

ANZECC Working Party on Marine Debris

**Final Report
Review of Legislation, Management Strategies
and Practices**

October 1996

Volume 1

**Please note - this is an unofficial version of this document at the moment
- the official version will be posted when it becomes available**

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 - B MARPOL 73/78 Annex V, Regulation 9
 - C Proforma Questionnaires
 - D US National Marine Debris Monitoring Program Methodology Developed by the US Centre for Marine Conservation
 - E US National Marine Debris Monitoring Program-Volunteer Handbook
 - F US National Marine Debris Monitoring Program-Survey Director Handbook
 - G Power Analysis for Beach Surveys of Marine Debris
 - H Marine Debris Beach Survey (NSW)
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Photographic acknowledgments - front cover

Top right - clockwise: Lisa France, Department of Environment,
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Abbreviation List

APPEA	Australian Petroleum Production and Exploration Association Limited
AAPMA	Association of Australian Ports and Marine Authorities
ACOS	Australian Chamber of Shipping
AFMA	Australian Fisheries Management Authority
AFZ	Australian Fishing Zone
AMCS	Australian Marine Conservation Society
AMSA	Australian Maritime Safety Authority
ANZECC	Australian & New Zealand Environment & Conservation Council
AQIS	Australian Quarantine and Inspection Service
ASA	Australian Shipowners Association
BIA	Boating Industry Association
CCAMLR	Convention for the Conservation of Antarctic Marine Living Resources
CONCOM	Council of Nature Conservation Ministers
CMC	Centre for Marine Conservation
CSIRO	Commonwealth Scientific Industrial & Research Organisation
DEM-N	Directorate of Environmental Management - Navy
DEP-N	Directorate of Engineering Policy - Navy
DEST	Department of the Environment, Sport and Territories
DI(N) Ops 19-1	Defence Instruction (Navy) Operations 19-1
DoE	Department of Environment
ESD	Ecologically Sustainable Development
EEZ	Exclusive Economic Zone
EPA	Environment Protection Agency
ET & BF	Eastern Tuna & Billfish Longline Fishery
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
ICS	International Chamber of Shipping
IGAE	Intergovernmental Agreement on the Environment
IMO	International Maritime Organization
IOC	International Oceanic Commission
KAB	Keep Australia Beautiful
KESAB	Keep South Australia Beautiful
LRRR	Litter Research & Recycling Association
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships
MEPC	Marine Environment Protection Committee
MESA	Marine Education Society of Australasia
MPCP	Marine Pollution Control Project
NEPC	National Environment Protection Committee
NEPM	National Environment Protection Measure

NMDMP	National Marine Debris Monitoring Program
PINS	Penalty Infringement Notices
RAN	Royal Australian Navy
Recfish Australia	The Australian Recreational & Sport Fishing Confederation Inc
RN	United Kingdom Royal Navy
SAFIC	South Australian Fishing Industry Council
SARDI	South Australian Research & Development Institute
SAWS	standard Australia wide survey
SEF	South East Fisheries
SETMAC	South East Trawl Management Advisory Committee
SETFIA	South East Trawl Fishing Industry Association
SOMER	State of the Marine Environment Report
SOS	State of Our Surf Review
SPREP	Convention for the Protection of the Natural Resources and Environment of the South Pacific Region
TRALAC	Tasmanian Recycling & Litter Awareness Council
UNCLOS	United Nations Convention on the Law of the Sea, 1982
UNEP	United Nations Environment Program
USN	United States Navy

Preamble

This document is the final report produced for the ANZECC Working Party on Marine Debris. The report is referred to as Review of Legislation, Management Strategies and Practices.

It is acknowledged that the degree of detail in some sections of this report has been limited by availability or existence of relevant data or literature.

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Executive Summary

Overview

This study develops directions for research, monitoring and actions to assess the significance of marine debris and to reduce its occurrence. The study presents a review of:

- legislation,
- management practices and strategies,
- ship board waste generation levels and
- existing programs for monitoring marine debris.

The study builds on The Australian Marine Debris Status Review (Stage 1 report) (Ref 38), which looked at the following sections:

- debris description;
- shipping lines;
- marine debris management;
- programs and attitudes;
- waste management practices and policies;
- legislation, treaties and conventions; and
- marine debris data bases.

The relevant conclusions from Stage 1 that have been built on in Stage 2 are:

- The solution to the marine debris problem must focus on tackling the problem at the source which reduces the need for clean up;
- legislation prohibiting the dumping of garbage at sea is essential;
- the main industry groups such as commercial fishers and boaters, plastics, shipping and packaging industries and recreational fishers and boaters need to be targeted to educate their members and staff on the detrimental effects of their activities on the marine environment; and
- the information from the variety of past litter surveys of Australia's beaches needs to be combined to devise a standard Australia wide survey to be used in the future.

This report then puts forward recommendations on the first four topics mentioned above, and provides a baseline for future work to be carried out in these areas.

Treaties, Conventions and Agreements

A review of international treaties, conventions and agreements was undertaken to identify the commitments the Australian Government has made and to identify the statutory provisions directly influencing the marine debris issue. The key convention is MARPOL 73/78 (Annex V- Garbage). This convention regulates the disposal of ship generated garbage and establishes areal limits on the disposal of garbage. MARPOL 73/78 prohibits disposal into the sea of plastics, including synthetic ropes, synthetic fishing nets and plastic garbage bags. MARPOL 73/78 prohibits the ocean disposal of dunnage, lining and packaging materials which will float unless the distance to land is greater than 25 nautical miles (nm) and disposal of food wastes and all other garbage including paper products, rags, glass, metal, bottles, crockery and similar refuse unless the distances to land or a special area are greater than 12 nm. These distances are reduced if the material has first been put through a grinder.

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For fixed and floating platforms, no discharge of garbage is allowable except for food waste which has been ground (to less than 25mm) and then only if the platform is more than 12 nm from the nearest land.

A new regulation (MARPOL 73/78 Annex V, Regulation 9) is coming into effect. It deals with placards, garbage management plans and garbage record keeping and will come into force on 1 July 1997 for all ships built after this date. Ships built before 1 July 1997 will have until 1 July 1998 to comply.

In Australia the enforcement of MARPOL 73/78 and other requirements rests with the Australian Maritime Safety Authority and the appropriate authorities of states with relevant legislation in place.

Other relevant treaties, conventions and agreements to which Australia is a signatory are also discussed. The United Nations Convention on the Law of the Sea (UNCLOS) states that all measures must be taken to avoid damage by pollution to other States and their environment.

Agenda 21 expands on the principles of sustainable development, the adoption of the "precautionary principle" and that the polluter should bear the cost of pollution.

There are various South Pacific Regional Conventions which have a commitment to encouraging the establishment of parks and protected areas, to ensuring that activities do not cause damage to areas outside the jurisdiction of the State, and to reduce and control pollution from vessels.

The *Convention for the Conservation of Antarctic Marine Living Resources* (CCAMLR) is concerned with the conservation of Antarctic marine living resources and the *1991 (Madrid) Protocol to the Antarctic Treaty* targets waste disposal and management and the prevention of marine pollution in the Antarctic region.

Legislation and Regulations

The Commonwealth, State and Territory legislation and regulations pertinent to marine debris have been identified and discussed.

The Commonwealth has addressed four of the five annexes of MARPOL 73/78, namely prevention of pollution from oil, noxious liquid substances in bulk, packaged harmful substances, and garbage, through *the Protection of the Sea (Prevention of Pollution from Ships) Act 1983*. Annex IV, sewage, has not yet been addressed.

Complementary legislation on Annex V of MARPOL 73/78 has been passed by some states. These are the *Transport Operations (Marine Pollution) Act 1995* in Queensland and the *Pollution of Waters by Oil and Noxious Substances Act 1986* in Victoria. NSW, Tasmania, South Australia, Western Australia and the Northern Territory have not passed supportive legislation or regulations although there are some allied pieces of statute. That legislation which is relevant to marine debris is discussed in this report.

Management Practices and Strategies

International, Commonwealth, state and territory legislations, conventions and guidelines form the framework for implementation strategies. An audit of strategies was undertaken using a proforma which was sent to all relevant organisations throughout Australia. Although the response rate was poor, some conclusions are made:

- publications of Codes of Practice are the most common strategy
- the Codes of Practice are primarily voluntary and provide an education role only
- co-ordination of strategies between organisations and between states/territories could be improved
- there has been insufficient monitoring of the effectiveness of each strategy, partly because of the recent commencement of most strategies
- any strategies are internally funded by member associations

Some excellent educational material regarding marine debris has been produced, with the most comprehensive that developed by the Australian Maritime Safety Authority and the former Tasmanian Department of Parks, Wildlife and Heritage, now the Department of Environment and Land Management. As well the Keep Australia Beautiful (KAB) campaign has an extensive Coast Care program, but this only applies to South Australia and Western Australia. The KAB campaign has school activity kits, stickers, garbage bags for boats and extensive education material which could be easily applied to the other states and territories.

Debris Disposal Quantities

An estimate of the amount of debris being generated by vessels within Australian waters was attempted. In general terms, only limited data were available.

Data that was available includes the following:

- waste generation on the Spirit of Tasmania, plying between Melbourne and Devonport,
- at the berth waste collection at Hobart for a sample of
 - commercial tankers/bulk and container vessels
 - Antarctic vessels
 - Japanese tuna vessels
 - Royal Australian Navy vessels
 - fishing boats
- waste generation over a 5 day period on HMS Chatham, a type 22 Batch III frigate
- US Navy ships
- a large passenger cruise vessel
- design estimates for the RAN
- basic information contained in MARPOL 73/78 Regulation 9

On the basis of the figures and numerous assumptions it was estimated that:

- some 13 800 tonnes of waste is generated aboard ships per year in Australian waters
- some 2 400 tonnes of fishing gear is lost or discarded each year
- only about 9 800 tonnes are recovered over berths and disposed of to landfills

- therefore, up to 6 500 tonnes of waste per year is discarded over board
- if 20% of the floatable waste that is discarded eventually reached the coastline, then deposition rates on beaches might be in the order of 6.5 kg/km.

The figures above involve many assumptions. However, the deposition rates found at an isolated beach, Anxious Bay in South Australia, tend to support the results.

Due to the lack of data, it is concluded that monitoring is required on the following:

- time and tonnage records of waste transfers from ships to Australian landfills
- waste composition analyses for selected loads
- selected beaches be monitored on a regular basis and that consideration be given to sites which are remote from urban stormwater influences

The possibility of fishing authorities monitoring the ingestion of and entanglement in debris by a range of marine fauna and the occurrence of lost or discarded fishing gear should be considered.

Existing Monitoring Programs and Proposed Australia Wide Survey

The relative strengths/weaknesses of existing and past marine debris surveys conducted in Australia are primarily dependent on their original objectives. The surveys which sought to clean up a beach environment and gain community participation have been very successful at achieving educational objectives but have been less successful at producing a long term baseline dataset.

Of the surveys identified, only 2 have been undertaken over a period of 5 years, which is considered to be the minimum period to establish a baseline (Ref 50). As a result, it is considered optimum to implement a new survey for at least 5 years to provide sufficient data to establish a baseline and determine trends, and therefore MARPOL 73/78 compliance. However, a more pragmatic time frame may be only 1 or 2 years.

The results of the marine debris monitoring programs assessed in the Stage 1 report showed a disparity between the sources of marine debris at different sites with some clearly indicating a dominance from land based activities. This factor is important when selecting sites for future surveys. Other aspects which are recommended for inclusion in the standard Australia wide survey are:

- use of the methodology adopted by the Centre for Marine Conservation (CMC)
- use of the existing CMC debris categories
- use of sandy beaches
- sampling throughout the year, at least quarterly, and additional sampling after major storm events
- photographs of different debris types to be used to ensure consistency in classification
- common methods for counting or weighing debris items
- identification of indicator items to categorise the source of debris
- use of site data cards for recording amounts and types of debris
- recording of the previous week's weather and the state of the beach to identify causal conditions

A list of groups which could participate in the surveys will need to be agreed. The ideal approach would be to hold a series of national workshops to discuss and provide feedback on the format of a standard survey, and to engender support. The survey should be adapted from the CMC and NMDMP information set out in Appendices D to F and existing Australian surveys such as the Ocean Watch Marine Debris Beach Survey (NSW) (Appendix H). A pilot study will also need to be undertaken to test the proposed survey techniques. The standard survey will have a broad range of participants and will need to be co-ordinated by a single body. A single source for co-ordinating of funding committed to maintaining the standard Australian survey is considered essential.

However, a more realistic approach might be to adopt the CMC and US National Marine Debris Monitoring Program (NMDMP) methodology and handbooks as they stand (see Appendices D to F) and integrate these immediately into existing programs, such as the Coastcare Commonwealth Coastal program or Ocean Watch program. After specific site selection has been carried out according to the methodology set out in section 5 of this report and Appendix D, a package including the existing NMDMP handbooks would be assembled, and facilitators could then train the community in the operation of the program. After 1 or 2 years of running this program, minor changes may be required to make it more suitable for Australian conditions.

As well as the development of a methodology for surveying marine debris stranded on the coastline, consideration needs to be given to undertaking offshore and seabed sampling to give a complete picture of the status of debris in the Australian environment.

In order to verify that there is a significant detrimental impact arising from marine debris, and in order to quantify this impact, it is proposed that monitoring regimes be established for:

- beach pollution
- at-the-berth waste collection
- vessel/debris collisions
- occurrences of entanglement of marine animals and evidence of problems associated with ingestion of debris by marine animals
- hazardous sites or events involving divers and marine debris.

There is also a need to maintain ship-based waste record sheets, as required under MARPOL 73/78 Annex V, Regulation 9, which applies to ships greater than 400t and with 15 or more people on board, so that waste generation levels can be assessed and monitored.

Summary of Recommendations

Enforcement Recommendations

The following enforcement recommendations have been developed in conjunction with the Working Party and have used the recommendations of specialist legal sub-consultant, Dr Michael White as a starting point. Dr White's recommendations are contained in Appendix A.

- a) It is recommended that ANZECC advise the **National Environment Protection Council (NEPC)** that a National Environment Protection Measure (NEPM) for maritime sourced Marine Debris be produced.
- b) It is recommended that ANZECC **encourage the State and the NT to bring their legislation into line with Australia's international obligations as a matter of urgency**. It may be appropriate for the NEPC to facilitate this process.
- c) It is recommended that ANZECC promote improving **the effectiveness and efficiency of prosecution of ships** that breach legislative requirements for control of marine debris.

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- d) It is recommended that ANZECC promote changes to intragovernmental procedures so that the **finances and costs of prosecutions under the relevant legislation be paid to the administering authority** to augment its income in relation to protection and preservation of the marine environment. Amongst the changes to prosecutions should be consideration of “On the Spot” fines for owners and masters of ships found to be in breach of laws or regulations. Such a system should include proper provisions for the allegations to be resisted in cases of innocence being pleaded.
- e) It is recommended that a **debris production and management auditing system**, based on the model given in Regulation 9 of Annex V, MARPOL 73/78, should be considered for vessels not included under MARPOL 73/78. A key development requirement should be to make allowance for establishment of actual, rather than theoretical, waste generation rates. This needs to be developed following consultation with relevant bodies and substantial trial processes.
- f) It is recommended that ongoing implementation of **Regulation 9** of Annex V of MARPOL 73/78 include an extensive consultation and education process involving all key maritime regulations, educators and operators.
- g) It is recommended that ANZECC promote **further marine debris control, research and education** in partnership with the public and private sectors.

Funding recommendations

- a) It is recommended that ANZECC give consideration to establishing improved sourcing and application of funding for marine debris control. The preferred source of funding is those parties responsible for production of marine debris. It may be appropriate to establish a small levy on appropriate land based and maritime commercial activities that generate marine debris. This would ensure that environmental costs associated with marine debris production are recovered and directed to debris management.
- b) It is recommended that application of funding include:
- research and development of mechanisms to minimise production and to improve collection, disposal and overall management of debris
 - monitoring and auditing of marine debris control particularly in relation to the proposed Australia wide survey
 - enforcement and coordination of marine debris control

Co-ordination recommendation

A key conclusion of this report is that improved co-ordination of overall marine debris control is required. Various options to achieved this are outlined below:

Option 1. Establish New Marine Debris Authority

A **single body** could co-ordinate funding initiatives and ensure that there is closer co-operation among AMSA, the State EPAs, the maritime divisions of the States and the NT and industry bodies. The body could also promote more effective administration of the legislation concerning marine debris. The new body would deal with all aspects of regulation and control of marine activities which affect, or threaten to affect, the marine environment. Through these actions the body would centralise the international responsibilities which Australia has undertaken through its international conventions and agreements. This body would ideally be located at a major port, thereby maximising the opportunity for interaction and practical implementation of strategies.

This option, however, is potentially incompatible with current Government policy and budget constraints. There will also be concerns over the most appropriate location for such a body and doubt over whether the new body would be able to efficiently make use of existing State based administrative infrastructure.

Option 2. Use of an existing Commonwealth Department for co-ordination

Many of the tasks required above can be forthcoming through the allocation of personnel within an **existing Department**, for instance the Department of the Environment, Sport and Territories. The Department's resourcing would however need enhancing with additional administration, funding and personnel

Option 3. Use of ANZECC Committee

The existing **ANZECC Committee** comprises key representatives from around Australia concerned with marine debris. The Committee could initiate directives and guidelines for the enforcement, education and co-ordination of strategies. Unfortunately, actual implementation would be difficult to specifically control. The inadequacy of current management processes is demonstrated by the current inconsistency in the level of compliance of legislation with MARPOL 73/78 and the lack of co-ordination of strategies. Application of this option would require extension of the tenure of this committee.

Option 4. Use of Existing State and Territory Authorities

This option would use the **existing State and NT administrative infrastructure** and maintains the existing balance of experience and knowledge. Co-ordination of these parties, however, is tenuous.

- a) **It is recommended that ANZECC facilitate improved co-ordination of marine debris control. This would be achieved by a combination of Options 2, 3 and 4, whereby existing resources are utilised and the ANZECC Committee, supported by the relevant Commonwealth State and NT departments.**

Management practices

- a) It is recommended that ANZECC promote **improved compliance of MARPOL73/78, Annex V including Regulation 9**. Consideration should be given to application of these provisions to vessels not currently covered by MARPOL 73/78 (ie. less than 400t and with less than 15 people on board).

- b) It is recommended that ANZECC encourage **further development of education campaigns** and specifically expansion of the KAB Coast Care campaign in South Australia and West Australia to a national level, with consistency amongst all states. It is recommended that various operators and in particular the Plastics and Chemicals Industries Association commence “responsible use” campaigns which would be aimed at consumers and linked to the recommended educational campaigns. This could be done by the Plastics Environment Council which has recently been formed by Australia’s leading resin manufacturers, importers and major converters to educate the government and industry on the environmental aspects of plastics and to help implement sustainable waste management methods through research and development.

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- c) It is recommended that the **Recreational Fishing and Boating Code of Practice be expanded** to include provisions for gear loss and that this Code be incorporated into the licensing system. This could be done by adopting the system used in Tasmania where educational material along the lines of that already produced by AMSA and the former Tasmanian Department of Parks Wildlife and Heritage is issued, along with copies of relevant Codes of Practice, with fishing permits and boat licences. It is recommended that recreational and commercial fishing Codes of Practice be revised to include better provision for marine debris control and be better co-ordinated, and that the authorities responsible for these Codes be encouraged to assess their effectiveness.
- d) It is recommended that ANZECC promote, where necessary, **the establishment, use and auditing of port waste facilities.**
- e) It is recommended that **increased research and development be undertaken** in relation to biodegradable products that occur as marine debris. For example the increased use of the Bio Bait Box should be further encouraged, as should the development of biodegradable plastic for use as bait bags and other products. The use of photodegradable plastic in Hi-Cone products is a useful solution, as it lessens the long term effects of wildlife entanglement, however the resulting small fragments of plastic can still be ingested. It is expected that the production of biodegradable plastic products will be slightly more expensive than conventional plastic. This could be addressed by offering incentives or government subsidies to producers of biodegradable products, by increasing taxes applied to traditional bait boxes or by passing legislation to control the use of competing non-biodegradable products.

Monitoring practices

- a) It is recommended that ANZECC facilitate the **development of an Australia wide survey which includes an** outline of monitoring/auditing procedures and standards for endorsement by each state and the NT for the collection of:
- beach monitoring data
 - waste collection, characteristic and disposal data from vessels across all berths (this data should be compatible with that of the Australian Waste Database)
 - data on entanglements of marine animals and problems resulting from ingestion of debris by marine animals
 - incidents involving ship/debris collisions
 - identified hazards recognised by divers.
- b) It is recommended that preliminary consideration should also be given to the use of existing fisheries or oceanographic research vessels for offshore surveys to confirm sources of debris. Consideration should also be given to the reimbursement costs for vessels that retrieve debris such as lost or discarded fishing gear.

- c) It is recommended that after a period of one year from the implementation of the Australia wide survey an annual consultancy, or some other arrangement, be commissioned to **collate all records from beach monitoring, waste collection, environmental impacts and dangers**, so that conclusions can be made about trends and compliance. This information should be summarised and forwarded to the IMO.

There are two possible options for developing and implementing a standard Australia wide survey:

1. that a **series of national workshops be held** to discuss and provide feedback on the format of a standard survey, and to engender support; or
2. that the **US NMDMP handbooks be adopted as they stand** and integrated into existing Australian marine debris programs. After 1 or 2 years appropriate minor changes may then be required

The first of these options would be ideal, but the second may be more practical in terms of budget and time constraints.

- d) It is recommended that **existing programs using existing mechanisms proceed wherever possible, and that they be integrated into the Australia wide survey**. For example, the Commonwealth Coastal Program is developing national monitoring sites, and marine debris could perhaps be accommodated within that framework.
- e) It is recommended the **community and key stakeholder input be obtained** in the selection of monitoring sites and any additions to reporting methodology. The objective of this input is to engender community and stakeholder support of the overall monitoring process.