



Environment & Society



White Horse Press

Full citation:

Burney, Jonathan, "Is Valuing Nature Contributing to Policy Development?"
Environmental Values 9, no. 4, (2000): 511-520.

<http://www.environmentandsociety.org/node/5815>

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Is Valuing Nature Contributing to Policy Development?

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ABSTRACT

This paper examines technical, ethical and ecological science perspectives on environmental valuation, and discusses problems in terms of the implications for practical policy-making. It suggests that all these perspectives raise legitimate concerns about the use of stated preference methods, but concludes that such methods still have a role to play in policy making for nature conservation provided they are applied in the right circumstances, designed very carefully, and used in conjunction with other decision-making tools.

KEYWORDS

Nature, biodiversity valuation, ecosystem functions, cost-benefit

1. INTRODUCTION

The purpose of this paper is to discuss the environmental valuation debate, and especially the issues raised in the April 1999 workshop, from the perspective of policy development. Since English Nature's Council has no specific position on environmental valuation techniques, this represents a personal view, but one which is shaped by the organisation's desire to ensure that nature conservation considerations are taken properly into account in public choice decisions.

English Nature is the UK Government's statutory nature conservation organisation. We deal with wildlife and earth heritage (geological conservation). Our main duties are to designate and ensure the proper management of National Nature Reserves and Sites of Special Scientific Interest (SSSIs), to undertake scientific research, and to advise Government on policies for, or affecting, nature conservation.

From an institutional point of view, we have a less strong duty to take account of costs and benefits than does the Environment Agency, for example. Operationally, our main priorities are mainly pre-determined by European or national legislation which is predominantly framed on scientific criteria (e.g. for the designation of Habitats Directive sites or SSSIs), or explicit Government mandate (for Biodiversity Action Plan priorities).

There are four potential areas where environmental valuation of some description could be important for English Nature's priorities:

- general policy advocacy about the importance of natural assets to society;
- development of specific policy mechanisms where demonstration of environmental externalities is needed to give weight to the developing ideas (for example environmental taxes, public good subsidies);
- cost benefit analysis, where the net social benefits quantified form part of the rationale for development proposals which may have impacts on nature (for example transport projects, flood and coastal defence projects, and EU structural fund projects); and
- evaluation of nature conservation programmes.

Section 2 of this paper considers some more technical aspects of the valuation debate. Section 3 focuses on the debate from an ecological science perspective. Section 4 attempts to draw out some policy implications. Section 5 relates some case study examples. Finally, section 6 concludes with an approach being considered at English Nature.

2. THE TECHNICAL DEBATE ABOUT ENVIRONMENTAL VALUATION

The technical difficulties relating to environmental valuation, and especially stated preference techniques, are well documented. Some environmental organisations believe those technical issues are so significant as to render these techniques inappropriate (RSPB 1998).

However, in defence of the practitioners of such approaches, the following points have to be borne in mind:

- The pervasive idea that such techniques are inevitably design-flawed may be over-stated. A consensus emerging recently is beginning to stress the need for careful design, and it is also true that the efforts of practitioners to experiment, test for design flaws, and develop new methods is under-recognised.
- New stated preference approaches, such as choice experiments, are being developed which may provide a more appropriate tool for 'difficult to

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measure' areas of policy, though there is not yet enough evidence to confirm this hypothesis.

- There is recent evidence of potentially useful mixed-methodology approaches where, for example, stated preference techniques are accompanied by stakeholder approaches (Turner et al. 2000).

Some concerns remain. From a nature conservation perspective, the main difficulties include:

- *The 'complex-good' problem* (Clark et al. 2000; Green 1997). This argues that people are not used to 'paying for the environment' in the way that they do regularly for, say, a bottle of wine or a day at the golf course. Consequently, their answers are less likely to be robust and the process may cause resentment as people may feel that Governments' should make these decisions on their behalf.
- *Information to participants*. Contingent valuation studies do not like to over-brief participants as this risks engineering a higher value than the participant really holds. This can lead to the 'merit-good' argument that people do not value nature 'as highly as they should' because they do not have sufficient information. It is a particularly difficult problem for biodiversity.
- *Mental account/embedding problems*. These include the tendency for people to express the same willingness to pay to preserve 1 species as for 10 species;
- *Reliability of benefits transfer methods in relation to biodiversity*. The expense of these studies has led to benefit transfer techniques whereby values elicited in one case study are then used in other situations. At best these will only be as good as the original study and are also likely to suffer from loss of robustness in 'translocation'. Testing these translocations seems to suggest reliable results for recreational benefits but they remain untested for other aspects of biodiversity.

The policy reality is that environmental valuation, including stated preference techniques, will not go away. Indeed one might predict their increased use. So for practical reasons, amongst others, it makes sense to try and develop and improve such approaches rather than reject them out of hand. However, while properly designed studies may in future help the debate they should not be used in isolation in decision making.

A number of developments are needed to make such approaches more meaningful for decisions affecting nature conservation. First, it is essential that sufficient information about the feature being valued is provided. There remain concerns that this is rarely achieved given the considerable costs of large scale surveys. The problem of 'engineering upwards' people's preferences for nature conservation could in principle be dealt with by accompanying the fuller information briefing with fuller briefing about competing resource demands.

Secondly, it seems obvious that preferences for these complex goods are 'constructed', so there is merit in the argument that there should be some way for participants to iterate their ideas before revealing a willingness to pay (Jacobs 1997). Thirdly, there remains the concern that any exercises revealing a specific willingness to pay for a specific habitat or species have a sense of 'false robustness'. The definition of the 'good' may be too specific for people to evaluate in terms of other nature conservation goods or other goods in general. It may be more appropriate, given the right information, to provide an approximate preference for a general reduction in the risk of biodiversity loss¹ or for the protection of a particular class of nature conservation asset (e.g. a nationally important site). Scientific and other criteria could then be brought in alongside these preference ranges for very generally defined 'goods'. For example, social preferences are elicited for the protection of a 'regionally important site;' and scientists and other stakeholders clarify what constitutes that definition.

3. ECOLOGICAL SCIENCE AND ENVIRONMENTAL VALUATION

Ecological economists have highlighted some specific issues in relation to ecosystem protection which are relevant to the environmental valuation debate. In a review for English nature, Turner et al. (2000) highlighted a number of issues identified in the literature.

First, there are many ecosystem services that meet the criteria of economic value (they contribute to well-being and are scarce) but that go unrecognised by people in general, who do not always perceive their indirect dependence on critical ecosystem services. There is a need to illuminate the 'mentally hidden' ecology underlying our environmental resource base (Limburg and Folke 1999).

Secondly, the complexity of ecosystems implies a complementarity of species and habitats. Attempts to understand society's willingness to pay for protecting a particular species may elaborate some of its values, but may not properly reflect the object's overall role in the functioning of the ecosystem at a wider scale.

Thirdly, the complexity problem affects our ability to weigh up the importance of objects. We are often in the territory of uncertainty, where we cannot apply meaningful probabilistic values, as opposed to 'risk', which cost-benefit analysis can handle more easily.

Fourthly, many effects may be wholly irreversible or irreversible except over very long time periods.

Finally, the continuation of benefits to society from functioning ecosystems depends on some minimum configuration of ecosystem structure and functioning of processes. So protecting ecosystem integrity becomes an important policy objective, and biodiversity is an important element of this.

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Turner et al. draw out some implications for environmental valuation from these points. They suggest that the problems of complexity, uncertainty and irreversibility indicate the need to incorporate some form of safe minimum standards methodology into cost-benefit analysis, though this is difficult to devise in practice; the need to evaluate effects at a landscape scale, where possible; and the need to supplement the cost-benefit analysis with other measures such as biophysical indicators of ecosystem integrity.

4. IMPLICATIONS FOR DECISION MAKING AFFECTING NATURE

This section attempts to draw together the implications of the ethical, methodological and ecological perspectives for the practical realities of policy decisions.

The April 1999 workshop investigated the notion of 'trade-offs', and a number of contributors argued that people simply do not mechanistically trade off 'the environment' against other welfare benefits. Some of the economics jargon is value-laden (in the wide sense) and has not helped the debate. So, it is probably more helpful to refer to stated preference techniques as being about 'willingness to pay for environmental protection' than 'valuing the environment' (Pearce 1999). Even then, some would argue that 'willingness/ability to pay' is a more appropriate term. Similarly, the notion of 'trade-offs' encourages a mental picture of a particular extreme of market system which is exactly what long term decisions about the environment should not be about. 'Public choice' is perhaps better jargon. That said, it is difficult in practice to argue against the economists' notion of opportunity cost. Decisions to protect the environment have economic costs in terms of the alternative options foregone, and these costs may be borne by those who are not wealthy.

Accepting the key principle of opportunity cost, the question in my mind is whether this in itself implies that societal choice must be made via the mechanism of individual preferences. This is the immediate logical leap made by many economists. It has some merit in that individual preference evaluation has a democratic element (one person, one vote) and measures what people actually want as opposed to what certain interest groups think they should want. The 'value-free' arguments for individual preference based methods are, of course, contested (Jacobs 1997). Economists also argue that social issues, (for example, ability to pay or impacts on different groups) can be taken account of by distributional weightings in cost benefit analysis, though there is little evidence of this happening even where it is obviously appropriate.

In practice, the validity of this 'logical leap' has as much to do with one's faith in the methods. There are some grounds for optimism which suggest that well-designed stated preference methods should input into decision making, alongside other methods. An alternative, and perhaps more practical approach,

involves well-informed stakeholder debate setting overall priorities, which translates into cost-effectiveness studies to inform the implementation of these priorities.

Vatn's arguments on commodification,² coupled with the literature on complex goods (Clark et al. 2000; Green 1997; Jacobs 1997) do serve as a warning about the extent to which one can meaningfully push the commodity metaphor and get useful results at the other end. In practice, it is the preciseness of the definition of the good that worries me more than the principle: can people really express a willingness to pay to prevent change in impact x on site y , bearing in mind their willingness to pay for nature conservation on other sites as against their other expenditure priorities? Evaluation of people's broader 'mental account' for nature conservation may be more realistic. This could then be linked with socially mediated scientific perspectives about more detailed level decisions.

The work on lexicographic preferences (Spash 1998) and incommensurate values (Martinez-Alier et al. 1998) is very relevant. But the implications of these arguments are a matter of judgement. Does the fact that a significant minority can not play the game invalidate the whole game? A practical policy maker might take the view that stated preference techniques should quantify these ethical positions, and then as a sensitivity analysis give these respondents a high value in the calculations.

So all these arguments serve as a strong warning about the design and interpretation of individual preference based techniques. But from a practical policy perspective, none is enough to rule them entirely out of court. As far as the warnings are concerned, they suggest the following points about such techniques for nature conservation. First, they will only deliver useful results if participants understand the issues properly. Secondly, the appropriateness of using such techniques to evaluate very specific 'goods' or situations is questionable. Thirdly, there is an argument for the development of techniques, including discussion, which allow people to iterate and construct their positions. Fourthly, monetary techniques may in future provide useful input into decisions but need to be supplemented by other forms of evaluation and must not be interpreted mechanistically in policy contexts. There is a clear role for deliberative processes both at the design stage and interpretation stage. Finally, the variability of different positions is increasingly being seen as important to decisions as the average willingness to pay; it is interesting to note how stated preference techniques are now being re-marketed as useful sources of socio-economic data from the contextual questions in the process.

As well as design and interpretation issues, this debate has implications for the appropriateness of different evaluation techniques. In his presentation to the April 1999 workshop, Stale Navrud referred to Bryan Norton's perspective (Norton 1992). This approach argues that the appropriateness of cost benefit analysis depends on two factors: the environmental damage costs involved, and

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the degree of irreversibility of any losses. Where both these factors are low, then cost benefit analysis is given very strong weight in the decision process. However, where potential environmental damage costs are very high, and the degree of irreversibility is high, a less dominant role is implied and cost-benefit analysis is used more in conjunction with other decision criteria; or alternatively, these are built into the cost-benefit process. This 'appropriateness matrix' has some validity in the UK context.

The need to prevent irreversible losses of important natural assets implies additional sustainable development considerations to supplement the welfare-economics based principles of cost benefit analysis. This is particularly necessary in relation to European and nationally designed sites, and Biodiversity Action Plan habitats and species. The next section describes how we have tried to elaborate such considerations with Government, but there remains a need to develop this further.

5. CASE STUDIES

Martinez-Alier et al. (1998) argue for multi-criteria analysis as a preferred approach given incommensurate values and other problems. Interest in these methodologies arose partly out of concerns about the difficulties in applying stated preference techniques for biodiversity issues, which many practitioners acknowledge, and also because in practice there is little actual data available unless one takes a huge leap of faith with benefits transfer.

Along with other environmental agencies, we helped the Department of Environment, Transport and The Regions (DETR) to develop their New Approach to Transport Appraisal (NATA). In a radical departure from the previous cost benefit guidance for roads, which many felt failed to take account of environmental issues at all, this new guidance involved a multi-criteria approach based on the evaluation of five main criteria, of which 'environment' was one, divided into 19 sub-criteria. Schemes' impacts on the natural and historic environment were assessed using a text-based scoring process based on a qualitative evaluation framework known as Environmental Capital (CAG/LUC 1997). To date, the main testing of this approach was in the 1998 Roads Programme. This was a little unusual as it involved deciding on the best, in cost benefit terms, of a basket of worked up schemes across the country; but because of the stage that the decision making process had reached, it was not applied to the consideration of different options within each scheme. Our perception from the experience to date is that the methodology represents a significant step forward, especially in terms of ensuring that nature conservation considerations are brought to the attention of decision makers. We also believe that it will help emphasise impacts on nature at the option design stage. However, there remain some doubts about whether, in the Roads Review example, the methodology

ensures the proper protection of important sites. In the end, decisions are made on ministers' evaluation of the weight that should be given to the environmental criteria in each case.

Similar work has been undertaken with the Ministry of Agriculture, Fisheries and Food (MAFF) on its guidance for flood and coastal defence projects, which have the potential to impact on coastal habitats and natural coastal processes. The new guidance (MAFF 1999; 2000) again represents a step forward in terms of environmental considerations, though some issues remain (Bowers 1999/2000). The new guidance contains some very helpful messages in terms of environmental considerations. It is weaker than NATA in terms of providing alternative appraisal frameworks, though the guidance does legitimise these. On the other hand, the cost-benefit process is also made subject to an 'environmental acceptability' test, which provides a form of safe minimum standard mechanism. As yet it is too early to comment on the environmental acceptability of the new guidance in practice, but its environmental acceptability test seems to have delivered significantly better outcomes since 1993.

6. CONCLUSION

Following the research by Turner et al., we are developing a methodological model. The first building block of this model is the descriptive approach; fundamental to this stage is the understanding of the types (i.e. categories) of benefits which nature provides to society, and the emerging literature on nature's functions or services is helping here (De Groot 1992; Daily et al. 1997); this stage is where we are putting much of our current effort. The second stage of the model involves the use of qualitative or quantitative evaluation techniques, such as habitat accounts (Haines-Young 1999), Environmental Capital and bio-physical indicators. The final stage, where appropriate to the benefit type or decision context, involves monetary approaches to environmental valuation. The model emphasises that the first two stages of the process should be achievable in most situations; the third stage may be achievable in some but is in any case accompanied by the other building blocks. Participation and sustainable development considerations also permeate each stage of the model.

Extended cost benefit analysis, for all its technical difficulties, is an attempt to find a way of highlighting the importance of the environment in decisions about the efficient allocation of public resources. So while critiques of this approach are very important to the debate, the fundamental policy question is about what the practical alternatives are given the institutional context.

At English Nature, we have stopped short of saying that stated preference techniques should not be used for decisions about nature conservation. It is worth noting that developments in environmental policy, for example pesticides and aggregate extraction, have benefited from the estimation of environmental costs,

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however rough these may be. Nevertheless, biodiversity is recognised to be a difficult area for these methodologies, and we would see them as being more appropriate for certain situations than others and often best mixed with other evaluation methods.

It is worth noting that for one of the applications we identified in section 1, namely general policy advocacy, we think we can get quite far by simple descriptive approaches which illustrate the importance of nature to society.

NOTES

¹ P. Clough, New Zealand Institute of Environmental Research, pers. comm. 1999.

² See Vatn's contribution to this issue.

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