



Australian Government
**Department of Agriculture
and Water Resources**

National Plan of Action for Minimising Incidental Catch of Seabirds in Australian Capture Fisheries



© Commonwealth of Australia 2018

Ownership of intellectual property rights

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia (referred to as the Commonwealth).

Creative Commons licence

All material in this publication is licensed under a Creative Commons Attribution 4.0 Australia Licence, save for content supplied by third parties, logos and the Commonwealth Coat of Arms.



Creative Commons Attribution 4.0 Australia Licence is a standard form licence agreement that allows you to copy, distribute, transmit and adapt this publication provided you attribute the work. A summary of the licence terms is available from creativecommons.org/licenses/by/4.0. The full licence terms are available from creativecommons.org/licenses/by/4.0/legalcode.

Cataloguing data

This publication (and any material sourced from it) should be attributed as: Department of Agriculture and Water Resources 2018, *National Plan of Action for Minimising Incidental Catch of Seabirds in Australian Capture Fisheries*, Canberra, July. CC BY 4.0.

ISBN: 978-1-76003-182-4

Internet

This publication is available at agriculture.gov.au/publications.

Contact

Department of Agriculture and Water Resources
Postal address GPO Box 858 Canberra ACT 2601
Telephone 1800 900 090
Web agriculture.gov.au

The Australian Government acting through the Department of Agriculture and Water Resources has exercised due care and skill in preparing and compiling the information and data in this publication. Notwithstanding, the Department of Agriculture and Water Resources, its employees and advisers disclaim all liability, including liability for negligence and for any loss, damage, injury, expense or cost incurred by any person as a result of accessing, using or relying on any of the information or data in this publication to the maximum extent permitted by law.

Foreword

Australian fisheries are among the best managed in the world. The Australian Government is working hard to keep them this way. An important part of this is ensuring that our fisheries resources continue to be managed sustainably and to minimise impacts of fishing activities on the marine environment.

I am pleased to release Australia's *National Plan of Action for Minimising Incidental Catch of Seabirds in Australian Capture Fisheries* (NPOA–Seabirds) which provides a national approach to mitigating the impact of fishing on seabirds.

Australia recognises the need to address the impact of fishing on seabirds. This action plan provides guidance on best-practice mitigation, monitoring and reporting of seabird interactions for all fishing activities. It will reduce duplication, target responses to areas that need it most and result in more uniform, efficient and cost-effective seabird bycatch management. Establishing minimum reporting standards will enable us to better understand the extent of seabird interactions across all Australia's capture fisheries.

NPOA–Seabirds demonstrates Australia's commitment to sustainable fishing practices internationally. It also fulfils our obligation to Food and Agriculture Organization (FAO) of the United Nations by aligning our national efforts with those of the FAO's [International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries](#) (IPOA–Seabirds).

NPOA-seabirds will enhance the reputation of Australia's sustainable seafood industry, particularly in high-value export markets, and help strengthen our international seafood brand.

Most importantly, it will build trust among Australians and international consumers that our fisheries are managed under a sustainable and environmentally responsible fisheries management regime.



A handwritten signature in blue ink that reads "Richard Colbeck". The signature is fluid and cursive, with a horizontal line underneath the name.

Senator the Hon. Richard Colbeck
Assistant Minister for Agriculture and Water Resources

Contents

Foreword	iii
1 Introduction	3
Commercial longline fisheries	5
Impact of fishing on Australian seabird populations	5
Commercial trawl fisheries	6
Commercial gillnet and entanglement net fisheries	6
Recreational and customary fishing	7
2 Rationale	8
3 Scope	9
4 Objectives	10
5 Framework for achieving NPOA–Seabirds objectives	11
Objective 1 Understand the extent of the incidental catch of seabirds	11
Objective 2 Implement best-practice seabird bycatch mitigation in capture fisheries	12
Objective 3 Promote development of innovative mitigation procedures and technologies that are feasible, effective and efficient	15
Objective 4 Increase awareness and understanding of the incidental catch of seabirds and best-practice mitigation	16
Objective 5 Promote adoption of effective mitigation measures in regional fisheries and conservation bodies	16
6 Government subcommittee	17
Implementation	17
Roles and responsibilities	18
Resourcing	18
7 Evaluation and review	19
Appendixes	
A Data collection categories	20
B Minimum standards for collecting seabird interaction data	21
C ACAP recommended best-practice approaches for longline and trawl fisheries	29
D Principles for recreational fishing codes of practice	34
E Voluntary implementation actions	36
Glossary	40
References	41

Introduction

Fishing represents a substantial threat to some seabird populations. Most seabirds are primarily surface feeders, taking their prey from the top few metres of the water column (Harper, Croxall & Cooper 1985). Many species are at-sea scavengers, preying on dead fish, squid and other marine life found floating on the surface. The negative effects of fishing practices occur most often when fishing and seabird foraging behaviour overlap (Alexander, Robertson & Gales 1997; Baker et al. 2002; Birdlife International 1995; Croxall 1998; Croxall et al. 2012; Gales 1998). Scavenging seabirds supplement their diet by feeding on discards from vessels and baited hooks, and from fisheries catch as it is being hauled (Baker et al. 2002).

The incidental catch of seabirds in capture fisheries has been of international concern since the 1980s (Brothers 1991; Gales 1998). Studies highlighting the number of seabirds killed annually by fishing operations include Anderson et al. 2011; Brothers 1991; Brothers, Gales & Reid 1998; Gales 1998; Gales, Brothers and Reid 1998, Zydulis, Small & French 2013.

Each Australian jurisdiction has its own regulatory approach to addressing seabird interactions. Australia's 200-plus seabird species are protected under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In accordance with the legislation, it is illegal to kill, injure, take, trade, keep or move these species in Commonwealth waters without a permit. Some species, such as albatrosses, petrels and shearwaters, are granted greater protection under the EPBC Act due to their 'threatened' species status. The [Commonwealth Fisheries Bycatch Policy](#) sets out a framework for minimising bycatch of species including seabirds that may be killed or injured as a result of interacting with fishing equipment. Protection of seabirds in state and Northern Territory waters is subject to the legislation and policies of those jurisdictions.

In 1999 the Food and Agriculture Organization of the United Nations (FAO) adopted the [International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries](#) (IPOA–Seabirds) (FAO 1999). IPOA–Seabirds is a voluntary instrument within the framework of the FAO Code of Conduct for Responsible Fisheries. It sets out principles and international standards of behaviour for responsible fishing practices. In 2009 the FAO expanded the plan to cover interactions between seabirds and all types of fishing gear used by industrial, recreational and customary fishers.

Development and implementation of this *National Plan of Action for Minimising Incidental Catch of Seabirds in Australian Capture Fisheries* (NPOA–Seabirds) fulfils Australia’s voluntary commitment to the FAO. NPOA–Seabirds has been developed in line with the FAO’s best-practice guidelines for reducing incidental catch of seabirds in capture fisheries (Box 1). It also incorporates findings of a 2013 national assessment (Baker & Finley 2013). The assessment recommended that the plan focus on collecting and analysing data to improve knowledge of seabird–fishery interactions and assess mitigation performance. This process would be a precursor to implementation of further mitigation measures. NPOA–Seabirds promotes national coordination to better understand and mitigate impacts of fishing activities on seabirds across jurisdictions, recognising that the state, Northern Territory and Australian governments have separate regulatory authority in their own jurisdictions and are best placed to determine what mitigation measures are needed.

Box 1 FAO best-practice guidelines for reducing incidental catch of seabirds in capture fisheries

1. Address incidental catch of seabirds in all capture fisheries.
2. Advocate seabird bycatch mitigation in regional fisheries and conservation bodies.
3. Identify extent of seabird bycatch in capture fisheries.
4. Implement mitigation measures.
5. Conduct mitigation research and development.
6. Provide education, training and outreach.
7. Conduct independent monitoring.
8. Establish objectives to avoid and minimise incidental catch of seabirds.
9. Implement monitoring and reporting arrangements.

Source: FAO 2009

Chapter 1

Impact of fishing on Australian seabird populations

The impact of fishing on Australian seabird species differs depending on the method of fishing and the foraging behaviour of each bird species. Seabirds are known to follow fishing vessels in search of discarded fish scraps, unused baits (offal) and bait that is accessible when fishing gear is set, hauled or in the water. As a result, many seabirds are injured or die after becoming entangled or hooked in fishing gear.

Our understanding of the extent of fishing impacts on seabird populations in Australian capture fisheries is limited by a lack of reliable data on interactions and species behaviour. Baker & Finley (2010) found that risks to seabirds are evident from fishing activities, particularly south of 30° latitude.

Longline, trawl and net fishing methods are likely to have an impact on seabird populations. Incidental catch of seabirds primarily occurs during setting and hauling, when baits or nets are close to the surface.

Recreational and Indigenous fishing can result in the incidental injury or death of seabirds (Campbell 2013; McPhee, Leadbitter & Skilleter 2002). Recreational fishing activities are widespread along Australia's east coast and may become more prevalent as coastal communities continue to expand.

Commercial longline fisheries

The incidental catch of seabirds during longline fishing and its impact on populations internationally is well documented (Anderson et al. 2011). Australia already has measures in place to reduce the incidental catch of seabirds during longline fishing. In 1992 incidental catch of seabirds during oceanic longline fishing operations was nominated and subsequently listed under the EPBC Act as a key threat to seabirds. As a result the *Threat Abatement Plan for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations* (TAP–Seabirds) was developed in 1998. TAP–Seabirds sets out mandatory mitigation requirements for longline fishing operations in Commonwealth waters (Commonwealth of Australia 2014). The plan has been reviewed three times since its release (2006, 2014 and 2017). The reviews have found that the TAP has been successful in significantly reducing the impact of longline fishing on seabird species in Commonwealth-managed fisheries (Commonwealth of Australia 2014).

In addition to requirements under TAP–Seabirds, best-practice measures have been adopted by Commonwealth commercial fishers to prevent interactions with seabirds. These include not discharging offal while setting and bringing in lines, the use of tori line devices when setting gear, only setting lines at night and using sinkers to ensure baited hooks sink quickly.

In 2008 a national assessment of the extent of seabird bycatch in longline fisheries highlighted a lack of reliable data on seabird interactions with fishers outside Commonwealth jurisdiction, who aren't subject to the requirements of TAP–Seabirds (Baker & Finley 2010). Improved national data collection would provide a better understanding of the impacts of longline fishing on seabirds across all Australian fisheries, and help ensure national consistency in management and reporting.

Commercial trawl fisheries

The impact of trawl fishing on seabird populations internationally is well documented (Bartle 1991; González-Zevallos & Yorio 2006; Sullivan, Reid & Bugoni 2006; Weimerskirch, Capdeville & Duhamel 2000).

The impact of trawl fishing on seabird populations in Australia is difficult to gauge. Until recently, limited research was available and fishers were not required to keep extensive records of interactions. This was partly due to the difficulty of observing and recording interactions and related mortalities. The collection of seabird interaction data is now recognised as a priority for the management of bycatch in Commonwealth trawl fisheries. These fisheries are required to report all seabird interactions and are subject to electronic monitoring and/or observer coverage. This has significantly improved availability of bycatch data for these fisheries. Since 1 May 2017 Commonwealth trawl fishers have also been required to have one of three approved mitigation techniques in place:

- Warp deflectors (pinkie buoys)—these must sit alongside the trawl gear as a visual deterrent and physical barrier between birds and fishing gear, and may be used in combination with zero offal discharge while fishing; recent research shows that pinkie buoys reduce seabird interactions with warp wires by 75 per cent.
- Bird bafflers—a form of modified tori line .
- Seabird sprayers—the two booms, which extend beyond the stern and over the warps, pump water through nozzles to create a curtain of water around each warp.

Operators in some Commonwealth fisheries also continue to trial new mitigation devices to further reduce interactions. A better understanding of national seabird impacts from trawl fishing would help fisheries managers design tailored mitigation actions.

Commercial gillnet and entanglement net fisheries

International evidence suggests that gillnet fisheries contribute to high levels of seabird incidental mortality (Anderson et al. 2011; Zydalis, Small & French 2013). Diving seabird species, such as penguins, shearwaters, cormorants and gannets, are particularly susceptible to entanglement in net fisheries.

Limited information is available on seabird bycatch levels in Australian net fisheries. This is because many net fisheries do not require or enforce logbook recordings of seabird interactions. Without data on specific fisheries, it is difficult to determine the level of interaction or the impact net fisheries may have on seabirds. Data limitations have also restricted the validity of research on developing best-practice seabird mitigation measures for net fisheries. However, since 2014 the Commonwealth gillnet fishing fleet has been subject to electronic monitoring, allowing collection of crucial data on seabird interactions.

Improving reporting requirements and setting minimum data standards across Australian net fisheries will have several benefits. It will increase understanding of the impacts of seabird interactions and drive fishery managers and industry to implement actions to mitigate interactions.

Recreational and customary fishing

Recreational (including commercial game and charter) and customary fishing can result in the injury or death of seabirds that ingest baited hooks and fishing line or get entangled in crab pots (McPhee, Leadbitter & Skilleter 2002). Most seabird interactions with recreational and customary fishers are unrecorded because fishers are not required to formally report incidents in the coastal waters where most recreational fishing occurs. Estimates of interactions are based on data collected from seabird rescue groups.

The Australian Government has supported the development of the National Recreational Fishing Code of Practice, which was most recently revised by the Australian Recreational Fishing Foundation in 2016. The code sets standards that seek to improve recreational fisher stewardship of the marine environment, including through sustainable fishing practices and responsible use of aquatic resources.

Case study 1 Understanding the impact of recreational fishing on seabirds

According to a southern Queensland rescue group, in 2012 more than 1,000 seabirds were rescued in the waters between the Sunshine Coast and Redcliffe Peninsula (Campbell 2013).

The majority of birds rescued were Australian pelicans and white ibises that had been injured in interactions with discarded fishing tackle. Significant numbers of white-faced herons, pied cormorants, wood ducks and silver gulls were also rescued. Over 60 per cent of birds rescued had wing or foot injuries. Most were released after less than two weeks. However, around 6 per cent died or had to be euthanased and 30 per cent required long-term treatment for beak or internal injuries.

Chapter 2

Rationale

Internationally, fishing has been identified as a threat to seabird populations. Following the release of IPOA–Seabirds in 1999, the Australian Government prepared an assessment report on the extent and nature of incidental seabird catch in longline fisheries (Commonwealth of Australia 2003). The report concluded that TAP–Seabirds was largely fulfilling the role of a national plan for longline fisheries.

Past national assessments of seabird bycatch across Australian fisheries have found that little information is available on the impact of other fishing methods on seabird populations (Baker & Finley 2010; Commonwealth of Australia 2003). The assessments identified a need to improve reporting standards nationally to better understand the extent of seabird interactions. NPOA–Seabirds addresses the need for national coordination and consistency to better understand and mitigate the impacts of fishing activities on seabirds.

Chapter 3

Scope

Implementation of NPOA–Seabirds will contribute towards achieving and maintaining a favourable conservation status for seabirds (Box 2) by providing a comprehensive and consistent approach to reducing the impact of fishing on these species. The scope of this plan covers:

- all species of birds that occur naturally in Australian marine areas, including migratory and threatened seabird species listed under the EPBC Act
- all commercial, recreational, customary and other relevant capture fisheries
- all waters under the jurisdiction of Commonwealth, state and Northern Territory fisheries
- all fishing undertaken by Australian-flagged fishing vessels on the high seas, including areas governed by regional fisheries and conservation bodies.

NPOA–Seabirds does not include those general actions for reducing threats to the conservation status of a species that are not directly related to fishing activity, such as threats to seabird breeding sites or from marine debris. These issues are addressed through other environmental actions and measures, including recovery plans established under the EPBC Act.

Box 2 Favourable conservation status

‘Conservation status’ means the sum of the influences acting on seabird species that may affect their long-term distribution and abundance. Conservation status is considered favourable when any of these conditions are met:

- distribution and abundance of the species approach historic coverage and levels to the extent that potentially suitable ecosystems exist and are consistent with wise wildlife management
- population dynamics data indicate that the species is maintaining itself long term
- the range of the species is neither currently being reduced nor likely to be reduced long term
- sufficient habitat exists and will continue to exist in the foreseeable future to maintain the population of the species long term.
- Conservation status is considered unfavourable when any of these conditions are not met.

Source: FAO 2009

Chapter 4

Objectives

NPOA–Seabirds is a voluntary measure. It is not a regulatory instrument. It provides guidance for regulators on best-practice mitigation and reporting of seabird interactions across all fishing operations in Australian waters.

NPOA–Seabirds aims to establish a nationally coordinated approach to avoiding or minimising seabird deaths or injuries resulting from capture fishing activities. Implementation of the plan by jurisdictions is voluntary. Jurisdictions are encouraged to implement consistent measures to address data limitations. This will ensure that sufficient information is available to undertake a comprehensive national assessment of the impact of fishing activities on seabirds.

The goal of Australia’s NPOA–Seabirds is to minimise and, where practicable, eliminate the incidental catch of seabirds in capture fisheries. To achieve this, NPOA–Seabirds has five objectives:

- **Objective 1** Understand the extent of the incidental catch of seabirds.
- **Objective 2** Implement best-practice seabird bycatch mitigation in capture fisheries to
 - minimise or, where practicable, eliminate the incidental catch of seabirds
 - contribute towards achieving and maintaining a favourable conservation status for seabirds.
- **Objective 3** Promote development of innovative mitigation procedures and technologies that are feasible, effective and efficient.
- **Objective 4** Increase awareness and understanding of the incidental catch of seabirds and best-practice mitigation.
- **Objective 5** Promote adoption of effective mitigation measures in regional fisheries and conservation bodies.

Chapter 5

Framework for achieving NPOA–Seabirds objectives

Objective 1 Understand the extent of the incidental catch of seabirds

Australia has a well-developed understanding of the extent of the incidental catch of seabirds in longline fisheries. However, many other fisheries in Australia are small-scale, low-value enterprises with limited capacity to support expensive monitoring programs. As a result, data on seabird interaction in these fisheries is limited. Action is needed to increase our understanding of the effects of different fishing gear types on seabirds in Australian fisheries.

To understand and manage the incidental catch of seabirds in capture fisheries across jurisdictions, fisheries managers need to:

- review available data about the incidental catch of seabirds
- validate data sources and, where appropriate, conduct more detailed investigations
- determine whether a problem exists based on
 - magnitude of seabird bycatch (rate or number)
 - species that are incidentally caught and their conservation status
 - spatial and temporal overlap of fishing effort
 - existing mitigation measures and their effectiveness
 - existing seabird monitoring programs and their effectiveness
- adopt a precautionary approach when information is lacking or unclear.

Fisheries managers should undertake risk assessments to determine the risk to seabirds from fishing operations. Where the risk is identified as high, managers should ensure appropriate management measures are in place. Managers can use a range of input, output and educational measures to reduce fishing-related mortalities. Measures can be targeted based on the identified risk.

Data collection and reporting programs, such as logbook reporting, e-monitoring and observer programs, should be designed to provide representative data on the incidental catch of seabirds, and be regularly reviewed. The size of the fishery and likelihood of interactions with seabirds should be considered when developing programs. Where possible, logbooks should be standardised to ensure information is collected and recorded consistently across jurisdictions and time. See Appendix A for a list of data categories that regulators should consider requiring fishers to collect. Suggested data fields for each category are provided at Appendix B.

If evidence indicates an incidental seabird catch problem, regulators should consider developing and implementing targeted programs to better understand or mitigate the impacts. Some government environmental agencies obtain data on seabird mortalities in coastal waters from seabird rescue groups.

Day-to-day monitoring will not always capture the information required to understand the extent of seabird incidental catch in a fishery. Jurisdictions may choose to undertake research or monitoring programs that focus on high risk and provide transparent and statistically robust estimates of seabird injury and mortality.

Under the EPBC Act, it is an offence to kill, take, trade, keep or move a listed species in a Commonwealth area, including Commonwealth waters, without a permit. Sometimes interactions with listed species are unavoidable. Under the EPBC Act, fishers must report such interactions to the Australian Government Department of the Environment and Energy within seven days of the incident occurring or face a fine. Fishers who promptly report interactions are meeting their legal obligations and helping the Australian Government protect marine species.

Objective 2 Implement best-practice seabird bycatch mitigation in capture fisheries

Feasible, effective and efficient seabird bycatch mitigation measures should be implemented in all capture fisheries where there is a risk of incidental catch of seabirds.

Seabird bycatch mitigation measures are ‘a modification to fishing practices and/or equipment that reduces the likelihood of seabird incidental catch’ (Brothers, Cooper & Løkkeborg 1999; Løkkeborg 2008, 2011). Measures can take many forms, including the use of bird-scaring devices, fishing gear modifications (for example, line weighting), temporal and seasonal restrictions and alignment with international best practice fisheries management (such as cleaning of nets or offal management).

Australia is a signatory to the international [Agreement on the Conservation of Albatrosses and Petrels](#) (ACAP), which coordinates international activity to mitigate known threats to these bird populations. ACAP develops best-practice advice for longline and trawl fisheries that jurisdictions can consider when regulating these types of fisheries (see summary in Appendix C). ACAP criteria for developing advice are summarised in Box 3.

Australia’s current TAP–Seabirds prescribes actions that fisheries managers and longline fishing operators must take in Commonwealth waters to reduce incidental seabird catch. Requirements under the plan are consistent with ACAP best-practice advice. TAP–Seabirds was implemented in 1998. Since implementation, incidental bycatch rates for several Commonwealth longline fisheries have dropped well below the maximum permissible levels of 0.01 or 0.05 birds per 1,000 hooks. For fisheries that score above this rate, an investigation into their operators occurs which can lead to fisheries managers imposing additional measures on the fishing operators to ensure the rate does not rise. TAP–Seabirds will remain in place, independent of NPOA–Seabirds.

International best-practice advice for gillnet fisheries is still being developed. In the interim, ACAP has pointed to research demonstrating that increasing the visibility of the net can reduce seabird bycatch (Bull 2007), as a particle measure fisheries managers could regulate.

Wherever possible, fisheries managers and operators should adopt data-driven solutions—supported by in-fishery trials—that effectively manage seabird bycatch by meeting or exceeding international standards. However, guidance on international best practice should not override tailored approaches that accommodate the unique features of particular fisheries. Similarly, international best-practice guidelines should not constrain the pursuit of continuous improvement in the mitigation of seabird interactions.

Several Australian fisheries have introduced measures that extend beyond international best practice. These initiatives provide a model of adaptive management for other fisheries.

Box 3 Agreement on the Conservation of Albatrosses and Petrels—best-practice seabird bycatch mitigation criteria

1. Individual fishing technologies and techniques should be selected from those shown by experimental research to significantly reduce [statistically] the rate of seabird incidental mortality to the lowest achievable levels.
2. Fishing technologies and techniques, or a combination of the two, should have clear and proven specifications and minimum performance standards for their deployment and use.
3. Fishing technologies and techniques should be demonstrated to be practical, cost-effective and widely available.
4. Fishing technologies and techniques should, to the extent practicable, maintain catch rates of target species.
5. Fishing technologies and techniques should, to the extent practicable, not increase the bycatch of other taxa.
6. Minimum performance standards and methods of ensuring compliance should be provided for fisheries technologies and techniques, and should be clearly specified in fishery regulations.

A significant reduction in incidental seabird mortality can be determined by either a direct reduction in mortality or a reduction in seabird attack rates.

Source: [Agreement on the Conservation of Albatrosses and Petrels](#)

NPOA–Seabirds seeks to ensure that affected capture fisheries employ proven technical and operational seabird mitigation measures to prevent interactions. Measures adopted should be tailored for the type of fishery and individual fishing operations.

Regulators of recreational, customary and small-scale fisheries should consider lower-cost management measures. These could include education and extension programs such as implementing a code of practice. Appendix D lists principles for developing recreational fishing codes of practice. To ensure the application of best practice in seabird bycatch mitigation, jurisdictions should maintain a focus on strong stakeholder engagement throughout implementation. Jurisdictions should share information and provide opportunities for support and technical assistance, particularly for fishers at a regional level.

Case study 2 Sliding lead-weight technology—new seabird bycatch mitigation device for longline fisheries

Correct use of line-weighting in longline fisheries is an effective method of minimising seabird bycatch because it sinks fishing gear rapidly. However, many fishers are reluctant to adopt the method, partly because of safety concerns. If a line breaks during hauling, traditional leaded swivels can cause serious injury or fatality if they fly back towards the crew.

Sliding lead weights may be a solution to this problem. The device was developed in consultation with the Australian Fisheries Management Authority, the Australian Antarctic Division and the East Coast Tuna and Billfish Fishery. The device places a sliding lead at or near the hook. The lead slides down the line when fish bite. When a hook is pulled from the fish's mouth, on or near the surface, the lead slides down the line and dampens the energy of the recoiling line and hook, reducing the likelihood of fly-back.

Findings indicate that sliding lead-weighting configurations increase hook sink rates and result in a reduction in seabird mortalities, without reducing the target catch. Members of the Queensland tuna industry have voluntarily adopted sliding lead weights.

Objective 3 Promote development of innovative mitigation procedures and technologies that are feasible, effective and efficient

New or improved technical measures for seabird mitigation can significantly reduce seabird bycatch. International best-practice guidelines provide a benchmark, but this should not preclude development of better approaches for local situations.

Incentives to trial new and improved technical measures will help ensure that new procedures and technologies are feasible, effective and efficient. Jurisdictions have a role in supporting and encouraging stakeholder and industry-led research and testing. This includes working with stakeholders to mitigate risks and providing advice on experimental design. Jurisdictions also have a role in effectively converting the results of studies into fleet-based uptake of measures.

Case study 3 Industry–science collaboration reduces seabird interactions with trawl fisheries

As a condition of their fishing permit all trawlers in the South East Trawl Fishery must follow the directions of an approved seabird management plan at all times. This plan directs each vessel to manage offal in a particular way and deploy an approved physical mitigation device when fishing in daylight hours.

With Australian Government support, the South East Trawl Fishing Industry Association and the Great Australian Bight Fishing Industry Association have developed and trialled two effective seabird bycatch mitigation devices for trawl fisheries: the sprayer and the bird baffler.

The sprayer device sprays seawater at high pressure where the warp enters the water, deterring seabirds from the area. Trials recorded a 92 per cent reduction in warp–seabird interactions.

The bird baffler device prevents birds from accessing the area between the stern of the vessel and where the warp enters the water. It comprises two booms that extend perpendicular to the side of the vessel. The booms have droppers that hang down to the water line and act as a curtain. Trials indicate that bird bafflers reduce bird and warp interactions by 96 per cent.

Objective 4 Increase awareness and understanding of the incidental catch of seabirds and best-practice mitigation

Education, training, incentives and outreach programs can reduce seabird bycatch by driving changes in behaviour and practices. The commercial fishing industry and recreational and customary fishing sectors should be encouraged to share experiences and exchange skills through existing networks and jurisdictions.

All jurisdictions and fishing sectors should consider the use of training and extension programs for fishers, and the production of best-practice seabird identification and seabird handling guides. Education and extension activities are particularly important for recreational fisheries where regulatory oversight of fishing practices is limited.

Case study 4 Education and outreach programs to reduce seabird bycatch: OceanWatch TAngler bins

The OceanWatch TAngler bins project encourages recreational fishers to dispose of fishing line and tackle responsibly. Associated education programs help recreational fishers understand that keeping their fishing spots tidy and free of lost and littered fishing line will help preserve their fishing spots and local wildlife.

More than 300 TAngler bins have been installed across Victoria, New South Wales and Queensland, resulting in the collection of more than 10 tons of discarded fishing line.

This project is a partnership between OceanWatch, local and state governments, land managers and volunteer groups who join the TAngler Bin Network.

Objective 5 Promote adoption of effective mitigation measures in regional fisheries and conservation bodies

NPOA–Seabirds applies to Australian-flagged fishing vessels operating on the high seas and in areas managed by a Regional Fisheries Management Organisation.

Seabirds cross national boundaries and can spend most of their lives migrating and foraging in waters distant from their breeding grounds. As a result, mitigating risk to seabird populations requires regional and international cooperation driven by action undertaken by regional fisheries management organisations and regional conservation bodies.

Australia will continue to pursue stringent and effective seabird bycatch mitigation measures through engagement in regional fisheries management organisations, regional conservation bodies and ACAP.

Chapter 6

Implementation

NPOA–Seabirds seeks to ensure a nationally coordinated approach to addressing the incidental catch of seabirds in all Australian capture fisheries. Actions to implement NPOA–Seabirds are detailed in Appendix E. These actions are not intended to be prescriptive, as it is recognised that the level of incidental catch of seabirds is likely to vary significantly across jurisdictions due to geographic location and extent of fishing operations. When prioritising the actions, jurisdictions will take into account factors including the nature and size of their fisheries and the seabird interaction risks. Implementation of these actions is subject to available funding and resources.

Implementation is expected to take four years and should recognise existing practices and management arrangements for Australian capture fisheries.

Government subcommittee

Implementation of NPOA–Seabirds will be overseen by the existing fisheries management subcommittee of the Australian Fisheries Management Forum (AFMF). The committee will review the progress of implementation and consider current and emerging issues related to the impact of fishing activities on seabirds.

Fisheries management agencies will prepare reports for the subcommittee annually. Content of the reports will be stipulated by the subcommittee and should identify what implementation actions have been undertaken. Where agencies have not implemented actions proposed under NPOA–Seabirds, reports should provide relevant justification. The subcommittee can request further information from agencies where warranted. The Department of Agriculture and Water Resources will be responsible for collating annual reporting and making it available on the NPOA–Seabirds page of the department’s website.

The subcommittee will also consider the benefits of holding periodic or ad hoc workshops to enable stakeholders to share experiences and exchange skills and knowledge.

Roles and responsibilities

Australian Government

The Australian Government will provide national policy leadership and help implement NPOA–Seabirds by providing impetus for whole-of-government approaches, coordinating the AFMF subcommittee, facilitating and encouraging research activities, and overseeing implementation of actions for fisheries managed by the Australian Government.

The Department of Agriculture and Water Resources will report to the FAO on the progress of developing and implementing NPOA–Seabirds as part of its biennial reporting on the FAO Code of Conduct for Responsible Fisheries. The Department of the Environment and Energy will report to ACAP.

State and Northern Territory governments

State and Northern Territory fisheries and government environment agencies will be responsible for overseeing implementation of actions in capture fisheries under their respective jurisdictions. Each jurisdiction will determine how best to do this. In some cases, current practices may already be consistent with the objectives of NPOA–Seabirds. Jurisdictions will provide input to the Department of Agriculture and Water Resources for annual reporting to the AFMF subcommittee.

Commercial, recreational and customary fishing sectors

The commercial, recreational and customary fishing sectors have a significant role to play in achieving and ensuring that the fishing practices of their stakeholders are ecologically sustainable and the objectives of NPOA–Seabirds are realised. Where possible, these sectors are encouraged to facilitate development and trialling of innovative mitigation measures and drive educational and outreach activities that promote best practice approaches to the mitigation of seabird interaction. Successful pursuit of ecologically sustainable practices by these sectors, in partnership with government agencies, will ensure that community support for fishing activities continues into the future.

Non-government sectors

Conservation groups, researchers, other interested organisations and members of the public can contribute to implementation of NPOA–Seabirds through on-ground activities and engagement with research, education and awareness programs.

Resourcing

Implementation of NPOA–Seabirds will require resourcing from all jurisdictions and fishing sectors, including financial in-kind commitments. Voluntary commitments from relevant stakeholders will help minimise the incidental catch of seabirds. However, resourcing remains the responsibility of anyone accessing or managing community-owned fisheries. Implementation of the plan recognises existing practices and management arrangements for Australian capture fisheries. This will help minimise resourcing pressures on stakeholders identified as delivering actions under the plan.

Issues and actions outlined in this plan will help responsible agencies guide and prioritise their own actions to minimise the incidental catch of seabirds in Australian capture fisheries.

Chapter 7

Evaluation and review

NPOA–Seabirds will be reviewed four years after its release. The Department of Agriculture and Water Resources will coordinate the review and communicate the outcomes.

The review will consider the effectiveness of the plan and any positive and negative effects of implementation. It will assess the extent to which NPOA–Seabirds objectives have been met and whether they have contributed to reducing seabird mortalities in capture fisheries. When evaluating the plan, the department will consider the effectiveness of other measures put in place to mitigate seabird bycatch, including TAP–Seabirds and state-specific measures. The review may make recommendations about developing and implementing a revised NPOA–Seabirds.

Ongoing evaluation and the four-year review will provide recommendations for improvements and future work, including any necessary changes to the plan. Consultation with key stakeholders will be central to the review.

Appendix A

Data collection categories

ABARES recommends using these data categories for recording interactions in fisheries logbooks and during observer programs.

TABLE A1 Minimum data categories and fields

Data category	Minimum data fields	Data use
Vessel specification	Vessel length, vessel type, gross registered tonnes, fishing master/skipper, number of crew, gear types	For covariates for standardising interaction rates and analyses of the implementation and effectiveness of mitigation measures
Fishing effort	Fishing time, spatial location and fishing method, number of hooks set, hours trawled, fishing conditions (weather), offal discharged	For analyses to determine frequency of interactions by gear, location and time of day
Mitigation measures	Mitigation technique, time of deployment, where on vessel deployed, whether mitigation operated according to specifications or was deployed unsuccessfully (including partially)	To standardise description of which and how mitigation measures were deployed to analyse implementation and effectiveness of mitigation measures
Interaction details	Number of interactions, how birds interact with the gear and on which part of the gear/vessel the interactions occur	For analyses of general and specific interactions
Fate details	Condition of the seabird (alive, dead or injured)	For partitioning analyses to estimate mortalities and encounters
Seabird identification	Species identification or evidence for its identification	For species-specific analyses
Seabird biologicals	Seabird size, evidence of maturity, counts, behaviour, tissue samples, handling methods	For covariate inclusion in analyses (for example, maturity status or bird density)

Source: ABARES (forthcoming)

Appendix B

Minimum standards for collecting seabird interaction data

ABARES recommends that managers implement minimum data standards for recording interactions in fisheries logbooks and during observer programs.

TABLE B1 Minimum data standards

Data field and instructions	Observations to be recorded
Gear	Gear used [insert details]
Date and UTC time	Fishing started on [insert DD/MM/YYYY] and ended on [insert DD/MM/YYYY] Setting started on [insert DD/MM/YYYY, HH:MM UTC] and ended [insert DD/MM/YYYY, HH:MM UTC] Hauling started on [insert DD/MM/YYYY, HH:MM UTC] and ended on [insert DD/MM/YYYY, HH:MM UTC]
Latitude and longitude	Fishing started at latitude [insert DD, N for north and S for south], latitude [insert MM], longitude [insert DD, E for east and W for west], longitude [insert MM] Fishing ended at latitude [insert DD, N for north and S for south], latitude [insert MM], longitude [insert DD, E for east and W for west], longitude [insert MM]
Marine seabirds caught	Marine seabirds caught [select Yes/No] For each species: <ul style="list-style-type: none"> • Species name [insert name and species code] • Alive, unharmed [insert number] • Alive, harmed [insert number] • Dead [insert number]
Mitigation method	Mitigation method used [insert details]

TABLE B2 Recommended data standards for independent observer programs

Data field and instructions	Observations recorded
Trawl fishing activities	
Observer details	Observer name [insert family name first] Observation period start date[insert DD/MM/YYYY], end date [insert DD/MM/YYYY]
Gear details	Net ID [insert number] Net type [insert ISSFCV] Head rope length [insert metres] Ground rope length [insert metres] Bobbin diameter [insert centimetres] Otter board to wing length [insert metres] Horizontal opening [insert metres] Vertical opening [insert metres]
Codend mesh	Mesh size [insert centimetres] Codend circumference [insert centimetres] Orientation [select Diamond/Square]
Otter board	Board type [insert type], weight [insert kilograms]
Net design	Make [insert details] Model [insert number] Other features [insert details]
Trawl details	Trawl ID [insert number] Trawl type [select Research/Commercial] Observed [select Yes/No] Gear [insert type] Target species [insert FAO species code]
Start and end fishing	Trawl started [insert DD/MM/YYYY] at latitude [insert DD, N for north and S for south], longitude [insert MM], longitude [insert DD, E for east and W for west], longitude [insert MM] Trawl ended [insert DD/MM/YYYY] at latitude [insert DD, N for north and S for south], longitude [insert MM], longitude [insert DD, E for east and W for west], longitude [insert MM] Trawl depth [insert metres] Bottom depth [insert metres]

continued ...

TABLE B2 Recommended data standards for independent observer programs continued

Data field and instructions	Observations recorded
Seabird interactions	Marine seabirds caught [select Yes/No] For each species: <ul style="list-style-type: none"> • Species name [insert name and species code] • Alive, unharmed [insert number] • Alive, harmed [insert number] • Dead [insert number] Bycatch mitigation measures employed [insert details] Bird-scaring (tori) lines in use [select Yes/No] Aerial extent of bird-scarer lines consistently extended at least 10 metres beyond point of entry of warps into the sea [select Yes/No] Bird bafflers in use [select Yes/No]
Trawl warp strike (monitored for 15 minutes immediately after net is deployed)	Mandatory 15 min monitoring started at [insert HH:MM UTC] and ended at [insert HH:MM UTC] Marine seabirds caught [select Yes/No] Heavy warp strikes for each species: <ul style="list-style-type: none"> • Species name [insert name and species code] • Alive, unharmed [insert number and select strike type Air/Water/Sinker] • Alive, harmed [insert number and select strike type Air/Water/Sinker] • Dead [insert number] Albatross [insert number and select strike type]
Offal management	Offal dumping position [select Port/Starboard/Stern] Offal dumping during shooting [select Never/Occasionally/Always] Offal dumping during hauling [select Never/Occasionally/Always]
Seabird abundance observation	Seabirds present in observation area [select Yes/No, insert name and species code] Estimated numbers [insert number]
Other	Trawl speed [insert knots] Horizontal opening [insert metres] Total catch [insert kilograms]

continued ...

TABLE B2 Recommended data standards for independent observer programs continued

Data field and instructions	Observations recorded
Longline fishing activities	
Observer details	Observer name [insert family name first] Observation period start date[insert DD/MM/YYYY], end date [insert DD/MM/YYYY]
Longline description	Longline type [insert FFSCV], Period when gear was used start date[insert DD/MM/YYYY], end date [insert DD/MM/YYYY] Target species [insert FAO species code] Main line: Material diameter [insert millimetres] Integrated weight [insert grams] Branch lines: material [insert type] Length [insert metres] Spacing [insert metres] Hooks: Type [insert details], make [insert details], total length [insert millimetres], shank[insert millimetres], gape [insert millimetres], throat[insert millimetres], front length [insert millimetres], usual setting position [insert position], line off bottom [insert metres], hooks off bottom [insert millimetres], baiting method [select Manual/Automatic], automatic baiting equipment [insert make and model]
Hook sinkers	Size [insert grams], position from hook [insert millimetres], longline setting position [select Port/Starboard/Stern], propeller rotation direction [select Clockwise/Anti-clockwise] Longline system: [select system single/double/trotline] <ul style="list-style-type: none"> • if single (auto) line [insert kilograms per metre] • if double (Spanish) line [insert kilograms per metre] • if trotline (vertical droppers/trots attached to a mainline) [insert kilograms per metre]
General streamer line description	Vessel equipped with streamer line [select Yes/No], Streamer line regularly set [insert number], Streamer line position [select Port/Starboard/Stern], Streamer line length [insert metres], Streamer length min/max [insert metres], Attached height above water [insert metres], Distance between streamers [insert metres] Streamers [insert number], Streamer design [select Single/Paired], Aerial extent of line [insert metres], Method used to assess aerial extent [insert details] Streamer material [insert details], Streamer line diameter [insert millimetres], Streamer colours [insert details] Streamer line over bait entry position? [select Yes/No], Distance from stern to bait entry point [insert metres], towed object [select Yes/No], Horizontal distance from bait entry point to streamer line [insert metres]
Daily setting observations	Sets (as per catch and effort log entries) [insert number], Set type [select Research/Commercial], Longline type code [insert FFSCV], Trotline cetacean exclusion device used [select Yes/No]

continued ...

TABLE B2 Recommended data standards for independent observer programs continued

Data field and instructions	Observations recorded
Setting information	<p>Must be collected the same day as hauling information is.</p> <p>Observation started on [insert DD/MM/YYYY], at [insert HH:MM UTC] and ended on [insert DD/MM/YYYY], at [insert HH:MM UTC] Vessel setting speed [insert knots], Sets unobserved since last set [insert number]</p> <p>Setting started at [insert HH:MM UTC], at latitude degrees [insert DD, N for north and S for south], latitude minutes [insert MM], longitude degrees [insert DD, E for east and W for west], longitude minutes [insert MM]</p> <p>Setting ended at [insert HH:MM UTC], at latitude degrees [insert DD, N for north and S for south], latitude minutes [insert MM], longitude degrees [insert DD, E for east and W for west], longitude minutes [insert MM]</p> <p>Setting information, Bottom depth [insert metres], total length of longline set [insert kilometres], hooks set [insert number]</p>
Details of longline setting	<p>Main line length [insert metres], Hooks set [insert number], Baskets/magazines set [insert number], Hooks per basket/magazine [insert number], Hooks baited [insert percentage], Distance between branches [insert millimetres], Distance of hooks off bottom [insert millimetres], Bait species [insert FAO species code], Deck lights during setting [select On/Off], Streamer lines used [select Yes/No], Number of streamer lines used [insert number], Aerial extent of bird scarer lines consistently achieved at least 100 metres? [select Yes/No], Bait entry position [select Port/Starboard/Stern]</p>
Daily hauling observations	Sets [insert number]
Hauling information	<p>Must be collected the same day as setting information is.</p> <p>Observation date [insert DD/MM/YYYY], Hooks observed (tally period) [insert number], Gear lost [insert number], Sections lost [insert number], Hooks lost that were attached to lost sections of the longline [insert number], Other hooks lost (excluding hooks attached to lost sections) [insert number]</p>
Observed catch composition	Haul was observed for fish/invertebrate bycatch [select Yes/No], If yes, estimated percentage of haul observed for bycatch [insert percentage]
Offal management	Offal dumping position [select Port/Starboard/Stern], Offal dumping during setting [select Never/Occasionally/Always], Offal dumping during hauling [select Never/Occasionally/Always]
Seabird interactions	<p>Marine seabirds caught [select Yes/No]</p> <p>For each species: Species name [insert name and species code], Alive, unharmed [insert number], Alive, harmed [insert number], Dead [insert number]</p>

continued ...

TABLE B2 Recommended data standards for independent observer programs continued

Data field and instructions	Observations recorded
Trapping/potting fishing activities	
Observer details	Observer name [insert family name first], Observation period start date [insert DD/MM/YYYY], end date [insert DD/MM/YYYY]
Gear type	Pot type [insert type], Mesh size [insert millimetres]
Funnel position	Orientation [insert details], Aperture [insert centimetres], Chambers [insert number], Escape port present [select Yes/No], Dimensions of escape port [insert centimetres]
Processing details and conversion factors	Haul number [insert number], Observer name [insert family name first], Target species code [insert FAO species code], Processing code [insert number], Length range individuals [insert min and max length], Live weight [insert kilograms], Processed weight [insert kilograms], Grade [insert details], Conversion factor [insert details]
Set and haul details	Observation date [insert DD/MM/YYYY], Set number [insert number], Set type [select Research/Commercial], Target species [insert FAO species code] Set start time [insert HH:MM UTC], latitude [insert DD; N for north and S for South], longitude [insert MM.mm], longitude [insert DD; E for east and W for west], longitude [insert MM.mm], bottom depth [insert metres] Set end time [insert HH:MM UTC], latitude [insert DD; N for north and S for South], longitude [insert MM.mm], longitude [insert DD; E for east and W for west], longitude [insert MM.mm], bottom depth [insert metres] Haul Start time [insert HH:MM UTC], latitude [insert DD; N for north and S for South], longitude [insert MM.mm], longitude [insert DD; E for east and W for west], longitude [insert MM.mm], bottom depth [insert metres] Haul end time [insert HH:MM UTC], latitude [insert DD; N for north and S for South], longitude [insert MM.mm], longitude [insert DD; E for east and W for west], longitude [insert MM.mm], bottom depth [insert metres]
Gear details	Length of line [insert metres], type of line [insert line description], Pot spacing [insert metres], bait [insert type] Setting : Pots set [insert number], pots observed [insert number] Hauling: Pots hauled [insert number], pots observed [insert number]
Observed interactions with birds or marine mammals	Marine species observed [list FAO species code] Setting: Species abundance (within 500 metre radius) [insert number for each observed species], gear interaction [select Yes/No] Hauling: Species abundance (500 metre radius) [insert number for each observed species], gear interaction [select Yes/No]
Offal management	Offal dumping position [select Port/Starboard/Stern] Offal dumping during setting [select Never/Occasionally/Always] Offal dumping during hauling [select Never/Occasionally/Always]
Seabird interactions	Marine seabirds caught [select Yes/No] For each species: Species name [insert name and species code], Alive, unharmed [insert number], Alive, harmed [insert number], Dead [insert number]
Seabird abundance observation	Seabirds present in observation area [select Yes/No] Estimated numbers of abundance [insert number by species]

continued ...

TABLE B2 Recommended data standards for independent observer programs continued

Data field and instructions	Observations recorded
Dahn/dropline fishing activity	
Observer details	Observer name [insert family name first], Observation period start date [insert DD/MM/YYYY], end date [insert DD/MM/YYYY]
Dahn/dropline description	Line type [insert description], Period when gear was used, start date [insert DD/MM/YYYY], end date [insert DD/MM/YYYY], Target species [insert FAO species code]
Main line	Line material [insert description] Line diameter [insert mm], Integrated line weight [insert gm]
Hooks	Hook type [insert description], Hook make [insert description], Total length [insert millimetres], shank [insert millimetres], gape [insert millimetres] throat [insert millimetres], Front length [insert millimetres]
Setting position	Line off bottom [insert metres], Hooks off bottom [insert metres], Baiting method [select Manual/Automatic], Automatic baiting equipment [insert make and model]
Offal management	Offal dumping position [select Port/Starboard/Stern], Offal dumping during hauling [select Never/Occasionally/Always], Propeller rotation direction [select Clockwise/Anti-clockwise]
General streamer line description	Vessel equipped with streamer line [select Yes/No], Streamer lines regularly set [insert number], Streamer line position [select Port/Starboard/Stern], Streamer line length [insert metres] Streamer length min/max [insert metres], Attached height above water [insert metres] Distance between streamers [insert metres], Number of streamers [insert number], Streamer design [select Single/Paired], Ariel extent of line [insert metres], Method used to assess aerial extent [insert details] Streamer material [insert details], Streamer line diameter [insert millimetres], Streamer colours [insert details] Streamer line over bait entry position [select Yes/No], Distance from stern to bait entry point [insert metres], Horizontal distance from bait entry point to streamer line [insert metres]

continued ...

TABLE B2 Recommended data standards for independent observer programs continued

Data field and instructions	Observations recorded
Details of dahn/dropline setting	<p>Main line length [insert metres], Hooks set [insert number], Hooks baited [insert percentage]</p> <p>Distance between branches/snoods [insert metres], Distance of hooks off bottom [insert metres]</p> <p>Bait species [insert species], Bait size [insert size mm], Bait proportion [insert details], Deck lights during setting [select On/Off]</p> <p>Streamer lines used [select Yes/No], streamer lines used [insert number], Daylight period – Moonlight, bait entry position [select Port/Starboard/Stern], Vessel setting speed [insert knots]</p> <p>Set start time [insert HH:MM UTC], latitude [insert DD; N for north and S for South], latitude [insert MM.mm], longitude [insert DD; E for east and W for west], longitude [insert MM.mm], bottom depth [insert metres]</p> <p>Set end time [insert HH:MM UTC], latitude [insert DD; N for north and S for South], latitude [insert MM.mm], longitude [insert DD; E for east and W for west], longitude [insert MM.mm], bottom depth [insert metres]</p> <p>Haul Start time [insert HH:MM UTC], latitude [insert DD; N for north and S for South], latitude [insert MM.mm], longitude [insert DD; E for east and W for west], longitude [insert MM.mm], bottom depth [insert metres]</p> <p>Haul end time [insert HH:MM UTC], latitude [insert DD; N for north and S for South], latitude [insert MM.mm], longitude [insert DD; E for east and W for west], longitude [insert MM.mm], bottom depth [insert metres]</p>
Gear lost	<p>Sections lost [insert number]</p> <p>Hooks lost that were attached to lost sections of the dahn/dropline [insert number]</p> <p>Other hooks lost (excluding hooks attached to lost sections) [insert number]</p>
Seabird interactions	<p>Marine seabirds caught [select Yes/No]</p> <p>For each species: Species name [insert name and species code], Alive, unharmed [insert number], Alive, harmed [insert number], Dead [insert number]</p>
Seabird abundance observation	<p>Seabirds present in observation area [select Yes/No], Estimated numbers of abundance [insert number by species]</p>

Appendix C

ACAP recommended best-practice approaches for longline and trawl fisheries

Summarised from the International Agreement on the Conservation of Albatrosses and Petrels.

TABLE C1 Trawl fisheries

Mitigation	Description	Objective of mitigation action
Nets		
Net binding	Net binding is when 3-ply sisal string is applied to the net on the deck, at intervals of around 5 metres.	Reduce seabird entanglements by preventing the net from lofting and mesh from opening.
Net weights	Adding weight on or near the codend to increase the angle of ascent of the net during hauling operations.	Reduce the time the net is on the water's surface, reducing seabird entanglements.
Net cleaning	Net cleaning involves removing all fish stickers and other material from nets.	Reduce net entanglement during shooting.
Cables		
Bird-scaring lines for warp cables	Attachment of a bird-scaring line to both the port and starboard sides of a vessel, above and outside the warp blocks.	Reduce seabird access to the danger zone, where warps enter the water.
Avoid use of net monitoring cables or employ bird-scaring lines	Net-monitoring cables should not be used. Where this is impracticable: <ul style="list-style-type: none"> • deploy bird-scaring lines positioned to deter birds from net-monitoring cables during fishing operations, and • install a snatch block at the stern of the vessel to draw the net-monitoring cable close to the water to reduce its aerial extent. 	Avoid or minimise risk of bird strikes.

continued ...

TABLE C1 Trawl fisheries continued

Mitigation	Description	Objective of mitigation action
Offal		
Full retention—recommended as best option	All waste material is converted into fish meal and fully retained.	Reduce the number of seabirds attracted to vessel.
Mealing—recommended when full retention is not possible	Mealing converts fish waste into fish meal, reducing the quantity of fish waste discharge. Discharging of meal should not occur during shooting and hauling.	Reduce the number of seabirds attracted to vessels.
Batching—recommended (when full retention or mealing not possible)	Where meal production from offal and full retention are impracticable, batching of waste (preferably for two hours or longer) should occur.	Reduce the number of seabirds attached to vessels.
General measures		
Area closures	Avoiding fishing at during periods of intense bird foraging activity.	Reduce seabird bycatch.

TABLE C2 Pelagic longline fisheries

Mitigation	Description	Objective of mitigation action
Branch line weighting—recommended for simultaneous use with night setting and bird scanning	Branch lines should be weighted to sink the baited hooks rapidly out of the diving range of feeding seabirds. Recommended minimum standards for branch line weighting configurations are either: <ul style="list-style-type: none"> • 40 grams or greater attached within 0.5 metres of the hook • 60 grams or greater attached within 1 metre of the hook, or • 80 grams or greater attached within 2 metres of the hook. 	Reduce seabird attacks on baited hooks.
Night setting—recommended for simultaneous use with branch line weighting and bird scanning	Most vulnerable seabirds are inactive at night. Setting longlines at night, between nautical twilight and nautical dawn, avoids contact with seabirds.	Reduce seabird bycatch.
Bird-scaring lines for vessels >35 metres long—recommended for simultaneous use with branch line weighting and night setting	Bird-scaring lines run from a high point at the stern (minimum of 8 metres above the water at the stern) to a device or mechanism that creates drag at its terminus, and consistently achieve an aerial extent of 100 metres. Vessels >35 metres long should use two bird-scaring lines, one on each side of the sinking longline. Streamers for vessels >35 metres long should be brightly coloured and a mix of long and short, placed at intervals of no more than 5 metres.	Reduce seabird attacks on baited hooks.
Hook-shielding devices—recommended for use in addition to the other mitigation measures listed in Table C2 (where required)	Hook-shielding devices to be deployed before setting to deter birds from accessing baited hooks. Hook-shields should be positioned at the hook and encapsulate the barb and point of the hook during setting. Hook shields should remain attached till they reach a minimum depth of 10 metres or a minimum immersion time of 10 minutes. Hook shields should meet minimum standards for branch line weighting.	Reduce risk of seabird bycatch on baited hooks.
Cables		
Time-area fishery closures	Temporary closure to fishing of important seabird foraging areas (for example, areas adjacent to important seabird colonies during the breeding season or highly productive waters when large numbers of aggressively feeding seabirds are present).	Avoid seabird bycatch.

TABLE C3 Demersal longline fisheries

Mitigation	Description	Objective of mitigation action
General		
Area and seasonal closures	Temporary closure to fishing of important seabird foraging areas (for example, near seabird colonies during the breeding season, when large numbers of aggressively feeding seabirds are present).	Reduce seabird bycatch.
Line setting		
Line weighting	Lines should be weighted to get the baited hooks rapidly out of the range of feeding seabirds. Weights should be deployed before line tension occurs to ensure that the line sinks rapidly out of reach of seabirds.	Reduce seabird attacks on baited hooks.
External weighted line: Spanish system	In the Spanish system the buoyant longlines are deployed with steel weights (minimum 5 kilograms) attached at intervals of 4 metres to make them sink.	Reduce seabird attacks on baited hooks.
External weighted line: Chilean method	This variant of the traditional Spanish double-line method uses a net sleeve or cachalotera, which envelops captured fish during hauling. Hooks are clustered on secondary lines that have steel weights (minimum of 5 kilograms) attached at intervals of 40 metres. Weights are deployed directly below the hooks. Hook-bearing lines sink in a vertical profile, resulting in very fast hook sink rates.	Reduce seabird attacks on baited hooks.
External weighted line: autoline	Autoline gear consists of a single line with steel weights (minimum of 5 kilograms) at intervals of 40 metres. These lines sink fast and consistently, with a near-linear profile from the surface.	Reduce seabird attacks on baited hooks.
Night setting	Most vulnerable seabirds are inactive at night. Setting longlines at night, between nautical twilight and nautical dawn, avoids contact with seabirds.	Reduce seabird bycatch.
Bird-scaring lines for vessels >35 metres long	Bird-scaring lines run from a high point at the stern to a device or mechanism that creates drag at its terminus. Vessels >35 metres long should use two bird-scaring lines, one on each side of the sinking longline. Streamers for vessels >35 metres long should be brightly coloured and a mix of long and short, placed at intervals of no more than 5 metres.	Reduce seabird attacks on baited hooks.

continued ...

TABLE C3 Demersal longline fisheries continued

Mitigation	Description	Objective of mitigation action
Bird-scaring lines for vessels <35 metres long	<p>Bird-scaring lines run from a high point at the stern to a device or mechanism that creates drag at its terminus.</p> <p>Small vessels should use a single bird-scaring line—either long and short streamers or short streamers only. Streamers for vessels <35 metres long should be brightly coloured. Short streamers (>1 metre long) should be placed at intervals of 1 metre along the length of the aerial extent.</p>	Reduce seabird attacks on baited hooks.
Offal and discard management	Offal and discards should be retained on board. If this is not possible, these should be either retained on board during hauling (preferable) or released on the opposite side of the vessel to the hauling bay.	Reduce seabird bycatch.
Line hauling		
Bird exclusion device (BED/brickle curtain)	A BED or brickle curtain is a horizontal support several metres above the water that encircles the entire line-hauling bay. Vertical streamers are positioned between the support and water surface.	Deter birds from flying into the area where the line is being hauled and prevent birds that on the surface from swimming into the hauling bay area.
Offal and discard management	Offal and discards should be retained on board. If this is not possible, these should be either retained on board during hauling (preferable) or released on the opposite side of the vessel to the hauling bay.	Reduce seabird bycatch.

Appendix D

Principles for recreational fishing codes of practice

Principle 1 Reduce seabird attraction to fishing activity

- Avoid bird feeding and nesting areas.
- Look out for diving birds, which may take bait when lines are cast.
- Avoid discarding fish waste in areas where you are actively fishing.
- Avoid fishing near fish-cleaning tables because seabirds are attracted to these areas.

Principle 2 Use responsible fishing practices

- Do not leave your fishing equipment unattended at any time.
- Avoid using alloy or stainless steel hooks; these remain intact indefinitely and can cause serious or fatal infections in seabirds.
- Use single hooks, barbless hooks and circle hooks to minimise harm.
- Don't leave anything behind—take all your tackle home and dispose of discarded fishing line, other gear or rubbish responsibly.

Principle 3 Promote best-practice hook removal

- If you accidentally hook a bird, carefully pull the bird in and if possible carefully de-hook it.
- If the hook is too deep to remove, contain the bird and call for help, or take it to the nearest vet so the hook can be surgically removed. Most vets will treat native wildlife for free.
- If the bird breaks free of the line, call for help immediately and keep the creature in sight so that a rescuer can find it.

Principle 4 Promote best-practice seabird handling

- Keep handling to a minimum to avoid causing stress to an injured seabird. Remain calm, speak quietly and refrain from sudden movements.
- Immobilise the beak and feet with a firm hold and gently restrain the rest of the bird.
- Do not hold birds around the neck. This restricts breathing and can cause muscle damage.
- When handling birds with long legs, hold the legs of the bird at the top of the femur where the legs and body meet. Hold the bird at waist height, away from your face.
- Protect your eyes and other body parts from birds with sharp beaks and claws.
- To minimise stress, attempt to create a quiet, dark, ventilated and temperature-controlled environment when holding and transporting birds.

Appendix E

Voluntary implementation actions

Objective 1

Understand the extent of the incidental catch of seabirds.

TABLE E1 Actions to achieve Objective 1, NPOA–Seabirds

Action	Responsible	Time frames
1.1 Conduct a qualitative or quantitative assessment of the level of incidental catch of seabirds and current use of mitigation measures in all relevant fisheries (Appendix A).	<ul style="list-style-type: none"> Fisheries management agencies 	By 2019
1.2 Develop a national data standard for logbook reporting of incidental catch of seabirds and the use of mitigation measures in commercial fisheries (Appendix B).	<ul style="list-style-type: none"> Department of Agriculture and Water Resources ABARES 	By 2019
1.3 Implement national data standard for logbook reporting, ensuring comparable, representative and verifiable time-series information.	<ul style="list-style-type: none"> Fisheries management agencies 	By 2020
1.4 Identify gaps in existing monitoring and data collection programs for recreational fishing to understand the incidental catch of seabirds.	<ul style="list-style-type: none"> Fisheries management agencies Department of the Environment and Energy 	By 2021
1.5 In capture fisheries with uncertain seabird catch levels, conduct independent monitoring to provide impartial and representative data.	<ul style="list-style-type: none"> Fisheries management agencies Commercial fisheries 	By 2021
1.6 Investigate potential for additional tools for seabird identification, such as morphological diagnostic tools or DNA identification kits.	<ul style="list-style-type: none"> Fisheries management agencies Industry bodies Research and development institutions 	By 2020
1.7 Analyse collected information to determine the extent of incidental catch of seabirds in capture fisheries.	<ul style="list-style-type: none"> Department of Agriculture and Water Resources (lead) ABARES Australian Fisheries Management Forum subcommittee 	By 2020

Source: ABARES (forthcoming)

Objective 2

Have best-practice seabird bycatch mitigation in capture fisheries to:

- minimise or, where practicable, eliminate the incidental catch of seabirds
- contribute towards achieving and maintaining a favourable conservation status for seabirds.

TABLE E2 Actions to achieve Objective 2, NPOA–Seabirds

Action	Responsible	Time frames
2.1 Identify and review use of existing mitigation measures in all relevant capture fisheries against best practice (using ACAP advice where appropriate).	<ul style="list-style-type: none"> • Fisheries management agencies • Department of the Environment and Energy 	By 2020
2.2 Assess the need for mitigation practices in all capture fisheries and implement best-practice mitigation where identified.	<ul style="list-style-type: none"> • Fisheries management agencies 	By 2021

ACAP Agreement on the Conservation of Albatrosses and Petrels.

Objective 3

Promote development of innovative mitigation procedures and technologies that are feasible, effective and efficient.

TABLE E3 Actions to achieve Objective 3, NPOA–Seabirds

Action	Responsible	Time frames
3.1 Encourage and support innovation in mitigation, including through research, development and extension.	<ul style="list-style-type: none"> • Fisheries management agencies • Department of Agriculture and Water Resources • Department of the Environment and Energy • Commercial fisheries • Recreational fishing representative organisations 	Ongoing
3.2 Assess the need for changed mitigation practices in all capture fisheries and implement best-practice mitigation where identified.	<ul style="list-style-type: none"> • Fisheries management agencies 	By 2019
3.3 Develop national guidelines for conducting research on seabird bycatch mitigation.	<ul style="list-style-type: none"> • Department of Agriculture and Water Resources • Department of the Environment and Energy 	By 2019
3.4 Develop a set of effective technologies that can be applied to different fisheries.	<ul style="list-style-type: none"> • Fisheries management agencies 	By 2019
3.5 Develop management arrangements that complement best-practice mitigation measures.	<ul style="list-style-type: none"> • Fisheries management agencies 	By 2019

Objective 4

Increase awareness and understanding of the incidental catch of seabirds and best-practice mitigation.

TABLE E4 Actions to achieve Objective 4, NPOA–Seabirds

Action	Responsible	Time frames
4.1 Incorporate within commercial and recreational education programs information about the incidental catch of seabirds and effective mitigation techniques.	<ul style="list-style-type: none"> • Fisheries management agencies • Commercial fisheries • Non-government environmental groups 	By 2019
4.2 Promote methods for recognising and reporting interactions with seabirds.	<ul style="list-style-type: none"> • Fisheries management agencies • Commercial fisheries • Non-government environmental groups 	Ongoing
4.3 Develop and promote duty of care and seabird handling techniques, especially for hooked and entangled seabirds.	<ul style="list-style-type: none"> • Fisheries management agencies • Commercial fisheries • Non-government environmental groups 	Ongoing
4.4 Provide guidance and raise awareness on best practice for minimising interactions with fishing gear and discarded gear.	<ul style="list-style-type: none"> • Fisheries management agencies 	Ongoing
4.5 Promote best-practice mitigation of seabird interactions in codes of conduct.	<ul style="list-style-type: none"> • Fisheries management agencies • Commercial fisheries • Non-government environmental groups 	Ongoing

Objective 5

Promote adoption of effective mitigation measures in regional fisheries and conservation bodies.

TABLE E5 Actions to achieve Objective 5, NPOA–Seabirds

Action	Responsible	Time frames
5.1 Advocate for effective mitigation measures in regional fisheries and conservation bodies.	<ul style="list-style-type: none"> Australian Government agencies on behalf of the government 	Ongoing
5.2 Encourage collaborative research between countries.	<ul style="list-style-type: none"> Australian Government agencies on behalf of the government 	Ongoing

Glossary

Term	Definition
ACAP	International Agreement on the Conservation of Albatrosses and Petrels.
AFMF	Australian Fisheries Management Forum, an informal network for sharing information between Australian, state and territory government agencies involved in managing fisheries and aquaculture in Australia.
bycatch	A species that is incidentally taken in a fishery and returned to the sea or killed or injured (but not taken) as a result of interacting with fishing equipment in the fishery.
capture fishery	Refers to all kinds of harvesting of naturally occurring living fish resources, including industrial, small-scale and recreational fishing.
ecologically sustainable development	under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> this is defined as using, conserving and enhancing community resources to maintain ecological processes and ensure quality of life into the future.
incidental catch	See 'bycatch'.
interaction	Any physical contact with a species and all catches (for example, hooked, netted, entangled), discards, releases and collisions with these species.
IPOA–Seabirds	The FAO's International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries.
NPOA–Seabirds	National Plan of Action for Minimising the Incidental Catch of Seabirds in Australian Capture Fisheries.
offal (marine)	Discarded waste from processing fish (such as discarded fish and other organisms and unused baits), discarded food and food scraps.
seabird	A species of the class Aves that frequents coastal waters and the open ocean, such as albatrosses, cormorants, gannets, gulls, pelicans, petrels and shearwaters.
TAP–Seabirds	Australia's Threat Abatement Plan 2014 for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations.

References

Draft National Plan of Action for Minimising the Incidental Catch of Seabirds in Australian Capture Fisheries

ABARES forthcoming, *Supporting information for the preparation of a national plan of action for seabirds in Australia*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

Alexander, K, Robertson, G & Gales, R 1997, *The incidental mortality of albatrosses in longline fisheries*, Australian Antarctic Division, Tasmania.

Anderson, A, Small, C, Croxall, J, Dunn, E, Sullivan, B, Yates, O & Black, A 2011, [Global seabird bycatch in longline fisheries](#), *Endangered Species Research*, vol. 14, pp. 91–106.

Baker, GB & Finley, LA 2010, *2008 National assessment report for reducing the incidental catch of seabirds in longline fisheries*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

— 2013, *National assessment of the incidental catch of seabirds in trawl, gillnet and purse-seine fisheries*, Fisheries Research and Development Corporation, Canberra.

Baker, GB, Gales, R, Hamilton, S & Wilkinson, V 2002, 'Albatrosses and petrels in Australia: a review of their conservation and management', *Emu-Austral Ornithology*, vol. 102, pp. 7–97.

Bartle, JA 1991, 'Incidental capture of seabirds in the New Zealand sub-Antarctic squid trawl fishery, 1990', *Bird Conservation International*, vol. 1, pp. 351–9.

Birdlife International 1995, 'Global impacts of fisheries on seabirds', paper presented at the London workshop on environmental science: comprehensive and consistency in global decisions on ocean issues, London, 30 November to 2 December.

Brothers, N 1991, 'Albatross mortality and associated bail loss in the Japanese longline fishery in the Southern Ocean', *Biological Conservation*, vol. 55, pp. 255–68.

Brothers, NP, Cooper, J, & Løkkeborg, S 1999, *The incidental catch of seabirds by longline fisheries: worldwide review and technical guidelines for mitigation*, FAO Fisheries circular no. 937, Food and Agriculture Organization of the United Nation, Rome.

Brothers, N, Gales, R, & Reid, T 1998, *Seabird interactions with longline fishing in the AFZ: 1996 seabird mortality estimates and 1988–1996 trends*, Wildlife report 98/1, Parks and Wildlife Service, Tasmania.

Bull, LS 2007, 'Reducing seabird bycatch in longline, trawl and gillnet fisheries', *Fish*, vol. 8, pp. 31–56.

- Campbell, M 2013, *Tactical Research Fund: reducing the impact of discarded recreational fishing tackle on coastal seabirds, 2011/057*, Queensland Department of Agriculture, Fisheries and Forestry, Brisbane.
- Commonwealth of Australia 2003, *Seabird interactions with longline fisheries in the Australian Fishing Zone: assessment report for the National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries*, Department of Agriculture, Fisheries and Forestry, Canberra.
- 2014, [Threat Abatement Plan 2014 for the incidental catch \(or bycatch\) of seabirds during oceanic longline fishing operations](#), Department of the Environment, Canberra.
- Croxall, JP 1998, 'Research and conservation: a future for albatrosses?' in G Robertson & R Gales (eds), *Albatross biology and conservation*, Surrey Beatty & Sons, Chipping Norton, New South Wales.
- Croxall, JP, Butchart, SHM, Lascelles, B, Stattersfield, AJ, Sullivan, B, Symes, A & Taylor P 2012, 'Seabird conservation status, threats and priority actions: a global assessment', *Bird Conservation International*, vol. 22, pp. 1–34.
- FAO 1999, [International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries](#), Food and Agriculture Organization of the United Nations, Rome.
- 2009, *FAO technical guidelines for responsible fisheries. No. 1, Suppl. 2. Fishing operations 2. Best practices to reduce incidental catch of seabirds in capture fisheries*, Food and Agriculture Organization of the United Nations, Rome.
- Gales, R 1998, 'Albatross populations: status and threats', in G Robertson & R Gales (eds), *Albatross biology and conservation*, Surrey Beatty & Sons, Chipping Norton, New South Wales, pp. 20–45.
- Gales, R, Brothers, N & Reid, T 1998, 'Seabird mortality in the Japanese tuna longline fishery around Australia, 1988–1995', *Biological Conservation*, vol. 86, pp. 37–56.
- González-Zevallos, D & Yorio, P 2006, *Seabird use of discards and incidental captures at the Argentine hake trawl fishery in the Golfo San Jorge, Argentina*, Marine Ecology Progress Series, vol. 316, pp. 175–83.
- Harper, PC, Croxall, JP & Cooper, J 1985, *A guide to foraging methods used by marine birds in Antarctic and sub-Antarctic seas*, BIOMASS handbook, no. 24, University of California, Davis, pp. 1–22.
- Løkkeborg, S 2008, *Review and assessment of mitigation measures to reduce incidental catch of seabirds in longline, trawl and gillnet fisheries*, Food and Agriculture Organization of the United Nations, Rome.
- 2011, 'Best practices to mitigate seabird bycatch in longline, trawl and gillnet fisheries—efficiency and practical applicability', *Marine Ecology Progress*, vol. 435, pp. 285–303.
- McPhee, DP, Leadbitter D & Skilleter, GA 2002, 'Swallowing the bait: is recreational fishing in Australia ecologically sustainable?', *Pacific Conservation Biology*, vol. 8, no. 1, pp. 40–51.
- Sullivan, BJ, Reid, TA & Bugoni, L 2006, 'Seabird mortality on factory trawlers in the Falkland Islands and beyond', *Biological Conservation*, vol. 131, pp. 495–504.
- Weimerskirch, H, Capdeville, D & Duhamel, G 2000, 'Factors affecting the number and mortality of seabirds attending trawlers and long-liners in the Kerguelen area', *Polar Biology*, vol. 23, pp. 236–49.
- Zydels, R, Small, C & French, G 2013, 'The incidental catch of seabirds in gillnet fisheries: a global review', *Biological Conservation*, vol. 162, pp. 76–88.



Department of Agriculture and Water Resources
General inquiry 1800 900 090
National office +61 2 6272 3933



agriculture.gov.au
Twitter: @DeptAgNews