

Back to the future with Ecopath and Ecosim

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Back to the Future (BTF) is a new approach which proposes rebuilding rather than sustainability as the proper goal of fisheries management (Pitcher and Pauly, 1998). The rationale is found both in recent work documenting the decline in trophic level brought about by industrial fishing (Pauly et al. 1998), and the longstanding concerns of indigenous and artisanal fishers about the effect of industrial harvest (Haggan, 1998).

The Ecopath mass-balance approach to aquatic ecosystem modeling has parallels with the way longstanding fishing communities view the environment. Both are more concerned with relationships, interactions and connections within an ecosystem than with achieving a deep understanding of isolated elements (Haggan, 1996). BTF uses Ecopath to re-construct the species composition, relative abundance and productive capacity of marine ecosystems at some past level, say before the onset of modern industrial fishing. For example, a recent BTF project of the UBC Fisheries Centre and the UBC First Nations House of Learning developed models of the Strait of Georgia ecosystem as it might have been 100 years and 500 years ago.

The first step is to create an Ecopath model of the present system. This can either be done as a student project, or as a major workshop bringing together experts in the various ecosystem components. Either way, the model focuses discussion and input from government science, university science, the traditional environmental knowledge (TEK) of indigenous communities, the knowledge of commercial and sport fishers, archival sources and the archaeological record. For

almost the first time, the BTF methodology provides the TEK of aboriginal peoples and maritime communities with a valuable, direct function in resource management.

Perhaps even more importantly, three elements combine to promote cooperation between a diverse group of stakeholders. First, a university-based unit, such as the UBC Fisheries Centre, can act as a neutral forum where frequently opposing sectors can meet and share knowledge in the interest of long-term conservation. Second, comparing the abundance of species (or functional groups) in an Ecopath mass-balance model with TEK and other views provides a starting point for discussion, and an element of cross-validation. Third, the abundance in the 'good old days' may provide a useful contrast to the present, often inequitable access to the resources.

Economic evaluations of past ecosystems (see Sumaila, this vol.) can then be compared with the present. Restoration goals, which can be simulated using Ecosim, can be based on the economic, social, and cultural values attainable by rebuilding. It requires no great stretch of the imagination to see the same interests agreeing on rebuilding goals and working together on ways to get there.

Current BTF projects initiated through the Fisheries Centre, UBC include a reconstruction of the Hecate Strait ecosystem of northern British Columbia in cooperation with the Tsimshian and Haida Nations. Also, a re-construction of the Hong Kong fishery as it might have been 50 years ago, prepared by T. Pitcher and R. Watson will form the basis for a major workshop in Hong Kong (see also Pitcher, this vol.).