How Many Eggs in One Basket?—Economic Input into Endangered Species Conservation

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Key Words: species at risk, conservation decision making, economic input, scope sensitivity, data accuracy

Extended Abstract: Economics, preoccupied with the optimal allocation of scarce resources, can potentially assist decision making in the field of conservation. Cost-effectiveness, cost-utility, cost-benefit, and portfolio analyses have been identified as useful techniques for supporting conservation projects because they highlight the efficiency aspects of such projects; nevertheless, the beneficial effect of economic inputs depends to a great extent on the capability of conservation managers to assess the quality of efficiency estimates. Aside from the limitations of the particular techniques used, quality is determined by the accuracy of the input data and the scope of the analysis; consequently, conservation managers need to be aware of both the range and accuracy of costs, returns, and risks that are taken into account when generating economic input into conservation decision making. The accuracy and scope aspects will determine whether the results should be incorporated into the decision-making process, and if so, at what level.

Finding reliable cost data has been problematic for many practitioners. Cullen et al. (2001) considered estimating the costs of programs and projects to be "the most difficult part of [their] research." Fairburn et al. (2004) expressed frustration over the difficulty of obtaining accurate expenditure data for the North Island kokako (*Callaeas cinerea wilsoni)* recovery programs. In evaluating six multiple-species projects in New Zealand, Cullen et al. (2002) indicated no source for the present value of expenditures over the life of the projects, and made no comments about the quality of the cost estimates used. In addition, the range of costs included in their analysis was narrow because the investments made by community groups and volunteers were often disregarded. For example, Cullen et al. (2002) estimated a present value of incurred costs of NZ$1.6 million (2001) for the Tiritiri Matangi Island restoration project based on the New Zealand Department of Conservation's input; however, the volunteer tree planting component of this project alone is estimated at NZ$0.9 million (2001) (Vesely and Craig, in preparation). Consequently, sound economic inputs into conservation projects require accurate cost recording on a continuous basis and at a series of levels.

The range of returns captured by economic analyses is also limited as the human aspect of acquired new knowledge and gained experience is mostly left out. This is a significant deficiency if it is not incorporated through other means in resource allocation decisions because advocacy

and direct involvement ultimately act in a positive feedback loop to reinforce resource allocation towards conservation, while new knowledge can positively affect the efficiency level of many projects in the long term. In these situations, a balanced investment that generates both ecological and nonecological returns from conservation will be preferable to one that provides a single type of return. The complementary character of a series of returns will need to be acknowledged along with efficiency considerations.

Risk is the often neglected dimension of conservation projects that is touched upon by a limited number of economic analysis techniques such as Stephens and Lawless' (1998) multi-criteria analysis. Although indispensable due to the irreversibility of the loss, risk analysis is applied more on an implicit basis with portfolio analysis being suggested as a potential framework (Hughey et al. 2003). Techniques such as risk decomposition (Pearson 2002), diversification (Markowitz 1991), stress testing (Pearson 2002), and scenario planning (Peterson et al. 2003) have been identified as being useful in assisting risk management in a conservation context. The full potential of these techniques will be investigated in the future.

Although conservation decisions are often going to be far from rational where fascination of, and subjective preferences for, certain species may translate into costly and risky species-saving endeavors, these costs and risks should be undertaken knowingly. What the economic approaches do is highlight an additional aspect of conservation decision making in which costs do matter relative to the achieved returns and involved risks. This makes the trade offs implied by the decisions made more explicit for all those involved, which is important given that resources for conservation are limited.

Conservation managers need to be aware of both the opportunities and shortcomings of the techniques proposed for providing economic input into conservation, as misinterpreting the accuracy of economic inputs or misjudging the scope of economic analysis will jeopardize the potential positive contribution of economics to conservation decision making. Conservation managers need to take notice of the assumptions made, assess the quality of input data used, and estimate the scope of the analysis performed. This will facilitate the informed inclusion of greater economic consideration in conservation management.

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