seabirds are incidentally caught, every reasonable effort should be made to ensure that birds brought onboard alive are released alive and that when possible hooks should be removed without jeopardizing the life of the birds.

Effectiveness: Depends on the number of birds brought onboard alive and this is considered small by comparison to the numbers killed in line setting.

Cost: Unknown.

¹ See: "Report of the Technical Working Group on Reduction of Incidental Catch of Seabirds in Longline Fisheries. Tokyo, Japan, 25-27 March 1998. FAO Fisheries Report No. 585.

² See report: "Preparatory Meeting for the Consultation on the Management of Fishing Capacity, Shark Fisheries and Incidental Catch of Seabirds in Longline Fisheries". Rome, 22-24 July, 1998. FAO Fisheries Report No. 584.

³ In this document the term "State" includes Members and non-members of FAO and applies *mutatis mutandis* also to "fishing entities" other than States.

Annex 2: Conservation status of seabird species most affected by mortality from longline fisheries within the Benguela ecosystem.

Seabird Species	IUCN Conservation Status (2017)
Cape Gannet <i>Morus Capensis</i>	Vulnerable
White-chinned Petrel <i>Procellaria aequinoctialis</i>	Vulnerable
Spectacled Petrel <i>Procellaria conspicillata</i>	Vulnerable
Northern Giant Petrel <i>Macronectes halli</i>	Least concern
Southern Giant Petrel <i>Macronectes giganteus</i>	Least concern
Wandering Albatross <i>Diomedea exulans</i>	Vulnerable
Tristan Albatross <i>Diomedea dabbenena</i>	Critically Endangered
Shy Type Albatross <i>Thalassarche steadi/cauta</i>	Near Threatened
Atlantic Yellow-nosed Albatross <i>T. chlororhynchos</i>	Endangered
Black-browed Albatross <i>T. melanophrys</i>	Near Threatened