

MULTIPLE USE MANAGEMENT STRATEGY EVALUATION FOR A COASTAL MARINE ECOSYSTEM

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Abstract:

The North West Shelf Joint Environmental Management Study (NWSJEMS) commenced in 1999 and was jointly funded by the Western Australian Government and CSIRO Marine Research.

The general objective of this four-year study was to develop and demonstrate practical science-based methods that support, under existing statutory arrangements, integrated regional planning and management of the NWS marine ecosystem. The two key objectives have been to:

- compile, extend and integrate the scientific information and understanding of the coastal marine ecosystems of the NWS; and
- develop and demonstrate practical science-based methods that support integrated regional planning and multiple-use management for ecologically sustainable development.

A Management Strategy Evaluation (MSE) framework has been used to develop a computer-based system for evaluating prospective multiple-use management strategies for the NWS. The MSE approach has been applied in many management situations elsewhere, but this is the first time an attempt has been made to develop and apply it to multiple-use management of a large coastal marine ecosystem. The framework provides a model that links the ecosystem and human impacts, and projects both the cumulative impacts of multiple uses and the responses of the ecosystem to management measures.

The MSE is applied to four sectors: oil and gas, conservation, fisheries, and coastal development. For each sector, a selection of development scenarios, provided by the relevant interest group, is represented. These scenarios include prospective future sectoral activities and their impacts, and the sectoral response to management policy and strategies.

An illustrative example is provided to demonstrate the tradeoffs that can be recognised and quantified using the MSE framework. The example explores the implications of a change in management strategy. This change not only has a direct impact on the targeted sectors, but also indirect impacts (including surprises). The example is very simple, but it illustrates connections among sectors and the interaction between ecosystem users and regulators in determining the outcomes of a management measure. Even in this simple example, a comprehensive model is required to allow realistic examination of multiple-use management and the cumulative impacts of human uses on the ecosystem.