

Ningaloo

WAMSI Node 3

Balancing human uses and impacts on our environment – Management Strategy Evaluation

Growing urbanisation, industrial and recreational developments have increased the need for government to broker a balance among the activities of many users of the environment and natural resources.

Background

One of the big challenges for contemporary Australian society is the management of competing human uses of, and impacts on, our environment. A management strategy evaluation (MSE) framework has been developed to help meet this need. The MSE framework integrates key ecological, physical and socio-economic processes in the Ningaloo region to recognise patterns and links across time and space scales using a range of computer simulation models. These models will be valuable to managers as they can make predictions about the effectiveness of management strategies given various scenarios.

CSIRO has developed a model of fish populations through ELFSim that is one stand alone component of the broader MSE. ELFSim is a decision support tool that takes into account fish populations, park zoning and the behaviour of fishers with the goal of assisting the management of the recreational harvest of key fish species in Ningaloo Marine Park. It has been designed to:

- support assessment of risks associated with recreational fishing, environmental and social trends in the region
- evaluate existing and alternative management strategies in relation to identified management objectives

- advance the science and tools used to characterise, monitor, predict and manage natural resources
- provide scientific decision support for multiple use management of coastal regions and estuaries, such as Ningaloo Marine Park
- enable quantitative assessments of zoning effectiveness and develop a means of exploring alternative scenarios and evaluate the relative effectiveness of potential management strategies.

Outcomes of applying the model

The model has been applied to a number of scenarios suggested by management agencies. These scenarios look at the effects of changing the regulatory regime and/or fishing conditions on the long term sustainability of key fish species. For example, one scenario examined the effects of the current sanctuary zones (established in 2005) compared to the previous zoning scheme (established in 1991). This scenario found current sanctuaries do protect more of the biomass of spangled emperor as this species does not range far, making them potentially vulnerable to local fishing effort.

ELFSim has also been used to examine the potential effect on spangled emperor of possible future scenarios such as



increased activity (e.g. tourism) and removing (or alternatively increasing) the recreational limits for fishing.

Future plans

In managing user-demands, governments are increasingly looking to science to guide and improve policy and management decisions.

Hence, scientific research agencies and decision-makers are seeking better ways of ensuring that decisions are based on recent and relevant science. Managers have an interest in these types of models if they can:

- provide a better understanding of how systems function and effects of human use
- provide predictions based on potential scenarios that managers feel may be important in coming years that will lead to more informed decision-making
- assist in the development of the marine monitoring program by identifying drivers of change and responsive elements in the ecosystem.

Outcomes of the ELFSim modelling framework will be transferred to the management agencies and stakeholders in the fishery in an easy to understand manner so that the information and tools may be used in planning for sustainable use of Ningaloo Marine Park.

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Ningaloo research is an initiative of the Western Australian Marine Science Institution, CSIRO's Ningaloo Collaboration Cluster and the Australian Institute of Marine Science, working in partnership with government, local communities and enterprises.