



Australian Government

Department of Agriculture, Fisheries and Forestry

Review of the Commonwealth Policy on Fisheries Bycatch

ISSUES PAPER – NOVEMBER 2012



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The information in this issues paper is current as at 9 November 2012.

Review of the Commonwealth Policy on Fisheries Bycatch

Issues paper

November 2012

Acknowledgements

In developing a list of potential issues for consideration during review of the Commonwealth Policy on Fisheries Bycatch, input was received from members of the review's steering and advisory committees and others closely involved with the bycatch policy for Commonwealth fisheries.

The Department of Agriculture, Fisheries and Forestry acknowledges with appreciation the contributions from the Australian Bureau of Agricultural and Resource Economics and Sciences, the Australian Fisheries Management Authority and the Department of Sustainability, Environment, Water, Population and Communities to this issues paper.

Funding to assist with elements of this report was provided by the Australian Government through the Fisheries Research and Development Corporation.

Purpose of this issues paper

This paper provides background information and seeks views from interested parties to inform the review of the Commonwealth Policy on Fisheries Bycatch 2000 (bycatch policy) and develop future policy options for bycatch management in Commonwealth fisheries.

In June 2012, the Department of Agriculture, Fisheries and Forestry (DAFF) hosted a workshop with range of stakeholders including government officers, the commercial fishing industry, environmental non-government organisations and research agencies. The workshop identified a number of issues relevant to the review and these were further developed and where possible, included in this paper.

How you can contribute?

All interested members of the Australian community including governments, industry and members of the public are invited to contribute to the review of the bycatch policy by providing written submissions on the issues canvassed in this paper, the questions posed and/or other matters relevant to the review.

You are encouraged to include a description of how the issue/s affect Commonwealth fisheries and suggest possible improvements or refinements to the policy to address such issues; wherever possible include evidence and/or examples to support your argument. When making your submission you should:

- any issues raised in this paper that you consider a priority for the review
- any of the issues raised in this paper that could benefit from additional context or information or for which there is a differing explanation/viewpoint to that provided in this paper
- future research and information needs relevant to the policy and its implementation
- additional issues that require consideration under the review that are not raised in the paper
- whether the policy would benefit from development and implementation of technical guidelines, similar to those for the Commonwealth Harvest Strategy Policy.

You do not have to comment on all aspects of the issues paper; you may wish to comment only on those aspects of interest to you. Equally, your submission need not be limited to the questions raised in the issues paper; comments on any other matter within the terms of reference that you believe would aid the review are welcome.

Submissions provided on matters outside the scope of the review and its terms of reference may not be considered. Not all issues raised will necessarily be addressed in the final review report or in any new policy.

In order to ensure submissions received are accessible by all members of the public, including vision impaired people using electronic screen reader technology; emailed submissions should be in a Microsoft Word (.doc or .docx) rather than PDF format.

Send your submission by email to bycatchreview@daff.gov.au (the preferred option).

Or you can post it to:

Review of the Commonwealth Policy on Fisheries Bycatch
Fisheries Branch
Department of Agriculture, Fisheries and Forestry
GPO Box 858
Canberra ACT 2601

Submissions should be received by 5.00 pm (Australian Eastern Standard daylight saving Time) Friday, 21 December 2012. Submission received after this time will be acknowledged and considered only to the extent practical but cannot be assured any consideration.

Publication of submissions

All submissions received, unless specifically advised otherwise, may be published on the DAFF website and available for public view. If you do not wish for your submission to be published, please clearly indicate this on your submission. If your full submission is not published, the title of the submission and the name of the submitting organisation or individual may still be published on the DAFF website. Contact details of individuals making submissions will be limited to name, suburb and state/territory.

The *Freedom of Information Act 1982* (FOI Act) applies to all documents in DAFF's possession. The FOI Act gives the Australian community the right to request access to documents the government holds. This includes the right to request access to any submissions provided to DAFF relating to the review, including any submissions provided on a confidential basis. Decisions about access to documents under the FOI Act will be made by an authorised FOI decision-maker in accordance with the requirements and exemptions of the FOI Act.

Your personal information will be used and stored in accordance with Information Privacy Principles.

If you consider your submission (or part of your submission) should not be published, or you do not wish for your details to be published please contact the Director, Fisheries and Marine Environment Section at DAFF before making a submission on 02 6272 5629.

What happens after the public consultation period closes?

Submissions received during the public consultation period will be reviewed and made publicly available. The government intends to draw on the views provided during this consultation to develop a review report outlining policy options for future bycatch management. If needed, further targeted consultation may be done to help refine the review report. The review report will be submitted to the Minister for Agriculture, Fisheries and Forestry in early to mid 2013.

Summary

In the years since the Commonwealth Policy on Fisheries Bycatch 2000 (bycatch policy) was developed, the broader legislative and policy environment covering Australia's oceans and their sustainable use has evolved substantially. The social and economic circumstances of fisheries have also changed both domestically and internationally. Further, community expectations about effective bycatch management continue to rise. With this in mind, the Australian Government is reviewing the bycatch policy for Commonwealth managed fisheries.

In March 2012, the Minister for Agriculture, Fisheries and Forestry, Senator the Hon. Joe Ludwig announced a review of the bycatch policy, and of the Commonwealth Fisheries Harvest Strategy Policy and Guidelines (harvest strategy policy) —both of which will run concurrently—and released the terms of reference for both.

In September 2012, Minister Ludwig announced a major review of Commonwealth fisheries legislation to be undertaken by Mr David Borthwick AO PSM. This review will complement the harvest strategy policy and bycatch policy reviews, and will identify what improvements are needed to ensure community and industry expectations for Commonwealth fisheries can be met.

The review of the bycatch policy seeks to improve management of bycatch in Commonwealth fisheries by developing a revised policy framework that intends to avoid, minimise and manage bycatch, that is practical, cost effective to apply and supports environmental and fisheries legislative requirements.

This issues paper, prepared by the Department of Agriculture, Fisheries and Forestry including the Australian Bureau of Agricultural and Resource Economics and Sciences, provides a snapshot of the bycatch policy at the time of establishment and the progress made: it also seeks to consider policy options for future bycatch management.

The bycatch policy applies to Commonwealth fisheries: state and territory fisheries are covered by the relevant state or territory legislation and policy. The paper aims to identify key issues or areas for improvement with the current bycatch policy, and to identify which are priorities for the review and how they might be addressed. Issues already identified include: clarification on the context and purpose of the bycatch policy, interaction with the harvest strategy policy; clear definitions of bycatch and other elements of catch; managing data poor species; consideration of use of reference points, decision rules and risk based approaches; and consideration of cumulative impacts from multiple fisheries.

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1 Introduction

Fisheries bycatch generally refers to the incidental capture of non-target species (Bensley et al, 2010) most or all of which is discarded. Some bycatch is common in most fisheries, the bycatch species type and frequency of interactions vary with each fishery, fishing method and time and area fished.

Australia has some of the best managed fisheries in the world and is considered to be at the forefront of progress in bycatch management. However, unwanted bycatch during fishing continues to be an issue of concern. International treaties, conventions and instruments, such as the United Nations Food and Agriculture Organizations Code of Conduct for Responsible Fishing are increasingly placing obligations on signatories to address bycatch. The code says “States and users of aquatic ecosystems should minimize waste, catch of non-target species, both fish and non-fish species, and impacts on associated or dependent species”.

Commonwealth managed fisheries can interact with up to 2,000 different marine species that are not retained for commercial purposes. It is important that any measures to minimise bycatch are practical and cost effective to implement. Additionally, bycatch is by nature, characterised by low data availability. Most issues detailed in this paper are cognisant of such data availability and quality issues.

The Commonwealth Policy on Fisheries Bycatch (bycatch policy) was released in 2000, building on the 1999 National Policy on Fisheries Bycatch and delivering on government initiatives at that time. The bycatch policy—daff.gov.au/data/assets/pdf_file/0016/5812/bycatch.pdf (pdf 455.90 kb)—sought to assess and minimise the impact of fishing on non-target species as an integral part of fisheries management. Management of bycatch in Commonwealth fisheries is principally governed by the *Fisheries Management Act 1991* (FM Act) and subject to environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Under the current bycatch policy, bycatch is defined as:

That part of a fisher’s catch which is returned to the sea either because it has no commercial value or because regulations preclude it being retained.

That part of the ‘catch’ that does not reach the deck of the fishing vessel but is affected by interaction with the fishing gear.

As a key mechanism of the bycatch policy, the Australian Fisheries Management Authority (AFMA) developed bycatch action plans (now called bycatch and discarding work plans) for all major Commonwealth fisheries. AFMA also undertook fishery-specific ecological risk assessments and used these to inform development of ecological risk management plans.

While examples of the improvements in bycatch management in Commonwealth fisheries are well documented (see case studies) some concerns and questions remain as to whether the legislation and policy have been effective in achieving objectives (Bensley et al, 2010).

In response to these concerns, the changing policy environment and to facilitate a more streamlined regulatory environment, the government is reviewing the bycatch policy. The Department of Agriculture, Fisheries and Forestry (DAFF), including the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), is the lead agency undertaking the review in close collaboration with AFMA and the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC).

The bycatch policy review focuses on the interaction of bycatch animal species with Commonwealth commercial fisheries. A review of the Commonwealth Fisheries Harvest Strategy Policy and Guidelines (harvest strategy policy) is underway concurrently with the bycatch policy review. The

government is seeking to ensure the policy framework for Commonwealth fisheries encompasses the range of effects of fishing, consistent with legislative objectives. By reviewing both policies simultaneously the government aims to address the effects of fishing on commercial and bycatch species (including protected species). This issues paper has been developed to gather stakeholder comment on bycatch policy and to seek input for the review.

Discussion on management approaches to target and/or byproduct species (that is, those species with commercial value) are outside the scope of this paper but will be considered as part of the review of the harvest strategy policy. Habitats and communities are necessary elements to be considered for future fisheries policy development. However, they are outside the scope of this review and will be considered by government through development of a broader ecosystem-based fisheries management process.

In addition, a separate review of fisheries legislation announced in September 2012 will look at fisheries management and will consider fisheries legislation, penalties, ministerial oversight, social, economic and environmental considerations.

The review of Commonwealth fisheries management legislation encompasses the entire Commonwealth fisheries management system including but not limited to: legislation (particularly the *Fisheries Management Act 1991* and *Fisheries Administration Act 1991*), ministerial oversight, application of the precautionary approach, penalties, licence cancellations, modern technology, co-management, cost recovery arrangements, research, community views and attitudes for fisheries management and other social, economic and environmental considerations.

Information on this review is available at daff.gov.au/fisheries/review-of-fisheries-management-act-1991-and-fisheries-administration-act-1991 of Agriculture, Fisheries and Forestry

Review of the bycatch policy is consistent with the green paper for the government's National Food Plan which aims to deliver a secure, sustainable, globally competitive food supply that supports improved environmental performance of fisheries and agriculture. The National Food Plan issues paper and green paper support the review of both the bycatch policy and the harvest strategy policy. The food plan green paper is available at daff.gov.au/nationalfoodplan/national-food-plan

Scope and purpose of the current Commonwealth Policy on Fisheries Bycatch

The overarching objective of the bycatch policy is to ensure maintenance of bycatch species and populations. This is supplemented with sub-objectives including:

- to reduce bycatch
- to improve protection for vulnerable species
- to arrive at decisions on the acceptable extent of ecological impacts.

More information on the sub-objectives and the guiding principles of the bycatch policy are detailed in the appendix.

The objectives were to be pursued by introducing bycatch action plans (later renamed bycatch and discarding work plans) for all Commonwealth fisheries as the mechanism for managing and reducing bycatch. The policy provided guidance on the form and development of bycatch action plans.

Further discussion on implementing bycatch action plans is on page 13.

Release of the bycatch policy recognised the need for a more strategic approach to bycatch management and that fishery specific actions are required to reflect the needs of the particular fishery and its bycatch issues (Bensley et al, 2010).

Questions to consider about the effectiveness, application, scope and purpose of current bycatch policy objectives include:

- 1. To what extent do you think the objectives and sub-objectives of the bycatch policy have been achieved?**
- 2. What factors do you think have facilitated and/or impeded progress against those objectives?**
- 3. Are the objectives and scope of the current bycatch policy sufficient? If no, how could the scope and objectives be revised?**
- 4. What do you think is the most important element or objective a bycatch policy should achieve and why?**

Terms of reference for the review

Terms of reference for the review of the Commonwealth Policy on Fisheries Bycatch 2000 were agreed to by the Minister for Agriculture, Fisheries and Forestry and the Minister for Sustainability, Environment, Water, Population and Communities.

A revised Commonwealth policy on fisheries bycatch will respond to key drivers including:

- The review of the harvest strategy policy, noting that a key objective of both policy reviews is ensuring they are aligned and complementary.
- The review of the *Environment Protection and Biodiversity Conservation Act 1999* – amendments giving effect to the government's response to the review will be considered by the Parliament in 2012. Consideration will need to be given to the interaction with fisheries legislation.
- The streamlined and increased efficiency of fisheries regulation, with the aim of reducing the regulatory burden on the fishing industry.
- Activities currently in place in response to bycatch-related objectives of the *Fisheries Management Act 1999*, and the 2005 Ministerial Direction.
- The completion of the marine bioregional planning process.

A revised fisheries bycatch policy may also contribute to:

- improving the public perception and confidence in Australian fisheries by demonstrating the sustainability of fisheries, particularly in relation to interactions with protected species, other bycatch and the broader marine environment.
- maintaining and increasing demand and market access for Australian seafood, in response to changing expectations from markets with respect to environmental stewardship.

Objective

To improve the management of bycatch in Commonwealth fisheries by developing an integrated policy and implementation framework that links with the harvest strategy policy and supports current environmental and fisheries legislative requirements.

The objective of the review is also to develop a framework that contributes to greater management certainty for fishers ensures the achievement of the environmental outcomes and increases confidence by the retail sector, consumers and the general public about the sustainability of Australian seafood.

While not limiting its scope, it is intended that the review of the bycatch policy will:

- Clarify the role of the bycatch policy within the context of an ecosystem approach to fisheries management and the implementation of ecologically sustainable development objectives.
- Identify and include reference to the domestic and international bycatch regulations and obligations with which Australian fisheries must comply.
- Review and assess the adequacy and application of existing definitions of bycatch, byproduct and discards, concurrently with the harvest strategy policy review. The current definitions in the policies require clarification to remove uncertainty about the application to byproduct and discards of byproduct or target species. It is anticipated that management of byproduct and discards of byproduct or target species will be primarily addressed by the review of the harvest strategy policy.
- Review the bycatch policy's objectives within the current policy and legislative environment.
- Consider and assess the robustness and applicability of risk based approaches to bycatch management for species or groups of species, taking into account their biological status, data availability and other factors.
- Evaluate the efficacy and appropriateness of reference points and structured decision rules in meeting the legislative and policy objectives for some bycatch species and/or groups.
- Review approaches to incorporating and addressing the potential cumulative impacts of fisheries' interactions with bycatch.
- Strengthen the existing bycatch management tools and arrangements (including bycatch and discard work plans, ecological risk assessment and management and national plans of action) through mechanisms that will enhance benchmarking, performance monitoring and reporting.
- Consider mechanisms to strengthen and streamline inter-agency collaboration, prioritisation and decision-making, to achieve increased transparency and certainty for stakeholders.
- Develop guidelines for stakeholder engagement on bycatch issues and their management.
- Evaluate whether further guidance on mechanisms for considering the social and economic aspects of bycatch management approaches is needed and how these aspects fit within the principles of ecologically sustainable development.
- Identify gaps, needs and priorities for future bycatch research that could be incorporated into strategic research plans.

In addition, the revised bycatch policy will be accompanied by a framework to facilitate implementation, and monitor progress and effectiveness of policy implementation.

The review will also take guidance from the recommendations from the DAFF ABARES 2010 review (Bensley et al, 2010) and the current Fisheries Research and Development Corporation (FRDC)-ABARES-AFMA bycatch standards project.

Scope

The review will provide a more effective and streamlined approach for the management of bycatch in Commonwealth fisheries. It will not extend to state and territories but DAFF will present the outcome at Australian Fisheries Managers Forum (the forum comprises heads/CEOs of the Australian and state and territory government agencies responsible for fisheries). The bycatch policy review will focus primarily on the treatment of bycatch, including threatened, endangered and protected species. It will also have regard to how the management of habitats and communities, which form part of ecosystem-based fisheries management, could be incorporated into Australian fisheries policy in the longer term. It is expected that the new policy will be aligned with, and operate alongside the Commonwealth Fisheries Harvest Strategy Policy.

Alignment with review of Commonwealth Harvest Strategy Policy and Guidelines

The harvest strategy policy is being reviewed concurrently with that of the bycatch policy. The government is seeking to ensure the policy framework for Commonwealth fisheries encompasses the range of the effects of fishing, consistent with legislative objectives. By reviewing both policies simultaneously the government aims to address the effects of fishing on all commercial and bycatch species (including protected species).

Committees and stakeholder workshop for the review

A steering committee comprising government representatives from DAFF, ABARES, AFMA and SEWPaC is overseeing the review. An advisory committee with members from government, commercial industry, recreational sector, research and environmental non-government organisations will provide advice to the steering committee on any technical or policy issues that may arise during the review. Both committees met for the first time in May 2012. A stakeholder workshop was held in June 2012 to identify the key issues to be considered. A copy of the workshop report is available at daff.gov.au/fisheries/environment/bycatch/review/stakeholder_workshop

2 Background

Domestic commitments

Management of bycatch in Commonwealth fisheries is principally governed by the *Fisheries Management Act 1991* (FM Act) and subject to environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Both provide a legislative framework that establishes the objectives and obligations for fisheries bycatch. Australia also implements its international obligations with respect to bycatch through this legislation. The key agencies involved in bycatch management in Commonwealth fisheries are DAFF, AFMA and SEWPaC.

DAFF assesses implementation of bycatch policy in line with the objectives of the FM Act and its portfolio objectives. This includes ensuring long-term sustainability, productivity and competitiveness of Commonwealth fisheries. It also involves monitoring AFMA's implementation of relevant policies and legislation and working with SEWPaC on implementing environmental legislation and policy.

AFMA is responsible for management fisheries under Commonwealth jurisdiction. AFMA was established under the *Fisheries Administration Act 1991*, which along with the FM Act identifies AFMA's objectives, functions and powers. Commonwealth fisheries legislation is designed to promote responsible fishing and conservation of marine living resources, and to ensure fisheries are managed in an efficient and cost-effective manner. The legislation aims to optimise sustainable productivity of fish stocks by maximising sustainable catch and pursuing economic efficiency under a range of objectives that also address cost recovery and ensure accountability to the fishing industry and Australian community.

The FM Act also sets out AFMA's responsibilities relating to the pursuit of ecologically sustainable development. This objective requires AFMA to ensure long-term sustainability of fisheries resources for the benefit of all users and interest groups both now and in the future.

The FM Act includes objectives that AFMA and the Fisheries Minister must pursue. Most relevant to bycatch management is Objective 1(b):

Ensuring that the exploitation of fisheries resources and the carrying on of any related activities are conducted in a manner consistent with the principles of ecologically sustainable development and the exercise of the precautionary principle, in particular the need to have regard to the impact of fishing activities on non-target species and the long term sustainability of the marine environment.

Ministerial Direction to AFMA to manage the broader environmental impacts of fishing

In 2005, as a consequence of the poor biological and economic status of a number of Commonwealth fisheries, the then Minister for Fisheries, Forestry and Conservation issued a direction to AFMA to take immediate action in all fisheries to cease overfishing and recover overfished stocks, avoid stocks from being overfished in the future and manage the broader environmental impacts of fishing, including threatened, endangered and protected species. It also directed AFMA to implement the Commonwealth Harvest Strategy Policy by 2007. The direction was issued under the authority of section 91 of the *Fisheries Administration Act 1991*.

Interaction with Environment Protection and Biodiversity Conservation Act

SEWPaC assesses the environmental performance of Commonwealth and state and territory fisheries with an export component and promotes ecologically sustainable management.

SEWPaC's primary role, through the EPBC Act, is to evaluate the environmental performance of fisheries, including:

- the strategic assessment of Commonwealth managed fisheries under Part 10 of the EPBC Act
- assessments of fisheries relating to impacts on protected marine species and communities under Part 13
- assessments for the purpose of export approval under Part 13A.

SEWPaC assess all export and Commonwealth fisheries against the requirements of the EPBC Act.

Part 10 strategic assessments are conducted against the *Guidelines for the Ecologically Sustainable Management of Fisheries 2nd edn* (the guidelines). The guidelines outline specific principles and objectives designed to ensure a strategic and transparent way of evaluating the ecological sustainability of fishery management arrangements. The guidelines include the principle that fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of ecosystems. This principle is supported by a number of objectives including:

- Objective 1: 'The fishery is conducted in a manner that does not threaten bycatch species'.
- Objective 2: 'The fishery is conducted in a manner that avoids mortality of or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities'.

The strategic assessment also informs assessments under Part 13 of the EPBC Act. Under Part 13, it is an offence to harm listed species (other than conservation dependent species) in Commonwealth waters unless fisheries have obtained a permit or management arrangements for the fishery are accredited. Management arrangements can be accredited under Part 13 if the Minister is satisfied that:

- Those management arrangements require individual fishers to take all reasonable steps to avoid killing or injuring a member of a species protected under the EPBC Act (that is a threatened species, a listed migratory species, a listed marine species or cetacean (protected species)).
- The fishery does not, or is not likely to, adversely affect the conservation status of protected species, or affect the survival and recovery of listed threatened species.

The EPBC Act is also the key enabling legislation for giving effect to a range of conservation focused international obligations to which Australia is a signatory, which include:

- Convention on Biological Diversity
- Convention on the Conservation of Migratory Species of Wild Animals
- Convention on International Trade in Endangered Species of Wild Fauna and Flora
- Convention on the Conservation of Antarctic Marine Living Resources.

The current bycatch policy, released in 2000, broadly coincided with the release of the EPBC Act in 1999. The policy does not specifically mention EPBC Act obligations for fisheries, in particular EPBC Act requirements for non-target and protected species.

The EPBC Act and FM Act have the same definition of ecologically sustainable development and the use of the precautionary principle in applying a precautionary approach.

In 2009, a review of the EPBC Act, available at environment.gov.au/epbc/review/index.html, delivered the following recommendation in respect to fisheries:

The Review recommends that the Act be amended so that the fishery provisions under Parts 10, 13 and 13A are streamlined into a single strategic assessment framework for Commonwealth and State and Territory managed fisheries to deliver a single assessment and approval process.

In 2011, the government responded:

that it agreed in principle to this recommendation, noting that the fisheries assessment provisions serve different functions including listed migratory species and ecologically sustainable management of commercial export fisheries. In undertaking any streamlining under the amended EPBC Act, these different functions would need to be preserved. The government supports in principle a progressive shift under the amended Act from individual assessments of fisheries to accreditation of fisheries management arrangements. The government will ensure that the amended EPBC Act includes the legislative capability for this. Available at environment.gov.au/epbc/publications/epbc-review-govt-response.html

5. To what degree should EPBC Act requirements be reflected in the bycatch policy?

Species protected under the EPBC Act

Some species that fishers may catch as bycatch are afforded higher levels of protection under the EPBC Act. The term 'protected species' means all species listed under Part 13 of the EPBC Act, including whales and other cetaceans and listed threatened, marine and migratory species. Protected species includes species considered threatened and as a result are listed as vulnerable, endangered or critically endangered under the EPBC because they are facing a level of high risk of extinction in the wild. These species require recovery in Australia and should be afforded different protection and consideration than other bycatch species. Species listed under the international conventions and agreements to which Australia is party, are also protected under the EPBC Act. This includes listed migratory species such as some sharks, birds and mammals. Interactions with species protected under the EPBC Act are generally considered as part of the strategic assessment process of individual fisheries.

It is an offence under the EPBC Act to kill, injure, take, trade, keep or move a member of a Part 13 listed species (other than conservation dependent species) in a Commonwealth area unless the action is covered by a permit issued by the Minister for Environment or is otherwise exempt. The EPBC Act also specifies that certain actions are not offences, including actions authorised by a permit, taken in accordance with a wildlife conservation plan made under the EPBC Act, covered by an approval in operation under Part 9 of the EPBC Act or undertaken in accordance with an accredited management plan or regime (such as fishery management plans or management arrangements). Fishers are obliged to report any interactions with protected species. It is an offence not to report interactions within seven days, unless other reporting arrangements are in place. Management of fishery interactions with protected species is an important consideration for the bycatch policy review.

SEWPaC is also responsible for implementing recovery plans for threatened marine species listed under the EPBC Act. The Threatened Species Scientific Committee advises the Minister for Environment on amendments to and updating of lists of threatened species, threatened ecological communities, and key threatening processes together with making or adopting recovery plans and threat abatement plans. Under the EPBC Act, a Commonwealth agency must not take any action that

contravenes a recovery plan or a threat abatement plan, and the Commonwealth must implement a recovery or threat abatement plan where it applies in Commonwealth areas.

International commitments

Development of arrangements for managing bycatch in Commonwealth fisheries is closely linked to international commitments, which originated in obligations established under the United Nations Convention on the Law of the Sea (UNCLOS 1982). In establishing the right to declare exclusive economic zones and to fish in those zones and on the high seas, UNCLOS requires member states to:

take into consideration the effects on species associated with or dependent upon harvested species with a view to maintaining or restoring populations of such associated or dependent species above levels at which their reproduction may become seriously threatened.

This obligation to conserve bycatch species is extended in the United Nations Fish Stock Implementation Agreement (UNFSA 1995) to apply to 'species belonging to the same ecosystem or associated with or dependent upon the target stocks'.

AFMA's objectives, which closely guide domestic management, also reflect obligations under UNCLOS and UNFSA which is annexed to the FM Act.

Requirements for international conservation and restoration of populations of threatened migratory species were first identified in the 1979 Bonn Convention on the Conservation of Migratory Species of Wild Animals. Appendices 1 and 2 to the Bonn Convention list species of whales, dolphins, turtles, seabirds, and sharks that are considered threatened or requiring international cooperation for their conservation. Under the Bonn Convention the 2004 Agreement on Conservation of Albatrosses and Petrels provides guidance on implementing effective mitigation measures to reduce fisheries-related mortality of seabirds. A memorandum of understanding on conservation of migratory sharks under the Bonn Convention came into effect in March 2010 and was ratified by Australia in May 2011 to 'achieve and maintain a favourable conservation status for migratory sharks'. There are also memoranda of understanding on the conservation of turtles and dugongs.

International requirements to adopt an ecosystem approach to bycatch reduction and conservation of endangered species can be traced back to Agenda 21 of the 1992 United Nations Conference on Environment and Development (the 'Earth Summit'). These actions emphasise the role of ecosystems in producing services supporting sustainable development, and call upon member states to 'promote the development and use of selective fishing gear and practices that minimize waste in the catch of target species and minimize by-catch of non-target species'. These requirements were elaborated in decisions under the United Nations Convention on Biodiversity (CBD) which entered into force in 1992. In 2000, the CBD formally adopted the ecosystem approach as the fundamental basis for its activities. Participants considered the purpose of an ecosystem approach to be 'to meet human requirements to use natural resources, whilst maintaining the biological richness and ecological processes necessary to sustain the composition, structure and function of the habitats or ecosystems concerned'.

In support of the fisheries management obligations established by UNCLOS and UNFSA, the Food and Agriculture Organization of the United Nations (FAO) provided guidelines for implementing responsible fisheries management practices. These guidelines, along with the FAO Code of Conduct for Responsible Fisheries (FAO 1995), include measures to protect endangered species, reduce bycatch and protect ecosystems. The guidelines suggest fisheries management objectives should include a statement to the effect that 'biodiversity of aquatic habitats and ecosystems is conserved and endangered species are protected'. In support of this objective, recommended management measures say that member states:

should 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 negative impacts on associated or dependent species, in particular endangered species.

The FAO supplemented the Code of Conduct with guidelines on implementing an Ecosystem Approach to Fisheries (FAO 2003), including:

minimizing fisheries impact on the structure, productivity, function and biological diversity of the ecosystem; does not threaten by-catch species; avoids mortality of, or injuries to, endangered, threatened or protected species; and minimizes the impact of fishing operations on the ecosystem generally.

The FAO published *Guidelines to Reduce Sea Turtle Mortality in Fishing Operations in 2010*, and *International Guidelines on Bycatch Management and Reduction of Discards* in 2012. The FAO also developed International Plans of Action (IPOAs) for conserving and managing sharks and for reducing incidental catch of seabirds in fisheries and recommends member states implement compatible national plans of action.

Although instruments such as the FAO Code of Conduct and related guidelines are not binding, many key provisions relating to high-seas fisheries have been implemented in the form of conservation and management measures that regional fisheries management organisations have adopted. Regional fisheries management organisations that have adopted bycatch related measures, of which Australia is a signatory and active participant, include:

- The **Western and Central Pacific Fisheries Commission** has adopted resolutions on implementing the FAO International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries and avoiding the capture of bycatch species. The commission has adopted binding conservation and management measures requiring: implementation of mitigation measures to reduce seabird mortality; implementation of the FAO Guidelines to Reduce Sea Turtle Mortality; full use of retained sharks and implementation of plans of action to reduce incidental shark mortality; and prohibition of retaining, transshipping or landing any part of a white shark.
- The **Commission for the Conservation of Southern Bluefin Tuna** has adopted mitigation measures to reduce seabird mortality during tuna longline fishing operations.
- The **Indian Ocean Tuna Commission** has adopted resolutions on implementing mitigation measures to reduce seabird mortality in longline fisheries, implementing the FAO Guidelines to Reduce Sea Turtle Mortality and prohibition on retaining on board, transshipping, landing, storing or selling any part of thresher sharks.
- The **Commission for the Conservation of Antarctic Marine Living Resources** convention applies to all living marine resources in the convention area. The commission has adopted conservation measures for minimising fisheries interactions with and mortality of seabirds, a prohibition on directed fishing for sharks and limitations on fishing for ice fishes.
- The **South Pacific Regional Fisheries Management Organisation** convention only entered into force in August 2012, and so conservation measures have not yet been adopted. However, the convention requires fisheries management to be consistent with the ecosystem approach and provides for measures to restore populations of non-target and associated or dependent species to above levels at which their reproduction may become seriously threatened.

Consistent or more advanced measures in Commonwealth fisheries predate many of these regional fisheries management organisation measures and resolutions.

3 Current bycatch management in Commonwealth fisheries

Since the 1990s Australia has made progress in research and implementation of mitigation and management measures for bycatch in Commonwealth fisheries. Some of the progress can be attributed to implementing management actions under the bycatch policy, but other factors include management responses to increasing international obligations and EPBC Act assessments of fisheries (see International commitments page 9 ,interaction with the EPBC Act page 7 and Figure 1: Bycatch case studies page 12).

Industry organisations and fishers have been involved and innovative in introducing codes of practice, mitigation measures and revised fishing practices to reduce unwanted bycatch in Commonwealth managed fisheries. Fishers have actively trialled bycatch mitigation tools such as seal and turtle excluder devices in trawl fisheries and tested different seabird deterring equipment in longline fisheries, in order to develop and adopt the most effective mitigation measures.

To improve monitoring of bycatch rates, AFMA implemented or increased observer programs in many fisheries and set target levels for observer coverage for many sectors of Commonwealth fisheries. AFMA trialled electronic monitoring (e-monitoring, a system of cameras on fishing vessels) to improve monitoring of interactions with large protected species and in other fisheries, e-monitoring improves the quality of self-reported data in logbooks, including of bycatch.

AFMA also implemented a management strategy to monitor and reduce interactions with Australian sea lions in the shark gillnet sector of the Southern and Eastern Scalefish and Shark Fishery that were identified under Part 13 and Part 13A of the EPBC Act. The strategy includes industry codes of conduct, mitigation trials, and an interim change to hook fishing methods, increased observer coverage, area closures and implementation of bycatch limits to trigger further management actions.

Listing of longlining as a 'key threatening process' to seabirds under the EPBC Act required development of a threat abatement plan for incidental bycatch of seabirds during oceanic longline fishing operations, first implemented in 1998. The threat abatement plan expired in August 2003, necessitating a review under subsection 279(2) of the EPBC Act and development of a second threat abatement plan (2006).The seabird threat abatement plan allows fishing to continue under specified conditions, while encouraging ongoing innovation in further reducing seabird bycatch.

It specifies several mitigation measures, levels of observer coverage and interim bycatch limits to trigger further management action, for example 0.05 birds per 1000 hooks in the Eastern Tuna and Billfish Fishery. Over the life of the first threat abatement plan (2001–06), substantial progress was made towards reducing the threat and level of seabird interactions (AAD 2006). The 2006 seabird threat abatement plan is being revised. Strategic assessments, recovery plans and threat abatement plans are formal documents under the EPBC Act that are administered by SEWPaC.

Funded by the Natural Heritage Trust, a wildlife bycatch project (Bensley et al. 2010) reviewed government performance in managing wildlife bycatch. It highlighted the need for:

- improved information to support decision-making
- effective performance monitoring and evaluation frameworks
- identifying priorities and attributing resources
- incentives and disincentives for stakeholders.

Figure 1: Bycatch case studies Northern Prawn Fishery

The Northern Prawn Fishery interacts with various protected species, including turtles, sea snakes, sharks and rays. However, most of the fishery's bycatch consists of small fish and invertebrates. In 2001, bycatch reduction devices (BRDs), which allow small animals to escape from nets, became mandatory in the fishery. Without BRDs, the ratio of prawn product to bycatch was around 1:10; BRDs, such as the Popeye Fishbox, reduce this ratio to about 1:5 (Raudzens 2007).

The fishery's protocol for trialling and implementing bycatch mitigation measures facilitated the successful development of BRDs. The protocol includes a list of approved options, which can be further refined as new information comes to hand. For example, at-sea trials of new BRDs and turtle-excluder devices (TEDs) must last two weeks, with up to 56 trawls observed. The main performance indicator is the difference in bycatch weight between the TED plus BRD and the TED-only nets. The reference point at which the candidate BRD can be considered for approval is a 10 percent reduction in bycatch.

Southern and Eastern Scalefish and Shark Fishery

The Southern and Eastern Scalefish and Shark Fishery started catch monitoring toward the end of 1992 through the Scientific Monitoring Program after introduction of total allowable catches. A review in 1995 recommended elements of the program be 'integrated' to monitor trawl catches at sea, landed trawl and non-trawl catches and the inclusion of fishing activities and catches from additional ports.

The new Integrated Scientific Monitoring Program design was accepted in 1997 to collect specialised data for the fishery. The program's sampling design prescribed the intensity and distribution of sampling required for estimating the total catch (retained and discarded) of quota and other species within stated precision levels. It also prescribed a sampling regime for length frequency and age composition of the catch for some retained commercial species. These data are essential for stock assessments and is not available through AFMA's standard processes (that is quota monitoring or logbooks).

This sampling regime was revised in 2010 as there had been substantial changes to the size and structure of the fishing fleet as well as significant changes to reporting obligations and information requirements. In addition, the then current Wildlife Trade Operation declaration under the EPBC Act required AFMA to "ensure statistically robust levels of ongoing observer effort (or other reliable method) to validate the nature and level of interactions by area, season and fishery for all bycatch species that are identified as high risk through the ecological risk assessment processes".

AFMA commissioned an independent consultant to redesign the sampling regime and this work was reviewed by a panel of Southern and Eastern Scalefish and Shark Fishery Resource Assessment Group Chairs and other experts, including ABARES statisticians and CSIRO stock assessment scientists. The revised sampling regime, which was implemented in 2010, differs from the original in that it broadens the focus from commercial species to include major non-quota species, high risk species and some protected species identified as at potential high risk through ecological risk assessments.

Funded by the Natural Heritage Trust, a wildlife bycatch project (Bensley et al. 2010) reviewed government performance in managing wildlife bycatch. It highlighted the need for:

- improved information to support decision-making
- effective performance monitoring and evaluation frameworks
- identifying priorities and attributing resources
- incentives and disincentives for stakeholders.

The report recommended improving implementation of bycatch policies and legislation and providing industry with the ability to clearly demonstrate its environmental stewardship. This included developing a more integrated, inter-agency working relationship and implementing bycatch mitigation performance standards and assessments.

AFMA's Environment Committee provided advice on strategies to address environmental issues, including minimising the impact of fishing on bycatch species. To varying degrees, AFMA's Resource Assessment Groups monitor the species composition of catches and trends in bycatch in their respective fisheries. To date, there has not been regular fishery-level estimation of the nature and extent of the bycatch of all species across Commonwealth fisheries. This is partly due to the low coverage and lack of spatial representivity of observer data, and an emphasis on assessing key commercial species and monitoring protected species interactions.

CSIRO is undertaking a FRDC-funded project to document changes in Commonwealth fisheries relevant to bycatch, collate and synthesise all available bycatch data for Commonwealth fisheries, and analyse and report on trends in bycatch rate, total bycatch and catch composition, to the extent that data and other information are adequate to support this analysis. CSIRO is examining seven Commonwealth fisheries over a 10- year period. The results of this work will inform the review process and enable the impact of potential policy proposals to be understood.

Bycatch action plans

All Commonwealth fisheries are required, under the existing bycatch policy, to prepare bycatch action plans - later renamed bycatch and discard work plans - to reduce the impacts of fishing on non-target species. The bycatch policy featured a checklist to guide the development of bycatch action plans for individual fisheries.

Under these bycatch and discard work plans, AFMA adopted a range of measures to address bycatch issues in Commonwealth fisheries. Fishery-specific ecological risk assessments identified the main risks, and ecological risk management plans were developed to manage those risks, for all major Commonwealth managed fisheries (see risk-based approaches on page 20). Mitigation measures for species identified as at potential high risk from fishing operations are documented in each fishery's bycatch and discard work plan. The work plans are developed in consultation with industry and research partners to identify cooperative, practical and affordable solutions to address bycatch and discarding issues. Examples of current bycatch and discard work plans can be found at afma.gov.au/managing-our-fisheries/environment-and-sustainability/Bycatch-and-Discarding/

6. How could the effectiveness, against the objectives of the bycatch policy, of mitigation and management measures implemented under bycatch and discard work plans be better demonstrated?

Bycatch management costs

Bycatch management and monitoring can add significant direct costs to fishing operations. However, requirements for improved bycatch management under the EPBC Act and other instruments establishes incentives related to achieving third party accreditation (under environmental certification schemes), which can lead to improved market access and retailer and consumer support, thereby offsetting the cost of bycatch reduction measures.

The cost of research undertaken to inform decision making in Commonwealth managed fisheries is currently apportioned between fisheries and the government in line with the Australian Government's cost recovery policy.

Costs for research to underpin evidence based decision making are generally funded by the fishing industry and government in an 80:20 split. Such research includes fishery independent surveys, catch monitoring, observer programs and e-monitoring, data analysis and reporting to inform ecological risk management decisions and development of bycatch mitigation measures.

Any increased requirements for monitoring, research, risk assessment and mitigation under a revised bycatch policy are likely to imply increased costs. Consideration will need to be given to optimising cost effectiveness of such requirements, and consideration may need to be given to cost recovery options. The three key areas of the AFMA Cost Recovery Impact Statement 2010 (CRIS) relevant to the review of the bycatch policy are Activity Groups 7, 8 and 9. AFMA's Cost Recovery Impact Statement 2010 is available at afma.gov.au/wp-content/uploads/2010/06/AFMA-Cost-Recovery-Impact-Statement-20101.pdf (pdf 176.78kb).

| |
|--|
| 7. Is there a private and/or public benefit to managing and monitoring bycatch? |
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4 Future policy objectives and considerations

Policies should include clear objectives on the purpose of the policy, and ensure alignment with legislative obligations and objectives. Following the June 2012 stakeholder bycatch workshop, it was suggested that the bycatch policy be updated to better reflect the government's obligations under domestic legislation and international fisheries and environmental conventions, guidelines and conservation and management measures.

Objectives under any revised bycatch policy will need to clearly address the diverse range of obligations related to bycatch management in a manner that is compatible with other fisheries management objectives. Consideration could be given to revising the objectives of the bycatch policy.

8. What should be the objectives of a revised bycatch policy?

Definition of bycatch

One of the driving considerations for both the harvest strategy and bycatch policy reviews is to ensure there are no gaps between these policies, so all species caught or impacted by fisheries are appropriately managed under one policy or the other. It should be clear which policy applies to which species under which conditions, including consideration of how species may transition between management under one policy to the other, as species status and fishing practices change. This requires that definitions of catch components, such as 'key commercial species', 'byproduct' and 'bycatch' species, are clear and unambiguous.

These definitions will guide decisions about which policy should apply to which species under which circumstances, so the appropriate management approach can be taken. Objectives and requirements for managing commercial species under the harvest strategy policy differ from those for managing bycatch species under the bycatch policy. The harvest strategy policy seeks to maximise the long-term net economic returns from sustainable harvesting of commercial species, whereas the bycatch policy seeks to minimise fishery impacts on bycatch. These two policies guide development of different research and data collection requirements, assessment approaches and management measures for each species group, species or fish stock, primarily depending on whether they are considered 'commercial'. An important task of the reviews is therefore to clarify which policy applies to each species, which requires that definitions of these groups are clear.

The current bycatch policy defines bycatch as:

That part of the fisher's catch which is returned to the sea either because it has no commercial value or because regulations preclude it being retained..That part of the catch that does not reach the deck of the fishing vessel but is affected by interaction with the fishing gear.

The current harvest strategy policy defines bycatch as 'species taken incidentally in a fishery where other species are the target, and which are always discarded'.

The June 2012 stakeholder bycatch review workshop considered an ABARES discussion paper on alternative definitions of bycatch and other catch components. Workshop participants broadly supported a division between commercial species (to be managed under a harvest strategy policy) and non-commercial species (to be managed under a bycatch policy; Figure 2).

The ABARES paper proposed the following definition of commercial species:

Species that are caught and kept by commercial fishers.

By default, non-commercial ('bycatch') species are defined as:

Species that interact with the fishing gear but which are not kept by commercial fishers.

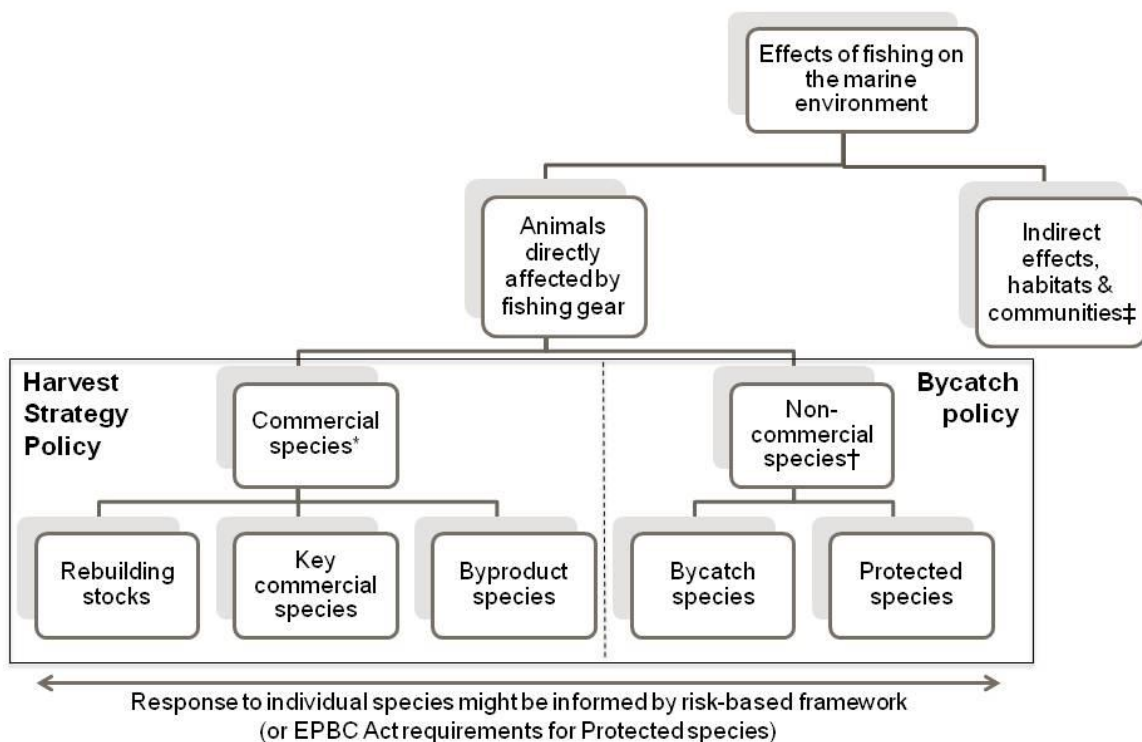
These definitions refer to species, and not to individuals. Part of the catch of a commercial species might sometimes be released or discarded, but this would not be classified as bycatch because the species is sometimes kept by commercial fishers, and so should be managed under the harvest strategy policy. Commercial species would therefore include species under rebuilding plans and those discarded or released because they are damaged, poor quality, an unmarketable size or in excess of quota.

Non-commercial species would then include marine wildlife, protected species and other fish species that are not retained, and should be managed under the bycatch policy.

9. Would you support use of the definitions, as detailed in Figure 2, to categorise catch and bycatch by commercial fishing operations? If no, what alternatives would you suggest?

The Bycatch policy is intended to apply to the monitoring, assessment and management of bycatch in the commercial Commonwealth fisheries, and is not intended to apply to recreational fisheries. However, there are a number of species that are caught as bycatch species in commercial fisheries, and which commercial fishers do not usually keep (such as sailfish) or are not permitted to keep (such as black marlin), but which are important target species in recreational fisheries.

Figure 2: Potential catch component classifications and policy applications.



‡To be covered by a yet to be developed, underpinning policy on the ecosystem approach to fisheries management.

* Includes key commercial species under rebuilding strategies and species sought by recreational fishers that are also kept by commercial fishers.

† Includes species sought by recreational anglers.

Source: Based on June 2012 ABARES bycatch policy review workshop discussion paper

Transitioning between key commercial, byproduct and bycatch status

In addition to clarifying the classification and definition of the different catch components, consideration needs to be given to dealing with circumstances under which management of a species may transition between the bycatch policy and the harvest strategy policy, as a result of changes in the status of those species. For example, a species may move from being bycatch to being a commercial species if a previously unwanted bycatch species is kept by commercial fishers and it can be fished sustainably.

Conversely market factors or declines in availability may result in a species moving from being a commercial species to becoming unwanted bycatch. Consideration needs to be given to how and when the harvest strategy and bycatch policies should be applied in response to such transitions.

10. Do you wish to comment on proposed approaches to managing the transition of species between being key commercial, byproduct and/or bycatch species?

5 Approaches to bycatch management

A range of approaches can be taken to monitoring and assessing bycatch interaction rates and fisheries-related mortality. The most appropriate approach depends on the difficulty and cost of collecting data for various bycatch species in different fisheries, and the risk to those species, as determined by ecological risk assessments. For fisheries for which comprehensive data on bycatch can be cost-effectively collected, a quantitative sustainability assessment approach could be taken. This has high data and analysis requirements which may only be achievable for a few high-risk species in larger fisheries.

In contrast, risk based approaches requiring moderate information can be adopted where improved data collection is difficult or unaffordable, recognising that management decisions still need to be taken in the absence of quantitative sustainability assessments. For low-profit, data-poor fisheries, where data collection cannot be easily or cost-effectively improved, a precautionary approach can be taken, aimed at minimising the likelihood of fishery impacts on bycatch species. The differences between these alternative approaches are summarised in Table 1.

Table 1: Overview of range of approaches to bycatch management, showing information requirements, relative costs and management options under each approach

| Assessment approach | Information requirements | Cost | Management options |
|---------------------------------|--------------------------|--------|---|
| Sustainability assessment based | High | High | Management strategies |
| Risk-assessment based | Medium | Medium | Tailored ecological risk management plans |
| Precautionary approach | Low | Low | Broad measures to avoid or minimise impacts |

Reference points and performance measures

Reference points in fisheries management are indicators of the level of fishing or stock size that are used as a benchmark against which to evaluate fisheries performance, and to prompt appropriate fishery management decisions as stock status changes in relation to agreed reference levels. The FAO defines a reference point as:

a conventional value, derived from technical analysis, which represents a state of the fishery or population, and whose characteristics are believed to be useful for the management of the unit stock.

Under the harvest strategy policy, harvest strategies and decision/control rules are developed for key commercial species in each fishery in relation to target and limit reference points. Similarly, the bycatch policy states that:

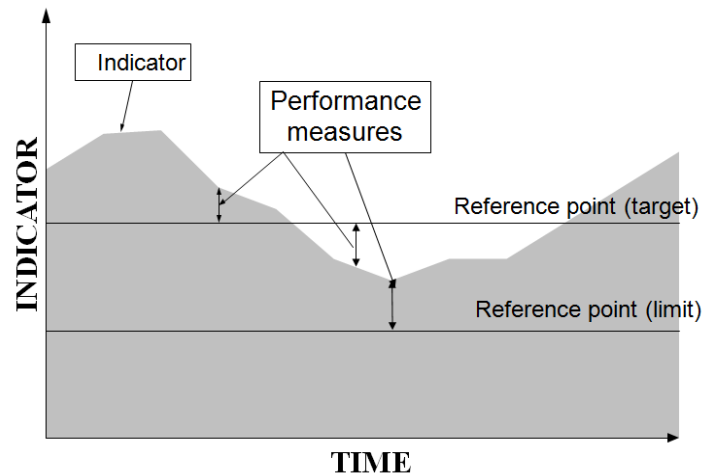
Decisions and actions to address bycatch will...use robust and practical biological reference points relating to bycatch, where possible, to make decisions on bycatch management.

Management trigger limits for bycatch interaction rates are examples of bycatch reference points sometimes used for protected species under the EPBC Act.

Sainsbury (2008) discusses use of target and limit reference points for bycatch. Fisheries management approaches using reference points generally envisage two classes of reference points: - target and limit. Target reference points are those levels (such as biomass of a stock, or a bycatch rate) that management approaches or strategies should aim to achieve. Limit reference points are those levels that should be avoided, with management intervention being required to move the resource back toward target levels if limit reference levels are breached. Reference point approaches are data intensive and require adequate data to determine appropriate reference

points, and to monitor performance against them. Such approaches may be applicable to certain high-risk species, with limit reference points being set at levels (such as in bycatch rate, or estimates of mortality) that then trigger some appropriate active management to reduce risk, interaction or mortality back toward target levels. **Error! Reference source not found.** shows how an indicator may be tracked over time and its value compared to both target and limit reference points.

Figure 3: Indicators and performance measures in relation to limit and target reference points



Application of bycatch reference points, whether expressed in terms of bycatch interaction rates, or actual incidental mortality levels, therefore provides a mechanism to directly address the third sub-objective under the current bycatch policy: to arrive at decisions on the acceptable extent of ecological impacts. However, Part 13 of the EPBC Act sets out two key tests relating to protected species:

- that an accredited fishery management plan requires operators in a fishery to take all reasonable steps to avoid interactions with protected species
- that the fishery does not, or is not likely to, adversely affect the conservation status of protected species, or affect the survival and recovery of listed threatened species.

Adopting reference points that specify bycatch interaction rates or mortality trigger limits that allow for some acceptable level of interactions for bycatch of protected species needs to be reconciled with the requirements under the EPBC Act to avoid such interactions. For example, monitoring of interaction rates and adaptive management is the core component of the fishery management response under AFMA's Australian sea lion management plan. This provides for increased spatial closures if unacceptable levels of sea lion interactions are recorded. The reference point trigger for further closures in each region is a preset number of observed sea lion mortalities based on the estimated maximum bycatch rate (approximately 2 per cent a year or 3 per cent each breeding cycle) that will still allow population growth in each region.

For the bycatch policy review a question that arises in relation to reference points and performance measures is:

11. Should the bycatch policy provide for development and adoption of bycatch reference points and performance measures as a basis for managing fisheries interactions with bycatch species? If yes how?

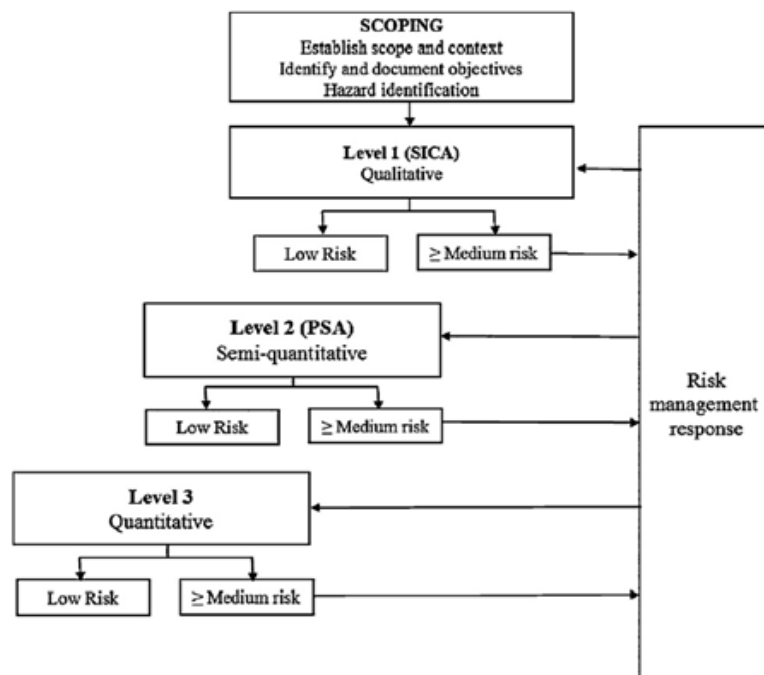
Risk based approaches

Ecological risk assessment

Depending on the information available and associated costs, bycatch management may be assessment based, risk based or precautionary, or some combination of these approaches. Risk based approaches recognise that decisions need to be taken in the absence of quantitative sustainability assessments and use whatever information is available to arrive at a risk-ranking for species groups in various fisheries, including evaluating the risk relating to uncertainty resulting from low levels of information. Given that information on bycatch interactions is often scarce, management of bycatch is often risk based.

Ecological Risk Assessment (ERA) covers a range of techniques for evaluating the risk of negative impacts on various components of the environment (species, communities, habitats). ERA includes assessment of the sources of risk, their consequences and the likelihood that those consequences may occur. The Ecological Risk Assessment for Effects of Fishing (ERAEF) framework developed by CSIRO and AFMA (Hobday et al. 2011) is the method used for Australian fisheries. This approach involves a hierarchical process with three levels; a qualitative analysis at Level 1, an indicator based analysis at Level 2 and a model based analysis at Level 3 (Figure 4: Overview of ERAEF ERA/ERM framework).

Figure 4: Overview of ERAEF ERA/ERM framework



Note Level 1 (SICA) (Scale x intensity) x Consequence Analysis: Level 2 (PSA): multi species Productivity-Susceptibility Analysis: Level 3 (SAFE) multi species Sustainability Assessment for Fishing Effects, or single species population/stock assessment.

Source: Hobday et al. 2011

When applied to fisheries, an implicit management objective is embedded in the ERAEF Productivity Susceptibility Analysis (PSA) and Sustainability Assessment for Fishing Effects (SAFE) methodologies, to ensure fisheries do not contribute to the decline of populations of bycatch species to levels at which their reproduction may become threatened.

Ecological risk management

AFMA's Ecological Risk Management (ERM) aims to integrate the assessment of risk (from ERAs) with the cost effective application of measures to minimise, monitor and control identified risks by minimising either the likelihood or consequence of fisheries interactions. ERM provides information to managers on the risk to each species being impacted by the fishery, and whether such impacts may endanger those populations, allowing measures to be developed to reduce these risks. ERM is therefore a formalised approach to systematically addressing the results of ERAs, including monitoring risks to reduce uncertainty in the risk assessment and implementation of effective management or mitigation measures to reduce risks to acceptable levels.

Information on fisheries impacts on bycatch species is typically sparse and often not spatially representative. Scandol et al. (2009) reviewed risk based approaches for data poor fisheries, highlighting the substantial investment many fisheries agencies made into risk-based management. They noted that, while implementing risk assessments is a fundamental part of the process, policy and legislative frameworks supporting effective risk management must exist to respond to the outcomes of those assessments. Scandol et al. (2009) list a number of useful guiding principles for designing effective risk management in data poor situations, such as bycatch species:

- recognise there are minimum standards of data for species that are subject to some type of risk or stock assessment
- acknowledge the best response to data-poor fisheries is not always to collect more data, in some situations it is better to implement management strategies that are robust to uncertainty and able to achieve acceptable levels of risk
- acknowledge when interpreting risk assessments, adoption of the precautionary approach implies that when the likelihood of an outcome is uncertain and the environmental consequence of this outcome is serious or irreversible, the interpretation of this likelihood should be the higher (more conservative) plausible estimate
- recognise within a multi-species fishery (in this context, a group of bycatch species), directed management of an indicator species is an effective strategy to manage species at equal or lower risk than the indicator species
- recognise harvest strategy frameworks with explicit decision rules provide an effective risk management framework for fisheries.

ERAs have been carried out for each Commonwealth fishery and have produced priority lists identifying key species that require attention in each fishery. ERM responses have been developed to address these, with bycatch species being managed using a variety of management responses under bycatch and discard work plans, specific fishery management strategies (e.g. sea lions, gulper sharks) and EPBC Act responses.

12. Should the bycatch policy and/or implementation guidelines include any additional requirements for, or guidance on, Ecological Risk Assessments and/or Ecological Risk Management processes for bycatch species? If yes, what additional provisions could be required?

Management strategy approaches

An option for bycatch management is to implement a more formal management strategy, similar to that implemented under the harvest strategy policy. Management strategies form the cornerstone of the harvest strategy policy. Specific harvest strategies are developed, setting out the management actions needed to achieve defined biological and economic objectives for each fishery. The components of a risk based approach (setting measurable objectives, developing reference points and performance measures, monitoring performance against objectives and adaptive management) could be combined into a formal management strategy for bycatch management.

Formal management strategies, similar to harvest strategies under the harvest strategy policy, include monitoring requirements, data inputs and assessments, review, feedback, adjustment decision rules and meta-rules that are agreed in consultation with stakeholders. Management strategies are usually statistically tested (a process called management strategy evaluation) against a wide range of possible future trends in fisheries impacts and bycatch population dynamics using alternative decision rules, to evaluate whether the approach is robust and has a high probability of meeting the objectives under all plausible future scenarios.

The advantages of a management strategy approach include the regular monitoring of performance against objectives and increased transparency around management decisions made in response to poor performance against the reference points. Testing of these procedures is used to ensure they have a high probability of achieving the objectives. This provides interested parties with greater certainty that management measures will be successful, and that objectives will be achieved. Implementation of predetermined and tested decision rules can substantially reduce the amount of supportive analysis needed for future management decision making and should provide stakeholders with greater confidence in the management process.

However, management strategy evaluations are data intensive and collection of required data, statistical evaluations and regular monitoring of performance can be costly and time consuming during the development phase. Progressive application of harvest strategies for commercial species across Commonwealth fisheries has required considerable funding and staff resources. As a result it has been difficult for small, low value or data poor fisheries to develop and implement harvest strategies. Most bycatch species are data poor compared with commercial species and it is likely that adequate data for management strategy evaluations may only be available for a limited number of bycatch species. Formal management strategies may only be feasible for a few of the highest priority, most threatened bycatch species, and then only for those for which adequate information can be regularly collected to monitor future management performance.

13. Is available information and data adequate to implement formal management strategies for any fisheries bycatch species, and could adequate information, be collected on fisheries impacts on these bycatch species?

Cumulative impacts

The bycatch policy review will be considering options and approaches for addressing the potential cumulative effects of fisheries interactions with bycatch species. Cumulative impacts are the combined effects on a resource, ecosystem or human community that result from incremental, cumulative or interacting impacts of individual activities, when added to other past, present and reasonably foreseeable future activities. Of most relevance to this review are cumulative impacts resulting from combined activities of a number of different fisheries. The impacts of individual fisheries may be low, but the environmental effects of a number of different fisheries can combine or interact with each other to cause aggregate effects that differ in magnitude, extent or nature from the effects of the individual fisheries. Different challenges are associated with assessing

cumulative impacts within a single jurisdiction, such as Commonwealth fisheries, and evaluating cumulative impacts of fisheries that occur in, or straddle, different jurisdictions. The two main contributing factors to cumulative impacts are:

- **Multiple fisheries:** Whereas individual activities or fisheries might be assessed as posing little individual risk to populations of bycatch species, the combined impact of a range of activities or number of fisheries may together pose a high risk to these populations. Within a single jurisdiction, this requires risk assessments to be designed to cover all fisheries, or to combine the results from multiple ERAs into an overview assessment.
- **Across areas or jurisdictions:** Impacts by a number of fisheries occurring in different areas, or across different jurisdictions (Commonwealth, state and territory) will contribute to cumulative impacts for wide-ranging species, such as marine mammals or seabirds. Evaluating these cumulative impacts could be more difficult if monitoring, data collection or management legal frameworks differ between these jurisdictions. The challenges of combining ERA results will be greater if data, analysis methods and the legal framework for mitigation differ across areas or jurisdictions.

Assessing cumulative impacts is an extension of individual fishery risk assessments. Most fisheries risk and impact assessments have focused on the risks to bycatch species posed by individual fisheries. The Ecological Risk Assessment for Effects of Fishing (Hobday et al. 2011) approach used for many recent AFMA risk assessments usually does not address cumulative impacts in Level 1 (Scale Intensity Consequence Analysis - SICA) and Level 2 PSA assessments. Level 3 SAFE assessments are potentially able to evaluate cumulative effects by estimating cumulative fishing mortality for a number of fisheries and comparing the result against reference points. For example, a SAFE assessment approach has been used to assess the cumulative fishing mortality of a number of different sub-fishery sectors methods on bycatch of sharks and rays in the Southern and Eastern Scalefish and Shark Fishery (Zhou et al 2007). However, these cumulative sustainability assessments tend to have fairly high information requirements.

A study of the feasibility of evaluating cumulative bycatch across fisheries (Phillips et al. 2010) noted low levels of available information on bycatch interactions and mortality rates for any fisheries. Low coverage levels and the non-spatially representative nature of available observer data represent the greatest impediment to a cumulative assessment of bycatch in Commonwealth fisheries at present. A comprehensive assessment of cumulative catch is also likely to require inclusion of mortality estimates for state fisheries, particularly for sea turtles and sharks which frequently interact with state fisheries. Ideally, compatible data collection protocols and adequate levels of observer coverage would be needed in state fisheries in terms of spatial, temporal and species level resolution (Phillips et al. 2010).

14. Should the bycatch policy seek to determine the cumulative impacts of all fisheries and sectors under its mandate? If yes, how?

15. What methods or approaches are appropriate for evaluating cumulative impacts of Australian fisheries on bycatch species?

Performance evaluation and adaptive management

An important component of any ERM strategy is regular monitoring of trends in performance against reference points using performance measures, to measure the effects of any management actions taken. Regular measuring of progress in actually reducing risks and bycatch rates is needed to evaluate to what extent management actions implemented under ERM plans have achieved the objectives. Regular performance evaluation – adaptive management - allows a feedback loop to be established whereby management actions can be changed if performance against objectives is unsatisfactory, or to lessen restrictive management measures if established targets have been met (see Management strategy approaches on page 22).

The combination of ERA, setting of broadly agreed objectives, establishment of appropriate reference points, regular evaluation of performance against objectives and reference points and adaptive management to respond to indications of poor performance, can then also constitute implementation of an Ecosystem Approach to Fisheries (FAO 2003).

- 16. What guidance could be provided on implementation guidelines to the bycatch policy to help implement adaptive management approaches and how could we best monitor this activity?**
- 17. How could bycatch of various species in different fisheries be cost-effectively monitored, to monitor management performance under the bycatch policy, and to identify emerging bycatch issues?**

6 Implementing, reporting and evaluating

AFMA's management framework provides points for engagement with the fishing industry and other stakeholders (through management advisory committees) and formulation of scientific advice (through resource assessment groups). These provide potentially useful mechanisms for identifying, managing and monitoring bycatch issues. However, management to date has been largely focused on commercial species management under the harvest strategy policy. Combined with poor information for many bycatch species, high cost of increasing observer data collection and a lack of reference points and performance measures, this has impeded the evaluation of performance of bycatch mitigation measures.

The separate components to performance evaluation are:

- evaluating of progress in developing and implementing management plans and mitigation measures designed to achieve bycatch management objectives
- evaluating performance of these measures in achieving those objectives, and minimising bycatch risk, interaction rates and mortality.

More emphasis has been placed on evaluating and reporting implementation of management plans and mitigation measures, and substantial progress has been made on implementation. Less progress has been made on improving monitoring, and reporting performance, of mitigation measures in actually reducing bycatch rates.

One option for providing increased emphasis and opportunity for bycatch management performance evaluation is to establish a dedicated technical bycatch working group to provide expert review of draft bycatch action plans (or similar) before they are implemented and to regularly monitor their performance in achieving the objectives established in bycatch action plans (or similar).

18. Is there a need for an independent expert based technical panel to review draft bycatch action plans (or similar) before their release, and to evaluate performance of bycatch management measures in achieving objectives? How could such a panel function?

Bycatch reporting

You are invited to comment on requirements and options for improved monitoring and reporting of bycatch levels in each fishery, to improve performance evaluation of bycatch management measures implemented under the policy. To varying degrees, records of interactions with bycatch species (discards and releases) are available for most Commonwealth fisheries, mostly from self-reported logbooks and independent observer data. AFMA regularly reports this information on fishery interactions with protected species. However, determination of reliable estimates of total bycatch mortality is currently difficult due to some non-reporting, under-reporting and species identification issues (for logbooks), as well as the level of coverage and adequate spatial representativeness (for observer data). Electronic monitoring (using cameras) could be used to collect additional information at lower cost than observer programs and could also be used to validate or improve the quality of logbook data.

In fisheries for which high levels of data exist, or could be cost-effectively collected, management strategies could specify high level standards for data collection and analyses to enable sustainability assessments for managing the bycatch of selected high risk species. Alternatively, for data-poor bycatch species, a risk based approach might only need expert based groups to occasionally check available information on fishery interactions with indicator species to identify significant changes warranting a reassessment of risk.

19. In what ways could reporting of bycatch be improved?

Development of implementation guidelines

The harvest strategy policy is supported by guidelines for its implementation. The policy focuses on high level objectives, principles and obligations, whereas the guidelines provide detailed practical assistance, much of it technical in nature, for the development and implementation of effective harvest strategies under the policy.

It may therefore be valuable to develop implementation guidelines for a revised bycatch policy, analogous to those for the harvest strategy policy, which would be developed after adoption of a revised policy.

Technical aspects of the bycatch policy that could be dealt with in more detail in associated implementation guidelines could include:

- Development of appropriate reference points for bycatch management and performance evaluation.
- Guidance on application of ERAs, methodology to be used in different situations, dealing with uncertainty and evaluation of cumulative impacts.
- Approaches to conducting quantitative sustainability assessments and implementation of formal bycatch management strategies, for fisheries with adequate information.
- Development of cost-effective ERM approaches to addressing risk identified in risk assessments or sustainability assessments.
- Appropriate approaches to estimating bycatch interaction rates and mortality estimates.
- Guidance of performance evaluation, to measure the effectiveness of bycatch management plans and mitigation measures in achieving objectives.

The FRDC -funded project - , Standards and Guidelines for Bycatch Management in Australian Commonwealth Fisheries - could be a useful starting point for developing bycatch implementation guidelines. The project, which is intended to inform this policy review, and which is nearing completion, identified seven standards intended to help fishery managers take a structured and cost-effective approach to identifying emerging bycatch issues, assessing options to manage bycatch (including mitigation measures) and to assess the performance of those measures. Guidelines associated with each standard provide practical assistance in implementing those standards.

20. Should a revised bycatch policy include more technically complex requirements for the development and implementation of bycatch monitoring, assessment, mitigation and management plans than the current bycatch policy?

21. What components should be included in implementation guidelines for the bycatch policy?

Stakeholder engagement

Stakeholder support for the revised policy is critical for the success of determining acceptable fisheries impacts and implementing appropriate responses. A strategy for stakeholder engagement will be developed to develop guidelines for stakeholder engagement on bycatch issues and their management, as per the terms of reference.

22. Do you have any suggestion on how best to engage with stakeholders and the broader community?

Questions

Scope and purpose of the current Commonwealth Policy on Fisheries Bycatch – Page 2

1. To what extent do you think that the objectives and sub-objectives of the bycatch policy have been achieved?
2. What factors do you consider have facilitated and/or impeded progress against those objectives?
3. Are the objectives and scope of the current bycatch policy sufficient? If not, how could the scope and objectives be revised?
4. What do you think is the most important element or objective a bycatch policy should achieve and why?

Interaction with the Environment Protection and Biodiversity Conservation Act 1999 – Page 7

5. To what degree should EPBC Act requirements be reflected in the bycatch policy?

Bycatch Action Plans – Page 13

6. How could the effectiveness, against the objectives of the bycatch policy, of mitigation and management measures implemented under bycatch and discard work plans be better demonstrated?

Bycatch management costs – Page 14

7. Is there a private and/or public benefit to managing and monitoring bycatch?

Future policy objectives and considerations – Page 14

8. What should be the objectives of a revised bycatch policy?

Definition of bycatch – Page 15

9. Would you support use of the definitions, as detailed in Figure 2, to categorise catch and bycatch by commercial fishing operations? If no what alternatives would you suggest?

Transitioning between key commercial, byproduct and bycatch status – Page 16

10. Do you wish to comment on proposed approaches to managing the transition of species between being key commercial, byproduct and/or bycatch species?

Reference points and performance measures – Page 18 and 19

11. Should the bycatch policy provide for development and adoption of bycatch reference points and performance measures as a basis for managing fisheries interactions with bycatch species? If yes how?

Risk based approaches – Page 20 and 21

12. Should the bycatch policy and/or implementation guidelines include any additional requirements for, or guidance on, Ecological Risk Assessments and/or Ecological Risk Management processes for bycatch species? If yes, what additional provisions could be required?

Management strategy approaches – Page 22

13. Is available information and data adequate to implement formal management strategies for any fisheries bycatch species, and could adequate information, be collected on fisheries impacts on these bycatch species?

Cumulative impacts – Page 22

14. Should the bycatch policy seek to determine the cumulative impacts of all fisheries and sectors under its mandate? If yes, how?
15. What methods or approaches are appropriate for evaluating cumulative impacts of Australian fisheries on bycatch species?

Performance evaluation and adaptive management – Page 24

16. What guidance could be provided on implementation guidelines to the bycatch policy to help implement adaptive management approaches and how could we best monitor this activity?
17. How could bycatch of various species in different fisheries be cost-effectively monitored, to monitor management performance under the bycatch policy, and to identify emerging bycatch issues?

Implementation, reporting and evaluation – Page 25

18. Is there a need for an independent expert based technical panel to review draft bycatch action plans (or similar) before their release, and to evaluate performance of bycatch management measures in achieving objectives? How could such a panel function?

Bycatch reporting – Page 25

19. In what ways could reporting of bycatch be improved?

Development of implementation guidelines – Page 26

20. Should a revised bycatch policy include more technically complex requirements for the development and implementation of bycatch monitoring, assessment, mitigation and management plans than the current bycatch policy?
21. What components should be included in implementation guidelines for the bycatch policy?

Stakeholder engagement – Page 26

22. Do you have any suggestion on how best to engage with stakeholders and the broader community?

Appendix: Core objectives and guiding principles of the Commonwealth Policy on Fisheries Bycatch

Core objectives of the Commonwealth Policy on Fisheries Bycatch

An overarching objective of the policy is to ensure that bycatch species and populations are maintained. Within this are the following sub-objectives:

1. To reduce bycatch. This could be by:

- developing, adopting, monitoring, reviewing and improving mitigation measures (eg Turtle Excluder Devices -TEDs, Bird Scaring Lines, appropriate area and seasonal closures, changing ways of fishing);
- reviewing the management of fisheries so that management measures incorporate bycatch reduction strategies and do not encourage discarding;
- increasing understanding of the reasons for bycatch in a particular fishery (eg monitoring changes in the level and composition of bycatch over time);
- ensuring that as markets develop for by-product, those species are managed formally as commercial species;
- incentive programs for fisheries, applying target species management arrangements and other measures to bycatch species where deemed necessary; and/or
- where appropriate, developing regulations under fisheries legislation to achieve bycatch reduction outcomes.

2. To improve protection for vulnerable species by:

- gathering data on the impact of fishing (and other sources of mortality or impact) on populations which may be vulnerable to fishing (or other) pressures;
- developing, implementing, monitoring and improving appropriate mitigation measures, including those implemented under fisheries regulations;
- education/awareness programs; and/or
- improved liaison, collaboration and development of cooperative arrangements with other agencies and stakeholders.

3. To arrive at decisions on the acceptable extent of ecological impacts by:

- using the best available knowledge within the framework of a precautionary approach;
- using appropriate biological reference areas (eg marine protected areas/multiple use zones);
- using biological reference points or the precautionary principle for management of bycatch species;
- identifying gaps in knowledge and, where feasible, collecting the appropriate data to reduce uncertainty in the management decision process;
- monitoring the impacts of fishing pressure on bycatch species; and/or
- emphasising the need for appropriate solutions (eg educational, economic incentives and engineering solutions) to the bycatch issue

Guiding principles

These guiding principles provide the philosophy which currently underpins the policy.

Decisions and actions to address bycatch will:

- foster stewardship of Australia's marine resources to maintain and improve the quality, diversity and availability of fisheries resources, and the integrity of the marine ecosystem into the future;
- promote cooperative and transparent approaches, involving all stakeholders, to ensure effective stewardship of our marine resources;
- manage marine resources so that short-term considerations are consistent with long-term goals, and apply the precautionary principle in the management of fisheries resources;
- recognise the unique biological, ecological, economic and social nature of individual fisheries by developing bycatch-action plans to address bycatch issues;
- encourage cooperation in the development of complementary arrangements between relevant authorities to ensure that, where stocks overlap or are split between jurisdictions or are migratory, effective management strategies are applied across jurisdictions. These include State and Territory agencies, other fisheries management agencies, and international bodies;
- use robust and practical biological reference points relating to bycatch, where possible, to make decisions on bycatch management. Develop biological reference points in consultation with stakeholders, recognising that in many cases there are limitations to the costs of determining these reference points. Where the use of biological reference points is not feasible, the precautionary principle will be used as a basis for decision making.

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