# Modeling the economic and ecological co-viability of the Northern Prawn Fishery in Australia

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## Abstract

With the development of the ecosystem approach to fisheries (EAF), fisheries management is increasingly required to deal with multiple, often conflicting objectives. In this context, the stochastic co-viability approach has been proposed as a useful modeling framework as it allows for the combined representation of complex fisheries dynamics, uncertainty and the need to include multiple dimensions in the evaluation of sustainability. The present paper focuses on the application of this approach to the case of the Northern Prawn Fishery (NPF) in Australia. The fishery is based on several high valued prawn species each with different biology: an uncertain resource, the white banana prawn (Penaeus merguiensis), a more predictable resource comprising two target tiger prawns (Penaeus semisulcatus and P. Esculentus) and the by-product blue Endeavour prawn (Metapenaeus endeavouri). A bio-economic multi-species and multi-fishing strategies model is developed to examine how the fishery can operate within a set of constraints relating to spawning stock size of each prawn species, impacts on benthos and habitats, and economic profitability of the fleet.