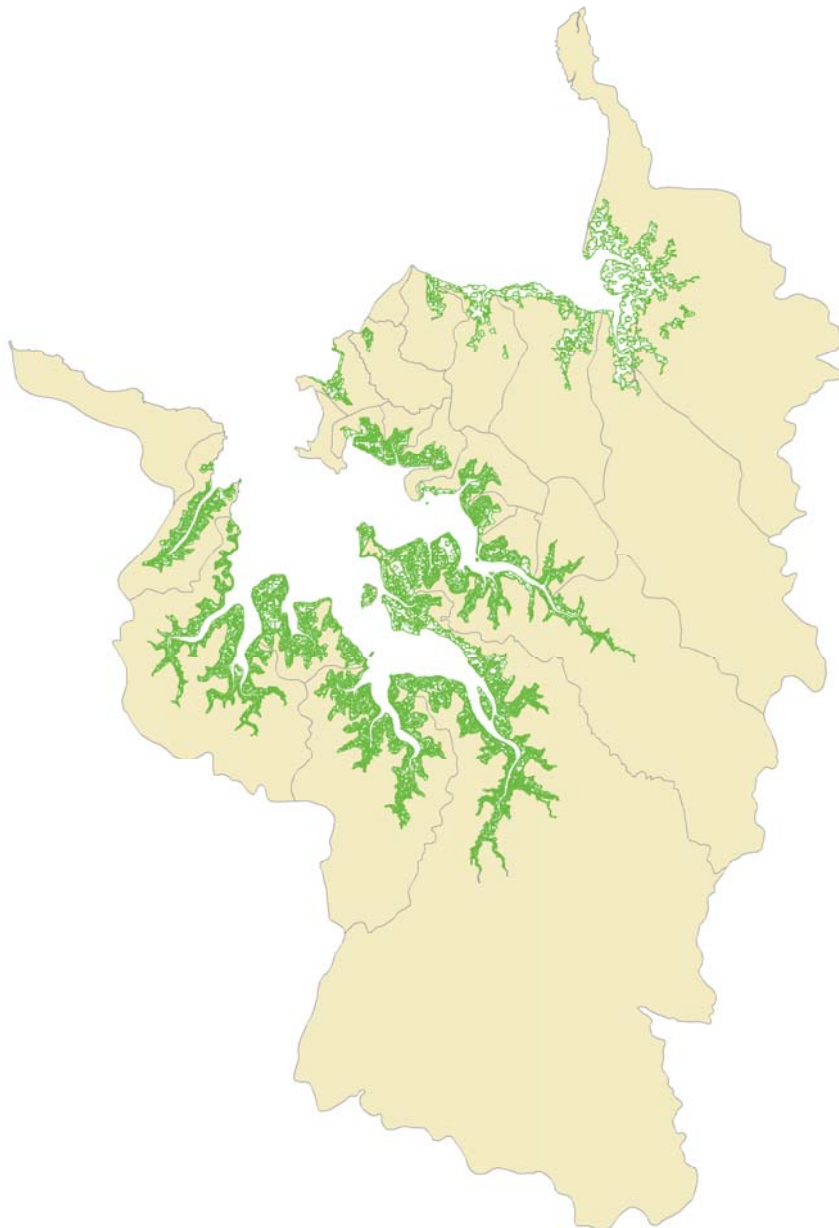




Darwin Harbour Advisory Committee

SUMMARY DOCUMENT

A Review of Environmental Monitoring of the Darwin Harbour Region and Recommendations for Integrated Monitoring



*Prepared by the Ecosystem Monitoring Group
A working group of the Darwin Harbour Advisory Committee*

September 2005

Contributors

This project was funded by the Darwin Harbour Advisory Committee (DHAC), through a special budget allocation by the Northern Territory Government, and supervised by the Ecosystem Monitoring Group which reports to DHAC.

The project officer was Jeff Morgan (Department of Natural Resources, the Environment and Arts), assisted by Julia Fortune. HLA-Envirosciences Pty Limited (Darwin) was engaged to undertake an analysis of environmental risks, production of causal-loop diagrams to help explain these risks, and editorial review of the project report.

The membership of the Ecosystem Monitoring Group comprises:

- Dr Simon Townsend (Chairman), Department of Natural Resources, the Environment and Arts (DNREA);
- Ms Kira Schlusser, Co-ordinator for the Darwin Harbour Regional Plan of Management;
- Ms Erica Eastik, Department of Defence (Australian Government);
- Ms Angelika Hesse, Darwin City Council;
- Dr Chris Humphrey, Environmental Research Institute of the Supervising Scientist;
- Mr Michael Lawton (Office of Environment and Heritage);
- Dr Andria Marshall, Department of Primary Industry, Fisheries and Mines;
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- Dr Owen Price (DNREA); and
- Ms Leonie Williams (DNREA).
- Professor Robert Wasson, chairman of the Ecosystem Research Group which reports to DHAC.

HLA-Envirosciences contributors were:

- Dr Sandy Griffin;
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This report should be referenced as:

Darwin Harbour Advisory Committee (2005). *A Review of Environmental Monitoring of the Darwin Harbour Region and Recommendations for Integrated Monitoring*. Darwin Harbour Advisory Committee, Darwin.

ISBN number: 0724 5487 85

Summary

The Integrated Environmental Monitoring Program (IEMP) project has identified that there is a wide range of environmental monitoring being undertaken by a variety of organisations in Darwin Harbour and its catchment. Present and past monitoring does not however monitor the spatial and temporal extent of all risks to the values of the harbour and catchment necessary to ensure continued good health. The project has also identified that the lack of a coordinated approach to reporting on the health of the harbour and catchment is a barrier to implementing an IEMP that must be overcome.

Primary Objective of the IEMP

Facilitate the development of an integrated environmental monitoring program for the Darwin Harbour Region in accordance with the Darwin Harbour Regional Plan of Management.

IEMP Elements

- Objectives of the Integrated Environmental Monitoring Program;
- Values of Darwin Harbour and its Catchment;
- Key environmental processes operating within Darwin Harbour and its Catchment that sustain those values;
- Major risks posed to key environmental processes of Darwin Harbour and its catchment;
- Simple conceptual models to qualify risks to key environmental processes;
- Analysis / review of monitoring programs to determine their suitability in terms of the environmental processes and risks the monitoring programs are addressing, the quality of data captured and the appropriateness of the monitoring methodology;
- Identification of weaknesses within monitoring programs, both in terms of environmental processes and risks that are not being monitored and methodologies / techniques of monitoring programs;
- Recommendation of additional monitoring programs to ensure environmental processes and risks are adequately monitored;
- Consideration of data management options;
- Coordination of monitoring, including an annual review of risks posed to key environmental processes to ensure the monitoring program is adaptive to change; and
- Reporting and information dissemination.

IEMP Objectives

Environmental monitoring efforts are based on a risk assessment of threats to Darwin Harbour and its catchment, both of which are to be reviewed by the Ecosystem Monitoring Group on a regular basis as directed by the Darwin Harbour Advisory Committee.

Gather information through environmental monitoring to enable reporting on the condition of Darwin Harbour and its catchment that will assist in identifying management actions that can be implemented to avoid / ameliorate risk to the values of Darwin Harbour and its catchment.

Coordinate monitoring effort to ensure compatibility between monitoring programs, specifically consistency of indicators, parameters and methodology.

Inform government and the community through reporting on the condition of Darwin Harbour and its catchment.

Critical Values of Darwin Harbour and its Catchment

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|---|
| Air quality |
| Ecological condition |
| Freshwater, estuarine and marine water quality and quantity |
| Groundwater quality and quantity |
| Recreational amenity |
| Visual amenity |
| Economic production / development |

Drivers of Change that Affect Key Environmental Processes

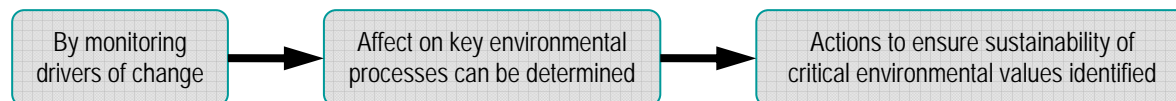
By identifying the environmental / ecological processes occurring within the harbour and its catchment, it is then possible to identify the drivers of change (or threats) that are most likely to impact upon these processes. To quantify the impact on key processes, environmental monitoring programs can be implemented. The use of conceptual models is important in this step. Conceptual models have been developed in tabular form (Appendix 1) and in a graphical form (Appendix 2).

Assessment of Risk Associated with Drivers of Change

A qualitative risk assessment was undertaken over short and longer term time frames in order to ascertain which drivers were most likely to have an immediate term effect on processes and therefore values of Darwin harbour and its catchment. The method used was based on *AS/NZS4360:2004 Risk Management*, which assesses the likelihood and consequence of an event occurring in order to obtain an overall risk rating. A detailed description of the outcomes are provided in section 5 of the report.

Review of Environmental Monitoring Programs

The review of environmental monitoring programs is based on the following assumption.



This approach aims to review existing environmental monitoring programs by correlating them to the relevant driver of change. This enables the identification of drivers of change that are not being monitored. Depending on the nature of drivers of change that are not monitored, recommendations for new monitoring programs / changes to existing monitoring programs are made. For a detailed review see sections 9 and 10 of the full report.

Barriers to an Integrated Environmental Monitoring Program

Lack of coordination / communication between environmental monitoring programs
Much data is inaccessible or unavailable
No evidence of a transparent, accountable process identifying monitoring needs
Inadequate resources (compounded by declining resources for NT Government monitoring programs)
Fragmented and technical reporting
Lack of environmental guidelines and accountability to the community

Recommendations to Overcome Barriers

1. Darwin Harbour Advisory Committee requests to have included in its terms of reference the role of regularly reviewing environmental monitoring programs within Darwin Harbour and its Catchment.
2. Under the coordination of the Ecosystem Monitoring Group, the organisation responsible for each monitoring program conducts a thorough review of individual monitoring programs to ensure consistency with best practice.
3. To strategically focus environmental monitoring efforts and ensure all important values of the harbour and its catchment are monitored, the Ecosystem Monitoring Group reviews the Integrated Environmental Monitoring Program on a regular basis as directed by DHAC and reports its recommendations to DHAC.
4. When new monitoring programs are proposed and statutory timeframes permit (*e.g.* for industry related monitoring programs), peer review of the design of environmental monitoring programs is to be encouraged.
5. Guidelines, also known as management action targets, relevant to the Darwin Harbour region are developed where needed to assist in the evaluation of monitoring data.
6. The environmental monitoring program inventory database is uploaded into the NT Spatial Data Directory.
7. The EMG identifies a suitable resource to maintain and update the environmental monitoring program inventory database and place it on the internet, including entering the information in the database into the

NT Spatial Data Directory.

8. All current monitoring programs review their data management requirements to identify what resources, if any, are required to ensure data is entered into and accessible in an appropriate corporate database.
9. The NT Government reviews the continuing declining resources allocated to environmental monitoring.
10. Darwin Harbour Advisory Committee play a role in facilitating data sharing agreements between various organisations if data sharing is perceived to be a problem.
11. Monitoring data collected by consultants for the NT Government be made available for inclusion into databases and this be stipulated in contractual agreements.
12. To improve accountability of monitoring programs and better inform government and the community, the Ecosystem Monitoring Group with funding from the NT Government and on behalf of the Darwin Harbour Advisory Committee compile a Darwin Harbour and Catchment Health Report.