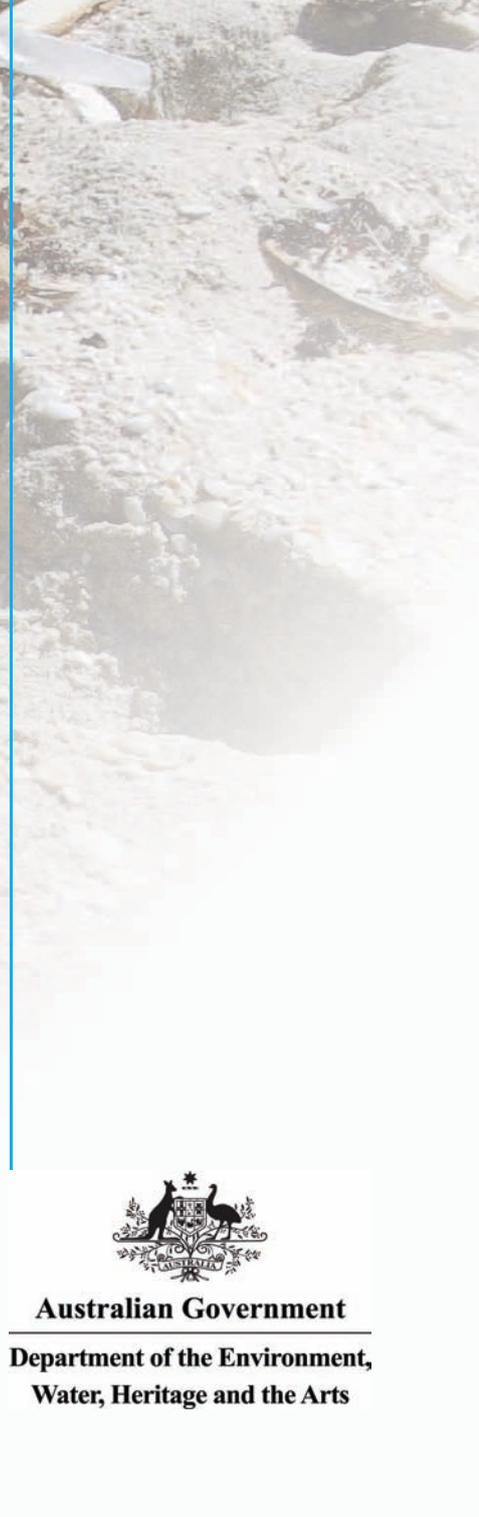


THREAT ABATEMENT PLAN

for the impacts of marine debris on vertebrate marine life

May 2009



Australian Government

**Department of the Environment,
Water, Heritage and the Arts**

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Cape Arnhem, Northern Territory. Dr Ilse Kiessling.

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Department of the Environment, Water, Heritage and the Arts

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Preface

‘Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris’ was listed in August 2003 as a key threatening process under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). A key threatening process is a process that ‘threatens or may threaten the survival, abundance or evolutionary development of a native species or ecological community’.

Under the EPBC Act, the Australian Government implements the threat abatement plan (TAP) as it applies to Commonwealth areas, and seeks the collaboration of state, territory and local governments and other stakeholders to implement the TAP as it applies to them.

Harmful marine debris negatively impacts substantial numbers of Australia’s marine wildlife, including protected species of birds, turtles and marine mammals. Threat abatement plans focus on strategic approaches to reduce the impacts of key threatening processes that jeopardise the long-term survival of native species and ecological communities. This TAP specifically provides a framework for the abatement of injury and fatality to marine species caused by harmful marine debris.

The Department of the Environment, Water, Heritage and the Arts is grateful for the assistance of a number of experts, managers, and community groups who have contributed to the development of this TAP.

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1. Background

In August 2003, 'Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris' was listed as a key threatening process under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). This threat abatement plan (TAP) aims to provide a coordinated national approach to the implementation of measures to prevent and mitigate the impacts of harmful marine debris on vertebrate marine life. Detailed information supporting this TAP is provided in the *Background paper for the threat abatement plan for the impacts of marine debris on vertebrate marine life* (Commonwealth of Australia, 2008). The background paper describes in more detail the key threatening process and its management via prevention, removal and mitigation.

Marine debris originates from sources both on land and at sea, and may travel long distances from where it first entered the marine environment. Harmful marine debris refers to all plastics and other types of debris from domestic or international sources that may cause harm to vertebrate marine wildlife. This includes land sourced plastic garbage (e.g. bags, bottles, ropes, fibreglass, piping, insulation, paints and adhesives), derelict fishing gear from recreational and commercial fishing activities and ship-sourced, solid non-biodegradable floating materials lost or disposed of at sea.

The key threatening process does not include debris that is not harmful to marine wildlife such as floating wooden objects and metal objects that do not cause entanglement and are unable to be ingested. Fishing nets and lines under the control of fishers, and marine debris resulting from the legal disposal of garbage such as food, paper, rags, glass, metal and crockery at sea under the provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL) are outside the scope of the TAP.

Harmful marine debris impacts on a range of marine life, including protected species of birds, sharks, turtles and marine mammals. Twenty marine species listed as threatened under the EPBC Act were identified as part of the listing of marine debris as a key threatening process as they are known to be impacted by harmful marine debris (Appendix A). Impacts of marine debris on wildlife include entanglement that can cause restricted mobility, drowning, starvation, smothering and wounding, in turn leading to infections, amputation of limbs and death. Debris such as plastic bags, rubber, balloons, plastic fragments and confectionery wrappers may be confused with prey species and ingested by marine wildlife, causing physical blockage in the digestive system and leading to internal injuries and starvation. Within marine food webs, plastic debris can also serve as a transport medium and a potential source of toxic chemicals such as polychlorinated biphenyls (PCBs), endocrine-active substances, and chemicals similar to dichlorodiphenyltrichloroethane (DDT). These chemicals are known to compromise immunity and cause infertility in animals, even at very low levels.

The most effective way to reduce the impacts of marine debris is to prevent it entering the marine environment, which requires the domestic and international origins of the debris to be determined. Mitigating the impacts of marine debris on marine species requires technical solutions and an information base from which to determine where management efforts should be targeted and what their effectiveness is over time. Abating harmful marine debris requires a multi-faceted approach involving the collaboration of researchers, industry, coastal managers, governments and polluters. The information and framework provided in the TAP is intended to promote collaboration between these groups and provide direction for research and management to address the key threatening process.

2. Objectives and actions

The aim of this TAP is to provide a coordinated national approach to the implementation of measures to prevent and mitigate the impacts of harmful marine debris on vertebrate marine life.

To achieve this aim, the plan provides a framework for implementing measures with four main objectives:

1. Contribute to the long-term prevention of the incidence of harmful marine debris
2. Remove existing harmful marine debris from the marine environment
3. Mitigate the impacts of harmful marine debris on marine species and ecological communities
4. Monitor the quantities, origins and impacts of marine debris and assess the effectiveness of management arrangements over time for the strategic reduction of debris.

To achieve the objectives of this plan, specific activities are outlined in Table 2.1 below (and described in more detail in the background paper). These activities seek to build on existing initiatives and strengthen coordination and partnerships to prevent, remove, mitigate and monitor marine debris. Activities are also targeted at addressing gaps in existing measures as identified in the background paper rather than duplicating any existing programs.

The criteria against which the achievement of the objectives will be measured will be consistent with national indicators for estuarine, coastal and marine ecosystems, namely:

- a general decline in the presence and extent of harmful marine debris in Australia's marine environment
- a general decline in the number of marine vertebrates dying and being injured as a result of ingestion and/or entanglement in harmful marine debris.

Implementation, monitoring and assessment of this plan against these indicators will ensure that threat abatement activities are consistent with other natural resource management initiatives being implemented around Australia. Performance criteria will be refined as part of the implementation of the TAP.

Table 2.1 Summary of threat abatement plan activities

Objective 1 – Contribute to the long-term prevention of the incidence of harmful marine debris				
Approach	Action		Lead responsibility	Commence within
Improve waste management practices on land and at sea	1.1	Australian Government in consultation with the states and territories to facilitate the review of existing arrangements relevant to the control of marine debris on vessels smaller than 400 gross tonnes (including fishing vessels).	Australian, state and territory governments	2–4 years
	1.2	State, territory and Australian governments and appropriate local bodies to facilitate studies of port facilities and boating hubs for the disposal of fishing gear, including assessment of availability, use, capacity and cost.	Australian, state and territory governments	2–4 years
	1.3	State and territory governments to consider reviewing legislation to ensure that details of waste reception facilities for ships are included in port environment plans.	State and territory governments	1–2 years
	1.4	State and territory governments to investigate how Australia’s obligations under MARPOL (i.e. to provide adequate waste reception facilities for ship waste) are encompassed in domestic legislation and policies.	State and territory governments	1–2 years
	1.5	DEWHA, in collaboration with DFAT and AMSA, to facilitate through international fora, taking into account policies and programs of IMO, studies of the ability of international ports in the Asia-Pacific region to handle vessel-sourced waste, particularly derelict fishing gear, including assessment of availability, capacity and cost.	Australian Government	2–4 years
	1.6	DEWHA, in collaboration with DFAT and AMSA, to facilitate through domestic and international fora, taking into account policies and programs of IMO, studies of the barriers and incentives to the use of existing port waste reception infrastructure in Australia and the Asia-Pacific region.	Australian Government	2–4 years
	1.7	Australian Government agencies in collaboration with state and territory governments to identify appropriate responses and responsibilities for recovery of hazardous debris at sea, notably large derelict fishing nets.	Australian, state and territory governments	1–2 years

Objective 1 – Contribute to the long-term prevention of the incidence of harmful marine debris				
Approach	Action		Lead responsibility	Commence within
Improve waste management practices on land and at sea	1.8	State, territory and Australian governments, in collaboration with industry, to identify and implement appropriate measures for incorporating waste reporting and management requirements (reporting and return of rubbish, damaged gear, etc. to port for disposal) into fishery management arrangements as appropriate.	Australian, state and territory governments	2–4 years
	1.9	State, territory and Australian governments, in collaboration with the fishing industry, to promote best practice waste management strategies on board fisheries vessels, including the uptake of existing codes of conduct, and identify any need for the development of new codes of conduct.	Australian, state and territory governments	2–4 years
	1.10	DEWHA to support an analysis of financial incentives to encourage return of waste generated at sea to land for appropriate disposal, for example: <ul style="list-style-type: none"> • fishing gear inventories by port and vessel supported by deposits and bounty initiatives • introduction of regulations relevant to insurance of lost fishing or other gear and/or insurance levies to support removal of derelict gear • repair, re-use and recycling initiatives. 	DEWHA	2–4 years
	1.11	DEWHA to support feasibility studies of market/consumer/peer-based incentives to encourage responsible handling and disposal of waste fishing gear, for example: <ul style="list-style-type: none"> • accreditation of sustainable practice in fisheries with specific reference to gear manufacture, use and handling • ‘stewardship’ arrangements for manufacturers and users of fishing gear. 	DEWHA	2–4 years
	1.12	State, territory and local governments and other relevant bodies to consider providing increased funding for the introduction of improved solid pollutant (particularly litter) control strategies in waterways.	State and territory governments and relevant bodies	2–4 years

Objective 1 – Contribute to the long-term prevention of the incidence of harmful marine debris				
Approach	Action		Lead responsibility	Commence within
Raise public awareness and improve education campaigns about the prevention of littering on land and at sea	1.13	State and territory governments to facilitate an analysis of the effectiveness of current litter public awareness and education campaigns to identify gaps and areas for improvement.	State and territory governments	1–2 years
	1.14	State, territory and Australian governments, in collaboration with appropriate non-government organisations, to develop options for establishing a more consistent and long-term national approach to litter abatement education, particularly for marine-based activities.	Australian, state and territory governments	1–2 years
	1.15	DEWHA and relevant agencies to examine introducing awareness-raising and outreach programs aimed at relevant groups contributing to marine debris in the Asia-Pacific region	DEWHA and relevant agencies	2–4 years
	1.16	DEWHA, in collaboration with DFAT, to identify opportunities for exchange visits between coastal (especially Indigenous) communities experiencing the impacts of marine debris and groups in other nations where large proportions of harmful marine debris originate.	DEWHA and DFAT	1–2 years
Build and strengthen international collaboration to identify the origins and effective responses to the prevention of harmful marine debris	1.17	DEWHA, in collaboration with DFAT, to strengthen relations with regional neighbours on marine debris through relevant fora, and develop collaborative project proposals to address the sources and impacts of harmful marine debris.	DEWHA and DFAT	2–4 years
	1.18	Australian Government to encourage and assist relevant nations to sign, ratify and enforce Annex V of MARPOL.	Australian Government	1–4 years

Objective 2 – Remove existing harmful marine debris from the marine environment
Objective 4 – Monitor the quantities, origins and impacts of marine debris and assess the effectiveness of management arrangements over time for the strategic reduction in marine debris

Please note that the actions are not prioritised and some actions below may address both objectives

Approach	Action	Lead responsibility	Commence within	
Development of a national approach to information collection and management	2.1	DEWHA in collaboration with state and territory governments and other relevant stakeholders to support the development of nationally consistent, statistically rigorous data collection protocols and survey methods. DEWHA to support the development and management of national mapping of the spatial distribution and concentration of marine debris over time to assess the significance of marine debris and to reduce its occurrence.	DEWHA	1–3 years
	2.2	State, territory and Australian governments to provide support for community-based coastal and waterway clean-up and monitoring activities.	Australian, state and territory governments	1–2 years
	2.3	DEWHA in collaboration with state and territory government to facilitate the establishment of a national network of a limited number of permanent marine debris monitoring sites (including within Commonwealth Marine Protected Areas) to promote consistent monitoring and information gathering and exchange, to enable understanding of long-term trends, and to inform adaptive and effective management responses.	DEWHA	1–2 years
Improve understanding of the origins of harmful marine debris	2.4	DEWHA to support a study on the wind and sea circulation patterns in the Asia-Pacific region as a basis for better understanding the pathways and potential sources and sinks of harmful marine debris of foreign origins in Australian waters.	DEWHA	1–2 years
	2.5	Australian Government to facilitate a feasibility study on introducing marking of fishing gear so that it may be identified as originating from a specific fishery. The feasibility study will also consider the practical implications of marking fishing gear and the implications of derelict gear being traced back to fisheries operations.	Australian Government	2–4 years

Objective 3 – Mitigate the impacts of harmful marine debris on marine species and ecological communities

Please note that the actions are not prioritised

Approach	Action	Lead responsibility	Commence within	
Facilitate implementation of wildlife research and recovery actions	3.1	State, territory and Australian governments to support expanded and consistent, long-term monitoring, investigation, recording and management of data on vertebrate marine life harmed and killed by the physical and chemical impacts of marine debris. This information will assist the impacts of different types of marine debris on vertebrates to be quantified and characterised. For example: <ul style="list-style-type: none"> • DEWHA to support monitoring of regurgitated marine debris at albatross and giant petrel breeding colonies (linked with the <i>Recovery plan for albatrosses and giant petrels</i> [Environment Australia, 2001]). 	Australian, state and territory governments	1–2 years
	3.2	DEWHA to coordinate marine debris abatement strategies identified in existing marine wildlife recovery plans. For example: <ul style="list-style-type: none"> • DEWHA to support analysis of the impact of marine debris on the survival and behaviour of marine turtles (linked with the <i>Recovery plan for marine turtles in Australia</i> [Environment Australia, 2003]). 	DEWHA	1–2 years
	3.3	DEWHA to support research on the nature of degradation pathways of synthetic debris in the marine environment (including biodegradable and oxodegradable plastics), the extent that degradation products are contaminated by other potentially toxic compounds, and the potential toxicity of debris types on marine species. For example: <ul style="list-style-type: none"> • DEWHA to support monitoring of the incidence of hatching failure due to eggshell thinning (linked with the <i>Recovery plan for albatrosses and giant petrels</i> [Environment Australia, 2001]). 	DEWHA	2–4 years
	3.4	DEWHA to identify measures to promote the uptake and application of biodegradable and oxodegradable plastic in marine-based industries and environments where it is found to be effective.	DEWHA	2–4 years

AMSA = Australian Maritime Safety Authority;

DEWHA = Australian Government Department of the Environment, Water, Heritage and the Arts;

DFAT = Australian Government Department of Foreign Affairs and Trade;

IMO = International Maritime Organization;

MARPOL = International Convention for the Prevention of Pollution from Ships

3. Implementation and evaluation of the plan

3.1 Duration and cost

Harmful marine debris is a threatening process that requires ongoing attention. The actions described in this plan are expected to require up to five years for implementation, although due to the longevity of marine debris in the marine environment, the results of threat abatement activities may take longer to determine.

Commitment from all levels of government, industry and the community is required to address this issue. In particular, cooperation and partnerships between governments and Indigenous communities and organisations will be important to the effective implementation of this Plan. The Australian Government has provided funding to continue existing efforts and implement a number of new measures outlined in this plan.

3.2 Evaluation

Before the end of the five-year plan implementation period, the Department of the Environment, Water, Heritage and the Arts will commission an independent review of the plan's effectiveness, in accordance with the requirements of the EPBC Act (Section 279(2)). The review will involve key stakeholder groups (industry, community groups, researchers and experts, Indigenous organisations, conservation organisations), and relevant Australian, state and Northern Territory government agencies. Recommendations from the review will provide a foundation for a revised plan, if required.

3.3 Ecological matters impacted by the plan's implementation

Implementation of this plan is intended to directly contribute to the protection of marine species described in the key threatening process listing and in the background paper. The plan is also likely to have broader benefits for marine species and communities currently impacted by marine debris, but not included in the key threatening process listing.

Appendix A

Species negatively impacted by marine debris

The table below contains species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) which are negatively impacted by ingestion of, or entanglement in, harmful marine debris as noted in the listing of marine debris as a key threatening process (TSSC, 2003) or otherwise documented. Table A1 is not an exhaustive list of species that may be negatively impacted by marine debris.

Information for species listed under the EPBC Act is available from the Species Profile and Threats Database: <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>.

Table A1 Species listed under the EPBC Act included in the key threatening process listing or otherwise documented as negatively impacted by ingestion of, or entanglement in, harmful marine debris

Type	Common name	Scientific name	Current status	Identified in key threatening process listing or other reference
Turtles	Flatback turtle	<i>Natator depressus</i>	Vulnerable	Identified in KTP listing
	Green turtle	<i>Chelonia mydas</i>	Vulnerable	Identified in KTP listing
	Hawksbill turtle	<i>Eretmochelys imbricata</i>	Vulnerable	Identified in KTP listing
	Leatherback turtle	<i>Dermochelys coriacea</i>	Vulnerable	Identified in KTP listing
	Loggerhead turtle	<i>Caretta caretta</i>	Endangered	Identified in KTP listing
	Olive ridley turtle	<i>Lepidochelys olivacea</i>	Endangered	Environment Australia (2003), Greenland et al. (2004)
Cetaceans	Southern right whale	<i>Enbalaena australis</i>	Endangered	Identified in KTP listing
	Blue whale	<i>Balaenoptera musculus</i>	Endangered	Identified in KTP listing
	Humpback whale	<i>Megaptera novaeangliae</i>	Vulnerable	Identified in KTP listing
	Sei whale	<i>Balaenoptera borealis</i>	Vulnerable	Bannister et al. (1996)
	Fin whale	<i>Balaenoptera physalus</i>	Vulnerable	Bannister et al. (1996)
	Bryde's whale	<i>Balaenoptera edeni</i>	Listed cetaceans	EPA (2003, 2004)
Sharks	Grey nurse shark (west coast population)	<i>Carcharias taurus</i>	Vulnerable	Identified in KTP listing
	Grey nurse shark (east coast population)	<i>Carcharias taurus</i>	Critically endangered	Identified in KTP listing
Birds	Antipodean albatross	<i>Diomedea exulans antipodensis</i>	Vulnerable	Identified in KTP listing
	Gibson's albatross	<i>Diomedea exulans gibsoni</i>	Vulnerable	Identified in KTP listing
	Grey-headed albatross	<i>Thalassarche chrysostoma</i>	Vulnerable	Identified in KTP listing
	Indian yellow-nosed albatross	<i>Thalassarche carteri</i>	Vulnerable	Identified in KTP listing
	Northern royal albatross	<i>Diomedea epomophora sanfordi</i>	Endangered	Identified in KTP listing
	Southern royal albatross	<i>Diomedea epomophora epomophora</i>	Vulnerable	Identified in KTP listing
	Tristan albatross	<i>Diomedea exulans exulans</i>	Endangered	Identified in KTP listing
	Wandering albatross	<i>Diomedea exulans</i> (sensu lato)	Vulnerable	Identified in KTP listing
	Blue petrel	<i>Halobaena caerulea</i>	Vulnerable	Identified in KTP listing
	Gould's petrel	<i>Pterodroma leucoptera leucoptera</i>	Endangered	Identified in KTP listing
	Northern giant petrel	<i>Macronectes halli</i>	Vulnerable	Identified in KTP listing
	Pelican	<i>Pelecanus conspicillatus</i>	Listed marine	Sloan et al. (1998)
Other	Australian sea lion	<i>Neophoca cinerea</i>	Vulnerable	Page et al. (2004)
	Seals		Listed marine	Pemberton et al. (1992), DTAE and DPIWE (2007)
	Dugong	<i>Dugong dugon</i>	Listed marine	EPA (2000)

Glossary, acronyms and abbreviations

Critically endangered	Under the EPBC Act, a native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Ecological community	Under the EPBC Act, an assemblage of native species that: (a) inhabits a particular area in nature; and (b) meets the additional criteria specified in the regulations (if any) made for the purposes of this definition
Endangered species	Under the EPBC Act, a native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Harmful marine debris	Land sourced plastic garbage, fishing gear from recreational and commercial fishing abandoned into the sea, and ship sourced, solid non-biodegradable floating materials disposed of at sea. In concordance with MARPOL, plastic material is defined as bags, bottles, strapping bands, sheeting synthetic ropes, synthetic fishing nets, floats, fibreglass, piping, insulation, paints and adhesives.
Key threatening process	Under the EPBC Act, a process that threatens or may threaten the survival, abundance or evolutionary development of a native species or ecological community.
Recovery plan	Under the EPBC Act, a document setting out the research and management actions necessary to stop the decline of, and support the recovery of, listed threatened species or threatened ecological communities.
Threat abatement plan	Under the EPBC Act, a plan providing for the research, management, and any other actions necessary to reduce the impact of a listed key threatening process on impacted species and ecological communities.
Threatened species	Refers to the Australian Government list of threatened native species divided into the following categories as per the EPBC Act: critically endangered; endangered; vulnerable; conservation dependent.
Vulnerable species	Under the EPBC Act, a native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
MARPOL	International Convention for the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978 relating thereto.
TAP	Threat Abatement Plan

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