Australian Government

Department of Agriculture, Fisheries and Forestry

National Strategy to Address Interactions between Humans and Seals: Fisheries, Aquaculture and Tourism






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National Strategy to Address Interactions between Humans and Seals: Fisheries, Aquaculture and Tourism.

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Foreword

Commercial fishing, aquaculture and marine-based tourism are important and valuable sectors of Australia's economy. The Australian Government is dedicated to helping these industries operate sustainably and profitably.

These industries have the potential to interact with seal and sea lion populations that inhabit Australia's southern coastal waters.

With the expansion of commercial marine and tourism operations, comes an increase in the frequency of human and seal interaction. As some seals and sea lions are listed as threatened species in Australia and protection is helping some of those populations to recover, it is crucial that adverse contact between humans and seals is prevented.

Addressing this issue, the Australian Government formed the National Seal Strategy Group to develop the *National Strategy to Address Interactions between Humans and Seals: Fisheries, Aquaculture and Tourism*. This Strategy provides the means to identify, minimise and mitigate adverse seal interactions in the fishing, aquaculture and tourism industries.

I trust that this Strategy will help our commercial fishing, aquaculture and tourism operators, and our environmental agencies, to better understand the potential risks and costs to both the environment and to industry, and to ensure that adverse human interactions with seals are minimised.

Eric Abetz
Australian Government Minister for Fisheries, Forestry and Conservation

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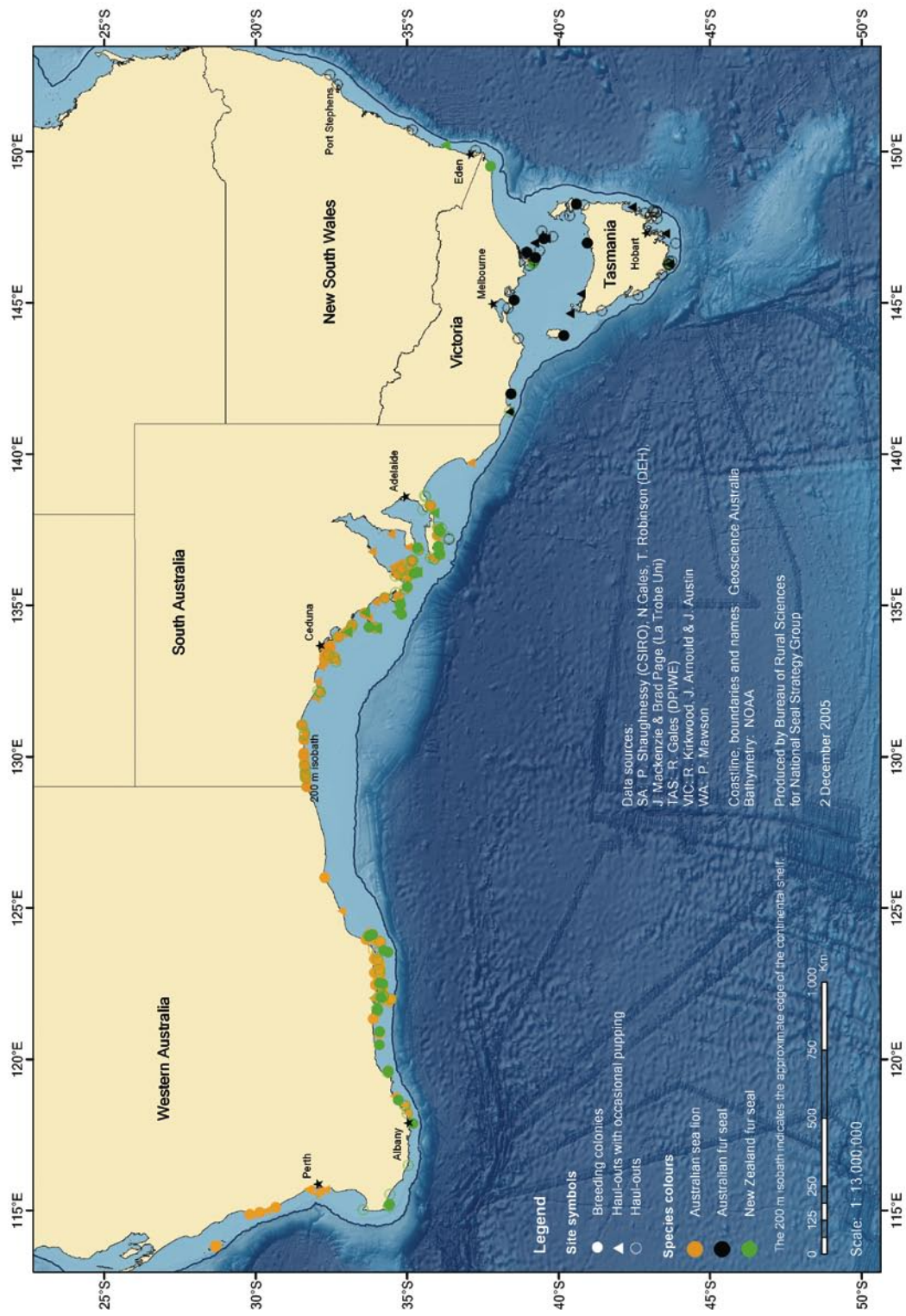

Executive Summary

In February 2003, the Marine and Coastal Committee of the Natural Resource Management Standing Committee identified the need to address the growing national issue of human-seal interactions in the fisheries, aquaculture and tourism sectors. In response, the National Seal Strategy Group (NSSG), comprising Australian Government and relevant State agency representatives, developed this Strategy. To support the development of the Strategy, an assessment report was prepared to provide background scientific information: *National Assessment of Interactions between Humans and Seals: Fisheries, Aquaculture and Tourism* (NSSG, 2007).

The Strategy aims to create a nationally coordinated approach to identify and address adverse human-seal interactions. Because all seal species are protected nationally, the Strategy clarifies the intention and requirements of legislation protecting seals in Australian waters to the commercial fishing, aquaculture and tourism sectors. It seeks to guide industry efforts to reduce any adverse impacts on seals while maintaining the ecological sustainability of those industries.

A combination of increasing seal numbers in some areas and an overlap between the ranges of seals and some fishing and aquaculture activities has created potential for increased interactions between seals and fisheries. The number of commercial tourism operations actively seeking to view seals has increased at many locations along the Australian coast in recent years. The Strategy outlines the impact of these increased interactions.

Seal interactions causing damage and loss of gear are a problem for many commercial fishing operations including gillnet fisheries, the Commonwealth Trawl Sector, and pot and trap fisheries. Loss of catch or bait is a significant problem for some fishers, resulting in economic loss to operators. Seals can become tangled in fishing gear such as gillnets, trawl nets, nylon ropes, bait straps and bait containers, leading to serious injury or death of seals, and safety concerns for fishers. There are anecdotal reports of illegal killing of seals by commercial and recreational fishers.

Seals also cause difficulties for the aquaculture sector. They attempt to access caged marine finfish in search of food, resulting in damaged gear, risk of injury to farm staff, stock losses and subsequent economic loss for operators. Seals can become fatally entangled in anti-predator nets, and illegal killing of seals has reportedly occurred near finfish operations.

Regulation of interactions between the public, particularly tourists, and seals varies between the states and often is location specific. Potential for tourists to disturb seals during breeding seasons is a serious concern, particularly for the more vulnerable Australian sea lion. Human disturbance can lead to injuries and mortalities to seals, especially to pups, and can lead to a risk to human safety if seals are approached. Any injury or death of seals would be of concern to the tourism industry.

The Strategy includes specific objectives and actions to be undertaken between 2007–2011 to address adverse human-seal interactions. It identifies the agencies and organisations responsible for implementing each action and gives timelines and performance indicators to assist in assessing progress and evaluating outcomes. The Strategy will be reviewed in five years against these measures and any advances in knowledge.

Introduction

A combination of increasing seal numbers[1] in some areas and the overlap between the ranges of seals and some fishing and aquaculture activities has created potential for increased frequency of interactions between seals[2] and fisheries. To meet conservation objectives and community expectations, governments and industry need to maintain sustainable and profitable business opportunities while minimising adverse interactions with seals. To meet this challenge, it is important that the nature of interactions is well understood and appropriately measured to determine what, if any, action is necessary. Developing tourism operations, which increasingly seek contact with seals, need information about when, or even if, it is appropriate to approach seals and how to do so without endangering themselves or causing harm to seals.

Objective

The Strategy proposes to create a nationally coordinated approach to identifying and addressing adverse human-seal interactions. In particular, the Strategy aims to assist commercial fishing, aquaculture and tourism sectors to understand the requirements of legislation protecting seals in Australian waters. It seeks to guide industry efforts to reduce any adverse impacts on seals while maintaining the ecological sustainability of those industries.

The Strategy includes specific objectives and actions to be undertaken between 2007–2011 to address adverse human-seal interactions. It identifies the agencies and organisations responsible for implementing each action and gives timelines and performance indicators to assist in assessing progress and evaluating outcomes. The Strategy will be reviewed in five years against these measures and any advances in knowledge.

1 Not all populations are increasing. For example, in Tasmania the Australian fur seal population is not showing any increase, and more generally neither is the population or range of Australian sea lions.

2 For the purpose of this document, the term 'seals' refers to the Australian sea lion and Australian and New Zealand fur seals, unless otherwise stated.

National Seal Strategy Group

In 2003 an inter-governmental working group, the Marine and Coastal Committee (MACC) of the Natural Resource Management Standing Committee, identified the need to address the growing national issue of human-seal interactions.

The MACC established a working group, the National Seal Strategy Group (NSSG), to develop a nationally coordinated approach to the issue. The terms of reference for the NSSG are as follows:

The NSSG will consider current and emerging human-seal interaction issues with the view to developing strategies to mitigate adverse impacts on Australian seal populations (Australian sea lions, Australian fur seals and New Zealand fur seals), and on the fisheries, aquaculture and tourism sectors. Based on these considerations, the NSSG will develop a draft National Seal Strategy for consideration by the MACC and in doing so will:

- Report to the Marine and Coastal Committee.
- Engage relevant stakeholders (including industry, seal researchers and environmental non-government groups) in the development of the National Seal Strategy to achieve commitment to the process.
- Develop a work programme.
- Share information and experiences on the nature and extent of human-seal interactions and existing management responses, including research activities.
- Develop an Assessment Report on the nature and extent of human-seal interactions, identify issues, and document existing management responses and relevant research.
- Develop a National Seal Strategy that identifies key issues relevant to interactions between humans and seals; and actions that can be implemented to manage those interactions in a coordinated way.

The Need for Action

Established seal populations around the coasts of southern Australia overlap with productive fishing grounds and the localities of many coastal towns and cities. As human populations increase and some seal populations begin to recover from past exploitation, the overlap between these areas will increase.

Seals, in search of prey, are attracted to marine finfish fisheries, rock lobster fisheries and marine finfish aquaculture operations. Some of the gear used in these operations poses a threat to seals through incidental injury, entanglement or drowning. Commercial fishers and aquaculture operators continually look for new ways to avoid such interactions with seals which potentially lead to reduced catch, damage to gear and fish stocks, and threats to the safety of operations.

In contrast, tourism operations which actively seek interactions with seals are becoming increasingly popular. However, irresponsible interaction between tourism activities and seals can lead to behavioural changes and reduced pupping success rates. Supplementary feeding can leave seals exposed to disease and poor nutrition. People wishing to view seals can also put themselves at risk by getting too close or by behaving inappropriately around seals. They may also be exposed to a higher risk of shark attack if swimming or diving near established seal colonies, for example at Dangerous Reef in South Australia.

Seals are intelligent animals. They will take advantage of easily accessible and rich food sources such as those encountered in fishing nets, marine finfish farms, or food associated with the presence of tourists or recreational fishers. If individual seals successfully obtain food in this manner, they may continue to seek out such food sources as an alternative to natural foraging behaviours. Other seals copy and learn this behaviour, perpetuating the problem.

The issue of culling seals has been raised in the public debate on seal versus fisheries competition as a way to minimise interactions between seals, commercial fisheries, and aquaculture operations. Currently, there is no scientific basis to predictions that a reduction in seal numbers would have either a positive or negative impact on commercial fish quotas (e.g., Yodzis, 2001 and Butterworth *et al*., 1988). Seal culling is not consistent with current community expectations about broader seal conservation objectives. The killing of seals is illegal under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), unless conducted under stringent permit conditions or other form of exemption issued by the Minister for the Environment and Heritage. In state jurisdictions similar legislated conditions apply (refer to Appendix C for further information).

The Status of Seal Populations

In Australian waters, seals occur predominately in areas surrounding the southern states from New South Wales to Western Australia. While there are ten species of seals which commonly occur in Australian waters, this Strategy focuses mainly on the three species living and breeding within the waters and lands of continental Australia: the Australian sea lion (*Neophoca cinerea*), the Australian fur seal (*Arctocephalus pusillus doriferus*) and the New Zealand fur seal (*Arctocephalus forsteri*).

Australia's fur seals were hunted extensively by sealers during the late 18th and early 19th centuries, mainly for their pelts (SOE Report, 2001). Australian sea lions (or hair seals as they were previously called) were also hunted extensively for their meat and oil. The number of New Zealand fur seals in Australian waters has been increasing since 1989 and it is generally

believed that some populations of Australian fur seal are also recovering, albeit slowly. In recent years, some fur seal breeding colonies have expanded significantly and several new colonies have been established (SOE Report, 2001).

breeding site fidelity and the breeding challenges faced by the Australian sea lion makes the species particularly vulnerable to human disturbance. These characteristics mean the injury or death of Australian sea lions as a result of interactions with

However, not all colonies are increasing and many have not re-established following the cessation of commercial sealing. New Zealand fur seals, for example, have only recently returned to breed in Bass Strait and only in small numbers.

Of most concern is the population status of the endemic Australian sea lion, which is listed nationally as 'vulnerable' under the EPBC Act and has an estimated population of less than 12000 individuals worldwide. The species has an unusually long breeding cycle — 17 to 18 months — and the timing of cycles varies between closely situated breeding sites. Females also show strong

fisheries, aquaculture, or through disruptions to pupping caused by tourism activities, can expose individual colonies to serious risk of decline. In fact, there has been no detectable population growth since harvesting of the Australian sea lion ceased and a conspicuous decline has been recorded in one well researched colony. Australian sea lions have not recolonised the Bass Strait area since the cessation of commercial sealing (NSSG, 2007).

All seal species are now protected nationally. Related legislation and associated conservation listings are presented in Appendix C.

Key Issues and Action Plans

Key issues and actions have been divided into three sections, each addressing an industry sector — fisheries, aquaculture and tourism. Each section includes a brief summary of the key issues for that sector followed by a table of actions that, once implemented, will reduce adverse interactions. This format simplifies the presentation of issues and to allow readers with a specific interest to focus on a selected industry sector. For detailed information on the nature and extent of interactions, refer to the report *A National Assessment of Interactions between Humans and Seals: Fisheries, Aquaculture and Tourism* (NSSG, 2007).

A well directed and adequately resourced implementation plan is vital to the success of the Strategy. To aid operation, actions have been assigned to relevant government agencies, industry-specific bodies and industry extension services, along with performance indicators and time-lines. Some outcomes will be achieved only by a national approach involving the support of a range of stakeholders, while others require a jurisdiction or industry sector focused approach.

References to *all fisheries* and/or *environment agencies* refer to both Australian Government[3] and state government agencies. However, some actions may not be applicable in all jurisdictions due to the diversity and abundance of local seal populations, the nature and scale of the local industries that are likely to interact with seals, and existing effective legislation and management frameworks.

Fisheries

Interactions between seals and fishing operations, causing damage or loss of gear, are a problem for gillnet fisheries, the southeast trawl fishery, and pot and trap fisheries. Losses of catch or bait are also a significant problem for some fishers. Seals can bite or remove fish entangled in gillnets, enter enclosed nets to collect fish or bait, or directly remove catch or bait from pots and traps. Actions to address these issues include gear modifications as well as education and awareness-raising campaigns alerting fishers to mitigation techniques and their application.

During purse-seine and trawl operations, just the presence of seals can disturb fishing operations. When fish are being encircled by a purse-seine net, seals can cause them to dive before the net is drawn tight resulting in a loss of catch and delays to fishing operations if seals are caught in the net.

Entangled seals may need to be brought on board fishing vessels to enable a successful and safer release. This causes loss of productivity, as carefully releasing seals from entanglement can be a difficult and time-consuming task. Additionally, a poorly performed release can result in injuries to both seals and fishers.

Entanglement, or bycatch, of seals can occur in fishing gear such as trawl nets, gillnets, and nylon ropes, as well as rock lobster pots, and can cause serious injury or death to seals. Also, widespread entanglement in fisheries related debris such as discarded and derelict nets, polypropylene straps (bait box straps), monofilament nets and nylon ropes generally prove fatal for seals (Shaughnessy, 1999 and Page *et al.*, 2004).

3 Please note all references to DEH in this document refer to the Australian Government Department of the Environment and Heritage and not the South Australian Government Department for Environment and Heritage.

To address specific adverse human-seal interactions in the Commonwealth Trawl Sector, the industry has developed a voluntary code of practice to minimise the incidental catch of seals – the *South East Trawl Code of Fishing Practice to Minimise the Incidental Bycatch of Marine Mammals* (SET Code). The SET Code could be used as a model for similar codes of practice or operational guidelines in other fisheries.

The following table (Table 1) lists actions to address these issues.

Table 1 Fisheries: Action Plan to reduce adverse human-seal interactions in commercial fisheries

Action	Responsibility	Performance Indicator(s)	Timeline
Objective 1—Obtain quantitative and independent data on the nature and extent of human-seal interactions in commercial fisheries			
1.1 Develop criteria for the assessment of fisheries as to their risk of adverse interactions with seals	Fisheries management agencies, environment management agencies, commercial fisheries members	• Agreed assessment criteria developed	2007
1.2 Using agreed criteria, assess the risk of adverse interactions and subsequent impact a fishery may pose on seals	Fisheries management agencies, environment management agencies	• Risk assessment reports	2007
1.3 As a priority, and where resources permit, establish observer programmes, or equivalent, in identified fisheries with robust systems to verify the accuracy of reporting	Fisheries management agencies	• Fisheries identified • Observer programmes, or equivalent, in place	2008 2009
1.4 Determine the level of observer coverage, or equivalent, required to robustly quantify the level of interactions	Fisheries management agencies, environment management agencies, peak industry bodies	• Jurisdiction-specific discussion papers	2009
1.5 Where required and resources permit, enhance existing observer programmes, or equivalent, to include a requirement to report on and quantify interactions with seals [Notwithstanding existing legislative requirements]	Fisheries management agencies	• New reporting procedures • Analysis of reports (on-going)	2010 ongoing
Objective 2—Minimise and mitigate adverse interactions between seals and commercial fisheries			
2.1 Identify and promote existing best practice and gear modifications to mitigate and minimise seal interactions with fishing practices and gear	DAFF, AFMA, State fisheries management agencies, peak industry bodies and associations, extension services, commercial fisheries members	• Fishery specific reports • Reports distributed to peak industry bodies • Adoption by Industry	2007 2007 ongoing
2.2 Review, and where necessary, revise the effectiveness of legislation and policy frameworks in all jurisdictions	DAFF, AFMA, DEH, State fisheries management agencies, State environment management agencies	• Gap Analysis Report • If necessary, implement revised frameworks	2008 2009 ongoing
2.3 Investigate the benefits and impacts of spatial and temporal closures	DAFF, AFMA, DEH, State fisheries management agencies, State environment management agencies, commercial fisheries members	• Discussion paper	2009 ongoing
2.4 Promote and if necessary require implementation of measures that are demonstrated to effectively mitigate adverse interactions	DAFF, AFMA, DEH, State fisheries management agencies, State environment management agencies, commercial fisheries members	• Items on peak industry body agendas • New management arrangements introduced	2008 2010
2.5 Identify and develop new practices and gear modifications to mitigate and minimise seal interactions with fishing practices and gear	DAFF, AFMA, fisheries management agencies, peak industry bodies and associations, extensions services, commercial fisheries members	• Research Proposals • Pilot programmes introduced	ongoing

Action	Responsibility	Performance Indicator(s)	Timeline
Objective 3—Develop and implement robust arrangements to report interactions across all commercial fisheries operations			
3.1 Jurisdictions to develop and implement reporting arrangements to achieve nationally consistent reporting	DAFF, AFMA, DEH, State fisheries management agencies, State environment management agencies	• Reporting framework developed • National reporting framework introduced	2007 2008
3.2 Encourage accurate and timely reporting of interactions and of information regarding practices and gear that are identified to influence interactions	Fisheries management agencies, peak industry bodies and associations	• Reporting of interactions	2008 & ongoing
3.3 Where appropriate, jurisdictions to develop and implement verification systems to assess the veracity of interaction reporting	Fisheries management agencies, environment management agencies	• Jurisdiction specific verification systems developed • Verification systems introduced	2008 2009
3.4 Where necessary, jurisdictions to review legislation to provide for protection of fishers who report incidental interactions.	DAFF, AFMA, DEH, State fisheries management agencies, State environment management agencies	• Management review • Recommendations implemented in relevant jurisdictions	2008 2010
Objective 4—Encourage fisheries resource users to embrace stewardship of the marine ecosystem			
4.1 Raise awareness amongst resource users about interactions and methods to mitigate adverse interactions	DAFF, AFMA, DEH, State fisheries management agencies, State environment management agencies, peak industry bodies and associations	• Information about seals, interactions, and mitigation measures disseminated to industry	2007 & ongoing
4.2 Encourage industry to develop environmental management systems (EMS) and/or Codes of Practice to take into account seal interaction issues	DAFF, AFMA, State Fisheries management agencies, peak industry bodies and associations	• EMS promoted on peak industry body agendas • Develop and adopt codes-of-practice • Assessment of whether or not codes are meeting their objectives	ongoing ongoing ongoing

Aquaculture

Several species of marine finfish are farmed in the coastal waters of Australia, notably salmonids in Tasmania and southern bluefin tuna and kingfish in South Australia. Australian sea lions, and Australian and New Zealand fur seals are known to try to access caged marine finfish in an effort to obtain food. In the process, seals can injure themselves and damage gear and fish - the latter resulting in economic loss for the operation. Seals can become fatally entangled in anti-predator nets designed to exclude them, and there are reports of illegal killing of seals near finfish operations. To date, attempts to mitigate such interactions have had varying degrees of success. Physical protection of farmed fish, along with constant vigilance, has proven to be the most effective mitigation technique despite its additional cost to the operator.

Farms that are most vulnerable to seal interactions are those that are located within, or adjacent to, major seal foraging areas, and those with ineffective anti-predator nets either above or below water. The amount of effluent, such as excess fish food, produced during marine finfish farming operations can cause wild fish numbers to increase outside pens. This attracts seals (Marine and Marine Industries Council, 2002).

Mortalities of Australian fur seals at Tasmanian salmonid farms have been reported since 1998 and they are becoming more frequent.

Seal entanglements have also been reported in the nets of tuna farms at Port Lincoln, South Australia. Entanglements can occur in anti-predator nets or when seals become trapped between an anti-predator net and the adjacent cage net (Kemper *et al.*, 2003). Individual seals usually attempt to access pens at night, and do not appear to be influenced by the size or species of fish in pens. During an attempt to access fish, seals are capable of damaging pens and allow fish to escape.

Fish farm operators have tried a variety of methods to discourage and repel seals from their operations. Deterrents such as chasing seals with boats, capture and relocation of troublesome individual seals, strategic lighting, seal crackers (and other aversive noises) and the use of emetic agents in baits help reduce the number of seal interactions in the short term. The only effective protection is to exclude seals from the immediate vicinity of fish pens by strategic site placement, regular gear maintenance and physical barriers using appropriate net designs and construction materials (Kemper *et al.*, 2003). Additional measures to reduce the attraction of seals to marine finfish farms include measured feeding regimes to minimise the likelihood of excess food entering the water column.

The following table (Table 2) presents actions to address these issues.

Table 2 Aquaculture: Action Plan to reduce adverse human-seal interactions with commercial aquaculture operations

Action	Responsibility	Performance Indicator(s)	Timeline
Objective 1—Obtain quantitative and independent data on the nature and extent of interactions between seals and aquaculture			
1.1 Identify operations and practices that are known or likely to have a high risk of adverse interactions with seals	Fisheries management agencies, environment management agencies, industry	• Agreed assessment criteria developed • Risk assessment reports	2007 2008
1.2 Determine appropriate methods to independently quantify the level and nature of interactions	Fisheries management agencies, environment management agencies, industry	• Appropriate methods developed in relevant jurisdictions	2009
1.3 Establish independent assessment programmes to monitor the level and nature of interactions	Fisheries management agencies, environment management agencies, industry	• Assessment programmes in place	2010
Objective 2—Minimise and mitigate adverse interactions between seals and aquaculture			
2.1 Identify and promote existing best practice and gear modifications to mitigate and minimise seal interactions	Fisheries management agencies, environment management agencies, peak industry bodies and associations	• Report - existing best practice • Report distributed to peak industry bodies • Adoption by industry	2007 2007 2010
2.2 Review the appropriateness of farm site locations relative to seal colonies and haul-out and foraging areas	DEH, State fisheries management agencies, State environment management agencies	• Where applicable, jurisdiction specific reviews of site locations	2008 & ongoing
2.3 Review and where necessary revise the effectiveness of legislation and policy frameworks in all jurisdictions	DAFF, AFMA, DEH, State fisheries management agencies, State environment management agencies, industry	• Gap Analysis Report • If necessary, implement revised frameworks	2008 2009 ongoing
2.4 Promote, and if necessary require, the implementation of measures that are demonstrated to effectively mitigate adverse interactions	Fisheries management agencies, environment management agencies, peak industry bodies and associations	• Items on peak bodies agendas • New management arrangements introduced	2008 2010
2.5 Identify and where necessary develop new practices and equipment to mitigate and minimise seal interactions	Fisheries management agencies, environment management agencies, peak industry bodies and associations	• Research Proposals • Pilot programmes introduced	ongoing
Objective 3—Develop and implement robust arrangements to report interactions between seals and aquaculture operations			
3.1 Jurisdictions to develop and implement reporting arrangements to achieve nationally consistent reporting	DAFF, DEH, State fisheries management agencies, State environment management agencies	• Agreed reporting framework • National reporting framework introduced	2007 2008
3.2 Encourage accurate and timely reporting on interactions and on practices and equipment that are identified to influence interactions	State fisheries management agencies, State environment management agencies, industry peak bodies, associations	• Reporting of interactions	2008 & ongoing
Objective 4—Encourage aquaculture industries to embrace stewardship of the marine ecosystem			
4.1 Raise awareness amongst resource users about interactions and methods to mitigate adverse interactions	DAFF, AFMA, DEH, State fisheries management agencies, State environment management agencies, peak industry bodies and associations	• Information about seals, interactions, and mitigation measures disseminated to industry	2007 & ongoing
4.2 Encourage industry to develop environmental management systems (EMS) to take into account seal interaction issues	DAFF, DEH, fisheries management agencies, environment management agencies, industry peak bodies, associations, extensions services	• EMS promoted on peak industry body agendas • Adoption of codes-of-practice • Assessment of whether or not codes are meeting their objectives	ongoing

Tourism

In recent years growth in tourism activities focused on seals (Birtles *et al.,* 2001) has increased the number of tourists interacting with seals (Kirkwood *et al*., 2003 and Orsini, 2004). Seal-specific tourist ventures currently operating in Australia include guided tours on-shore, boat cruises and swimming and scuba diving with seals (Kirkwood *et al*., 2003). Particular concerns include:

- the potential for seal populations to be disturbed by tourists, particularly during the breeding season and particularly for the Australian sea lion
- identifying and managing risks to human safety, and
- behaviour changes and habituation associated with an increase in the frequency of seals obtaining food unnaturally in areas visited by tourists.

Several recent studies have examined interactions between seals and tourists, however they are limited to specific areas and time periods. There is a need for research into the effects of these interactions across jurisdictions and over time because approaches to tourism-related regulations across the jurisdictions are currently limited, vary between states and are often location-specific.

Seal colonies that are easily accessed by tourists are most affected. Organised viewing of seals occurs at Seal Bay on Kangaroo Island, Baird's Bay and Point Labatt in South Australia, Montague Island on the south coast of New South Wales, Seal Rocks at Portland and Port Phillip Bay in Victoria, various places in Tasmania and a number of locations on the southwest coast of Western Australia.

Many seal viewing activities are subject to limited regulation or are simply unpoliced. Recreational beach walkers, anglers, divers and boat users can have unplanned encounters with seals in and around seal haul-out and breeding areas. This disturbance can lead to delayed or missed breeding opportunities and to injury, stress and mortality as pups are particularly vulnerable to disturbance. Another concern is the potential for transmission of diseases, reported to be possible if domestic dogs are exercised near seal haul-out and breeding areas. The impact of distemper virus on pinniped populations can be catastrophic (Jensen *et al*., 2002) and is particularly concerning for the small, isolated populations of Australian sea lions.

Some state agencies do regulate tourism activities. Codes of conduct have been, or are being, developed by some state governments and the industry to manage these interactions as well as future development of the industry.

The following table (Table 3) presents actions to address these issues.

Table 3 Tourism: Action Plan to reduce adverse human-seal interactions with commercial tourism operations

Action	Responsibility	Performance Indicator(s)	Timeline
Objective 1—Obtain quantitative and independent data on the nature and extent of interactions between seals and tourism operations			
1.1 Develop criteria for the assessment of tourism operations as to their risk of adverse interactions with seals	Environment management agencies	• Agreed assessment criteria developed	2007
1.2 Using agreed criteria, assess tourism operations as to their risk of adverse interactions with seals	Environment management agencies	• Risk assessment reports	2008 ongoing
1.3 Determine and develop appropriate methods to independently quantify the level and nature of interactions	Environment management agencies	• Jurisdiction-specific reports detailing agreed methods	2009
1.4 Establish independent assessment programmes to monitor the level and nature of interactions	Environment management agencies	• Assessment programme(s) in place	2010
Objective 2—Minimise and mitigate adverse interactions between seals and tourism operations			
2.1 Identify and promote existing best practice to mitigate and minimise adverse seal interactions	Environment management agencies, peak industry bodies and associations	• Survey report • Report distributed to peak industry bodies and associations	2007 2008
2.2 Review the appropriateness of the locations of tourism activities relative to seal colonies and haul-out sites, and aquaculture and commercial fishing operations.	Environment management agencies, peak industry bodies and associations	• Site review report	2008 & ongoing
2.3 Review and, where necessary, revise the effectiveness of legislation and policy frameworks in all jurisdictions	Environment management agencies	• Gap Analysis Report • If necessary, implement revised frameworks	2008 2009 ongoing
2.4 Investigate the benefits and impacts of spatial and temporal closures	Environment management agencies	• Discussion paper	2009
2.5 Promote and if necessary require implementation of measures that are demonstrated to effectively mitigate adverse interactions	Environment management agencies, peak industry bodies and associations	• Items on peak industry body agendas • New management arrangements introduced	2009 ongoing
2.6 Public education programmes targeting non-tourist operation visitors about threats to seals and humans	Environment management agencies, peak industry bodies and associations	• Public education programme(s) delivered across jurisdictions	ongoing
2.7 Identify and, where necessary, develop new practices and equipment to mitigate and minimise adverse seal interactions	Environment management agencies, peak industry bodies and associations	• Research proposals • Pilot programmes implemented	ongoing
Objective 3—Develop and implement robust arrangements to report interactions between seals and tourism operations			
3.1 Jurisdictions to develop and implement reporting arrangements to achieve nationally consistent reporting	DEH, State environment management agencies	• Agreed reporting framework • National reporting framework introduced	2007 2008
3.2 Encourage accurate and timely reporting of interactions and on practices and equipment that are identified to influence interactions	DEH, State environment management agencies, industry peak bodies and associations	• Reporting of interactions	2008 & ongoing
Objective 4—Encourage tourism industries to embrace stewardship of the marine ecosystem			
4.1 Raise awareness amongst the tourism industry and the general public about interactions and methods to mitigate adverse interactions	Environment management agencies, industry peak bodies and associations	• Information about seals, interactions, and mitigation measures disseminated to industry and the general public	2007 & ongoing
4.2 Industry to develop and adopt sustainable environment tourism practices	Environment management agencies, industry peak bodies, associations	• Adoption of codes-of-practice	ongoing

Implementation and Review of the National Seal Strategy

The Australian Government will manage implementation of the Strategy in cooperation with agencies responsible for the commercial and environmental sustainability of the industry sectors, and state government agencies responsible for the protection of seal populations. Specific issues, information gained through ongoing consultation with key stakeholders, and existing and future management and legislative frameworks in each of the jurisdictions will determine the nature and extent of responsibilities of agencies.

Monitoring progress

An implementation group will ensure the actions outlined in the strategy are completed effectively and within agreed timeframes. Key challenges for the group include maintaining ongoing commitment from all stakeholders and ensuring adequate resources are available to support implementation. It will be important to create and maintain awareness of implementation activities and achievements.

Evaluation of progress

The implementation group will regularly report to the Natural Resource Management Marine and Coastal Committee about the Strategy's implementation. Reports will give details of the effective and timely implementation of actions and any problems that arise, including resource issues. The group will also report on any new priority actions identified throughout the life of the Strategy.

Review

A full review of the effectiveness of the Strategy, including ongoing need, will be carried out five years after its release. Accurate measurement and reporting on effects of actions, including the identification of any impacts on industry and seal conservation objectives, will be vital to the review process.

Auditing actions and their impact on seal species

Apart from making sure that actions are implemented, it will be important to measure success of the National Seal Strategy against baseline data. Efforts will be made to establish an agreement between the Australian Government and state governments to ensure data is comparable across jurisdictions and is regularly compiled and reviewed.

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Australian Government

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Glossary

Adverse interaction: problem involving 'risk' to subjects (generally humans, seals or assets in the case of this strategy) that ultimately results in harm to the subject.

Aquaculture: commercial husbandry of fish or other aquatic organisms.

Bait bands: heat sealed plastic bands used to hold bait boxes together.

Breeding colony: an area of land frequented by seals where there have been at least 15 pups recorded during at least one survey over the past 20 years (see also seal colony).

Bycatch: species caught incidentally to the target species in fishing.

Cull: removal of animals to affect the remaining system (Yodzis 2001).

Ecologically Sustainable Development (ESD): using, conserving and enhancing the community's resources so the ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be improved.

Gillnet: net of varying size mesh used to catch (tangle or snare) fish.

Habituation: tolerance to a particular stimulus resulting from repeated exposure to that stimulus.

Haul-out: a place on land where seals leave the water to rest and congregate (non-breeding).

Human-seal interaction: any encounter between a human and seal in which either or both reacts to the presence of the other, where 'reacts' implies a change in behaviour of the human and/or seal involved.

Listed marine and/or migratory species: a marine and/or migratory species that has been listed as protected under the Australian Government *Environment Protection and Biodiversity Conservation Act 1999*.

Mesh-net: see gillnet.

Pinniped: seal, sea lion, fur seal and walrus species of the order Pinnipedia.

Pupping: the period during which seals give birth to their young.

Purse-seine: nets operated from a vessel at the sea surface, first surrounding schooling fish then closing off the bottom of the net to prevent escape.

Seal colony: a permanent site or group of sites where seals congregate to breed (see also breeding colony)

Trawl: fishing with a weighted net mid-water or dragged along the sea floor, in depths ranging from a few metres to approximately 1500m.

Abbreviations

AFMA	Australian Fisheries Management Authority
DAFF	Australian Government Department of Agriculture, Fisheries and Forestry
DEH	Australian Government Department of the Environment and Heritage
EMS	Environmental management systems
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
MACC	Marine And Coastal Committee
NSSG	National Seal Strategy Group
SET Code	*South East Trawl Code of Fishing Practice to Minimise the Incidental Bycatch of Marine Mammals*

References

Australian State of the Environment Committee, 2001. *Australia State of the Environment 2001*, Independent Report to the Commonwealth Minister for the Environment and Heritage, Commonwealth of Australia, Canberra.

Birtles, R.A., Valentine, P.S., & Curnock, M.I. (2001). *Tourism based on free-ranging marine wildlife: opportunities and responsibilities*. Wildlife Tourism Research Report No 11, Status Assessment of Wildlife Tourism in Australia Series, CRC for Sustainable Tourism, Gold Coast, Queensland, Australia.

Butterworth, D.S., Duffy, D.C., Best, P.B. and Berg, M.O. (1988). On the scientific basis for reducing the South African seal population. *South African Journal of Science* **84**: 179-188.

Jensen, T., van de Bildt, M., Dietz, H.H., Anderson, T.H., Hammer, A.S., Kuiken, T. and Osterhaus, A. (2002). Another phocine distemper outbreak in Europe. *Science* **297** (5579): 209.

Kemper, C.M., Pemberton, D., Cawthorn, M., Heinrich, S., Mann, J., Wursig, B., Shaughnessy, P., and Gales, R. (2003). Aquaculture and marine mammals – co-existence or conflict. In: *Southern Hemisphere Marine Mammal Biology and Conservation*. Kirkwood, R. and Gales, N. (eds.). Surery Beatty Publishers pp. 208–28.

Kirkwood, R., Boren, L., Shaughnessy, P., Szteren, D., Mawson, P., Hückstädt, L., Hofmeyer, G., Oothuizen, H., Schiavini, A., Campagna, C. and Berris, M. (2003). Pinniped-focused tourism in the southern hemisphere: a review of the industry. In. *Marine Mammals: Fisheries, Tourism and Management Issues*. Gales, N., Hindell, M. and Kirkwood, R. (eds.). CSIRO Publishing: Collingwood, Victoria. pp. 257–76.

Marine and Marine Industries Council. (2002). *A seal/fishery interaction management strategy: Background report*. Department of Primary Industries, Water and Environment, Tasmania. pp 97.

National Seal Strategy Group (2007). National Assessment of Interactions between Humans and Seals: Fisheries, Aquaculture and Tourism. A report prepared by the Natioanl Seal Srategy Group and Carolyn Stewardson (Bureau of Rural Sciences) (in prep).

Orsini, J-P. (2004). Human impacts on Australian sea lions, *Neophoca cinerea*, hauled out on Carnac Island (Perth, Western Australia): implications for wildlife and tourism management. Masters Thesis, School of Environmental Science Murdoch University, Western Australia. 134 p.

Page, B., McKenzie, J., McIntosh, R., Baylis, A., Morrissey, A., Calvert, N., Haase, T., Berris, M., Dowie, D., Shaughnessy, P. and Goldsworthy, S.D. (2004). Entanglement of Australian sea lions and New Zealand fur seals in lost fishing gear and other marine debris before and after Government and industry attempts to reduce the problem. *Marine Pollution Bulletin* **49**: 33–42.

Shaughnessy, P.D. (1999). *The Action Plan for Australian seals*. Environment Australia: Canberra, Australia. 116 p.

Yodzis, P. (2001). Must top predators be culled for the sake of fisheries? *Trends in Ecology and Evolution* **16** (2): 78–84.

Appendices

Appendix A Government and non-government stakeholders

Government

Department of the Environment and Heritage, Australian Government

Department of Agriculture, Fisheries and Forestry, Australian Government

Australian Fisheries Management Authority, Australian Government

Department of Immigration and Multicultural and Indigenous Affairs, Australian Government

Department of Industry, Tourism, and Resources, Australian Government

Department of Primary Industries, New South Wales

Department of Environment and Conservation, New South Wales

Department of Primary Industries, Victoria

Department of Sustainability and Environment, Victoria

Department of Primary Industries and Water, Tasmania

Department for Environment and Heritage, South Australia

Department of Primary Industries and Resources, South Australia

Department of Conservation and Land Management, Western Australia

Department of Fisheries, Western Australia

CSIRO, Division of Marine Research

State Tourism Commissions

Non-government

Tasmanian Fishing Industry Council

South Australian Fishing Industry Council

Western Australian Fishing Industry Council

South East Trawl Fishery Industry Association

Commonwealth Fisheries Association

Seafood Industry Victoria

New South Wales Seafood Industry Council

Seafood Council (South Australia)

Tuna Boat Owners Association of South Australia

Recfish Australia

VR Fish (Victoria)

National Aquaculture Council

Eco-tourism Australia

The National Environment Consultative Forum (NECF currently has 34 member organisations)

SeaNet

The Australasian Regional Association of Zoological Parks and Aquaria

Tasmanian Aquaculture and Fisheries Institute

University of Tasmania

Australian Maritime College

Relevant Local Aboriginal Land Councils

Relevant Native Title Representative Bodies

State Tourism Operator Bodies

Wildlife Tourism Australia

Appendix B Roles and Responsibilities

Implementation of the Strategy requires a partnership between governments, industry, non-government organisations and the public.

Government

The Australian Government can contribute to the implementation of the Strategy by providing national policy leadership through inter-governmental initiatives, such as:

- providing impetus for whole-of-government approaches
- the facilitation of and encouragement for research and development activities
- protection of species listed under Australian Government legislation, and
- management of Australian Government fisheries.

The Australian Government also has responsibility for seals in continental shelf waters outside state waters (three nautical miles) and within the Exclusive Economic Zone (200 nautical miles).

State government agencies have responsibility for the ecologically sustainable management and development of their industries.

Local governments in some jurisdictions manage seal haul-out and breeding areas and play a key role in raising community awareness and providing education opportunities.

Industry

The commercial fishing, aquaculture, and tourism industries have a responsibility to ensure practices are ecologically sustainable. Industry initiatives, including development of action plans and codes of practice along with education and awareness activities, will play a significant role in the implementation of the Strategy. Industry will also play an essential role in reporting and monitoring interactions.

Tourism industries benefit from the health and diversity of seal populations. Ecologically sustainable practices will ensure community support of the industry, maintaining its future profitability. Development of best practice guidelines will ensure, for example, that breeding sites are not on tour itineraries. They will require that clients are fully informed about the effect humans can have on seals and about any penalties associated with illegal interactions with seals. Industry ownership of mitigation techniques and education programmes will remain important as the industry develops.

Non-government roles

Conservation groups, researchers, other interested organisations and members of the general public can carry out actions that potentially support the implementation of the Strategy. Complementary on-ground activities and links with industry and government can encourage appropriate research, education and awareness programmes. These will help to ensure new practices are implemented.

Appendix C Australian Government and State legislation relating to seals

All seal and sea lion species are protected (listed marine species) under the EPBC Act 1999, which is administered by the Australian Government Department of the Environment and Heritage (DEH). The Australian sea lion is listed as vulnerable under the EPBC Act. The Australian Government is responsible for seals outside state waters and within the Australian Economic Exclusion Zone. State government conservation and/or fisheries agencies are responsible under state legislation for seals on land and in waters up to three nautical miles off-shore.

Table 4 is a summary of the relevant Commonwealth and state legislation applying to seals. The table also shows the relevant management authority that administers the legislation and any listing or category attributed to seals under each instrument.

Under the EPBC Act it is an offence to kill, injure, take, trade, keep or move a member of a listed threatened species, listed migratory species or listed marine species in a Commonwealth area (s 254) unless the action is covered by a permit issued by the Minister for the Environment and Heritage or is otherwise exempt. It is also an offence to 'not report' any interactions with listed species (s 256). The EPBC Act specifies:

- that all Australian Government (Commonwealth) managed fisheries undergo strategic environmental impact assessment before new management arrangements are brought into effect (s 147), and
- that all fisheries with an export component undergo assessment to determine the extent to which management arrangements will ensure the fishery operates in an ecologically sustainable way (s 303FN (10A)).

Table 4 Australian Government and State Legislation relevant to seals

Jurisdiction	Authority	Act	Listing/Category
Australian Government	Department of the Environment and Heritage	*Environment Protection and Biodiversity Conservation Act, 1999*	**Vulnerable** Australian sea lion Sub-Antarctic fur seal Southern elephant seal **Listed Marine Species** All pinnipeds
Western Australia	Department of Conservation and Land Management	*Wildlife Conservation Act, 1950*	**Specially Protected** Australian sea lion New Zealand fur seal **Protected** All pinnipeds
South Australia	Department for Environment and Heritage	*National Parks and Wildlife Act, 1972* *South Australian Fisheries Act 1982*	**Protected** New Zealand fur seal All pinnipeds **Rare** Australian sea lion Australian fur seal Leopard seal Southern elephant seal
Victoria	Department of Sustainability and Environment	*Wildlife Act, 1975; National Parks Act 1975 Flora and Fauna Guarantee Act, 1988*	**Protected Wildlife** All pinnipeds *[Wildlife Act 1975]*
Tasmania	Department of Primary Industries, Water and the Environment	*Nature Conservation Act, 2002*	**Protected** All pinnipeds **Rare** New Zealand fur seal
New South Wales	NSW National Parks and Wildlife Service	*Threatened Species Protection Act, 1995*	**Vulnerable** Australian fur seal New Zealand fur seal

Once a fishery is identified as requiring assessment, the responsible management agency (either the Australian Fisheries Management Authority or State fisheries agencies) assesses the fishery against the Australian Government's "Guidelines for the Ecologically Sustainable Management of Fisheries". Principle two of the Guidelines states "Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem". Its first objective is "The fishery is to be conducted in a manner that does not threaten bycatch species" and its second, that "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". In the case of seals, each fishery must demonstrate that its management arrangements achieve these objectives and that the level of response is relative to the degree of risk of death, injury, etc. to individual seals or seal/sea lion populations.

Under the EPBC Act, it is an offence to kill seals in Australian waters. A permit will only be granted if the activity:

- contributes significantly to the conservation of the listed threatened species or the listed marine species concerned, or

- the impact of the activity on a member of a listed threatened species or a member of a listed marine species concerned is incidental to, and not the purpose of, the taking of the activity, and
- the taking of the activity will not adversely affect the survival or recovery in nature of the listed threatened species or the conservation status or population of the listed marine species, and
- the taking of the activity is not inconsistent with a recovery plan that is in force for the listed threatened species or a wildlife conservation plan that is in force for the listed marine species, and
- the holder of the permit will take all reasonable steps to minimise the impact of the activity on the listed threatened species or the listed marine species, or
- the specified activity is of particular significance to indigenous tradition, and will not adversely affect the survival or recovery in nature of the conservation status of the listed threatened species or the listed marine species concerned, or
- the specified activity is necessary in order to control pathogens, and is conducted in a way that will, so far as is practicable, keep to a minimum any impact on the listed threatened species or the listed marine species concerned.

The Act specifies that certain actions are not offences (s 255). These include actions authorised by a permit, taken in accordance with a wildlife conservation plan made under the Act, covered by an approval in operation under Part 9 of the Act or undertaken in accordance with an accredited management plan or regime. Specified actions such as humanely killing an animal to relieve or prevent suffering or to prevent a risk to human health or serious threat to human life are not offences. However, a deliberate act of malice or other interaction occurring despite an accredited management regime is an offence. Similar conditions apply in State jurisdictions under the relevant State legislation.

Appendix D National Seal Strategy Group Membership

The National Seal Strategy Group members included representatives from:

Department of Agriculture, Fisheries and Forestry, Australian Government

Department of the Environment and Heritage, Australian Government

Australian Fisheries Management Authority, Australian Government

Department of Environment and Conservation, New South Wales

Department of Primary Industries, New South Wales

Department for Environment and Heritage, South Australia

Department of Primary Industries and Water, Tasmania

Department of Primary Industries, Victoria

Department of Sustainability and Environment, Victoria

Department of Conservation and Land Management, Western Australia

Department of Fisheries, Western Australia

These agencies have responsibilities for managing interactions between humans and seals.

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