EVALUATING FUTURE ECOSYSTEMS: A GREAT STEP BACKWARD?

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"Those who do not remember the past are condemned to repeat it"
George Santayana (1863-1952)

ABSTRACT

The Goal of Back to the Future is to restore some past level of abundance and diversity. The first objective is to engage scientists, managers, policy makers and the maritime community in developing the best possible computer models of present and past ecosystems. The second objective is to assign ecological and social as well as economic value to past and present systems, so that collaborators can set restoration goals. New valuation techniques, while innovative, use prices and costs from today's fleet to value past systems. This paper asks how we might harness the creative potential of the collaborators to design new fisheries that make sense in terms of the ecosystems and human communities that depend on them. A 'capital/interest' approach is suggested where the biomass essential to maintain productive potential and species of social and cultural importance are considered as natural and social capital, and, as such, not subject to commercial harvest.

'Back-to-the-Future' has strong ethical and participatory elements (Haggan 2000, Haggan *et al.* 1998), one goal of which is to find new ways for a very broad constituency to work on assigning ecological as well as social values when comparing ecosystem states. In brief, ecological value is assigned by giving fish in the water some value relative to those caught. For instance, one could assign equal value to fish in the ocean to those caught (Sumaila *et al.* 2001). Social value is assigned by including the value to future generations (Sumaila and Walters 2004).

One major problem that arose at the December workshop in Prince Rupert related to eulachon, an important food and trade item with high social and cultural value to First Nations. The past ecosystem models presented at the workshop showed very high dollar values for eulachons, derived from the only existing commercial fishery on the Fraser River. First Nation participants made it clear that they did not want a monetary value put on an integral part of their culture and subsistence economy.

How then can we assess, or indeed compare the real value of ecosystem components whose predominant values are non-monetary? This raises the question of 'Ecosystem Justice' addressed by Brunk and Durham (2000) in 'Just Fish: Ethics and Canadian Marine Fisheries' (Coward *et al.* 2000). Sumaila and Bauwumia (Ibid.) argue convincingly that the market cannot guarantee justice for ecosystem components that have no 'monetary value'.

Costanza and colleagues (1997) valued global ecosystem, or 'life support' services such as oxygen production at $US33 trillion/year, or almost double global GNP of $US18 trillion. The Costanza approach is related, as it values quantities that cannot be bought or sold, but is not directly comparable as it assigns dollar values

A 'CAPITAL-INTEREST' APPROACH

It seems to be a given that money is the only 'yardstick' that economists can readily apply. It is certainly a 'currency' that today's decision makers readily appreciate. Those who deal in money have a shrewd idea of the value of capital,. They also see it as something that should be conserved. Consider endowment funding where the interest from a significant capital amount is used to finance ongoing activities, cover core operations and maintain the principal against inflation, or indeed add to it over time. For example, the David and Lucile Packard Foundation dispensed ~$US614 million in 2000 (www.packfound.org) based on capital assets of approximately $9.8 billion. We might then consider the spawning biomass of species necessary to maintain a

Can quotas protect ecosystems?

Quota fisheries are seen by many fisheries managers as a way to protect the desired species. However quota holders have no incentive to protect other ecosystem components. Indeed the scientific uncertainty of existing stock assessment may require quotas that are so conservative that foregone catches could wipe out economic gains (Walters and Pearse 1996). Other authorities (Anderson 1994; Turner 1997) point to high-grading as an inherent problem of quota systems.

Haggan, N. (2004) Evaluating Future Ecosystems: A Great Step Backward? Pages 109-111 in Pitcher, T.J. (ed.) Back to the Future: Advances in Methodology for Modelling and Evaluating Past Ecosystems as Future Policy Goals. Fisheries Centre Research Reports 12(1): 158 pp.

desired ecosystem state as 'natural capital', MPAs would be another way to protect such natural capital. This can certainly be valued (Sumaila and Walters 2004, Sumaila *et al.* 2001), but could be protected by laws and regulations designed to protect resources in perpetuity.

Similarly, we might consider a category of 'social and cultural' capital to protect species such as eulachons and whatever amount of other species are necessary to maintain the culture and existence of First Nations (see Lucas 2004, this volume), and indeed aspects of the lifestyle of other maritime communities. Brody (1988) showed that subsistence hunting by interior British Columbia tribes had significant monetary value by quantifying the cost of equivalent foodstuffs and the value of furs, handcrafts and guiding. Nothing in Brody's work suggests that the tribes would have accepted money in lieu of these traditional activities (see Sumaila 2004, this volume).

FISHING RESTORED ECOSYSTEMS: KEEPING THE OPTIONS OPEN

A second problem arose as a result of using prices and costs from today's fisheries to value past ecosystem states. Hence, we drag existing fisheries structure back with us, ending up with 18 fisheries (16 existing and 2 new ones). This effectively perpetuates today's fleet structure and high degree of specialization where billions of dollars worth of vessels (to say nothing of license values) lie idle for most of the year. It also perpetuates existing divisions, forcing people to defend existing gear types instead of putting their minds to a fresh approach. The unfortunate example picked by the team for the December Prince Rupert workshop (Power, 2003, Power *et al.* 2004, this volume) simply illustrates the problem of forcing people to defend an existing structure rather than having the freedom to design new fisheries (or re-establish ancient methods such as selective trap and weir fisheries) in their home waters. An unfortunate consequence of the valuation approach *as applied* is to negate the opportunity provided by *Back to the Future* to take a new look at how to harvest restored systems.

A better question might be: if we could restore the abundance and diversity of the 1750s ecosystem, how would we harvest it – forgetting that we're 'salmon scientists' or 'halibut scientists' or gillnetters or trawlers or herring or halibut fishermen? Might we not want to consider more local, multi-species fisheries with multi-purpose vessels, where fisheries would be a year-round activity.

What about a form of area licensing that makes sense in terms of the ecosystem and the human communities, rather than an arbitrary line on a map? Such a system would 'vest' the interest in the resource in First Nations and other stable communities that have a long-term interest in maintaining productivity. This is important, as ownership by large corporations, or what Ommer (2000) characterizes as 'footloose' capital runs a real risk that large corporations would see economic sense in catching the last fish and investing the proceeds in ventures that will provide their shareholders with a higher rate of return.

We might also want to concentrate on methods that maximize value rather than volume, for instance, a 6.5 oz can of sockeye branded as 'Copper River Red' sells for $US 8.50 (www.copperriverred.com and see Simeone 2004, this volume), or, the value of live rockfish for the restaurant trade.

There is clear agreement on the need for flexibility in designing sustainable and responsible fisheries of the future. The criteria suggested by the CUS BTF team provide a start (see Pitcher 2004, this volume). But the challenge for *Back to the Future* is to find ways to improve and facilitate this with the participation of local fishing communities.

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