

9. DISCUSSION

A. Results of the public surveys and choice experiment

Response rate and sample characteristics

Response rate: A 32% response rate is comparable to the 34% rate for a previous Scottish postal CV study by Bullock and Kay (1997) and 30.8% for Whitten and Bennett (2001), but less than the 53% rate for Christie (1999) and 64% for Macmillan et al (2001). DTLR (2002) recommends the use of a reminder to maximise return rates and this would probably have given a higher return rate¹. There was evidence of non-response bias based on the use of the mountains for recreation, since return rates were more than twice as high from the recreational member organisations than from local communities², and within the local community returns 80% had taken part in mountain recreation in the last year, far higher than would be predicted from a random sample. This allowed an agglomeration of the two populations to provide a population of ‘recreational users of Scotland’s mountains’.

Socioeconomic and attitudinal characteristics: Respondents were generally more wealthy, older, and more frequently male than a random sample of the Scottish population. They also had a very high level of formal education. These results match those of Mackay (1999), whose survey of recreational users found that 61% had a degree or diploma, and HIE (1996), who found that 66% of respondents were male, 42% between 35-54 and 64% in social class ABC1. Open-air recreation seems to be predominantly a pastime for the well-off and well-educated: ‘it is not so much a group of tinker, tailor, soldier, sailor on the hills, it is more the case of teacher, doctor, bureaucrat and business executive’ (Mackay 1999).

The difference in incomes between residents and non-residents of mountainous areas may be an artefact of the sampling technique, but it is consistent with the national trend outlined in Section 2C. Mountain residents are also less likely to think wind farms have a negative impact on mountain landscapes, suggesting that geographical location is influential in forming attitudes to development – as would be expected

¹ Not possible in this study due to time constraints

² The low return rate from mountain communities may also reflect a high proportion of second home ownership and therefore property vacancies

given the distribution of benefits related to these kind of projects, and the kind of local versus national arguments that have accompanied previous development proposals.

Respondents show a higher level of environmental concern than the general population would be expected to, since 64% of respondents agreed or strongly agreed with the statement that ‘protecting the environment is the most critical issue facing society at the moment’. This can be compared to a survey conducted in 1996-7, when only 15% of respondents mentioned the environment as one of the most important issues the government should be dealing with (DEFRA 2001). This may reflect the fact that the sample includes members of a wild land preservation trust, or it may be that walkers and mountaineers are more environmentally concerned than average.

Relative importance of non-market attributes

The three more qualitative measures of preference (Tests 1-3) show a good agreement about which non-market benefits are important for recreational users of the Scottish mountains. The general priority is as follows:

1. Landscape or scenic beauty (most important in all cases)
2. Wildness or lack of crowds
3. Wildlife
4. Challenging climbing, mountaineering and other recreation
5. Provision of rural livelihoods³
6. Recreational and other amenities (e.g. paths, interpretation) and hydrological services such as provision of clean water

Across the sample, the top three attributes are public environmental goods, and ‘challenging recreation’ only averages as the fourth most important factor. The environmental benefits of Scotland’s mountains are highly valued by recreational users. The low relative importance of recreational amenities is supported by Christie (1999) whose estimates of public willingness to pay for these amenities is low compared to CV studies that include wildlife and landscapes (e.g. Macmillan et al 2001).

Socio-economic factors are not good predictors of attitudes, although there is one good correlation in Table 21 which makes logical sense and helps to back up the

³ Not strictly a non-market benefit, but assumed to be linked to the benefits of rural and cultural heritage

validity of these qualitative methods – mountain residents are more likely to agree with the statement *‘I value the Scottish mountains because they provide livelihoods for local residents’*.

Respondents were generally least interested in the value of mountains in providing clean drinking water for lowland areas. This is not unexpected, since there is little public awareness about the hydrological services provided by mountains (Crabtree et al 2002), because the service doesn’t seem to be under threat, and because the value is utilitarian, in contrast to the other environmental benefits offered. It does help to illustrate the limitations of a ‘referendum’ approach to setting environmental management objectives, since less high-profile objectives such as this might be ignored.

Choice experiment

Protests: A 15% protest rate (18% if blank cards are included) is lower than that found by Hanley et al (1996), who found a protest rate of 45-49% (in Alvarez-farizo et al 1999), and it compares with an 18% protest rate reported by Christie (1999).

The fact that protesting correlates logically with two measures of respondent attitude to the environment helps to validate the method. Alvarez-farizo et al (1999) predict that protesting is related to income, but there is no evidence for a relationship in this study.

Estimating WTP from positive bids and genuine zero responses: The main problem encountered is the fact that the wealthiest respondents behaved as if money was no object – the level of tax wasn’t a predictor of their choice in the choice experiment at the levels offered. To improve the results, a further survey would have to be done with higher tax values included.

Leaving these high-income respondents out of the results (20% of the sample) will give an under-estimate of WTP, but it is the best course of action because of the ‘fat tail effect’ of extrapolation using the logistic model when respondent WTP is much higher than the tax levels offered in the choice cards. It means a lower sample size (N=190 after protests removed) which does reduce the reliability of the WTP estimates⁴ and the likelihood of detecting significant differences between attributes. However, it is larger than the sample of 100 non-protest responses obtained in a

⁴ Mitchell and Carson (1989) recommend a sample size of at least 286 which will then deviate up to 20% of true WTP 90% of the time, and recommend N>600 for policy evaluation.

published study by Hanley and Craig (1991). DTLR (2002) points out that smaller sample sizes can be employed in choice modelling studies where multiple valuations are elicited from each respondent.

To recap, the mean annual WTP of this sample for each attribute offered is:

- Planting of native forests: **£76**
- Decline in bird species: **£72**
- Bird populations increase: **£63**
- Planting of native forests and increasing heather moorland: **£37**
- Improved employment and services for local communities: **£33**
- Unrestricted responsible access, paths signed and maintained: **£26**
- *Increasing area and quality of heather moorland⁵: **£21**
- *Unrestricted responsible access for walkers: **£15**
- *Purpose built mountain bike trails: **50p**

Willingness to pay for unrestricted responsible access, mountain bike trails or increased heather moorland is not significantly more than zero at the 5% level. The first two are not unexpected since unrestricted access to the mountains exists in a *de facto* form at the moment (MCofS/SLF 1996), and mountain bikes are a divisive issue amongst traditional recreational users.

Validity of the estimates of WTP

This section of the report will outline some potential criticisms of the validity of the WTP estimates, but in fact there is a lot of evidence from internal correlation and agreement with previous studies that the results offered above are a reasonably robust estimate of the WTP for the policy scenario presented within the population studied, and that there is a considerable willingness to pay for environmental benefits from Scotland's mountains amongst the population studied. The validity tests come from Garrod and Willis (1999) and DTLR (2002).

Content Validity: A low rate of protesting or confused responses indicates that the framing of the study is reasonable, the scenario presented is believable, and the payment vehicle is appropriate. The scenario of a hypothecated tax does fit with the recent government policy of Landfill Tax Credits under the Landfill tax (Entrust 2002) and proposed uses of London congestion charging (BCC 1999), and the fact that it is a 'Scottish tax' is no longer unbelievable given increasing pressure for the Scottish Executive to have fiscal autonomy (Freedland 2002).

⁵ Asterisks denote WTP not significantly different from zero at the 5% level

Criterion Validity: There are no actual markets or simulated markets for comparison, but a previous study by Macmillan et al (1999) showed that stated CV WTP for donations towards purchase of the Isle of Eigg closely matched the actual payments to a charitable appeal.

Convergent Validity: In terms of orders of magnitude the results do compare favourably with previous studies, for example the public WTP of £20-£53 per household per annum obtained by Macmillan et al (2001) for replanting of native forests in Strathspey or Glen Affric (depending on the location and the model used); the WTP estimate of £53-103phpa for the landscape benefits of grazing management in the Southern Uplands (Bullock and Kay 1997); and the estimates of attribute values between £6-£50phpa that Hanley et al (1998) obtained for the Breadalbane ESA policy using a choice experiment. That study also found that woodland was the most highly valued attribute.

Theoretical Validity: The fact that respondent income is inversely related to WTP supports the validity of the results, since this would be predicted by economic theory (Mitchell and Carson 1989, Alvarez–farizo et al 1999). Because socio-economic factors have to interacted with policy attributes (Hanley et al 2001) it is not possible to accurately assess the ‘15% benchmark’ proposed by Mitchell and Carson⁶ (1989). A distance decay effect has been predicted for some environmental goods whereby value declines with distance from the site (DTLR 2002) – the opposite is seen in this study but there are a number of possible explanations: incomes are lower in mountainous regions; recreational users that travel further might be predicted to value the resource more highly; or it could be a sampling artefact, since much of the residents sample is randomly selected, whilst the non-residents are all members of voluntary groups and would be predicted to have higher WTP on this basis.

Internal consistency: Despite the problems of comparing attitudes with preferences for real policies, the relative importance of the different categories of non-market benefits shows good agreement with the three attitudinal tests. All four rank landscape and wildlife benefits above local community benefits and recreational amenities such as paths and mountain bike tracks. This is a good indicator that the relative priorities identified by the choice experiment are valid.

Problems with the model:

⁶ 15% of variation predicted by socio-economic differences between respondents is an indication of satisfactory theoretical validity

1. The conditional (fixed-effects) logistic regression used in the analysis is a reasonably simple model and may result in some biases. For example it treats every response to a choice card as independent (Gould 1999), despite the fact that the five responses from the same respondent would be predicted to be related – this is a pseudoreplication problem and is likely to over-estimate the statistical significance of the coefficients in the model by overstating the size of the sample.
2. Multinomial logit models also assume the independence of irrelevant alternatives (IIA), arising from the assumption that the error term is independently and identically distributed to the indirect utility function. This relies on the probability of choosing an alternative being dependent only on the options from which a choice is made (Whitten and Bennett 2001). There was no test for a IIA violation in this experiment and this may mean that WTP estimates are biased. If a IIA violation were detected then analysis using a nested logistic model or a multinomial probit model would be recommended (DTLR 2002).
3. Another potential bias comes in the treatment of income non-responders – these were assigned the modal income class, but in fact Alvarez-farizo et al (1999) suggest that income non-response is non-random with respect to income.
4. The use of a main-effects design will not test for interactions between attributes, which would be expected to some degree in this scenario – for example respondents may favour the wildlife benefits more if they are combined with a native forest setting.

Hypothetical/Information/Framing bias: The most important potential bias in this study is the fact that the scenario is very broad in its geographic scope and its policy ambitions, and that it contains minimal information about the details of the policy – for example there is no quantification of the ‘policy on’ or ‘policy off’ levels of attributes. The broad geographic scope is an advantage in many ways since it does not rule out respondents who are only interested in certain areas, and because it allows a long term, broader focus as opposed to the minutiae of short term management issues that can dominate in certain areas⁷. The lack of detailed information provision may not be critical since it is likely that recreational users will already have significant knowledge about the relevant issues and opinions about priorities (Garrod and Willis 1994), but it leaves a very important question of what the respondents really think they are valuing. Since little information is provided,

⁷ For example a pilot survey that intended to include just the Cairngorm range raised controversial local issues about the location of the National Park boundary, which seemed to obstruct the view of the ‘bigger picture’ and longer term trends in the mountain environment.

respondents will be making choices on the basis of the knowledge they already have about the mountain environment – which will vary between respondents and may not be accurate. The lack of definition in the scenario also gives the possibility of an abstract or symbolic response where respondents are valuing the principle of protecting the environment rather than the policy scenario proposed (Hanemann 1994, Price 2000). If this were the case, the choice experiment is more a test of attitude than quantifiable preference.

It can be accepted that responses may depend on the prejudices and misconceptions of the respondents, since that is the way that democracy works. The problem of abstract or symbolic responses due to the breadth of the scenario is more difficult, and it may mean that the results are not directly comparable to previous studies that have focused on willingness to pay for the geographically defined benefits of a policy such as an ESA policy. Respondents in this case may be valuing the principles behind the policy, since the predicted benefits are not geographically defined. It is proposed that this approach is still a valid one, since it would provide useful information about public demand for real life policies that have a diffuse geographical impact – the EU Regional Policy is one example.

Strategic bias: It is possible that respondents overstated their WTP because they didn't believe they would have to pay the tax, but thought that their response would be used to determine investment of existing funds in mountain-related projects. As the contingent valuation method becomes more widely known this is a potential problem, particularly within the social groups reached by this study. In this study only three respondents stated that they chose a scenario because 'they wouldn't really have to pay', but it is possible that others may have kept their motives hidden. The payment vehicle chosen means that free-riding is unlikely to be a problem since all Scottish residents are required to pay the tax.

Implications for the choice experiment method

A number of written complaints indicated that respondents do not like this method because it appears illogical, since the attribute provision does not appear to be related to the amount of tax paid in each of the choice sets. This may be unimportant, but it could potentially increase the level of protesting or irrational responses.

Compared to previous CV studies, the WTP estimates from this study are high. This is comparable to the estimates from the Hanley et al (1998) choice experiment study,

even though the Hanley study uses a quadratic model which decreases WTP values. This might reflect the broad geographical scope and ambitious aims of the policy being valued in this study, or be a peculiarity of the Scottish mountains⁸, but it could also be that the choice experiment technique tends to elicit higher values. This could be either because respondents select more expensive options than they would in a standard CVM, or because the method of analysis using the logistic model exaggerates WTP by extrapolating beyond the upper tax bids in the surveys. At least when a more standard CVM approach is used you are using explicitly stated WTP rather than that produced by a predictive model - it would be interesting to see whether respondents in this or the Hanley study agreed to an annual woodlands tax of £76 or £50 respectively if presented in a dichotomous choice CVM format.

A contrasting argument can be made that the WTP estimate obtained by this study is lower than would be expected, since it is valuing a policy that covers all of the Scottish mountains and would therefore be predicted to elicit values many times higher than previous studies focusing on a single ESA or other small part of the region. The lack of quantification of attribute levels or regional impacts in the current study mean that this criticism is not really viable, but the good agreement with WTP values elicited for more localised policies does raise the possibility that respondents have a pre-defined 'reasonable amount' to spend on an environmental tax and will do so regardless of the scope of the benefits (i.e. it could support criticisms of part-whole bias in CVM studies (e.g. Diamond and Hausman 1994).

Summary of Results

- 1. There is a significant willingness to pay for a policy designed to deliver environmental benefits from Scotland's mountains.** The most attractive attributes of the policy are the expansion of native forest (mean WTP=£76) and the protection of bird species (mean WTP=£72).
- 2. There is a significant willingness to pay to support local communities in mountainous areas,** even amongst non-mountain residents (mean WTP=£43). Little or no previous research has been done into the public benefits derived from the cultural heritage and the maintenance of populations and socio-economic activity in mountain areas (Crabtree et al 2002) so this study provides a unique social dimension and supports the hypothesis that these benefits are significant.

⁸ For example a particularly high environmental quality, cultural resonance or politically disempowered population

3. Landscape benefits are perceived as most important (including ‘wildness’), followed by wildlife benefits and then support for local communities and provision of recreational amenities such as paths and interpretation. This pattern is consistent across a number of different tests.

B. Environmental management implications

The environmental benefits of landscape and wildlife are important to recreational users and therefore important for the open-air recreation industry. This is supported by Mackay’s (2001:167) conclusion that ‘the recreation value of the Cairngorms depends highly on the environmental values’, and the results of a choice experiment with climbers by Hanley et al (2000), where the scenic quality of a hypothetical route was a significant predictor of whether it was chosen⁹. Open-air recreation is very important for local economies and employment in mountainous areas (Section 2B), and this study supports the conclusion of HIE (1996) that ‘the long term economic development of mountaineering is dependent on environmental quality and on managing the impacts caused by growth in activity.’

Previous studies show that non-mountaineering visitors, the general public and visitors from overseas share a similar appreciation of the environmental benefits of Scotland’s mountainous areas (e.g. Macmillan et al 2001, Cobbing and Slee 1992, Macpherson Research 1998). This means that protecting and enhancing environmental benefits is a critical issue for the tourism industry and for the wider public welfare in Scotland, the UK and beyond.

An integrated approach: This result provides further support for a strategic, integrated approach to managing the Scottish mountain environment (CCS 1990, Wightman 1996a, Housden 2001, SNH 2002a). Management of the open-air recreation sector cannot be separated from the management of the other land-uses that provide or inhibit the provision of environmental benefits - it must be accepted that ‘no sector is an island’. An integrated approach is happening to some extent: the economic development sector is accepting the importance of environmental benefits in acting as a magnet for businesses and other economic activities (Hunter pers comm. 2002); the work of the Access Forum, Deer Management Roundtables, and Moorland Working Group is promoting dialogue between sectors (Cooke pers comm. 2002); the Cairngorms and Southern Uplands Partnerships promote and lead

⁹ With ‘very scenic’ climbs adding £25.05 in value measured as hypothetical travel costs

an integrated approach at a regional level (Tabor pers comm. 2002); and the National Parks at Loch Lomond and Cairngorm combine environmental and social objectives in their founding legislation (Warren 2002). However the conflicts and divisions between sectors are evident in responses to the forthcoming Land Reform Bill (Cooke pers comm. 2002), and further efforts are needed to break down the barriers. Lack of geographical integration can also be a strategic barrier, in that management of the Scottish mountains is split between several local authorities and therefore management may lack coherence (Gimingham 2001a, Warren 2002). This is particularly important in the Southern Uplands where there is an east-west split in local government and tourist boards between Borders and Dumfries and Galloway, and further local authorities cover the north (Tabor pers comm. 2002). The SNH Natural Heritage Futures is an attempt to overcome this by recognising 'Hills and Moors' as an entity and promoting a strategic approach across a wide area of the uplands (SNH 2002a).

The wider context: Scotland's mountainous areas retain natural or semi-natural ecological processes, and this is increasingly rare in the post-industrial developed world. This and previous studies provide evidence that they provide valuable non-market benefits, in common with other 'wild nature' areas around the world (Balmford et al 2002). The Balmford study identifies that the loss of natural ecosystems worldwide is often attributable to three drivers: a lack of information on the non-market benefits provided; a failure of markets to provide them; or a failure of policy interventions creating so-called 'perverse subsidies'. The history of land use in Scotland includes examples of all three of these problems. Valuing non-market environmental benefits and assessing the environmental management implications is an important tool for the worldwide conservation of wild habitats, and the Scottish mountains provide a useful microcosm.

Economic implications: It can be accepted that Scotland's mountains provide non-market environmental benefits that are valued by society and important for the tourism industry, and that providing these benefits often means a direct or opportunity cost for landowners or land managers. In economic efficiency terms, they should be compensated for these costs – this could be achieved in a number of ways:

1. **Entry fees or charges for services such as private roads and car parks.** Entry fees would be a theoretically sound approach, but the Scottish people are

fundamentally opposed to the principle of paying for access to the hills (Donohoe pers comm. 2002), and it would be practically very difficult. Recreational users may be more prepared to pay for services.

2. **Generating revenue through business activities**, particularly in the tourism industry: the findings suggest that there is potential for further transformation of environmental benefits into recreational environmental products, which will create wealth and employment (Merlo et al 2000), for example in expanding nature tourism opportunities (Tourism and Environment Forum 2002).
3. **Conservation ownership**: Conservation organisations such as RSPB own land and manage it for environmental benefits – their costs are paid by donations from members.
4. **Public subsidies**: This is typically the most appropriate and equitable method for paying for public environmental and cultural benefits because it does not depend on exclusivity of the resource and recognises the benefits that accrue to wider society, not just visitors or other users. The most important channel of public funds to the Scottish mountains is agricultural support funding under the CAP, discussed below. This is a potential problem since across large areas the primary land use is not agriculture but field sports, which receives little or no public money – in many cases the public environmental benefits are subsidised by the private wealth of the owner.

Equity and the social utility function: A strict public welfare approach does not include equity concerns – it values gains to the richest person in society the same as gains to the poorest. This is particularly relevant to this study, since there is an income differential between mountainous and other areas (HIE 2001), and this study is investigating the preferences of a rich, well-educated recreational user population¹⁰. Their preferences are important, but they must be balanced against the interests of local people in these areas - a number of past land-use debates have polarised local ‘development’ interests against national ‘conservation’ interests (Warren 2002). Although the growing economic importance of tourism means that local and national priorities are more likely to coincide, this is still an important issue. One economic approach is to select a social utility function that amplifies the importance of the preferences of local communities or the poorer members of society.

¹⁰ Christie (1999) pointed out that public investment in open-air recreation in this area is likely to be regressive – giving money back to the richer people in society.

Implications for current policy

Overall: Aggregate WTP values between £1.7-6.1m for environmental and cultural benefits can be interpreted as having a number of different implications for public policy. The first would be that it indicates a failure of current policy to deliver enough of the environmental benefits valued by society, and that more investment is required. This is the logical inference if it is assumed that respondents are already aware of how much is being spent on the mountain environment. However, the level of current expenditure is not outlined in the surveys (and is very difficult to determine). If respondents are in fact answering for how much they are WTP *in total* towards providing environmental benefits then the interpretation is more difficult, since this is just a small sub-set of the population. The order of magnitude is similar to that spent on ESA policy (£9.7m in 2000-1 (Warren 2002)) but further research would be necessary for any conclusions to be made on value for money from mountain related environment policies.

Agricultural support: Financial support for agriculture is a controversial topic because of the large budget of the CAP, its historical emphasis on production at the expense of environmental and social benefits, and the perception that it is protectionism disguised as social or environmental policies (Potter and Burney 2002). Economically, it can be justified in two main ways:

- a. society benefits directly from the presence of communities and socio-economic activities in rural or remote areas, or
- b. these activities are multifunctional, providing environmental benefits that are valued by society or form the basis of a tourism industry.

The findings of this study suggest that recreational users living outside mountainous areas value a policy aimed at providing benefits to communities within them. If this was confirmed by further research it would be an important finding, since Crabtree et al (2002) couldn't find a single study that supported a direct demand for the rural and cultural heritage benefits of socio-economic activities in mountainous areas. It would provide a direct justification for agricultural support or other policies aimed at maintaining viable communities in mountainous areas (e.g. EU Regional Policy). This and previous studies have also demonstrated a demand for the environmental benefits associated with heather moorland, native forests and other upland landscapes – as discussed in Section 4A these are multifunctional landscapes associated with

human management, and this justifies support aimed at maintaining these management activities. It also gives a justification for the changing policy context in agriculture and forestry, where payment is moving away from production towards payment for non-market environmental benefits and rural development.

Targeting support: If these results were confirmed by further research they would be significant, but they would not provide a catch-all economic justification for agricultural or community support. If the objective of policy intervention is to maintain viable communities or provide public environmental benefits then it needs to be targeted to areas where it will achieve these positive impacts. This and previous studies raise the possibility that mountainous areas are particularly deserving of public investment: the tourist industry is significant and closely tied to environmental benefits; the value of environmental benefits in these areas will probably be higher than in lowland areas¹¹; and land-use activities are particularly multifunctional (Crabtree et al 2002). This argument requires robust evidence since the political barriers are large - the agricultural lobby is dominated by lowland interests and the mechanisms of funding environmental stewardship in mountain areas is complicated by diverse land uses and likely public resistance to subsidising sporting estates. Socially it is also potentially problematic because farmers and land managers may object to the principle of being paid to be rangers in a giant country park (Black pers comm. 2002).

Land ownership: The significance of landownership in the provision of environmental benefits is a subject of polarised debate. One side of the debate would argue that the private subsidies provided by wealthy landowners contribute to maintaining viable communities and multifunctional land uses that generate environmental benefits, at no cost to the public purse (e.g. Cooke pers comm. 2002). The other side would argue that private landownership is a barrier to the sustainable development of communities and the provision of environmental benefits, since private landowners are pursuing their own objectives for the land, and are not operating as economically rational businesses, so fiscal incentives do not provide a suitable level of environmental benefits (e.g. Wightman 1999). Both sides are probably true at different times and in different places - as outlined in Section 2B, this is an important political issue that is unlikely to ever reach consensus.

¹¹ A combination of unique mountain habitats, landscapes and species, and popularity of the area for recreation

The significance of the land reform process is therefore also a matter of debate. Its most direct impact will be the likely creation of a *de jure* right of access to the Scottish countryside, which may not be significant for regular users in mountainous areas since it will not be a tangible difference from the current *de facto* right, but it will be significant for the tourism industry given the finding that 37% of foreign visitors described uncertainty about access as a problem in the Scottish countryside (Macpherson Research 1998).

National Parks: Recommendations for the creation of national parks in Scotland have reached the government at regular intervals since the 1940s (e.g. Gardner 1942, CCS 1990), and they have acted 60 years later in the creation of the Loch Lomond and the Trossachs National Park (19 July 2002) and the Cairngorms National Park (imminent). They have broad objectives, including sustainable local economic and social development as well as protection and enhancement of the natural environment (Warren 2002) – if the findings of this project were supported by further studies they would justify this inclusive remit.

Supplying the perceived demand for environmental benefits

Landscape and Wild land (inc forests/moorland): A portion of the landscape benefit identified in this study clearly relates to the topography – which no-one is proposing to change – but the results also indicate that the vegetation cover and wildness of the landscape is important, and these benefits can be protected and enhanced by policy intervention. As pointed out in Section 4A, the subjective nature of landscape appreciation can mean that it doesn't receive the same attention as more quantifiable attributes such as biodiversity – for instance there isn't a landscape equivalent of the EU Natura 2000 Network. This is a critical issue since a number of contentious recent debates have considered landscape impacts, for example from wind farms, ski-lifts¹², bulldozed roads¹³, hydropower facilities¹⁴ and blanket afforestation¹⁵. The National Scenic Area designation covers a large area of the Scottish mountains, but some stakeholders maintain that the mechanisms for enforcement need strengthening (Mackay pers comm. 2002). There are some positive signs: a strategic approach to landscape protection and enhancement has been developed recently for indicative forestry strategies, SNH guidelines on

¹² E.g. Cairngorm funicular at Coire Cas (Warren 2002)

¹³ In SNH (2002)

¹⁴ e.g. Shieldaig hydro scheme in Wester Ross (SNH 2002)

¹⁵ e.g. Blanket afforestation in the flow country (Hanley and Craig 1992)

renewable energy¹⁶ (SNH 2002b), and pilot strategies for NSA management in Wester Ross and Dumfries and Galloway (Tabor pers comm. 2002); and the Landscape Character Assessment (LCA) technique is designed to promote an objective approach to landscape characterisation as a sound basis for decision making (Countryside Agency/SNH 2002).

The results emphasise the value of the ‘wild land’ nature of the mountains – this has traditionally been a poorly defined attribute, but a recent policy paper by NTS (2002) and a consultation by SNH (2002c) have identified some core attributes and critical issues. Wild land is vulnerable to developments such as bulldozed roads and wind farms, and also to increased levels of recreational access. Difficult decisions need to be made about the merits of access-restricting policies such as the ‘long-walk in’ or car parking charges compared to the objective of allowing free, easy access for the enjoyment of mountain areas (Hanley et al 2002, Sibly 2001).

The results of the current study indicate that a policy of native forest expansion is highly valued by recreational users and this supports the policies being undertaken by the Forestry Commission in its own forests and its grant-making activities. Increasing the area and quality of heather moorland is also valued, but to a lesser extent. Given the declining trends identified by the Moorland Working Group (2002) it would appear that achieving this objective would require further public investment, for example in subsidising heather management on sporting estates (e.g. through Natural Care payments (SNH 2001)).

Wildlife and biodiversity: Wildlife and biodiversity objectives will often overlap with landscape objectives – as in the expansion of heather moorland and native forests - and they are often well represented in environmental management debates and designations, probably because of their quantifiable nature and the existence of strong lobbying and land owning non-governmental organisations such as the RSPB. This study shows that recreational users value the health of bird populations in the mountain environment and this probably indicates a wider value for wildlife and biodiversity in this area – although White et al (2001) point out that WTP is generally higher for birds than other animals. The disproportionately large number of Natura and other designations in Scotland’s mountains (Robinson 2002) suggests that public policy has this issue covered, but there are concerns about financing for

¹⁶ Seeking a ‘strategic approach in which renewable energy development is guided towards the locations and the technologies most easily accommodated within Scotland’s landscapes and habitats without adverse impact, and which safeguards elements of the natural heritage which are nationally and internationally important’ (SNH 2002b)

the Natura network (Markland 2002) and its ability to deal with wider issues such as overpopulation of red deer and land-use changes driven by external economic factors. The robustness of the SSSI designation has been questioned after the observation that out of a total of around 6000 UK SSSIs there were 997 instances of damage or partial loss between 1990-95 (May and Tregonning 1998)¹⁷. One important issue in this context is the ongoing raptor debate, which has tended to polarise the field sports sector – accused of unnecessary persecution of raptors such as hen harriers on grouse moors – and the wildlife conservation lobby. This is an area where further research is necessary (Smith pers comm. 2002).

In addition, the impact of climate change on upland habitats such as Caledonian pine woodland and peat bogs is predicted to be severe (UKCIP 2001), and conservation strategies need to recognise the implications of this threat and plan accordingly.

Recreation: This study did identify a willingness to pay for signed and well-maintained paths, but it is low in comparison to other attributes. Other recreational amenities such as interpretation and mountain bike trails also appear to have relatively low importance in user preference. This is not unexpected, since the focus group identified a tension with the management of recreational access - many recreational users feel that it detracts from the attributes of self-reliance and wildness that they value in mountain recreation. It also may be a function of the sample chosen, since only 30% of respondents had been mountain biking in the last year. However, even if it is unpopular, maintenance of paths and management of users is necessary in many places for ecological and landscape reasons¹⁸ and therefore this is another demonstration of the limitations of a referendum approach to environmental management. The fragmentation and lack of a strategic approach to the provision and management of open-air recreation in the Scottish mountains has been criticised by Christie et al (2000), who propose the application of a cost-benefit methodology similar to this one to the strategic analysis of recreation policy. A fragmented approach and large number of public bodies with overlapping responsibilities within the recreational sector is likely to make it more difficult to integrate with wider strategies aiming to provide the environmental benefits that recreational users value.

Communities: This study is unique in demonstrating that recreational users of mountain areas value a policy designed to provide socio-economic benefits to

¹⁷ Although there was a declining trend in instances of damage during this period

¹⁸ An example is the significant negative landscape impact of walkers causing erosion on Stac Pollaidh in Inverpolly NNR, which led to the construction of a new footpath

communities in these areas. If further research were to confirm this finding and demonstrate that it existed throughout society it would provide a strong justification for policies such as LFA agricultural subsidies and EU Regional Policy aimed at territorial cohesion¹⁹. The complexity of issues related to achieving this objective preclude further discussion in this study, beyond pointing out that the debate and action in this area revolve around overcoming the physical and geographical barriers to economic development in mountainous areas, and providing jobs, houses and services for the people that live in them (Shannon pers comm. 2002). There has traditionally been a tension with national environmental interests, as conservation interests have been perceived as restrictive and over-bearing, but as the importance of environmental benefits in attracting tourists, public subsidies and relocating businesses becomes more apparent it is likely that this tension will ease.

C. Critical issues for Scotland's Mountains

The broad scope of this project means that 'recommendations' are likely to be over-generalised and unhelpful, so instead a list of ten critical issues is outlined below. These come from the public surveys, literature review and stakeholder interviews carried out in this project²⁰, and they are intended to guide policy-making and future research.

1. MANAGING CHANGE. Section 2B points out that change has been the status quo in the Scottish mountain environment in recent history. It has often been negative in terms of the environment, since short-term monetary benefits have been favoured over the long-term objectives of maximising non-market environmental benefits and promoting rural development - blanket afforestation in the 1970s-80s is a good example, and climate change looks set to be an important force in the future. Structures for managing change and ensuring that public benefits are maximised and sustained are critical²¹ – good models are the indicative strategies developed for forestry and wind farms. It is critical that management is objective-driven, and this requires a better understanding of what society values about the mountain environment. Development and implementation of more and better valuation techniques and surveys is important to help determine these objectives.

¹⁹ The maintenance of socio-economic activities throughout the relevant territory, in contrast to the centripetal nature of undirected economic development (Gaskell pers comm. 2002)

²⁰ The majority of these points are repeated from earlier in the report, so for the sake of clarity are not referenced here.

²¹ Mackay pers comm. (2002), SNH (2002a), CCS (1990)

2. PLANNING FOR PEOPLE. Further research is needed, but it seems that beyond the benefits to the people themselves there at least two further reasons for prioritising the needs of communities living in mountainous areas: the public values them directly for cultural reasons; and they are required directly or indirectly as environmental managers, since the public values environmental benefits associated with human management of the mountain environment. A balance must be struck between preserving environmental and cultural benefits and causing economic and social development to stagnate – the critical issues are providing quality jobs and services and affordable housing, and seizing the opportunities that telecommunication developments provides for new models of economic growth. Service provision is an area that requires particular research and learning from other mountainous or rural areas²². It is critical that the significant natural heritage of the mountains is recognised as a magnet for new businesses and an asset for the tourism industry, rather than a constraint for social and economic development.

3. INTEGRATING LAND USE STRATEGIES. Establishing mechanisms for integrating land use sectors to maximise public benefits is critical, for example through the targeting of public funding to encourage multifunctional management of land. Geographical integration is also important, particularly in the Southern Uplands where a more cohesive approach is likely to have benefits. However, integration is not a panacea in all cases and it could lead to over-complication of decision-making processes.

4. RECOGNISING AND MAXIMISING ASSETS. The aesthetic landscape benefits, wildlife, wild land character and recreational opportunities of the mountain environment are critical for the tourism industry and for maximising public benefits from the mountains. It is critical that these four issues are given a high priority. A strategic approach to protecting and maximising these benefits is critical, for example by strengthening the National Scenic Area designation and extending it to protect wild land areas, and by taking a more strategic national approach to the management of open-air recreation that includes the better provision of facilities such as car parking and well-maintained footpaths.

5. MONITORING CHANGES TO ALLOW ADAPTIVE MANAGEMENT.

The policy context is very dynamic at the moment, and it is critical that environmental baselines are established and the impacts on the mountain environment are monitored. This will allow adaptive management to improve the policies in the future. For example the establishment of National Parks and the

²² Shannon pers comm. 2002

changes in the forthcoming Land Reform Bill are likely to have significant impacts and would benefit from monitoring, review and fine (or coarse) tuning.

6. ATTRACTING AND TARGETING PUBLIC FUNDING. A good case for higher levels of public funding can be made given the high level of public environmental benefits associated with mountainous areas. The way in which public funds are targeted and implemented in mountainous areas is critical. Research is required into the means of implementation that maximises public benefits – currently the majority of funding goes through the agricultural sector and is production-linked, and this may not be the best means of implementation for the future. Instead, positive incentives for objective-driven environmental management - as in the SNH Natural Care programme (SNH 2001) - is a potential model for future implementation, although this requires further research.

7. EDUCATING. Educating the general public about the mountain environment is critical, because the new access policy means they need to know how to behave responsibly and because greater awareness and experience of the mountains will probably mean that they value them more.

8. DEALING WITH CONFLICTS. There are some critical conflicts in the mountains, for example balancing private property rights against the public interest, balancing land uses such as field sports, agriculture and conservation against the right of public access for open air recreation, and balancing local and national interests in development planning. Resolving these conflicts should be based on dialogue and comprehensive stakeholder participation, but ultimately win-win solutions may not always be possible. In that case, strong political will is necessary to achieve an outcome that benefits society today and in the future.

9. MAKING RATIONAL DECISIONS ON LAND OWNERSHIP. Further research is needed to ensure that decisions on land ownership and the associated rights and responsibilities are based on evidence and the maximisation of public benefits rather than on political or historical hang ups. For example, it is critical that better information is gained about the economics of sporting estates, the long-term economic potential of community ownership and the environmental impact of landownership patterns. Research is needed into changes to the land market that would slow the rapid turnover of Highland estates.

10. DEALING WITH ROOT CAUSES. Proximate causes of loss of habitat and habitat quality and landscape deterioration include overgrazing by sheep and deer, afforestation and footpath erosion. The ultimate causes are much more deeply ingrained in the system – for example the patterns of public subsidies, land valuation

based on sporting cull size and the concentration of recreational users at honey-pot sites. Solutions that tackle these ultimate causes as well as directly culling deer or maintaining footpaths are more likely to be successful and sustainable in the long term.