PORT OF TOWNSVILLE

BASELINE SURVEY *update*

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A thorough survey of the port and surrounding areas could provide the best insurance against invasion by foreign marine pests.

Marine Invaders

Marine plants and animals can be transported across thousands of kilometres of ocean on the hulls of recreational, fishing and commercial vessels, and in the ballast water of ships. Most of these species will not survive the journey. But, if conditions are right, those that do survive can thrive in their new environment and become pests.

Marine Biosecurity in Australia

There are over 200 exotic marine species reported from Australian waters, most of which, it is believed, were introduced unintentionally via mariculture and shipping activities. Only a few of the species that have been introduced are considered as pests. However, to control the spread of introduced marine pests, we need to know their present distribution and abundance in Australian ports.

In collaboration with James Cook University and the Cooperative Research Centre for the Great Barrier Reef World Heritage Area (CRC Reef), a survey of the Port of Townsville and adjacent marine areas was carried out in November 2000.

The aim of this survey was to describe the existing marine communities and determine whether any non-indigenous species, of pest status or otherwise, were present within the Port of Townsville and adjacent marine areas. This Port Baseline Survey provides an inventory of native marine biodiversity while acting as a health check of the Port of Townsville.

How the results will be used to manage the Port of Townsville

In addition to acting as a health check for the Port of Townsville, the results of the survey will be used in Australia's Decision Support System (DSS). The DSS incorporates results from port surveys around Australia. It is used to assess the risk associated with both commercial and recreational marine transport and determine whether a particular vessel could be a carrier, or vector, of a foreign marine species.

By incorporating the results from the Townsville Port Baseline Survey, the DSS will become a better tool for managers of ports around Australia. It will enable better risk-assessment of ships visiting Townsville and will improve the efficiency of management of hull fouling and ballast water to prevent the introduction of new marine pests.

Port of Townsville

The Port of Townsville is centrally located along the Queensland coast, within the Greater Barrier Reef World Heritage Area and adjacent to numerous pristine coastal habitats. It is the main multi-commodity bulk shipping facility servicing northern Australia, providing an international and domestic shipping gateway to a variety of industries located in north Queensland.

Because of the international and domestic shipping trade through the Port of Townsville, there is a risk that a non-indigenous species could be introduced to, and subsequently establish in the port. If exotic species have been introduced to the Townsville region, the most likely means of introduction are:

- by natural expansion of their range from other parts of Australia where they have previously been introduced;
- by shipping, either by ballast water or hull fouling;
- by domestic translocation from fishing or recreational vessels.

The highest risk species for tropical ports in Queensland are those from tropical regions overseas because these regions have similar environmental characteristics and biological assemblages to those in Queensland. If established, marine pests could potentially affect the high recreational, commercial and natural value of the Port of Townsville and surrounding coast. Therefore, it is crucial to determine the location and numbers of any marine pests in the port.

The Survey

During the survey, 15 different sampling techniques were used. These techniques were design to collect a representative sample of organisms from the natural and constructed habitats tha occur within port and marina environments. The sampling program was labour intensive an based on sampling protocols developed by the Centre for Research on Introduced Marine Pests (CRIMP) in association with the Australian Association of Port and Marine Authorities (AAPMA). The protocols ensure that different agencies and research organisations acros Australia follow a similar approach during port surveys and use standardised survey metho

Tropical port environments differ from those in temperate waters. Therefore, the sampling techniques used for the Port of Townsville differed slightly from the protocols developed by CRIMP. This ensures that all aspects of the biologically diverse tropical environment wer considered.

The surveys searched for several species that have been introduced to the Townsville regio but are not currently listed as target pest species (Hewitt & Martin, 1996). These include severa isopods and ascidians. Other species, such as the green algae *Caulerpa taxifolia* may also occur in the region (Furlani, 1996).

Results to date

Over 1300 different marine organisms (both plants and animals) were collected during the surveys within and around the Port of Townsville in November 2000.

None of the target pest species listed by the Australian Ballast Water Management Advisory Committee (ABWMAC) and in Hewitt & Martin (1996) and Furlani (1996) were identified when preserving samples in the field, by divers during pile scrape samples or when examini underwater videos of the areas under investigation. However, all specimens have not yet bee properly identified so it is still possible (although unlikely) that pest species are present.

Some organisms were collected that closely resemble introduced species, however, the identity needs to be confirmed by expert taxonomists. There were very few of these species which suggests that, even if they are introduced, they are unlikely to detrimentally impact nativ communities. There was a high biodiversity of organisms in the Townsville region, includin corals, zooanthids, seastars, brittle stars, crustaceans and fish. This suggests that Townsville supports a rich and diverse assemblage of marine organisms.

Future Research

This survey has provided a much-needed baseline of information describing the current statu of the marine communities in the Port of Townsville and surrounding marine habitats. However, given the high level of domestic and international shipping that passes through th area the threat of a non-indigenous marine species being introduced to the Townsville regio still exists. Therefore, it is crucial to continue to monitor the Port of Townsville because thorough, regular surveys are the best insurance against invasion by foreign marine pests. Ide further surveys should be conducted every two or three years during different seasons.

References

Furlani DM. 1996. A Guide to the Introduced Marine Species in Australian Waters. Centre for Research on Introduced Marine Pests Technical Report No. 5. CSIRO Marine Research. Hobart, Tasmania.

Hewitt CL, Martin RB. 1996. Port Surveys for Introduced Marine Species: Background Considerations and Sampling Pro Centre for Research on Introduced Marine Pests Technical Report No. 4. CSIRO Marine Research. Hobart, Tasmania.

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