

# **Addressing Shipping Related Marine Pollution in the Pacific Islands Region – the Invasive Marine Species Aspect.**

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## **1. INTRODUCTION & BACKGROUND**

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### **1.1. The Region**

The term ‘Pacific islands region’ is used to describe that area of the Pacific Ocean encompassing the island countries and territories of Micronesia, Melanesia and Polynesia, excluding Rapa Nui (Easter Island) Aote-aroa (New Zealand) and Hawaii. The countries and territories which comprise the Pacific islands region are all members of both the South Pacific Regional Environment Programme (SPREP) and the Pacific Community (serviced by the Secretariat of the Pacific Community -SPC) (Table One). Australia, France, New Zealand and the United States of America are also members of both SPREP and SPC but are not considered part of the Pacific Islands region for the purposes of technical assistance under PACPOL. They are important supporters of PACPOL.

Within this region exists a diversity of physical and biological environments; from large, high, jungle-clad continental islands in the west to rugged volcanic outcrops and isolated, low-lying coral atolls throughout the north and east. The total combined land area of these islands constitutes a mere 550,000 km<sup>2</sup>, spread across a huge 30 million km<sup>2</sup> of ocean. Coastal and marine environments are therefore extremely important.

Coral reefs and seagrasses throughout the entire region typify Coastal and marine environments, with mangroves extending as far east as Samoa. Village-based subsistence fishing forms a mainstay of virtually all island societies, and modern commercial uses of these environments, such as coastal and marine-based tourism and commercial fishing, form the major components of most regional economies.

The importance of coastal and marine environments to every aspect of the lives of Pacific Islanders cannot be overstated. The impacts of marine pollution, including ship-related pollution, constitute a major concern for Pacific Island peoples.

### **1.2. Shipping in the Region**

The Pacific islands have an extremely rich maritime heritage. The islands themselves were first populated by what are arguably the greatest mariners in human history. In pre-European times the Pacific islanders navigated wooden canoes held together with coconut fibre across thousands of miles of open ocean, with nothing but the stars and their intimate knowledge of the sea to aid navigation. Today, this seafaring tradition is continued, with several island countries, such as Kiribati and Tuvalu, being suppliers of seamen to the regional and global shipping fleet.

There are also the epic voyages of European exploration, with seafarers such as Magellan, Tasman, Cook and Bligh carving their places into history with their own outstanding feats of navigation. World War II heralded another major chapter in maritime history. Some of the largest naval battles ever were fought on the Pacific Ocean (with their subsequent pollution).

In modern times, as island states located within the world’s largest ocean, the island members of SPREP are overwhelmingly dependent on shipping for economic survival in the modern age. The initial marine spill risk assessment for the region is currently being completed. Its aim is to characterise quantitatively the shipping routes, pattern and frequency of voyages and types of cargoes as well as to map navigational hazards and assess the level of shipping risk at both the regional and national levels. This data has been mapped on a Geographic Information System (GIS) to determine marine collision and grounding hazard

potential, and will be used for shipping management and contingency planning purposes at both levels. Shipping in the region can be grouped into the following broad categories:

- Transit shipping: Ships, which pass through the region without stopping, en-route to other destinations.
- International shipping (as distinct from transit shipping): Ships calling at the major ports of the region from outside the region, either with incoming cargo or tourists (cruise ships) or to take out exports. Regional shipping: Ships trading (both cargo and passengers) between the countries and territories within the region.
- Domestic shipping: Ships trading (both cargo and passengers) within each country in the region.
- Foreign fishing fleet: Fishing vessels from distant water fishing nations operating within the region.
- Domestic fishing fleet: Fishing vessels from the Pacific islands themselves.
- Miscellaneous: Special purpose vessels such as warships research vessels, tourist vessels and private yachts and pleasure and fishing craft.

### **1.3. Marine Pollution in the Region**

Despite the benefits and necessity of shipping, this human use of the ocean can also cause a range of sometimes-severe environmental impacts. These include (but are not restricted to):

- The translocation and introduction of marine species across environmental barriers attached to ships' hulls and within ships' ballast tanks.
- Shipping accidents resulting in sometimes-catastrophic releases of oil and possibly other contaminants.
- The disposal of ships' wastes, including waste oil and plastics and other garbage into the sea.
- The dumping of wastes other than ships' wastes at sea (as defined by the London Convention).
- The leaching into the sea of toxic chemicals from anti-fouling paints on ships' hulls.
- Coastal and marine environmental impacts from the development and operation of ports which serve the shipping industry.

Compared to other regions of the world, the Pacific is probably relatively free of marine pollution. This may be due to the huge area of the region and the relatively low intensity and small size of ships (apart from transit shipping) servicing the region. Never-the-less, there are some serious pollution 'hot spots' in the region, including the highest levels of tributyl tin measured in port sediments anywhere in the world (Maata 1997).

Although data is lacking, characteristics of ship-related marine pollution in the region may be as follows:

- Water and sediments in many ports in the region are severely polluted (as referred above).
- Marine debris, especially from the foreign fishing fleet, appears to be a major problem in some areas (Noughton, pers comms 1999).
- The provision of ships' waste reception facilities in regional ports is generally inadequate.
- World War II saw major oil pollution incidents throughout the region (for which the environmental impacts and recovery have never been properly assessed).

- Groundings and sinkings of vessels, especially fishing vessels, are extremely common in the region (Preston et al 1997).
- The accuracy of navigation charts, the standards of navigation aids and the standards of maritime training may not be as high in the region as other parts of the world.
- The introduction of foreign marine species, including by transit shipping undertaking reballasting at sea (in order to protect countries outside the region) could be a major problem, but has not been assessed.
- The capacity of Pacific Island countries and territories to prevent and respond to shipping impacts is currently limited, and most countries do not have adequate pollution prevention and response plans.

The IMO, as the United Nations agency with global responsibility for shipping matters, considers the Pacific islands as an ‘Area of Concern.’

#### **1.4. The Development of PACPOL**

Co-operative, multi-lateral programmes to address marine pollution have been in place in many other regions for some years now, including the Baltic Sea, Caribbean Sea, Indian Ocean, the Mediterranean Sea and the East Asian Seas. The need for a similar initiative in the Pacific Islands region has long been recognised by IMO and SPREP member countries. This need is reflected in the National Environmental Management Strategies (NEMS) that have been prepared by SPREP for each island member country.

In response to this need, during the early 1990’s IMO assisted SPREP to prepare the *SPREP/IMO Strategy and Work Programme for the Protection of the Marine Environment in the South Pacific Region* (SWPPMESPR, or more simply the SPREP/IMO Strategy). This was published in 1993. Unfortunately, for various reasons, the SPREP/IMO Strategy was not implemented.

The development of PACPOL stems directly from a revision and updating of the SPREP/IMO Strategy, and represents a concerted effort to resurrect this strategy and proceed with project implementation.

Development of PACPOL was undertaken during the 1998 calendar year by the SPREP Marine Pollution Adviser with funding from the Commonwealth Secretariat (COMSEC) and the Canadian International Development Agency (CIDA), under the Canada - South Pacific Ocean Development Programme Phase II (C-SPOD). PACPOL’s 5-year Strategy and Work Plan was approved by members at the 10<sup>th</sup> SPREP Meeting in September, 1998. Implementation began in late 1999 as funding from C-SPOD came on line.

## **2. PACPOL Strategy**

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### **2.1. Aim & Objectives**

The aim of PACPOL is:

- To maintain, protect and enhance the quality of coastal and marine environments in the Pacific Islands region by minimising ship-related marine pollution.

The objectives of PACPOL are:

- To assess the current and potential risks of ship-related marine pollution in the Pacific islands region.
- To assist SPREP island members to develop better capacity to effectively *prevent and respond* to shipping incidents and marine pollution, including:

- Increasing membership of IMO and adoption and implementation of MARPOL and other international marine pollution conventions.
- Increasing adoption and implementation of the SPREP Convention Pollution and Dumping Protocols.
- Developing regional and national marine spill contingency plans and associated activities and systems.
- Targeting projects to address identified high priority marine pollution problems.

## 2.2. Focal Areas

There are four focal areas to be addressed through the current PACPOL Strategy and Work Plan. They are

- Marine spills
- Ship's waste
- Invasive marine species
- Port development and operations

## 2.3. Geographical Scope

The geographical scope of PACPOL is the Pacific islands region, defined as the coastlines and all marine waters within the 200 nautical mile limits of the 22 Pacific island countries and territories which are members of SPREP (SPREP island members) (Table One and Figure One).

SPREP island members are grouped into two categories, the 14 independent and semi-independent countries (Pacific Island countries) and the eight territories (Pacific island territories - Table One).

In addition to the SPREP island members, there are four developed countries, which are also members of SPREP (Table One). Although two of these, Australia and New Zealand, are arguably islands, all four developed countries are referred to as SPREP non-island members. They do not constitute part of the Pacific Islands region, but play a vital role in supporting PACPOL.

**Table One: SPREP Member Countries and Territories**

SPREP Island Members		SPREP Non-Island Members
Pacific Island Countries	Pacific Island Territories	
Cook Islands	American Samoa (US)	Australia France New Zealand United States of America
Fiji Islands	Northern Mariana Islands (US)	
Kiribati	French Polynesia (France)	
Marshall Islands	Guam (US)	
Federated States of Micronesia	New Caledonia (France)	
Nauru	Pitcairn Islands (UK)	
Niue	Tokelau Islands (NZ)	
Palau	Wallis & Futuna (France)	
Papua New Guinea		
Samoa		
Solomon Islands		
Tonga		
Tuvalu		
Vanuatu		

## 2.4. Funding

The current 5-year PACPOL Strategy and Work Plan is funded by the Canadian Government through the Canada-South Pacific Ocean Development Programme.

### 3. Planned Activities for Addressing Shipping Related Invasive Marine Species

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#### 3.1. The Existing Situation

Management of Invasive Marine Species is non-existent in the region. Level of awareness to the potential catastrophic impacts is very low and as a result there has been no concerted action to manage the issue. This level of awareness is best indicated through the fact that when SPREP (the regional inter-governmental agency mandated with environmental protection and management) went about drawing up a “Draft Regional Strategy on Invasive Species ” as recently as 1999, it was decided that IMS be addressed separately. This was due to two main reasons, the first was that the participants were not fully aware of the issues and the second it was seen as being sufficiently different to invasive terrestrial species issues to warrant being addressed separately.

This thinking is now under review. It probably needs to be addressed as a separate component but still as part of an overall regional strategy on invasive species. What is important is that members have approved a Regional Invasive Species Strategy. It is fortunate that the strategy in its current form only indicates broad generic activities that need to be implemented so it is simple to add IMS as a category of invasive species for which all the activities also apply. PACPOL is providing input into the workplan to implement the regional strategy by addressing the ship-related vectors for IMS.

#### 3.2. PACPOL Invasive Marine Species Activities

This is the only focal area of PACPOL where we have had no implementation. We have not been able to secure funding primarily because funding sources have not been available until recently. We have submitted proposals to a number of donors and are consulting with the Global Ballast Water Programme on the possibility of being included as a region in their second phase.

In the meantime we have been working to raise awareness with our members on the potential impacts of IMS particularly through ship-related vectors. Presentations have been made to SPREP staff by the Globallast Technical Adviser and this has been followed up by the presentation of a paper on IMS at the 3<sup>rd</sup> PACPOL Workshop held at Tahiti in October by the Globallast co-ordinator in China. I was scheduled to make a similar presentation at the Association of Pacific Ports Conference held at the Federated States of Micronesia in mid September but was unable to attend due to disruptions in flight schedules through Hawaii due to the events of September 11<sup>th</sup>. This presentation has been rescheduled to next year’s conference. The objective of these presentations is to secure support for implementation of activities when funding comes on line and to give our members notice so that they can make arrangements to facilitate implementation.

There are two specific activities under the IMS focal area of PACPOL;

- **IMS Risk Assessment of the Pacific Islands Region.** – The aim is to assess the risks in the Pacific islands region via shipping and will include both the ballast water and hull fouling vectors. Two activities that we have undertaken over the past 18 months should facilitate this IMS risk assessment because they provide data on shipping routes, volumes, type of cargoes and the port waste reception facilities. These regional activities are the marine spill risk assessment and the survey ship’s waste reception facilities. We see the outcomes of this workshop as essential guidance to how this risk assessment will be carried out.
- **Surveys for IMS in Pacific Island Ports** – This needs to be carried out for all ports in the region to determine the presence/absence of IMS, to assess the impacts of IMS where present and ultimately to recommend management options. We have considered ports within the region and have assessed that the most at risk are the bulk loading ports for sugar/woodchips, ore and phosphate. A proposal has been lodged with AUSAID to fund pilot surveys of a bulk loading ports in Fiji and Nauru. The surveys are proposed to be carried out by a team from the Bishop Museum and James Cook University in

conjunction with a team from the University of the South Pacific. The University of the South Pacific team will through this survey become proficient in the use of CRIMP techniques to become the regional centre for providing this service to the Port Authorities.

It is then intended to hold a regional training workshop in the techniques primarily involving the University of Papua New Guinea and the University of Guam so they can set themselves up as sub-regional centres. It was decided to have these teams resident with the Universities because of the small size and limited expertise in regional agencies as well as their high turnover of staff through promotions, transfers or resignations. It is hoped that through this set up IMS port surveys are more cost-effective for Port Authorities in the region.

An issue that has been raised as a concern for the region but not addressed through a specific activity is an assessment of the accepted practice of mid-ocean transfer of ballast water. Our region straddles the main shipping routes between the Americas and Asia and is concerned about the potential impacts by ships in exchanging ballast water in transit. Documented studies by the Cawthron Institute of ships plying the East Asia - New Zealand route have shown fresh-water from the Sepik River in Papua New Guinea in their ballast tanks. If fresh water from the Sepik River can be picked up then there is a real chance that purged ballast water could reach inland waters.

### **3.3. Regional Invasive Species Strategy**

Following are the generic areas to be addressed through the Regional Invasive Species Strategy. It is intended to address IMS in the longer term through this strategy. In the short term we intend to continue to address the ship-related vectors through PACPOL.

The current draft regional strategy was formulated at a regional workshop held in Nadi, Fiji in 1999. In its current format it is limited to Terrestrial Invasive Species only but it is intended to incorporate IMS issues. The draft strategy is now being evolved into a Strategy and Work Plan by SPREP's Invasive Species Project Officer.

#### *3.3.1 Aim of the Regional Strategy*

To promote the efforts of Pacific Island countries in protecting and maintaining the rich and fragile natural heritage of the Pacific Islands from the impacts of invasive species through cooperative efforts to:

- ◆ Develop and maintain an effective, coordinated network of information and technical expertise
- ◆ Prevent the introduction of new invasive species
- ◆ Reduce the impact of existing invasive species
- ◆ Raise awareness
- ◆ Build the capacity required to manage the threats posed by invasive species

#### *3.3.2 Strategy 1: Information*

Strengthen both basic and applied research on invasive species by identifying high-priority research needs, and encouraging work on high priority problems. Establish biological surveys for all member countries. Emphasise prevention and early detection, and evaluation of exotic species that are present or are potential problems. Establish long-term monitoring of high risk native areas for incursions of recognised invasive species.

Strengthen linkages between Pacific island countries and scientific institutions, sources of technical and research assistance or other bodies of information. Share information regionally through the establishment of mutually accessible databases and web sites.

Develop a regional clearing-house for information on invasive species that is easily accessible, perhaps through a web-based information system.

### 3.3.3 Strategy 2: Awareness

Raise public awareness of invasive species threats to conservation.

Work with economic interests (agriculture, aquaculture, forestry, horticulture, public health, shipping, military, some biocontrol operations and genetically modified organisms technology) to raise their awareness of risks to biodiversity of invasive species. Represent invasive species issues at regional and national meetings, and funding organisations in order to increase awareness.

Develop awareness of the accidental movement of invasive species into new relatively pest-free areas, especially their inter-island transfer within one country.

Promote awareness of the inter-island transfer problem by education programmes in identification, establishing networks (national and regional) and early warning databases.

Develop awareness of the dangers of accidental introduction of invasive species to biodiversity. For example by the movement of machines and in particular the inter-island transfer of pests, especially from invaded areas to new or pest-free areas. The establishment of an effective communication network and a manual of existing and potential invasive species may assist with identification, behaviour, where to look, how to exclude, eradicate and control them.

Further communication of the problem can be achieved by networking, international linkages, national working groups, regional expert groups, and an early warning database.

### 3.3.4 Strategy 3: Infrastructure

At the national and regional level, develop ongoing training programmes in the areas of species identification, field detection, quarantine inspections, monitoring and the like, and a network of resources that allow for the transfer of information to appropriate field workers.

Develop and upgrade regional and national facilities such as reference collections and specialised facilities for border control.

Promote and strengthen initiatives that facilitate the use and sharing of existing regional facilities by government agencies in-country and between countries (e.g. South Pacific Regional Herbarium, Bishop Museum collections, quarantine facilities).

### 3.3.5 Strategy 4: Protocols

Develop and strengthen protocols and procedures – particularly:

- ◆ Develop and strengthen procedures to process applications for species introduction to assess their potential impact on native species or ecosystems.
- ◆ Promote the use of existing protocols for pest risk assessment, modified to accommodate Pacific island countries, before pests are introduced into a country.
- ◆ Develop early warning and response systems for invasive species.
- ◆ Develop guidelines for pest management that consider the full biological and conservation consequences of control or eradication operations, including restoration.
- ◆ Collaborate with other organisations to develop appropriate policies to address the potential conservation/environmental risks of genetically modified organisms.

### 3.3.6 Strategy 5: Legislation

Survey existing environmental and other relevant legislation in each Pacific island country to determine its adequacy for protecting biodiversity from the threats of invasive species. Develop model legislation which includes provision for mitigating these threats and which makes use of principles for invasive species developed by other organisations (such as IUCN) and countries. Produce country-specific recommendations for modifying or developing new legislation which adequately regulates the following:

- ◆ importation of all living organisms
- ◆ surveillance for new incursions
- ◆ risk analysis of import applications
- ◆ assessment of environmental risks prior to introduction of genetically modified organisms
- ◆ quarantine procedures
- ◆ export of pests
- ◆ movements of species between islands
- ◆ control or eradication of invasive species
- ◆ monitoring

### 3.3.7 Strategy 6: Funding

Develop long-term external funding mechanisms that will ensure Pacific island countries are able to undertake work for the management of threats from invasive species.

Make representation to government leaders to improve long-term funding to address the pressing issues of invasive species of conservation concern in the region. Demonstrate the extent of the invasive species problem in the region, cast in economic cost/benefit terms and the necessity of taking action. Secure support for invasive species issues among local communities (including village councils) as well as at national, regional and political levels (e.g. South Pacific Forum). In order to do make these representations for more funding, determine and develop a regional resource of materials, in easy-read language, that identifies the magnitude of the invasive species problems in the region. Needed information includes: the area of natural ecosystems degraded by invasive species, their conservation impact and the consequences of not taking action.

Maximise funding self-sufficiency by promoting full participation of local communities in project development, management and implementation to ensure a long-term local commitment.

Promote invasive species as a criterion in national, regional, and international disaster management plans.

### 3.3.8 Strategy 7: Linkages

Establish and maintain a network among Pacific island countries and organisations that improves communication, cooperation and information sharing, and to maximise the effectiveness of invasive species work in the Pacific. Specific actions include: development of common standards of border control, staff exchange programmes, nomination of an invasive species position within appropriate organisations, and establishment of national working groups and a regional expert group.

Regional participation is needed in the development of international standards and programmes that govern the movement of invasive species in commerce (e.g. Convention on Biological Diversity, International Plant Protection Convention, World Animal Health Organization (OIE), and others).



### 3.3.9 Concluding Comments:

The workshop confirmed the need for a regional invasive species strategy as a platform for obtaining funds for in-country projects. The country issues have been successfully tabled for those countries that participated (see Appendix 1). The regional invasive species strategy may now be used as a vehicle to : (1) seek funds from international agencies and donor-countries, (2) reinforce and guide national biodiversity management plans (such as the National Biodiversity Strategic Action Plans), (3) complement other regional invasive species programmes, especially the United States of America's Invasive Species Management Plan and (4) guide the Regional Invasive Species Programme administered by the South Pacific Regional Environment Programme in writing its annual workplans.

Finally, the workshop identified at least one regional generic need: a marine regional invasive species strategy and implementation plan which, together with the terrestrial regional species plan, may include wetland habitats such as intertidal zones (e.g. mangrove forests and estuaries).

### **References**

Adams, T., Richards, A., Dalzell, P. & Bell, L. 1995. Research on Fisheries in the Pacific Islands Region. In South Pacific Commission and Forum Fisheries Agency Workshop on the Management of South Pacific Inshore Fisheries - Manuscript Collection of Country Statements and Background Papers Vol 2. Integrated Coastal Fisheries Management Project Technical Document No. 12. SPC Noumea.

Baker, J. 1992. Ecological Recovery Following Oil Spills. Proceedings of SPILLCON 92. AIP Melbourne.

Maata, M. 1997. The Degradation of Tributyltin (TBT) in Tropical Marine Sediments. PhD Thesis. USP Suva.

Preston et al 1997 Ship Groundings in the Pacific Islands Region

SPREP (1999) PACPOL Strategy and Workplan

SPREP (2000) Invasive Species in the Pacific: A Technical Review and Draft Regional Strategy