Australian Government
Australian Fisheries Management Authority

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21 December 2012

Ms Sophie Dunstone
Committee Secretary
Senate Standing Committee on Environment and Communications
PO BOX 6100
Parliament House Canberra ACT 2600

Dear Ms Dunstone

Inquiry into the effectiveness of threatened species and ecological communities' protection in Australia

Thank you for your letter of 7 November 2012 inviting AFMA to provide a submission to the Senate Standing Committee on Environment and Communications.

The AFMA submission on the inquiry into the effectiveness of threatened species and ecological communities' protection in Australia is provided as an attachment to this letter.

If you have any further questions please do not hesitate to contact me or Nick Rayns

Yours sincerely

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Australian Government

Australian Fisheries Management Authority

AFMA Submission – Inquiry into the effectiveness of threatened species and ecological communities' protection in Australia

GENERAL COMMENTS

The Australian Fisheries Management Authority (AFMA) was established under the *Fisheries Administration Act 1991* to manage the resources of Australia's Commonwealth fisheries on behalf of the Australian community using the provisions of the *Fisheries Management Act 1991* (FM Act). In general, AFMA manages commercial fisheries from three nautical miles offshore to the boundary of the Australian fishing zone and Australian vessels fishing on the high seas. State and Northern Territory governments manage fisheries within their borders and inside three nautical miles from shore.

Up until the late 1900s fisheries agencies in Australia had virtually sole responsibility for the management of fisheries resources and the impacts of fishing on the natural environment. The objectives of all fisheries legislation at that time reflected this and still does today. The FM Act includes the objective:

> "*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 (which include 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".*

In 1999 the Commonwealth consolidated its environment legislation in the *Environment Protection and Biodiversity Conservation Act* (EPBC Act) and became more directly involved in the management of Australian fisheries. Since that time Australian fisheries have been managed under the legislation of the relevant fisheries management jurisdiction as well as that currently administered by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC).

Under the EPBC Act, fisheries impacts are assessed through three separate processes as outlined in Part 10, Part 13 and Part 13A. All of these consider the effect of fisheries on the marine environment, protected species and communities and the ability of fisheries management to minimise the risk of unacceptable impacts. Moreover, individual species within those fisheries may be separately assessed through nomination as threatened species or a method of fishing as a Key Threatening Process.

AFMA's current management arrangements for Commonwealth fisheries have developed significantly over the last decade to focus on an ecosystem based approach to fisheries management. This approach assesses the total impacts of fishing on all aspects of the marine environment and that effective management strategies are in place that ensure ecologically sustainable fisheries.

Through these strategies AFMA ensures that current management arrangements for Commonwealth fisheries at least meet, and often exceed, all environmental management conditions imposed under the EPBC Act. However, the overlap and duplication between

fisheries management (both Commonwealth and State/Territory) legislation and the EPBC Act creates considerable inefficiency and uncertainty for both governments and stakeholders, particularly the Australian fishing industry.

This submission provides details on the existing ecosystem based management framework and outlines areas for further improvement. Key areas for improvement include harmonising existing environmental and fisheries regulations to improve efficiency and prioritisation of management actions that ensure adequate protection is given to protected threatened species and ecological communities whilst recognising the economic benefits of the Australian fishing industry. Specific comments are outlined against each of the inquiries terms of reference.

SPECIFIC COMMENTS

(a) management of key threats to listed species and ecological communities;

Existing management arrangements for threatened species and ecological communities impacted by Commonwealth fisheries

In accordance with its objective to pursue ecologically sustainable development, AFMA has progressively moved to an ecosystem based approach to fisheries management through the development and implementation of the *Ecological Risk Management (ERM) framework* (**Attachment 1**). The ERM framework complements the existing *Commonwealth Policy on Fisheries Bycatch* and strengthens the procedures for assessing environmental risks and implementing appropriate management actions.

Under the ERM framework the impacts of Commonwealth managed fisheries on all aspects of the marine ecosystem are assessed through Ecological Risk Assessments (ERA). This includes the assessment of impacts on:

- Target species
- Bycatch and byproduct species;
- Threatened Endangered and Protected (TEP) species;
- Habitat; and
- Ecological communities.

Management strategies for commercial species are developed in accordance with the *Commonwealth Harvest Strategy Policy* and are outlined in each fisheries harvest strategy or statement of management arrangements.

Following the ERA, an ecological risk management strategy is developed for each fishery that outlines the management strategies to address identified risks to all aspects of the marine ecosystem. Management responses to identified issues can be implemented through regulation and other management tools in the FM Act e.g. fisheries closures to protect sea lions and gulper sharks as well as industry initiatives.

Specific actions to minimise bycatch, reduce the risk to TEP species and address potential high risk species identified through the ERA, are developed through fishery based bycatch and discards workplans. The bycatch and discard workplans were introduced in the Commonwealth Policy on Fisheries Bycatchand are a core component of a fisheries ERM strategy.

Management actions implemented through bycatch and discards workplans are developed through close engagement with the fishing industry and include innovative gear modifications that reduce bycatch, improvements to monitoring and species identification and implementing tools such as turtle excluder devices (TEDs) that reduce the capture of TEPs. The unintended capture of marine turtles in trawl nets in the northern prawn fishery has reduced dramatically through the use of TEDs that provide a barrier at the net opening with an escape hatch above it allowing turtles to escape. In the year prior to the introduction of TEDs, 780 marine turtles were reported captured in logbooks with 96 fatalities. In 2000 directly after the mandatory introduction of TEDs, 56 captures were reported with 12 fatalities[1].

All Commonwealth fisheries subject to the FM Act have ERM strategies in place and have undergone ecological risk assessments ranging from qualitative assessment of risks in all fisheries to a fully quantitative assessment in higher impact fisheries. Bycatch and discards workplans have been implemented in each fishery.

The ERM framework relies on information and data collected through continual monitoring of fishing catch and effort. The effectiveness of existing management measures is regularly reviewed with alternative approaches implemented where necessary through a process known as the adaptive management cycle (Figure 1). The ability to reliably assess the impacts of fishing and whether management arrangements are having the desired effects is crucial and AFMA has invested heavily in reliable monitoring processes.

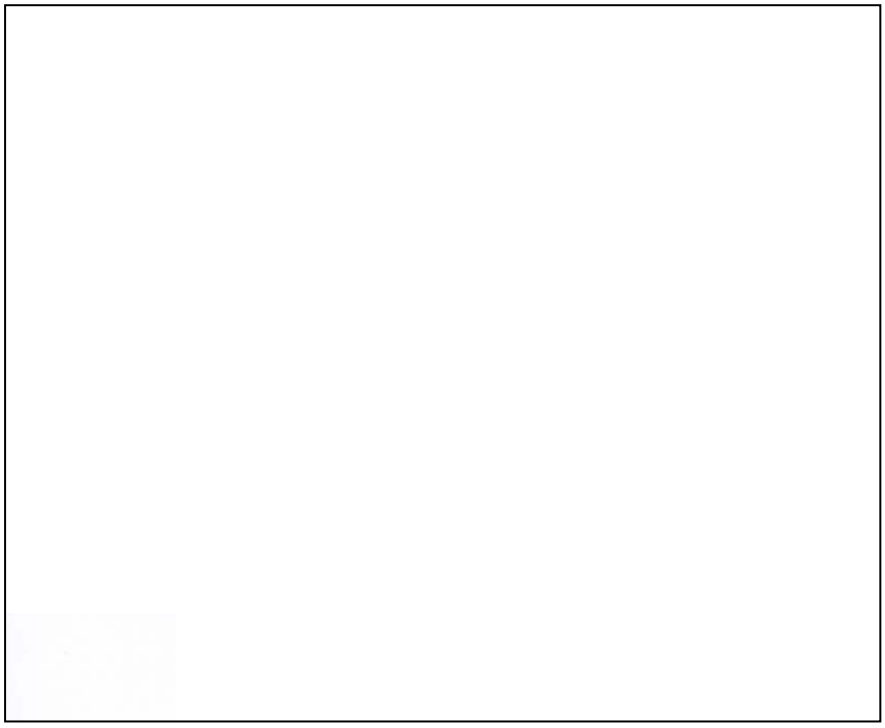


Figure 1. The double Adaptive loop management process adopted by AFMA (from Sainsbury 2005[2])

[1] Garvey, J., R and Lilly, S., D. (2001). Northern Prawn Fishery and Kimberley Prawn Fishery data summary 2001. Logbook program Australian Fisheries Management Authority, Canberra.

[2] Sainsbury, K. J. (2005). Cost-effective management of uncertainty in fisheries. In: National Outlook Conference, Canberra, ACT. Australian Bureau of Agricultural and Resource Economics. Pp. 13.

Monitoring and reporting of the catch of threatened species

Comprehensive monitoring programs are established in Commonwealth fisheries that ensure reliable data is collected to support scientific assessments and decision making. This includes a logbook program where fishers report total catch and effort data including interactions with protected species and an on-board observer program to collect independent data on catch and interactions.

AFMA is continuously working to improve monitoring programs and has completed trials of electronic monitoring (EM) systems in the Northern Prawn Fishery (NPF), Gillnet Hook and Trap Sector of the Southern and Eastern Scalefish and Shark Fishery (SESSF) and the Eastern Tuna and Billfish Fishery. EM systems include the use of multiple video cameras and sensors to monitor catch and effort allowing up to 100% of fishing activity to be monitored in a cost effective fashion. A sample of the video footage is analysed post capture to identify potential interactions with protected species and independently record data on catch and effort. This audit approach is demonstrated to improve the reliability of self-reported logbook data whilst potentially monitoring up to 100% of fishing effort and ensuring reliable information on the impacts of fishing. AFMA is in the process of rolling out EM technology in selected fisheries.

Since August 2005, AFMA, on behalf of fishing operators, has been reporting protected species interactions reported in the logbooks to SEWPaC. This streamlined arrangement has removed the obligation for industry to dual report to both AFMA and SEWPaC. However, it does not remove the reporting obligation.

Under the arrangements contained within a Memorandum of Understanding (MOU), AFMA provides SEWPaC with quarterly reports that summarise protected species interaction information reported through AFMA logbooks. All quarterly summary interaction reports provided to SEWPAC are posted on the AFMA website at: http://www.afma.gov.au/managing-our-fisheries/environment-and-sustainability/protected-species.

In addition, AFMA provides individual interaction reports to SEWPAC under the MOU's agreed triggered reporting arrangements. This occurs when the number of interactions with certain species in any period reaches an agreed threshold level. Species covered under triggered reporting are all whale species, all dolphin species, Great White sharks and Grey Nurse sharks.

Through the ERM framework, Commonwealth Policy on Fisheries Bycatch and Harvest Strategy Policy, AFMA has a comprehensive and precautionary management framework that pursues ecologically sustainable fisheries and ensures that risks to all aspects of the marine environment are assessed and managed.

Areas for improvement

AFMA has progressively moved to a risk based approach for assessment and management of threats to the marine environment posed by commercial fishing. However, some elements

of the assessments conducted under the EPBC Act are inconsistent with this approach and result in duplication of management efforts and inefficiencies that are detrimental to prioritising efforts to protect threatened species. A general summary of these issues that was included in the AFMA submission to the Borthwick review of Commonwealth fisheries management legislation (the Borthwick review) is provided at **Attachment 2**.

The EPBC Act seeks to minimise harm and mortalities thereby forcing a continual cost to be incurred even when very few additional individual mortalities may be prevented. An objective that provided for an acceptable level of mortality of TEP species would enable AFMA to more efficiently direct its research and cost-effectively manage its fisheries in a manner that ensures ecological sustainability.

AFMA recognises that necessary information may not always be available to set an acceptable level of mortality for all marine wildlife. In such cases a risk based approach that expressly considers benefits such as fishery closures and marine protected areas (offset approach) could achieve this objective. As a precondition a fishery would need to demonstrate that all reasonable measures are taken to minimise interactions. Further impacts would be considered acceptable provided sufficient alternative safeguards or 'offsets' were in place to protect the species. This approach can be applied to managing the impacts of habitats and communities where existing closures and marine parks provide protection.

The applicability of using reference points for bycatch of protected species as well as commercial stocks is well established. The *Threat Abatement Plan 2006 for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations* is one such example were a limit reference point has been defined for the maximum interaction rate with seabirds. This has proved very successful at reducing the risk to seabirds to acceptable levels and recognises that some impact may be acceptable and defines what that is. This is a more practical way of ensuring that resources are applied appropriately and to areas of genuine high risks. Without defining a limit reference point or acceptable impact, government and industry resources can be misapplied in effort to reduce interactions well below a rate that might be biologically acceptable or necessary. In some cases this can be, and has been, to the detriment of other environmental impacts that would benefit from additional funding from a limited pool of funding.

In summary there are benefits to defining acceptable impacts on TEP species through reference points and accounting for environmental benefits provided through fishing closures and marine parks.

Commonwealth fisheries are undergoing a combination of reviews where all aspects of the legislation and key policies are simultaneously under review. This affords a unique opportunity to harmonise existing environmental legislation with fisheries legislation and address the threatened species listing criteria for marine fish. As reviews of the Commonwealth Harvest Strategy Policy and Guidelines and the Commonwealth Policy on Fisheries Bycatch are completed, AFMA will continue to strengthen the role of the ERM framework and harmonise its operation with the Commonwealth Policy on Fisheries Bycatch.

(b) development and implementation of recovery plans

Under the Commonwealth Fisheries Harvest Strategy Policy and Guidelines (HSP), formal rebuilding strategies are required to be developed for all domestically managed species which are below their biomass limit reference point. Stock recovery plans currently exist for Orange Roughy, Blue Warehou, Southern Bluefin Tuna, Eastern Gemfish and School Sharks. A stock recovery plan is currently being developed for two Gulper Shark species. It should be noted that a limit reference point under the HSP is not related to the future risk of extinction of the species.

Formal rebuilding strategies developed through the Commonwealth harvest strategy and international collaboration (where applicable for international stocks) are the most effective approaches for recovering commercially exploited species. Stock rebuilding strategies are proving effective for species such as Orange Roughy and Southern Bluefin Tuna (SBT).

SBT is a migratory species that is fished by different countries across its range. Due to heavy historical fishing effort the spawning stock was reduced to well below the limit reference point. International collaboration on management arrangements was formalised in the mid -1990s with the establishment of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) and the introduction of a global Total Allowable Catch (TAC) limit. Following scientific advice in 2009 that the spawning stock was estimated to be depleted by 95% the TAC was cut by 20% and a stock rebuilding strategy was developed. The rebuilding strategy was agreed by all member nations of the Commission and came into effect in 2011. The rebuilding strategy is now used to establish annual global catch limits that will ensure the spawning stock rebuilds to above the limit reference point. Initial data on the stock is positive with higher than average numbers of juvenile fish detected over the past 5 years and the agreed rebuilding strategy will ensure the catch is limited to a level that allows the stock to reach the rebuilding target.

In summary it would be beneficial to maintain recovery of commercially fished stocks within the Commonwealth Harvest Strategy Policy Framework.

(c) management of critical habitat across all land tenures

The ERM framework considers impacts on marine habitat through qualitative assessment in the ERA process. AFMA is continuing to investigate options for managing the impacts on marine habitat including through fisheries closures and working with SEWPAC on the implementation of the Commonwealth Network of Marine Reserves.

(d) regulatory and funding arrangements at all levels of government

There is considerable overlap in between fisheries management and assessment functions conducted by SEWPAC and AFMA. This creates inefficiency that is exacerbated by the current need to conduct several EPBC Act approval processes for each individual fishery. The result is a long and costly process for both governments and fishery stakeholders.

The EPBC Act considers the effect of fisheries on the marine environment, protected species and communities and the ability of fisheries management to minimise the risk of unacceptable impacts. These requirements are outlined in Part 10, Part 13 and Part 13A of the EPBC Act. Currently assessments against these parts are required for each fishery. The potential for duplication and/or inconsistency in decision making is obvious and evidenced by Part 13 approvals having almost no conditions while various conditions are placed on Part 13A approvals. The inefficiency of the current multilayered approval processes against the EPBC Act needs to be addressed by replacing it with a single environmental approval process for each fishery.

Moving to a one step, five-yearly accreditation of AFMA and State/Territory management systems under the EPBC Act would remove the current inefficiency, inconsistency and uncertainty for Australia's fisheries and reduce cost and red tape for both government and stakeholders. The development and implementation of national marine environmental standards and national fisheries assessment criteria will ensure adequate environmental protection is being provided under the EPBC Act and fisheries legislation. These policies should specify the practical environmental outcomes sought under the EPBC Act and set common timeframes for achievement of actions/outcomes and reporting in all jurisdictions. This approach would allow SEWPAC to shift its focus away from day-to-day fisheries management wherein different and often unique conditions are placed on individual fisheries. It should be noted that it is the activity that is subject to the EPBC Act and not the government regulator (e.g. AFMA). However, EPBC Act conditions are often written so as to place conditions on the regulator rather than on the activity which is a legally unsound approach.

There has been apparent inconsistency in the assessment of Australian sea lions under the EPBC Act across State and Commonwealth jurisdiction where the same fishing method is employed. A case study outlining the different management approaches taken through application of the EPBC Act to minimise gillnet fishing impacts in different jurisdictions is provided at **Attachment 3**.

Given that national environmental standards and conditions would take some time to develop and implement, in the shorter term, consideration could be given to the establishment of a joint Science Advisory Group to provide advice to both AFMA and SEWPAC on the ecological risks from fishing including bycatch of threatened, endangered and protected species. A joint approach would provide a forum for coordinated expert consideration and ensures multi-disciplinary resolution of complex natural resource management issues. Draft Terms of Reference for such a group were proposed in the submission to the Borthwick review and are provided at **Attachment 4**.

In summary consideration could be given to developing and implementing practical national marine environmental standards and policies and accrediting fisheries management systems against them.

(e) timeliness and risk management within the listing processes

The AFMA ERM framework provides a comprehensive risk assessment process that has qualitatively and quantitatively assessed the risks from impacts of fishing for over 2,000

species as well as habitats and communities. The ERAs identify species at potential high risk and prompt an ERM response to address the threats and ensure the impacts are within acceptable limits. Where a threat is identified, Commonwealth fisheries legislation allows for rapid intervention to halt fishing effort through measures such as a fishing closure or to reduce catches through a reduction in the catch limit. The fisheries ERM framework allows for a high degree of control over the management of risks and threats that delivers results with immediate effect and considerably faster than is possible in the terrestrial environment or through the EPBC Act listing process.

There are some significant challenges with the existing threatened species listing process under the EPBC Act that do not effectively account for the biological characteristics of marine species. This has the potentially detrimental effect of identifying false positives and directing resources away from where they are most required. The key examples of this include challenges with the listing of migratory species such as Mako Sharks and not recognising the biological characteristics of marine fish.

A recent development with the proposed listing under the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) of a number of commercially harvested marine species (Long-finned and Short-finned Mako Sharks, Porbeagles and Spiny Dogfish) has highlighted a difficulty for the EPBC Act. Under s209(3) the list of migratory species must include all migratory species that are (i) native species and (ii) from time to time included in the appendices to the Bonn Convention. There are two possibilities for listing species on the Bonn Convention, either

- Appendix I , which means strict protection; or
- Appendix II, which means international cooperation would benefit the species.

When this Section was introduced it was intended to automatically pick up migratory species as they were listed and provide the appropriate level of protection for these species. However, the scope of listing under Appendix II of the Bonn Convention is such that a large number of commercially harvested marine species would qualify. All Commonwealth fisheries have Part 13 accreditations under the EPBC Act allowing for interactions with migratory species. However, this accreditation does not allow for transport or sale of these species. Australia is thus imposing a higher level of protection for these species than is required under the Bonn Convention and disadvantaging Australian fishers.

This issue was identified in *the Independent Review of the Environment Protection and Biodiversity Conservation ACT 1999* and Minister Burke has announced, in his response to the review, that the EPBC Act will be amended to address this anomaly.

There are several procedural issues which need to be addressed when considering the listing of marine finfish species. Firstly, the criteria for classifying a species as endangered under the EPBC Act are subjective. The provisions of the EPBC Act reflect the historic focus on threats to high order terrestrial species such as mammals, and are less appropriate for marine fish due to clear biological and reproductive differences. Further detail is provided in **Attachment 2**.

This issue is acknowledged in the EPBC Act itself under s180, which provides for the making of regulations that specify criteria for native species of marine fish. However, such regulations have not yet been drafted, leaving the Threatened Species Scientific Committee

to determine whether a nominated species has "... undergone, is suspected to have undergone or is likely to undergo in the immediate future, a severe reduction in numbers". Such criteria do not necessarily facilitate objective assessment on a scientifically rigorous and biologically relevant basis. While the EPBC Act clearly provides for the development of specific assessment criteria to direct the nomination and assessment process for the listing of marine fish this has not occurred in the 13 years since the legislation was enacted.

In summary there is a need for biologically appropriate criteria to be developed and implemented to ensure, effective and efficient application of the listing process to marine fish.

(f) the historical record of state and territory governments on these matters

AFMA has no specific comment on this matter.

(g) any other related matter

There are no other matters on which AFMA wishes to comment.

CONCLUSION

The AFMA ERM framework provides a comprehensive and precautionary management approach that assesses the risks to all aspects of the marine environment including threatened species and ecological communities and ensures management responses are implemented. The ERM framework and the management response are highly adaptive and are continuously revised as updated information becomes available.

The EPBC Act provides strong and necessary protection to threatened species through the threatened species listing process and assesses ecological communities through the strategic assessment process. However, there are some areas of inefficiency and duplication in environmental regulation that risk diverting attention and resources from high risk areas that need reconsideration.

In conclusion whilst AFMA has developed in place an effective framework for managing the impacts of Commonwealth fisheries on threatened species and ecological communities, there is need to harmonise this with the existing environmental regulations and strengthen nationally cohesive management for fisheries. Options to achieve these objectives include:

- Defining acceptable impacts on TEP species through reference points and account for environmental benefits provided through fishing closures and marine parks.

- Maintain recovery of commercially fished stocks within the Commonwealth Harvest Strategy Policy and Guidelines.

- Develop and implement practical national marine environmental standards and policies and accredit fisheries management systems against them.

- Amend the EPBC Act as proposed to avoid unintended and unnecessary protection of marine migratory species.

- Develop and implement criteria to ensure biologically appropriate, effective and efficient application of the listing process to marine fish.

- Capitalise on the opportunities presented through current fisheries reviews of legislation and policy to improve the efficiency and effectiveness of protection for threatened species and ecological communities.

ATTACHMENTS

1. AFMA's Ecological Risk Management Framework

2. Integration of the various sections of the EPBC Act

3. Different approaches to managing the risks of gillnet fishing to Australian Sea Lions under the EPBC Act

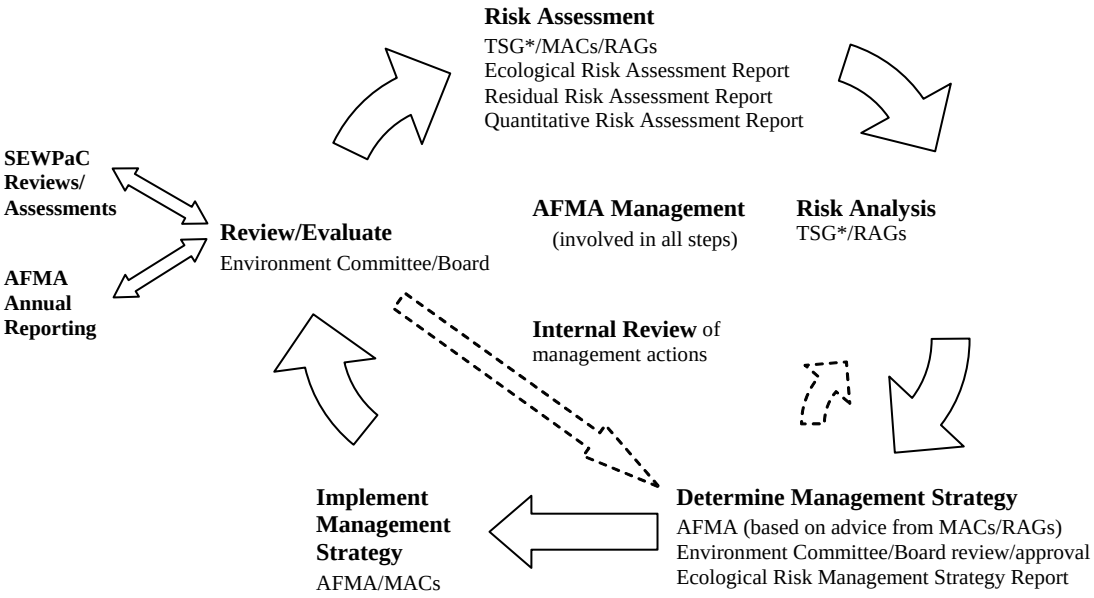
4. Proposed Terms of Reference for Scientific Advisory Group

Ecological Risk Management

A key initiative driving the implementation of the ecological component of Ecologically Sustainable Development (ESD) in Commonwealth managed fisheries is the implementation of an Ecological Risk Management (ERM) framework. The framework details a process for assessing and progressively addressing the impacts that fisheries' activities have on five aspects of the marine ecosystem: target species, byproduct and discard species, protected (TEP) species, habitats and communities.

Key to AFMA's implementation of ESD has been to develop and implement an ecological risk management (ERM) framework (refer to **Figure 1**). The framework details a robust and transparent process to assess, analyse and respond to the ecological risks posed by Commonwealth managed fisheries.

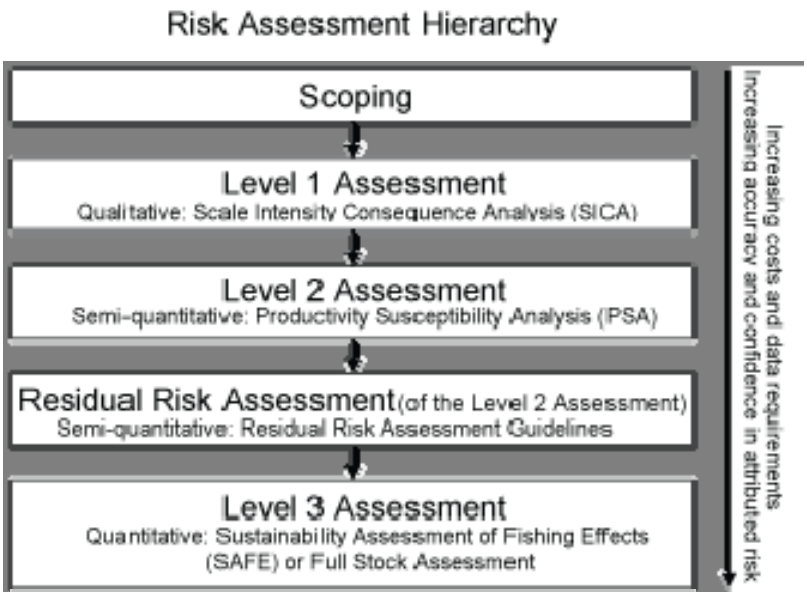
Figure 1: Ecological Risk Management framework



*TSG – Technical Support Group – currently provided by CSIRO

The ERM framework progresses through a number of steps and involves a hierarchy of risk assessment methodologies progressing from a comprehensive but largely qualitative analysis at Level 1 to a quantitative analysis at Level 3 (refer to Figure 2). This approach is a means of screening out low risk activities and focusing more intensive and quantitative analyses on those activities assessed as having a greater environmental impact on AFMA managed fisheries.

Figure 2: Risk assessment hierarchy



The Fishery Risk Assessment Methodology

The initial assessment stage involves the development of a qualitative ecological risk assessment (ERA) for each individual fishery. ERAs assess the impact, direct and indirect, that a fishery's activities may have on the marine ecosystem. These assessments provide the foundation for further risk assessment and analysis. ERAs have now been completed for all major Commonwealth managed fisheries. The process that has been applied is detailed below.

Scoping

At the **scoping** stage, a profile is developed for each of the fisheries being assessed. This includes gathering the information needed to complete more detailed level one and two assessments. Analysis focuses on the characteristics of the individual fishery, which may be divided into sub-fisheries based on fishing method and/or spatial coverage if this is more appropriate for assessment. At this stage, the general fishery characteristics are documented, and a list of all "units of analysis" (all species, habitat types and communities present in the fishery) is generated. Hazards and objectives for the fishery are also identified (for more detail refer to Hobday *et al*., 2007).

Level 1 – Scale, Intensity, Consequence Analysis (SICA)

Level 1 is a qualitative assessment of scale, intensity, consequence analysis that identifies which hazards (activities) lead to a significant impact on any species, habitat or community. This involves an assessment of the risk posed by each identified fishing activity on each of the ecosystem components. At this level, analysis is conducted on whole ecosystem components (target; bycatch and byproduct; TEP species; habitats and communities), not at the individual species level. Level 1 is used as a rapid screening tool, with a "worst case" approach used to ensure only genuine low risk elements (either activities or ecosystem

components) are screened out. This analysis uses the most vulnerable sub-component and the most vulnerable unit of analysis within each component (e.g. the most vulnerable species, habitat type or community). Further to this, where judgements about risk are uncertain, the highest level of risk regarded as plausible is used (for more detail refer to Hobday *et al*., 2007).

Level 2 – Productivity Susceptibility Analysis (PSA)

Level 2 PSA is a semi-quantitative analysis of the risk posed by fishing to all individual species, habitats and communities identified in the scoping stage. Level 2 PSA allows all units (species, habitats or communities) within any of the ecological components to be effectively and comprehensively screened for risk. Level 2 PSA assesses the direct impact of fishing and is based on the assumption that risk to an individual unit is based on two characteristics of the unit:

- **Susceptibility:** where the extent of the impact on an ecological unit is determined by the susceptibility of the unit to the fishing activities; and
- **Productivity:** which determines the rate at which the unit can recover after potential depletion or damage by fishing activities.

For the Level 2 assessment, each unit within the ecological component is assessed for the risk it faces from the fishery. The Level 2 PSA approach examines a number of attributes of each unit that contribute to or reflect its *susceptibility* or *productivity*. A score on a three point scale (low, medium, high) is determined for each unit for both productivity and susceptibility which combined provides a relative measure of risk for each unit. The Level 2 PSA risk scoring system is precautionary in that, where there is no information known on a specific productivity or susceptibility attribute for a unit, it is given a default score of 'high risk'.

Level 2 PSA Residual Risk Assessment

In 2007 AFMA, with input from CSIRO and stakeholders, developed a set of guidelines to assess the residual risk for species identified as having a high potential risk based on the Level 2 analysis. The guidelines have been designed to ensure that a consistent, transparent and repeatable process is adopted across all fisheries. A summary of the guidelines is given in **Table 1**. Within each category there are clear decision rules that can be applied to a species (if relevant) to calculate Level 2 PSA residual risk. Each of the guidelines was applied on a species-by-species basis to determine the Level 2 PSA residual risk within the fishery.

When determining the Level 2 PSA residual risk, all considerations included in the calculation process must be recorded, along with the guidelines applied with a detailed justification clearly stated. This ensures that a transparent process is maintained. In review of the ERA results, the guidelines have been applied to all high risk species by managers in consultation with MAC members and experts. Broadly the application processes involved the following steps:

- Sorting the ERA result by high risk, then grouping the high risk species by role within the fishery, then by taxonomic group;

- Creating a list of all management arrangements not included in the Level 2 PSA results for reference when applying the guidelines;
- Considering each management arrangement to relevant high risk species;
- Collating spatial information from experts, observer and logbook data for all high risk species for reference when applying the guidelines;
- Deciding if and what guideline applies to each of the high risk species by conducting a species-by-species application;
- Making changes to the necessary attributes, productivity and susceptibility scores to calculate the Level 2 PSA residual risk score;
- Recording all workings, guidelines used, how they have been applied and a justification for the Level 2 PSA residual risk score;
- Providing preliminary Level 2 PSA residual risk results to MACs for feedback; and
- Finalising the Level 2 PSA residual risk results for release.

Constraints of Level 2 PSA Results

The methodology used in the Level 2 PSA assessment results in risk scores of high, medium or low to reflect potential rather than actual risk. Quantifying the actual risk for any species requires a Level 3 assessment. Due to the semi-quantitative nature of the Level 2 PSA risk assessment, analysis does not take into account all management measures currently in place in fisheries, which may result in an over-estimate of the actual risk for some species. The management arrangements that are not accounted for in the Level 2 assessment include:

- Limits to fishing effort;
- Catch limits (such as Total Allowable Catches - TACs); and
- Other controls such as seasonal closures.

Management arrangements that *are* accounted for in the assessment include:

- Spatial management that limits the range of the fishery (affecting availability);
- Gear limits that affect the size of animals that are captured (selectivity); and
- Handling practices that may affect the survival of species after capture (post capture mortality).

As a result, the Level 2 PSA is intentionally designed to generate more **false positives** for high risk (species assessed have a high risk when they are actually low risk) than **false negatives** (species assessed to be low vulnerability when they are actually high vulnerability). This is due to the Level 2 PSA methodology adopting a **precautionary** approach to uncertainty. An example of this is when a species is missing information on its productivity and susceptibility attributes the risk score defaults to a higher risk.

In addition, TEP species are included within the assessment on the basis that they occur in the area of the fishery, whether or not there has been a recorded interaction with the fishery. For this reason there may be a higher proportion of false positives for high risk TEP species, unless there is a robust observer program that can verify that species do not interact with the fishing gear.

When AFMA reviewed the methodology using example fisheries, some additional concerns arose. Since the original Level 2 PSA results were produced there is now an improved understanding of: new or updated catch data available from log books and catch records; advances in scientific knowledge that may have become available; and more resolution on the spatial distribution of species etc. Each of these issues is discussed below.

Improved data

The ERA process adopts a precautionary approach if there is uncertainty about an attribute the higher risk score is used. At the Level 2 PSA when a species is missing either a productivity or susceptibility attribute the score defaults to a high risk category. Furthermore, species attributes that were originally calculated for the fishery may be out-of-date because additional or more precise information has become available.

Additional information

Since the time of the original ERA assessment, additional information may now be available as a result of other investigations and research etc.

Spatial assumptions

The Level 2 PSA utilises a precautionary approach when calculating susceptibility by assuming species distribution is only within the jurisdictional boundary of the fishery. While this is appropriate for species that form discrete populations or stocks, the risk score for species that extend beyond the boundary of the fishery such as pelagic and migratory species is not.

Interaction and catch data

Some species have a low to negligible level of interaction with the fishing gear. Species with very low biological productivity may however still be scored high or medium risk irrespective of their low susceptibility. Considering that the likelihood of interaction is already low there is little additional management that a fishery can introduce to mitigate the risk. Therefore the level of interaction or capture should be included as part of the Level 2 PSA residual risk process.

Management arrangements

As stated above, effort and catch limits for target and byproduct species are not taken into account in the ERA even though these arrangements may mitigate risk for some species. The Level 2 PSA residual risk process allows many of these management arrangements to be incorporated into the assessment.

Some management arrangements concerning the mitigation of bycatch have been incorporated into the initial ERA process; however, they may now be out-of-date since the initial ERA assessment. The Level 2 PSA residual risk process incorporates some of these management arrangements into the results to better represent the overall risk for a species.

There may be a beneficial overlap of management arrangements for individual species that were not a specific target of that arrangement if there is a high degree of association between the species. In some instances the initial ERA may not have considered the benefit of management arrangements between associated species.

Although seasonal, spatial and depth closures have been considered in the initial ERA, more recent management measures have not been accounted for. The Level 2 PSA residual risk process will consider some of these arrangements and will bring the assessment up-to-date.

Level 3 – Quantitative Risk Assessment

At the conclusion of the Level 2 PSA assessment, a number of units may have been identified as being at high risk because of the activities of the fishery. At this stage a Level 3 analysis may be warranted. This can take various forms including a quantitative sustainability assessment for fishing effects (SAFE) developed by CSIRO to assess multiple species or a fully quantitative assessment of a specific species (similar to a standard stock assessment). Quantitative risk assessments constituting the equivalent of a Level 3 risk analysis currently exist for many species. Before proceeding to a fully quantitative Level 3 assessment, investigation of suitable existing information to further understand the risk scores for high risk units should be identified. This may help to overcome some of the constraints of the Level 2 PSA results (outlined below) prior to proceeding to more costly Level 3 analysis for the remaining high risk units.

Fishery Risk Assessment Reports and Management Strategies

Risk assessments have now been completed to at least the Residual Risk Assessment Level 2 for all major Commonwealth fisheries, with most having undergone further quantitative risk assessments. The result of these risk assessments is a priority list identifying the key ecological areas in each fishery that require management attention. Ecological risk management strategies have now been developed to address the priority lists identified for each fishery.

Once identified, species that form the priority list for each fishery will be managed either through fishery specific arrangements or under one or more of the following policies or measures:

- Harvest Strategy Policy and Guidelines;
- Non-key Commercial Species (byproduct) Policy;
- Bycatch and Discard Program;
- Shark Policy and the Chondrichthyan Guide for Fisheries Managers; and
- Protected (TEP) species under various international plans of action, recovery plans etc.

This ERM strategy clearly identifies how each species or group of species may be managed under the policies or measures described above.

ERM strategies to address those remaining species identified as at medium or low risk may be implemented at a later date. Due to limitations in the ERA methodology, for assessing the impacts of fishing operations on habitats and communities, AFMA will defer the development of an ERM strategy for these components until more refined and meaningful results become available.

Measuring individual mitigation strategies

In managing the priority species identified in each fishery AFMA prepared reports with clear performance measures which address both long and short term goals and aims. Ongoing monitoring and review of the mitigation measures will occur. In the medium to longer term these results will also be used when assessing any change of status of a species eg. where a bycatch or byproduct species moves to become a target species. Mitigation actions can be taken for individual species or groups of species.

Outcomes of the ERM strategies and measures described in each fishery's various work plans and Harvest Strategies will flow into a number of processes including annual reporting to the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC, formerly DEWHA).

It is expected that each fishery will be reassessed against the ERA methodology on a periodic basis in line with the review of any Wildlife Trade Operation (WTO) accreditation in place in the fishery.

Attachment 2

Integration of the various sections of the EPBC Act

Commonwealth-managed fisheries are covered by separate assessments under Part 10, Part 13 and Part 13A. All of these assessments consider the effect of fisheries on the marine environment, protected species and communities and the ability of fisheries management to minimise the risk of unacceptable impacts. Moreover, individual species within those fisheries are separately assessed through nomination as threatened species or the method of fishing as a Key Threatening Process (KTP). The potential for duplication and/or inconsistency in decision making is obvious. The subsequent listings of Southern Bluefin Tuna and Patagonian Toothfish under the EPBC Act when they are the sole or predominant species in fisheries that had previously passed strategic assessment under a different part of the EPBC Act are examples of the perceived inconsistencies of the EPBC Act processes.

AFMA welcomed the EPBC Act changes which introduced the proposed priority assessment list, in an attempt to better focus and streamline the process for considering nominations for protection of species and communities. However, AFMA is concerned that this opportunity has not been fully realised because the process still includes potential listing nominations that do not meet the criteria for being considered. Inclusion on the priority list of nominations that clearly do not meet the criteria involves unnecessary use of AFMA and Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) resources that could more usefully be employed to address real conservation and management issues. For example, the nomination of trawling in the SESSF as a KTP clearly fails to satisfy the EPBC Act criteria for listing as a KTP. The inclusion of this nomination on the proposed priority assessment list has caused AFMA, other organisations and industry to expend considerable resources in preparing submissions. AFMA has also commissioned research to further address these issues. While this research may be useful in the longer term it is being carried out at the expense of more pressing research.

Unwarranted nominations also have an effect on the operations of DSEWPaC. The DSEWPaC website lists over 450 recovery plans in preparation (106 fauna, 337 flora and 18 ecological communities). The use of resources currently dedicated to responding to unjustified nominations could help alleviate this situation.

The EPBC Act originally provided for recovery plans to be developed for all threatened species. While this may have seemed like a good idea when establishing the EPBC Act, it hasn't proved useful in practice. The 2006 amendments allowed for the Minister to determine whether a recovery plan was required. There are now hundreds of species listed under the EPBC Act - of which only a very small proportion has recovery plans in place. There simply isn't the government support in terms of funding to give effect to what the EPBC Act was originally designed to do. Clearly the costs of doing this are prohibitive and the Act should be amended to prescribe more cost effective solutions for dealing with threatened species. One solution is to develop formal and transparent risk-based approaches to species status and priority. AFMA has done this for its fisheries over the past five years, starting with almost 2,000 species it is now focused on less than 70. Another approach AFMA has used is to take mitigating action immediately rather than wait years for a species to have a recovery plan developed.

There are several procedural issues which need to be addressed when considering the listing of marine finfish species. Firstly, the criteria for classifying a species as endangered under the EPBC Act are subjective. The provisions of the EPBC Act reflect the historic focus on threats to high order terrestrial species such as mammals, and are not appropriate for marine fish. This weakness is acknowledged in the EPBC Act itself under s180, which provides for the making of regulations that specify criteria for native species of marine fish. However, such regulations have not yet been drafted, leaving the Threatened Species Scientific Committee to determine whether a nominated species has "... undergone, is suspected to have undergone or is likely to undergo in the immediate future, a severe reduction in numbers". Such criteria do not provide confidence that nominations will be assessed objectively on a scientifically rigorous and biologically relevant basis.

The EPBC Act does not necessarily require amendment as the use of regulations may be the appropriate mechanism if the criteria are likely to change over time. For example, in the absence of regulations under s180 AFMA has relied on the Commonwealth Fisheries Harvest Strategy Policy (HSP) released in 2007 jointly by the Minister for Sustainability, Environment, Water, Population and Communities and the Minister for Agriculture, Fisheries and Forestry. The HSP states that if a stock biomass is at or below a biomass limit (BLIM), the default for which is 20 per cent of the unfished biomass, the risk to that stock is considered unacceptably high, and targeted fishing ceases. While a stock is above BLIM there is no expectation that the species would be added to the list of threatened species. It would be appropriate to build this policy into regulation rather than legislation to allow for modifications if the HSP is further developed.

Part 13 of the EPBC Act

A recent development with the proposed listing under the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) of a number of commercially harvested marine species (long-finned and short-finned makos, porbeagles and spiny dogfish) has highlighted a difficulty with the EPBC Act. Under s209(3) the list of migratory species must include all migratory species that are (i) native species and (ii) from time to time included in the appendices to the Bonn Convention. There are two possibilities for listing species on the Bonn Convention, either

- Appendix I , which means strict protection; or
- Appendix II, which means international cooperation would benefit the species.

When this Section was introduced it was intended to automatically pick up migratory species as they were listed and provide the appropriate level of protection for these species.

However, the scope of listing under Appendix II of the Bonn Convention is such that a large number of commercially harvested marine species would qualify. All our fisheries have part 13 accreditations under the EPBC Act allowing for interactions with migratory species. However, this accreditation does not allow for transport or sale of these species. Australia is thus imposing a higher level of protection for these species than is required under the Bonn Convention and disadvantaging Australian fishers.

There are a number of ways of dealing with this anomaly. The most direct and preferable is to amend the EPBC Act to require only native species included in Appendix I of the Bonn Convention to be included on the list of migratory species.

For many years there has been considerable debate within the IUCN and other fora about the applicability of the current suite of IUCN criteria in the assessment of the conservation risks to commercially-harvested fish species especially bony fish. This debate has been fuelled by widespread concern among fisheries scientists about the suitability of the criteria for assessing biological risk to fishes from commercial fisheries.

While fish species have a wide variety of life-history strategies, the majority of bony fish species have what ecologists refer to as 'R-selected' strategies. These strategies are characterised by short life spans, early maturation, low parental investment in offspring (e.g. broadcast spawning of millions of relatively small gametes) and high compensation to mortality. Species with such strategies are also likely to show marked fluctuations in population size in response to changes in the environment. Such species typically show sustained recruitment down to relatively low levels of parental biomass and stock – recruitment curves with high steepness (i.e. high compensation). This means that most bony fish species are strongly resilient to relatively high levels of perturbation including fishing mortality.

The IUCN criteria were initially developed for assessing species with 'K-selected' life strategies such as large terrestrial mammals. Such species are typically long-lived, late maturing and produce relatively few offspring with high parental investment. Populations of such species show far less compensation to significant mortality and are far slower to recover from perturbation. While many sharks and rays have life-history strategies closer to those of mammals, applying the IUCN criteria to most species of bony fish would be highly questionable given their markedly different strategies.

To expand further on this point, for a wide range of commercially harvested fish species, the biomass level capable of producing maximum sustainable yield has been shown to fall in the range of 40-60 per cent of the 'unfished' level (i.e. carrying capacity). As a result, a 50 per cent depletion could be a very appropriate fisheries management target for sustainable exploitation. However, a 50 per cent depletion occurring over a 10 year period (or three generations) would mean that the population now satisfies Criterion A(1) of the IUCN Vulnerable Taxa Criteria. This IUCN classification signifies a population to be "….considered to be facing a high risk of extinction in the wild". For most species of bony fish this conclusion just does not stand scrutiny and cannot be justified.

The FAO Committee on Fisheries (COFI), has regularly identified these problems with the IUCN criteria, and has set up two Technical Consultations seeking to find alternative approaches when assessing biological risks from commercial fisheries under the Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973 (CITES). The last such consultation, in Namibia 2-25 October 2001, addressed the issue of listing criteria in detail, and provided a report setting out some important principles:

- The best scientific advice available shall be used
- Current stock sizes should be compared with appropriate previous baselines
- Listing proposals shall be evaluated on a case by case basis in a transparent and neutral scientific process

A key recommendation in the report of the second Technical Consultation stated the listing criteria must be designed to take account of the natural dynamics of fish stocks, such as the rapid natural fluctuations of many fish stocks.

The drafters of the EPBC Act obviously appreciated the difficulties in applying the IUCN criteria to marine fish. The EPBC Act provides under Section 179 for the making of regulations to prescribe criteria for the critically endangered, endangered and vulnerable categories. Regulation 7.01 of the Environment Protection and Biodiversity Conservation Regulations 2000 specifies criteria for each category. Section 180 provides for the making of regulations that specify criteria for native species of marine fish. At this stage, DSEWPaC has not drafted regulations under this Section.

The American Fisheries Society has developed separate criteria for assessing extinction risks for fish species. These criteria endeavour to take resilience of different fish species into account when assessing the risk posed by different levels/rates of depletion. Previously the Australian Society for Fish Biology had developed its own criteria but it has now, surprisingly, adopted the IUCN criteria.

In support of the views above the need to re-consider extinction risk assessment in marine fisheries management, it should be noted that there is a distinct lack of precedent for the biological extinction of marine, bony fish as a direct result of commercial fishing. For target species, fish populations will reach a point where further fishing is no longer economically viable, and this point will usually be observed well before biological extinction occurs or becomes a significant likelihood. This is not the case for species taken as bycatch.

Attachment 3

Different Approaches to Managing the Risks of Gillnet Fishing to Australian Sea Lions under the EPBC Act

- Australian sea lion populations were listed as threatened (vulnerable) under the Environment Protection and Biodiversity Act 1999 (EPBC Act) in 2005.
- AFMA and the governments of Western Australia and South Australia manage gillnet fisheries that pose a risk to Australian sea lions through entanglement with the gear that results in injury or death.
- In response to concerns from AFMA and scientists that gillnet fishing posed a potentially significant but unknown risk to Australian sea lions, Commonwealth gillnet fishers operating in Commonwealth waters off South Australia agreed to participate in a scientific study to collect specific data on the risk their gillnet operations may pose to Australian sea lions.
- The scientific report from the Fisheries Research and Development Corporation funded research project 2007/041 'The impact and mitigation of Australian sea lion bycatch in the Commonwealth managed shark gillnet fishery off South Australia' was publicly released in April 2010. The report estimated that the mortality of sea lions taken as bycatch in these gillnets could constitute a threat of extinction for some discrete sub-populations and identified gillnet fishing as a key threat to Australian sea lion populations.
- In 2010, AFMA and the Commonwealth-managed gillnet fishing industry took immediate steps to reduce interactions through large area closures around sea lion colonies and developed a formal sea lion management strategy to manage ongoing risks.
- Initially AFMA more than doubled the onboard monitoring of the vessels by observers and promoted research to assist in the development of long-term mitigation arrangements. Based on this additional data collection AFMA then moved to require 100 per cent observer coverage or equivalent independent monitoring using cameras.
- In addition, in 2010 AFMA formed a Australian Sea Lion Working Group consisting of marine mammal experts, state and Commonwealth agencies, environmental representatives and the Commonwealth fishing industry to provide advice on further management requirements to monitor and manage the risks to Australian sea lions and other threatened, endangered and protected species from Commonwealth gillnet fishing.
- On 21 June 2010 the then Minister for Agriculture, Fisheries and Forestry, Minister Burke, approved funding of $300 000 to support electronic monitoring of sea lion interactions with shark gillnets. Electronic monitoring systems were installed on 12 Commonwealth-managed vessels in the seal lion management area.
- Following further advice from marine mammal experts who recommended that female sea lion bycatch mortality should be as close to zero as possible, AFMA implemented further spatial closures in May 2011. Observer requirements for the South Australian component of the fishery were raised to 100 per cent and trigger limits for further area closures in the sea lion management zones were reduced from 52 to 15 over the seven management zones in January 2012.

- After further marine mammal interactions in the fishery in 2011 and 2012 over 70 per cent of the South Australian component of the SESSF is presently closed to gillnet fishing. Catches of target species in the fishery for the 2010-11 season dropped by over 60 per cent. The mean annual value of production for this component of the fishery was valued at $6.8 million for the previous five fishing seasons.
- In order to alleviate the financial impacts on Commonwealth-managed gillnet fishers affected by closures AFMA issued temporary permits which allow for fishers to use hook fishing methods. Hook fishing methods are known to have a much lower interaction rate with marine mammals than gillnets.
- Conditions imposed by the Minister for Sustainability, Environment, Water, Population and Communities on the Commonwealth gillnet fishery are, appropriately, very stringent and the entire Southern and Eastern Scalefish and Shark Fishery has been warned by DSEWPaC that failure to meet these conditions could result in the removal of approvals under the EPBC Act necessary to legally operate in the fishery and/or export fish taken.
- By contrast, gillnet fisheries managed by both the South Australian and Western Australian governments have much lower levels of information about the potential risks to Australian sea lions and other marine mammals. Levels of independent monitoring are low and these state-managed gillnet fisheries are permitted to use gillnets immediately adjacent to Australian sea lion colonies.
- Despite the apparent uncertainty about the risks posed to Australian sea lions in these state-managed gill net fisheries, the conditions imposed on these fisheries by the Minister for Sustainability, Environment, Water, Population and Communities do not approach the stringent requirements imposed on the Commonwealth-managed fisheries.

Attachment 4

Proposed Terms of Reference for Scientific Advisory Group

A shared Scientific Advisory Group (SAG) would assist both AFMA and DSEWPaC to ensure greater consistency in the advice both agency receives on bycatch issues and provide greater separation between bycatch policy formulation and the scientific inputs to this process.

Bycatch is defined 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 from being retained; and that part of the catch that does not reach the deck of the fishing vessel but is affected by interaction with the fishing gear.

AFMA and DSEWPAC are committed to addressing bycatch issues under both the *Fisheries Management Act 1991* and *the Environment Protection and Biodiversity Conservation Act 1999*. This commitment is reinforced by the Commonwealth Policy on Fisheries Bycatch and the 2005 Ministerial Direction to AFMA.

Advice to DSEWPAC and AFMA
The role of the SAG will be to provide scientific advice to AFMA and DSEWPAC on specific bycatch issues as requested. Specifically, when requested, to advise on:

- quantitative operational objectives that are consistent with agreed policy objectives for identified bycatch species or issue of concern; and/or
- the probability of the achievement of the quantitative objectives through implementation of management strategies proposed by AFMA.

Membership
The chair of the SAG would be an independent and credible scientist. Standing members of the SAG would have the following skill sets:

- marine ecosystem science;
- marine fisheries science;
- numeric (population and ecosystem) modelling;
- statistics; and
- ecological risk assessment.

The SAG would have a maximum of six standing members including the Chair.
In addition to standing members, two additional temporary members may be co-opted for specific issues where particular expertise is required on the ecology of the species or issue under consideration. Such members would be identified by the Chair of the SAG.

Meetings
Meetings would be held as required.

Term of appointment
Members would be appointed for two years. The SAG would only be formed if guidelines for policy development are agreed by DSEWPaC, DAFF and AFMA.

Remuneration
Non-government members would be offered remuneration for time and all travel and meeting costs would be paid by AFMA and DSEWPaC.