

Are we managing the environment yet? The manager's dilemma and the first whiff of a solution

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This paper explores one problem we face in manipulating the natural systems that are our sustenance. We articulate the Manager's Dilemma in managing ecosystems (often in crisis) for diverse human uses, sustainably. Then, we examine selected models to see if solutions to the Dilemma might be beginning to emerge.

The latest scientific response to environments in crisis is ecosystem management. The objective is usually defined as something like "ecosystem health." The scientific challenge is to define and understand, restore, and finally, sustain the health of the ecosystem. One horn of the Manager's Dilemma is here, in the technical and scientific: the first step of the program (define and understand the ecosystem) could easily consume all the available resources well into the next millennium. An intriguing theoretical possibility is that much of the ecosystem management will be required in areas of "irreducible ignorance," in any case. That is, we can *never* understand enough to predict around such ignorance. The taxonomy of

ignorance explains this.

A second horn of the Manager's Dilemma is social or political: the various groups of human users of the ecosystem in question make dramatically divergent, often conflicting, demands of the system. Some are subsistence needs; others are commercial; still others are recreational; yet others are aesthetic, or even ethical. How to accommodate this diversity in a single management scheme? The manager is charged, then, with managing the unknown and to some extent unknowable ecosystem for the use of a collection of human sub-populations with essentially irreconcilable goals for that single environment: the Manager's Dilemma. The political ("values") and scientific ("indicators") paradigms diverge.

The whiff of a solution to the Dilemma may be emerging from a number of Canadian case studies that are reviewed in detail. All meld the scientific with the political in striving to manage healthy ecosystems, sustainably.