MARINE DEBRIS IN AUSTRALIA – THE INTERNATIONAL DIMENSION
CASE STUDY ABSTRACT

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Origins of marine debris in Australia

Many thousands of tonnes of marine debris are washing ashore on Australia’s coasts each year. While there have been a number of studies conducted around Australia, it is not possible to definitively identify the principal source of marine debris. However across Australian waters estimates of marine-sourced waste and debris are as follows:

- around 13,800 tonnes of waste is generated aboard ships per year,
- around 2,400 tonnes of fishing gear is lost or discarded,
- only around 9,800 tonnes of debris are recovered over berths and disposal to landfills, and
- up to 6,500 tonnes of waste per year is lost or discarded overboard (ANZECC, 1996).

The origins of debris on Australian beaches are also influenced by a number of factors. These include proximity to cities, access to the beach, population of surrounding areas and vicinity of marine-based activities. Around 80% of marine debris on coastlines around much of Australia is terrestrial in origin (State of the Marine Environment, 1995). However, in Northern Australia the majority of marine debris is marine in origin. On remote coasts, the fishing industry tends to be the most significant source of debris. Coastal and offshore shipping are also significant sources near approaches to ports and along coasts and islands in heavily trafficked areas.

Northern Australia is especially vulnerable to marine debris given the proximity of intensive fishing operations, difficulties in surveillance and enforcement, and ocean circulation patterns and prevailing wind patterns that appear to concentrate floating debris before dumping it on coastlines and beaches. Marine debris in northern Australia is also an international issue both in terms of its sources and impacts. While some of the debris washing ashore on Australia’s northern coasts has been identified as originating from Australia’s prawn (shrimp) trawling fleet, the majority comes from external sources. This demonstrates the nature of this problem as truly regional, and one which would benefit from further collaboration through APEC.

Impacts of marine debris in Australia

The impacts of marine debris in Australia whether environmental, economic, cultural or aesthetic, are widespread and likely to be considerable. Many people share a concern about the impacts of debris and the threats posed to public safety, navigation, the tourism and fishing industries, and marine habitats and wildlife. Indigenous people and communities across northern Australia are particularly concerned about the impacts of debris on animals and landscapes for which they have long held cultural and totemic responsibilities, as well as the resources they continue to value for food and cultural purposes (Kennett et al., 1998).

Derelict fishing gear has been identified as the most hazardous type of marine debris to marine species (Laist, 1997). Globally, ‘ghostfishing’ can result in catch rates approaching that of active gear, and has
been demonstrated to negatively affect commercial fishstocks (Laist, 1996; Bullimore et al., 2000; Donohue et al., 2000; Laist and Liffman, 2000). In southern parts of Australia, Australian sea lions and New Zealand fur seals have become entangled in lost and discarded fishing gear (Pemberton, et al., 1992; Page et al., in prep). In northern Australia’s Arafura Sea, records of entangled and stranded marine wildlife are almost entirely limited to land-based observations over a small area of coastline. However preliminary reports suggest that disturbingly high numbers of marine species are being harmed and killed by debris while at sea, or as a result of their injuries on shore.

For example, more than 700 marine turtles (of at least four species) entangled in derelict fishing gear of foreign origin have been recorded along the northern Australian coast within the Gulf of Carpentaria, since 1996 (Kiessling, 2003). In 1998 and 1999 (prior to the mandatory introduction of Turtle Exclusion Devices (TEDs) in the Australia Northern Prawn Fishery), the total number of turtles caught by active prawn trawl gear in the Gove fisheries statistical area was 173, of which 31 (18%) were dead when they were hauled aboard (Sharp et al., 1998) (since the introduction of TEDs turtle bycatch has been reduced to negligible levels). In contrast, the number of turtles found stranded in derelict fishing net over a four month period at an adjacent coastal area (measuring around 10% of the mainland perimeter of the Gove fisheries statistical area) numbered 29, of which 50% were already dead when found (Roeger, 2002). While it is not possible to accurately compare the impact of active fishing effort and that of derelict fishing gear on marine turtles, fishing debris appears to pose a threat of at least similar order to that posed by prawn trawling prior to the introduction of TEDs.

Other than turtles, anecdotal reports suggest that many other protected species such as whales, dugong, and sawfish are being entangled in derelict fishing gear and other debris in northern Australian waters. Given the absence of widespread coastal monitoring in northern Australia and the paucity of information on quantities of debris in our marine environment, the numbers of stranded animals found on coastlines is likely to represent only a tiny fraction of the actual number of animals becoming entangled in marine debris in the Arafura and Timor Seas.

While the true social and economic costs of marine debris in Australia are unknown, marine debris is also likely to have significant economic implications for industries such as tourism, shipping and fishing. Internationally, marine debris is resulting in considerable economic cost to the fishing industry through fouling of active fishing gear and pollution of catches (Nash, 1992). In the Arafura and Timor Seas region debris, especially derelict fishing nets, has entangled rudders and propellers of marine vessels, and smaller items have been reported to clog cooling water intakes, resulting in engine failure (Nash, 1992; Haynes, 1997). Marine debris has also been identified as having a major impact on tourism, including areas close to urban centers on East Timor (Teixeira, pers. comm., 2002).

In northern Australia, children playing on remote beaches have been cut badly by broken glass from large numbers of light globes and fluorescent tubes washed ashore there. Hundreds of often full, rusty gas cylinders pose a significant explosive threat to beachgoers, and potentially hazardous substances (eg sump oil, detergents, fuels) regularly wash ashore in containers such as 44-gallon drums. The high cost of clean up operations for polluted beaches is prohibitive for many of northern Australia’s remote coastal communities, and the tonnes of fishing gear washing ashore have resulted in public antagonism towards the fishing industry as a whole (Sloan et al., 1998). Indigenous people and communities across northern Australia have commented on the social and cultural impact of marine debris: ‘we are the ones on the ground looking out and seeing all this marine debris coming in. We are the ones who are affected. We and our marine species as well’ (Munungurritj, pers. comm., 2003).

**Australian responses to marine debris**

The Australian government has recognised the significance of marine debris and seeking to address its sources and impacts in a number of different ways:

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**References**


More than A$300,000 has been invested through the Australian Government’s Natural Heritage Trust towards community-based projects tackling marine debris. These projects include waste reception projects, education programs, derelict fishing net identification tools and monitoring of the impacts of debris on populations of turtles, seals and dugongs.

The Australian Government has initiated a number of reviews and reports on the issue of marine debris. The most recent report entitled, ‘Finding Solutions to Derelict Fishing Gear and other Marine Debris in Northern Australia’ (Kiessling, 2003) was sponsored by the National Oceans Office and the Department of Environment and Heritage. This report outlines the current state of knowledge on the sources and impacts of marine debris in northern Australia and presents a range of options at appropriate scales towards mitigation of the impacts of debris and prevention of the issue at its source.

The issue ‘injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris’ has recently been listed nationally as a key threatening process under the Australian Government’s Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999). This listing will now lead to the development of a Threat Abatement Plan, which, under the EPBC Act 1999, is required to be in place before August 2006. The Threat Abatement Plan will build on existing activities to mitigate marine debris such as government programs to improve waste retrieval from watercourses, anti-littering laws, laws controlling overboard disposal of garbage and fishing gear from ships and boats, and plans to reduce litter from plastic shopping bags. The Threat Abatement Plan will also examine the effectiveness of joint agreements with other nations (and analyse the need for new agreements) to address the issue of marine debris and its impact on wildlife.

A number of research and non-government initiatives are also being undertaken around Australia including seal entanglement studies on Kangaroo Island (Page et al., in prep), turtle entanglement studies in Arnhem Land (Roeger, 2002), and identification of derelict fishing gear through a ‘A Fishing Net Identification Kit for Northern Australia’ (WWF, 2002). There are currently few published results of these initiatives.

While domestic efforts targeting marine debris concerns are growing, Australia shares a challenge with other nations in how to effectively address the international dimensions of marine debris. Given the international origins of much of the marine debris washing ashore in northern Australia in particular, collaboration with neighbouring countries will be important to finding solutions to the issue at its source.

Options to address marine debris in the APEC region

Options to address marine debris and its impacts can be divided into two broad classes: those directed at modifying the behaviour of fishers and other mariners, and technical options to reduce the persistence and impact of debris once it has entered the sea. In both cases there is a great need for good information on the extent and magnitude of marine debris issues, improved national policy and legislation and enforcement of existing and new law, and a critical role for education and training. Greatest short-term gains are likely to come from modification of behaviour, working through both incentives for better practice and increased disincentives (penalties) for, and probability of detection of, poor practice.

Australia recognises that a number of APEC economies face significant marine debris issues. Australia is interested in working with other nations to address the issue of marine debris at its source and with a focus on the regional and international dimensions of marine debris, options could include:
Science and policy

In order to address marine debris at its source, a basic requirement is to increase our capacity to connect items of debris to the activities of particular nations, sectors, companies, vessels and/or individuals operating in the APEC region. This could include:

- mapping of wind and drift patterns throughout the APEC region,
- mapping of fishing operations in the APEC region including identification of gear types, management arrangements and operational structures,
- careful analysis of the socio-economic drivers of polluting behaviour in the APEC region including ‘perverse incentives’ which favour disposal of fishing gear over its repair or reuse,
- verification of the source of derelict fishing gear via collaboration with gear experts and surveillance operations,
- application of techniques internationally to permanently mark or otherwise reliably identify fishing gear.

Fishing gear and practices

- Investigate financial incentives to encourage the retrieval, return and recycling of vessel sourced waste (including derelict fishing gear), such as:
  - tax credits for gear choice (eg items that can be recycled versus those that cannot),
  - gear/port/vessel inventories, gear deposits and bounty initiatives,
  - insurance for gear removal, and
  - subsidized disposal, repair, re-use and recycling initiatives
- Investigate market/consumer/peer based incentives such as
  - industry accreditation of sustainable practice in fisheries with specific reference to gear manufacture, use and handling, and
  - ‘stewardship’ arrangements with manufacturers regarding the disposal of fishing gear.

Ports and disposal

- Determine the capacity of ports throughout the APEC region to handle vessel sourced waste, particularly derelict fishing gear
- provision of improved and easily accessed facilities for disposal of waste in the APEC region
- introduction of fishing gear repair, re-use and recycling initiatives at key ports throughout the APEC region
- publicity regarding the impacts of discarded fishing gear and availability of facilities for recycling or appropriate disposal.

Domestic and international regulatory structures

- Joint activity between APEC working groups (marine resources, fisheries, transportation, education)
- Analyse the effectiveness of existing legal, regulatory and management regimes with respect to marine pollution especially marine debris, with a specific focus on identification of the opportunities for more effective implementation of MARPOL Annex V in the APEC region
References


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