



Taking an ecosystem approach to upland management

HUNT multi-criteria workshop report

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Contents

Summary	3
Context.....	5
Key questions addressed	5
Method	6
Key findings	8
Responses to policy priorities (identified in the Land Use Strategy & modified by participants) ..	9
Synergies and compromises in managing for multiple priorities	12
1. How do managers view the delivery of priorities by the main forms of upland management?	14
2. Comparing regional and national responses	14
3. Implications for policy priorities	16
4. Enabling mechanisms for delivering multiple priorities	17
Evaluating the approach: lessons for best practice and wider applicability.....	18

Summary

An ecosystem approach¹ is being promoted as a means of achieving more integrative and sustainable natural resource management that also contributes to social and economic needs. In Scotland, this is being developed via the Land Use Strategy (2011). However, there is little guidance on how to achieve this approach in practice, particularly to assess where competing priorities are compatible and how to make trade-offs where they are not.

We explored the use of Multi-Criteria Decision Analysis as a structured and systematic approach to assess the ability of different land-uses to deliver public and private benefits, and how the diverse priorities of different stakeholders affect the trade-offs that they make. This method was applied during three workshops (held in January and March 2012), attended by land managers and members of national organisations with strong interests and expertise in hunting and biodiversity conservation in upland Scotland. We assessed what environmental, social and economic benefits are delivered by a range of current management types, and how management priorities and trade-offs vary amongst private, public and third-sector landowners and managers.

By identifying the common ground and key trade-offs required to meet policy goals for a transition to an ecosystem approach in upland Scotland, where hunting is a significant activity, the results provide useful knowledge to underpin sustainable decision-making over land management:

- Overall, management for deer stalking was considered to best deliver the broadest range of current management priorities, including economic, social, cultural and environmental values, when compared with alternatives such as conservation, forestry, renewable energy and tourism.
- A broader range of priorities was delivered in the NW than in the Central Highlands. This can be partly explained by the lower productivity and higher costs associated with livestock and game production in the NW, which make the available incentives for native woodland restoration and renewable energy attractive alternatives. Delivering more priorities in the Central Highlands entails greater compromise and incurs higher costs due to the economic value of sporting activities. This makes trade-offs towards public policy related interests such as woodland and renewables a less attractive option at current values.
- There is a perceived tension between types of management needed to achieve socio-economic objectives and those required to meet environmental goals.
- There are also potential conflicts between national priorities for woodland expansion and increased renewable energy generation as two routes to a lower carbon economy, since these are not considered compatible on the ground.
- Perceived links between management and peat restoration are weak, indicating a need for improved communication and guidance on the broader value of managing peatland resources to ensure that peatlands are managed for biodiversity and carbon benefits. The same may apply to water resources, *e.g.* provision of drinking water from moorland catchments.
- Encouraging responsible public access as part of general public education is important to promote understanding of management practices and thereby prevent disruption of estate activities arising from 'irresponsible' access. Participants considered that government should

¹ CBD <http://www.cbd.int/ecosystem/principles.shtml>

take greater responsibility for public education. Education can play an important enabling role in the delivery of public and private priorities.

- Supportive institutional mechanisms are critical for delivering multiple benefits, particularly for ensuring a reasonable balance between the relative costs and benefits of managing land for public and private interests. Relatively short-term planning timeframes for public policy priorities limit the willingness of managers to make the long-term investments needed to deliver national and regional sustainability.
- Public policy priorities are ranked similarly to many private objectives and there is therefore scope for achieving public benefits alongside private objectives. Where trade-offs are required to deliver multiple benefits, these are locally specific and trade-offs towards public objectives are more attractive where costs for alternative uses (e.g. sporting, farming or forestry) are higher.

This methodological approach provides an improved understanding of and capacity to deal with conflict over multifunctional land-uses by representing the range of priorities held by different stakeholders and their assessment of the capacity of different land-uses to deliver economic, social and environmental benefits, and so contribute to the development of more integrative policy instruments for ecosystem management and conflict resolution.

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Context

To meet competing demands from natural resources on a global scale, more integrated, ecosystem-based approaches to management are required. This involves recognising and managing trade-offs in order to avoid conflict. Management for sporting activities in the Scottish uplands, for instance, takes place alongside a range of other land management priorities, in addition to broader government objectives relating to public benefits provided by these ecosystems. Current strategies for land use developed by the Scottish government, in parallel with EU and international approaches, emphasise an ecosystem approach² in order to deliver environmental, economic, social and cultural benefits. This approach places greater emphasis on the public benefits provided by natural resources at a landscape scale.

There is, however, little guidance on how to communicate these national priorities and translated them into regional land management decisions. These are key challenges facing Scotland's policy-makers and land managers. A strategy is needed that helps ensure that public and private objectives for upland management are fully recognised and identifies where these are and are not compatible in order to assess the trade-offs and manage competing priorities between different strategies, resources and users.

Multi-criteria decision analysis (MCDA) is one of few methods that can incorporate the complex diversity of values and objectives held by policy-makers and land managers to assess how well alternative management strategies fulfil these differing priorities. The method was applied in three participatory workshops with regional and national level stakeholders to assess what environmental, social and economic benefits hunting delivers alongside a range of coexisting land-uses, and to identify how these perceptions and perceived barriers to changing management priorities vary spatially and from policy to practice. The results allowed us to identify key synergies and trade-offs required to meet policy goals for a transition to an ecosystem approach to land management in Scotland. These results were complemented by qualitative cost-benefit analysis (CBA), which provided a systematic way of representing variations in the perceived gains and losses associated with different forms of land management, including various styles of hunting, conservation, forestry and farming.

Key questions addressed

To develop a functional ecosystem approach, policy-makers and land managers need to understand:

- What are the important priorities for upland management (e.g. renewable energy, peat regeneration, protected areas management, public access, income generation) emerging from recent and upcoming policies?

² CBD <http://www.cbd.int/ecosystem/principles.shtml>

- What criteria are important to upland managers? What criteria are important to national-level organisations charged with the task of communicating policy goals, representing members' interests and helping members deliver a balance of private and public goals?
- What benefits (goods and services) do different land management types (e.g. sporting, farming, forestry, conservation) currently deliver?
- Which land management types provide compatible ways of delivering national and regional land management priorities, where are the gaps in knowledge and what are the trade-offs if wider benefits are sought?

Method

Three workshops were held during which MCDA was used to structure the discussions. The first two workshops had a regional focus to examine differences in attitudes amongst stakeholders (1) who manage intensively for game in the Central Highlands and (2) where hunting is practiced on a more extensive scale in the North-West Highlands. Two landowners from the NW took part in the Central Highland workshop for logistical reasons. In both areas, hunting coexists with other land-uses, including conservation. Differing management strategies may be pursued both within individual properties (i.e. trade-offs exist within ownership areas) and at a landscape-scale (i.e. potential differences occur between neighbours). The regional contributors (11 from the NW, 15 from the CH) manage 3.6% of the total mainland area of Scotland or approximately 6.6% of the Scottish uplands. To compare the priorities of local stakeholders directly involved in the management of regional upland areas with those held at national level, a third workshop was held with the National Consultative Group (NCG) convened for the HUNT project³. This was attended by 11 representatives from eight national organisations with strong interests and expertise in hunting and biodiversity conservation, including Scottish Natural Heritage, Game and Wildlife Conservation Trust, Royal Society for the Protection of Birds, Association of Deer Management Groups, British Deer Society, British Association for Sporting and Conservation, Cairngorms National Park Authority and Scottish Land & Estates. The stages of the workshop process are shown in Figure 1.

As outlined in Figure 1, the MCDA process consists of four main steps:

1. **Define and rank priorities:** Following an introduction and outline of the aims and method, a preliminary list of 15 land use priorities emerging from the Scottish Land Use Strategy was presented and discussed (Figure 1: stage 3, Figure 2). Participants clarified the definitions and relevance from their perspectives to identify where policy and other priorities overlap and diverge. Participants then suggested additional priorities to capture the full range of benefits that moorland environments deliver. In the regional workshops, managers were asked to identify any additional priorities that are important in making upland management decisions from their own perspective; in the national level workshop, representatives were asked to consider what additional priorities they consider when representing the management interests relevant to their organisation.

Priorities are rarely of equal weight to different stakeholders in decision-making. Each participant therefore ranked the priorities in order of importance to their current management strategy (for

³ <http://fp7hunt.net/>

managers) or to their organisation's current objectives (for national representatives). Each participant also indicated whether the priority was considered to have a beneficial or detrimental influence. Results were collated and the relative order of the priorities was discussed to consider similarities and differences between policy (public) and private priorities. Regional findings were presented and discussed during the national level workshop to assess how national priorities translate to regional implementation and to further explore trade-offs and compatibilities between the priorities for national-level decision-making.

2. Define land management context: Current land management types that characterise the uplands were outlined and discussed to provide a clear context for considering what benefits are currently provided by the main forms of upland management (Fig. 1, stage 4). The Scottish uplands can be characterised by six main land-management types and are defined in terms of their primary objective (see Figure 4). The characteristics of each were discussed to establish an agreed set of main management types for each region.

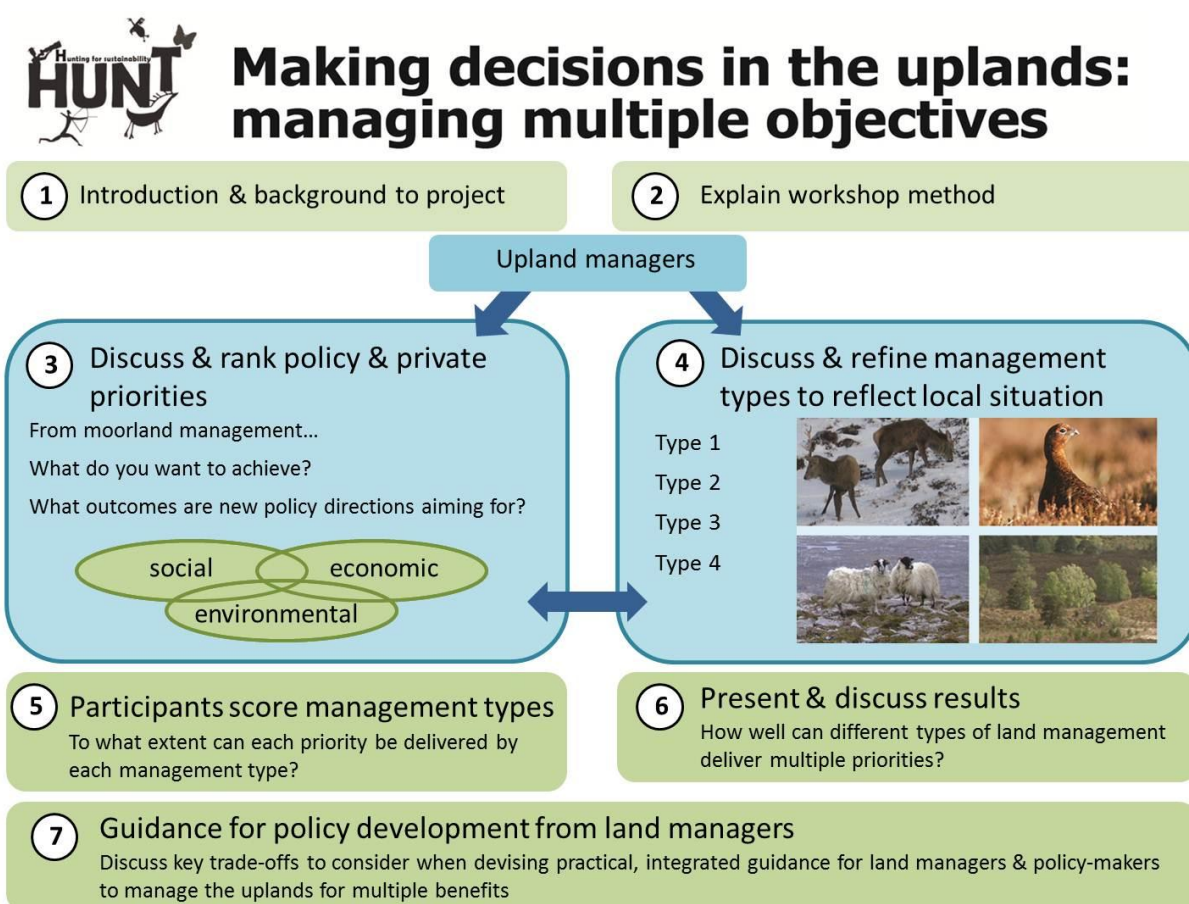


Figure 1. Schematic representation of the MCDA process as applied to Scottish land-use.

3. Score management types against priorities: Participants were asked to consider what benefits are currently provided by these land-uses and identify where trade-offs are necessary for delivering the priorities identified above. Participants were asked to score how well each land management type achieves each priority (Fig. 1, stage 5; see Figure 4 for scoring scale). This requires managers to consider the relative strengths of each land-use, so helping to identify where trade-offs are required to deliver additional priorities. Managers were again requested to consider these scores in relation

to managing the upland areas on their estate. To discuss preferences and trade-offs, preliminary results were collated and presented by recording the three land uses that each participant felt best delivered each priority (Fig. 1, stage 6). During the regional meetings, participants then recorded the main costs and benefits that they associated with each management type. Following further discussion, each group qualitatively evaluated the usefulness of the MCDA method for structuring complex interactions and decision-making discussions.

4. Apply priority rankings to scores to provide weighted indication of how well priorities are delivered: In recognition that priorities are not equally important to participants when making decisions about land management, the priority ranks were used to weight the capacity of each management type to deliver the priorities. These weighted scores were calculated after the workshops. In the case of the national workshop, scoring of the land management types was not undertaken in recognition that many of the participants represent a range of members' interests and would not therefore be able to offer a single score for each land-use or priority. Instead, the regional rankings and weighted scores were presented and discussed in terms of the potential consequences of seeking a wider range of benefits.

Key findings

Figure 2 shows how the original policy priorities discussed by the regional and national groups were expanded to reflect their wider goals. The relative ranking of the different elements is shown in Figures 3-4 and indicates how different stakeholder groups approach decision-making and management, and how values vary between regional and national scales. The public (policy) derived priorities were generally well received, aside from some rephrasing and additions, and overall they were not ranked lower than other priorities added by managers. In part, this reflects differing interpretations, but also provides grounds for reconciling public and private objectives. Significantly, both regional managers and national representatives felt that it was equally important to discuss the mechanisms via which objectives and priorities are delivered. This is reflected in the summary presented below.

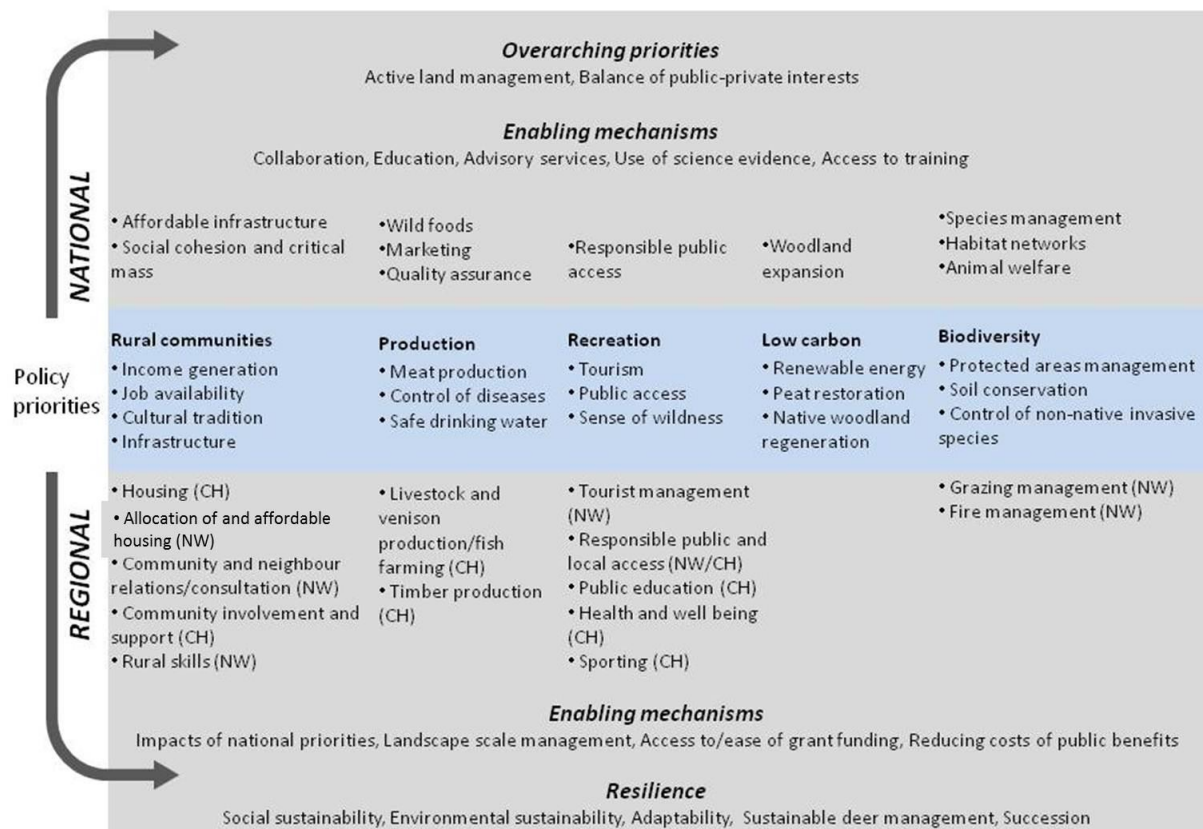


Figure 2. Priorities drawn from the Scottish Land Use Strategy and identified by participants.

Responses to policy priorities (identified in the Land Use Strategy & modified by participants)

Policy priorities were discussed in five broad categories: Rural communities, Food production, Recreation, Low carbon, and Biodiversity.

Rural Communities: Concerns over sustainability are reflected in the importance placed on Rural Communities as a policy priority, Because income generation was the highest ranked policy priority for both regional groups, this implies a dependence on income for the resilience of fragile rural economies. Income represents the influence and interactions of many of the other priorities and is an important benchmark for managers. Amongst the other Rural Communities policy priorities, job availability and cultural tradition were also consistently ranked highly by participants and were amongst the most important priorities for the CH and national groups. There was recognition from all groups that good community relations and social cohesion were necessary to underpin viable rural communities, in addition to a need for affordable housing and infrastructure. The highest ranked priorities for both regional groups also highlight the importance of distinctive regional interests: sporting in the CH, particularly deer management, and native woodland regeneration in the NW. Here, participants commented on the need for productive woodlands to meet future energy needs, with debate over the merits of exotic versus native woods, both of which can contribute to a low carbon and productive economy.

Biodiversity: Species management was the most important priority at the national level by a large margin. This was considered a more appropriate theme than the narrower policy priority ‘Control of non-native invasive species’, particularly outside protected areas. Priorities related to the management of protected areas and conservation were ranked relatively highly in the NW. This contrasts with the lower rankings given by the CH group. Concern was expressed by all groups over the need to control some native species as well as the non-native invasive species recognised by policy-makers, and the importance of land managers for achieving this, e.g. bracken control. This supports the idea that protection of a species should be based on the viability of the local population, rather than of the species wherever it exists. National representatives also favoured greater review of when protection is or is no longer appropriate.

Low carbon: Responses to low carbon priorities varied significantly between groups. This strongly reflects trade-offs and opportunities. Native woodland was the highest ranked priority by the NW group and, with renewables, provides a valued source of grant income for rural economies and communities. These were less valued in the CH due to the economic and cultural importance of sporting interests, which would incur costs from a shift towards woodland regeneration or the development of renewables. Peat restoration was ranked relatively low in the regional workshops, leading national level participants to suggest that there is a lack of awareness of the broader significance of peatlands to climate change mitigation. This may indicate a breakdown in communication between policy and national level bodies, on one side, and land-managers on the other.

Recreation priorities received very varied ranks, indicating divergent opinions; all groups were keen to clarify their values in terms of the management of recreation and access. Tensions between public access and estate activities are considered further below. Regional participants placed greater value on sense of wilderness than national-level representatives, for whom it was the lowest ranked policy priority.

Production: Safe drinking water, meat production and control of disease received the lowest ranks from the NW group, but were relatively important for the CH group. This reflects lower agricultural productivity and higher production (e.g. transport) costs in the NW. Safe drinking water and control of diseases were also ranked amongst the lower importance priorities for the national group. The provision of drinking water may be not viewed by some managers and national-level representatives as an important wider public benefit which is directly related to moorland management, at least amongst sporting and conservation interests. This again suggests failings in communication from policy to national level organisations and land managers regarding the role of management in maintaining and enhancing the value of water resources.

Figure 3. Relative rank of priorities for (a) Central Highlands (left) and (b) NW Highland workshops (right), calculated as the average for all participants. The columns (left) indicate the number of participants who considered the priorities to be largely beneficial (positive), detrimental (negative), both (positive & negative) or neither (neutral). Titles in black font indicate policy priorities drawn from the Scottish Land Use Strategy, while those in red indicate additional priorities identified by participants.

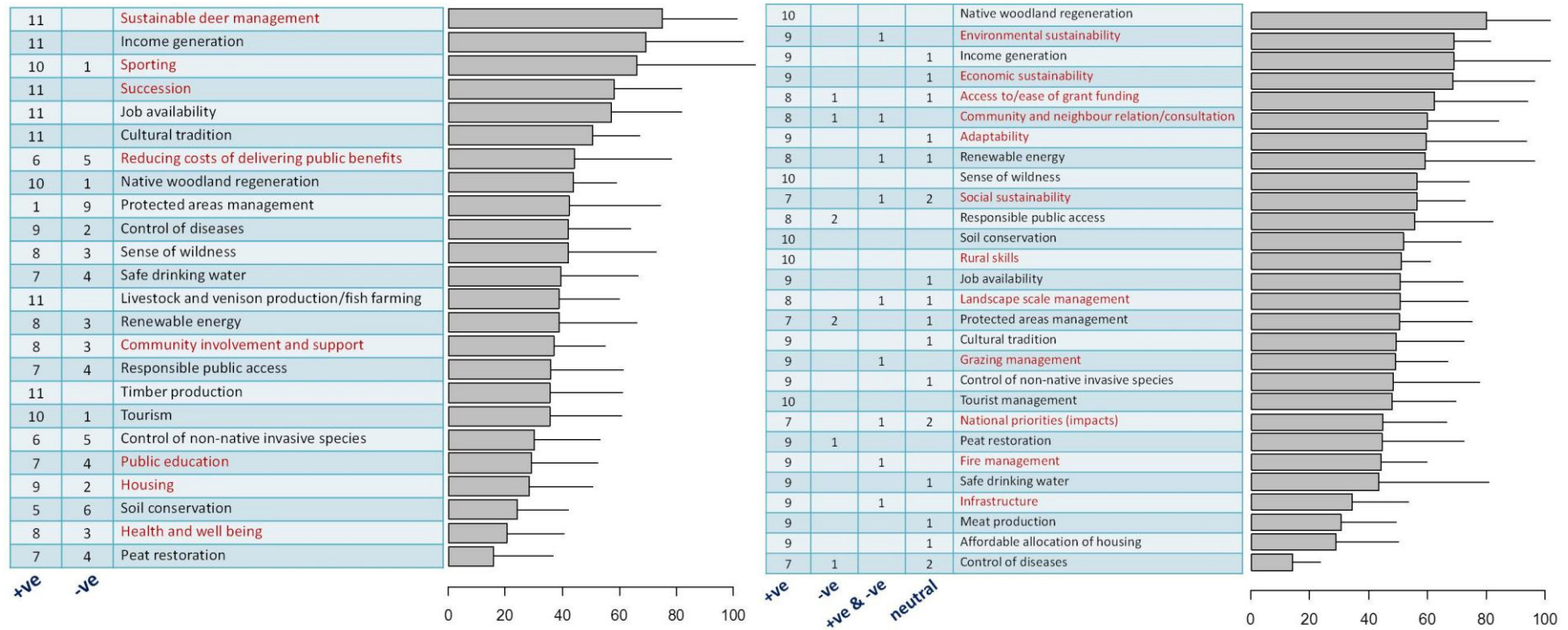
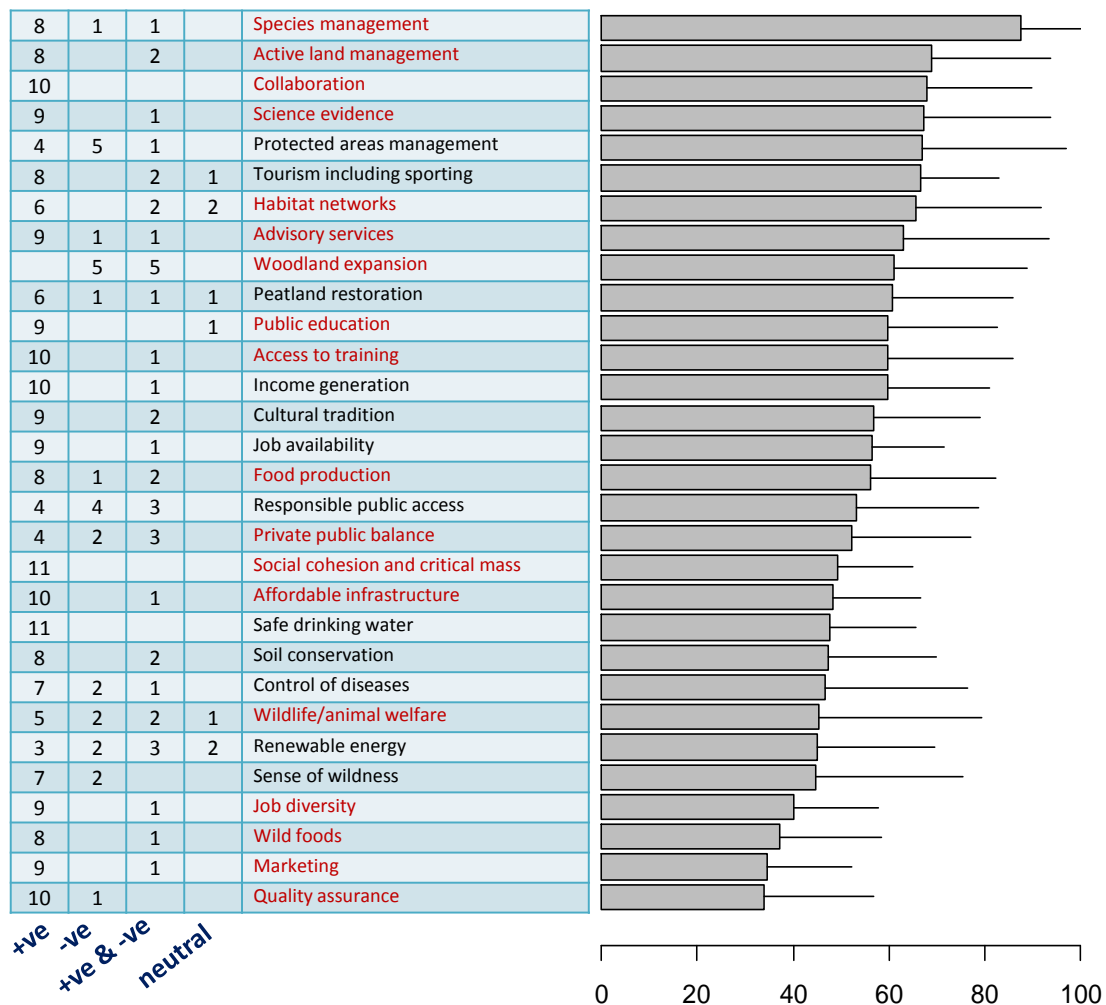


Figure 3c. Relative rank for priorities in national level workshop.



Synergies and compromises in managing for multiple priorities

The complexity of the Ecosystem Approach, including the need to make difficult trade-offs between ecosystem services, requires an understanding of how the values and priorities of public, private, regional, national and international interests interact. An understanding of the synergies between types of management and individual priorities is an important step towards successfully managing resources for a broad range of interests and minimising conflict. A multi-criteria approach shows three main findings:

1. Public priorities are ranked similarly to private objectives and there is therefore scope for achieving public benefits alongside private objectives.
2. There are gaps in the communication of public policy objectives to land managers, particularly in relation to the value of peat restoration and role of upland management in the provision of drinking water. This would benefit from increased attention by national level private sector organisations.

3. There are a number of trade-offs required to deliver multiple benefits and these are locally specific, with public objectives causing lower trade-off effects in areas where environmental and infrastructure constraints give rise to higher costs for delivering sporting, farming and forestry objectives.

Of the six land-use types selected for consideration (Figure 4), grouse shooting was only considered a major practice in the CH, where habitat allows sufficient population productivity. In the NW, participants distinguished native woodland from commercial forestry, recognising that native woodlands can be productive as well as supporting biodiversity and sequestering carbon. In both regions, the term Nature Reserve was discarded in favour of more clearly-defined terms. It was replaced by Conservation Areas in the NW and by Designated Areas in the CH. This reflects the broader acceptance and importance of conservation on a landscape scale, beyond designated sites, in the NW, compared with emphasis on legally designated sites within the wider landscape in the CH. Management for tourism and renewable energy were two additional practices independently added by both regional groups.

The scores for how land management types deliver the priorities were weighted by the ranks given to each priority to indicate how well participants feel that these land-uses deliver priorities in each region, while also accounting for the differing importance (i.e. weight) attached to each priority by the participants. Figure 4 shows, on average, how well management types deliver the range of priorities agreed in each region, and Figure 5 uses cluster analysis to show overall similarities and differences in the extent to which land managers' feel that different land-uses deliver a range of national and regional level priorities. This provides a visual summary of managers' views on the strengths and weaknesses or incompatibilities.

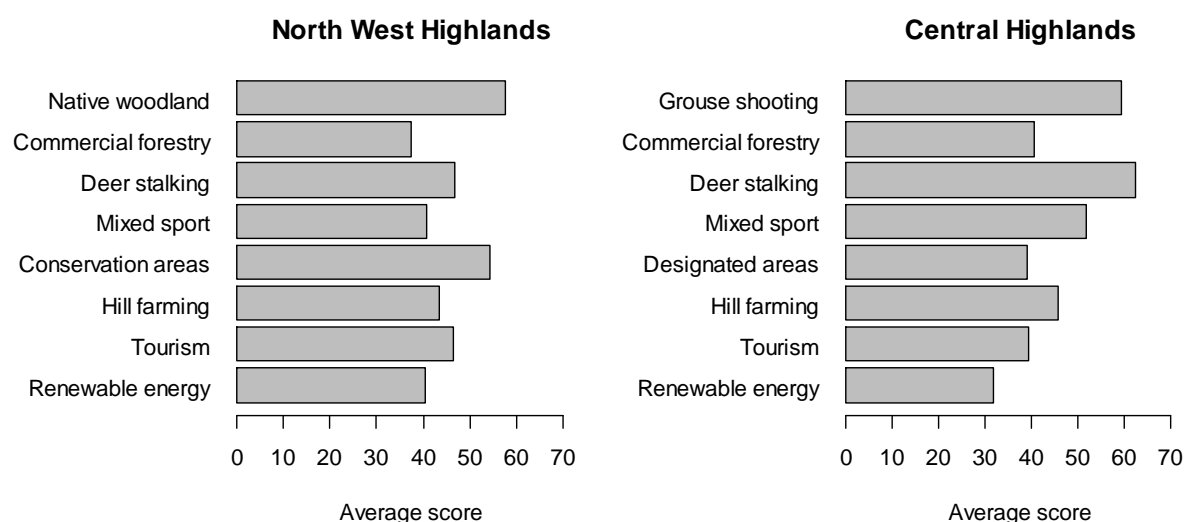


Figure 4. The average weighted score (across all participants and priorities) for how well each management type delivers the agreed set of priorities in each region, indicating the extent to which multiple priorities are delivered. A scoring scale of 0-100 was applied, using the following for guidance: **100**: land-use fully achieves priority, **75**: land-use largely achieves priority, **50**: land-use partially achieves priority, **25**: land-use poorly achieves priority, and **0**: land-use is irrelevant for priority.

1. How do managers view the delivery of priorities by the main forms of upland management?

Regional differences in managers' views about the benefits delivered by different types of land management reflect environmental opportunities and constraints as well as incentives and trade-offs. In the CH area, local management consistently delivers priorities linked to conservation, rural communities and estate resilience or sustainability (Figure 5a). Overall, deer stalking and grouse shooting were considered to best deliver the broadest range of priorities, while priorities related to the delivery of benefits such as food production, recreation and tourism were less consistently delivered. Renewable energy emerges as the least beneficial option. In the NW area, native woodland and conservation areas received the highest average scores overall (Figure 4) and native woodland was considered to deliver the broadest range of priorities in the view of regional land managers. Overall, a broader range of priorities were delivered in the NW, including recreation and renewable energy (Figure 5b). As discussed below, the distribution of costs and benefits influence regional values and decision-making which affect the likely acceptability and achievability of policy priorities.

2. Comparing regional and national responses

As anticipated, regional and national-regional differences are evident, but sustainability and supportive infrastructure emerged as critical factors for delivering multiple priorities from Scotland's upland resources in a sustainable manner. **Sustainable management** emerged as one of the most important considerations in both regions, with sporting and conservation also of primary importance. This includes sustainable deer management - the most highly ranked priority in the CH, and the wider social, economic and environmental sustainability factors which were highly ranked priorities added by the NW group. These values are associated by land managers with long-term stewardship and the term 'succession' was used in the CH to express a desire to pass estates on in good economic and physical condition to the next generation.

Overall, the regional groups scored resilience, community and livelihoods priorities highest (e.g. sustainable management, income generation), whereas the national level group scored active, holistic management and associated processes (e.g. collaboration, science-base), most highly, with community priorities in the middle ranks. The national group tended to promote broader **strategic processes** rather than practical measures to deliver multiple benefits. For example, woodland expansion reflects a current government commitment to increase woodland cover nationwide, while species management and habitat networks are also broad scale frameworks for the conservation of biodiversity rather than the operational priorities important to regional managers, such as grazing and fire management. Similarly, regional groups specified livestock, venison, fish and timber as Production priorities, while the national group was concerned with marketing and quality assurance of produce. Despite these differing perspectives, a common factor cited by all three groups was the need for **broad scale enabling mechanisms**, highlighting the importance of institutional factors for delivering priorities (see Section 4, below).

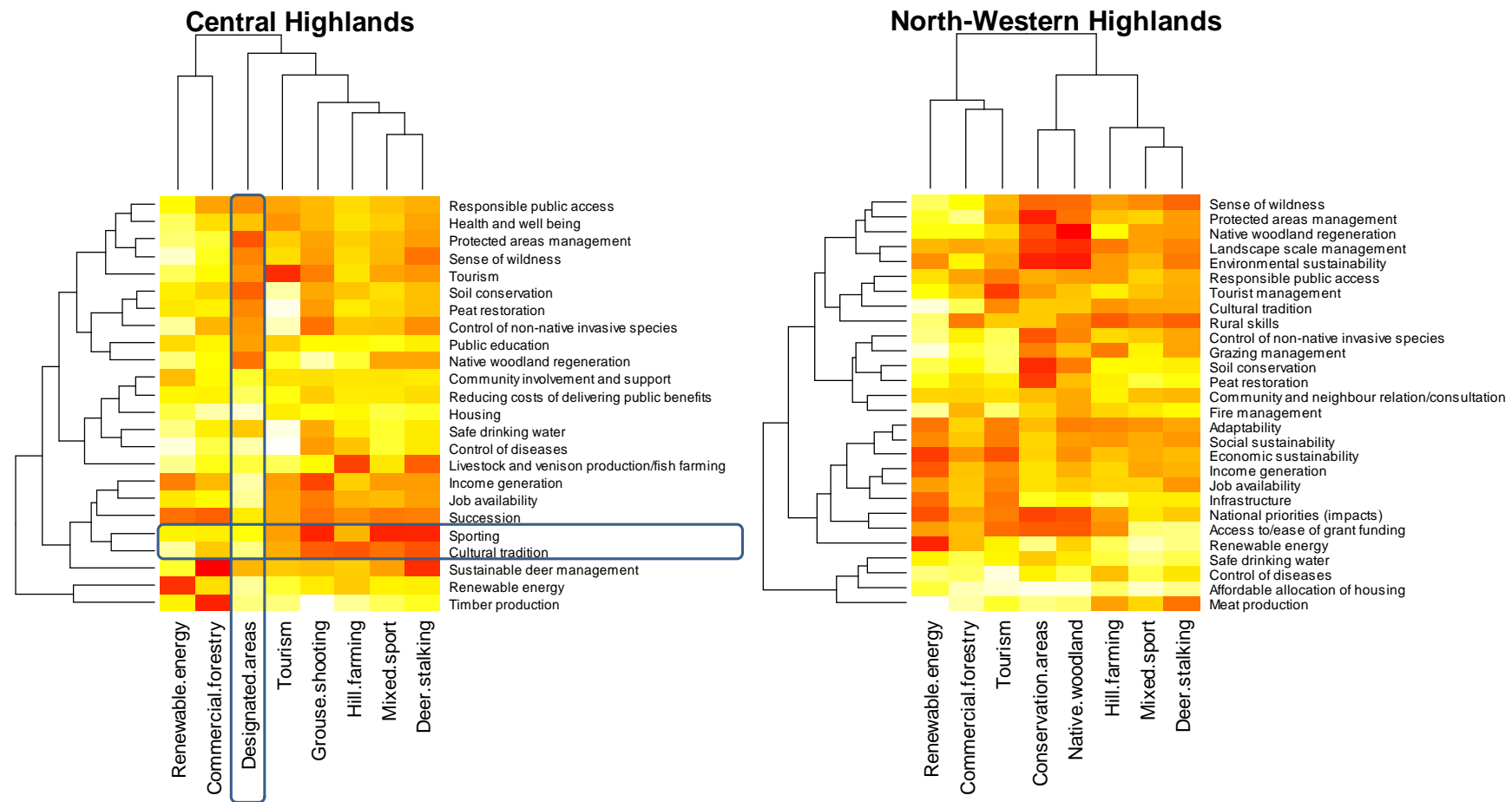


Figure 5. Cluster diagrams summarising managers' views on how priorities are delivered by land management types in the (a) Central Highlands and (b) NW Highlands. Priorities are shaded according to how well they are delivered from white/pale yellow (not well delivered) to red (well delivered). The clusters separate management types (top) according to how similarly they deliver the set of priorities, and separate the priorities (left) according to how similarly they are delivered across the management types. For example, the box highlighting 'designated areas' shows how this type of management better delivers priorities related to conservation and education (darker colours) than those related to communities and income (lighter shades). The box highlighting 'sporting' and cultural tradition' shows that these priorities are delivered similarly across the management types, suggesting they are closely linked

3. Implications for policy priorities

Overall, the results indicate that few management types alone are considered by land managers to deliver across the range of priorities for the uplands. This reflects social values, economic and environmental capacities, notably the distribution of costs and benefits for delivering varied priorities. A range of management types are therefore required to deliver the range of priorities across public and private interests. Considering the policy themes in more detail:

Rural communities: Priorities for rural communities are highly variable in how well they are delivered by the set of management types in both regions. For example, in the NW area, income, job availability and infrastructure are the key priorities delivered by land management for renewable energy, while rural skills and cultural tradition are linked to sporting management. In contrast, community/neighbour relations and housing receive low scores across all types of management, suggesting that they are poorly delivered by current land-uses and infrastructure. Although affordable housing was considered a relatively low priority, community relations were considered important (Figure 3b) and are an important enabling factor needed to support the delivery of priorities (see below). Overall, priorities for income and jobs are best delivered by management for renewable energy, tourism and commercial forestry. They also score well for some of the overarching **resilience and sustainability** priorities added by participants. Environmental sustainability is considered to be well-delivered by current sporting, woodland and conservation management in the NW. Similarly sustainable deer management is delivered by sporting management in the CH area. However, environmental sustainability scores more highly than any of the biodiversity priorities, suggesting that participants may not view biodiversity policies as intrinsic aspects of environmental sustainability. In the NW, higher scores for economic and social sustainability and other rural communities priorities (e.g. income, infrastructure, and job availability) tend to equate with lower scores for environmental sustainability and biodiversity priorities, and vice versa. This indicates a perceived tension between types of management needed to achieve socio-economic and environmental goals, and emphasises the importance of transparency when dealing with competing priorities and making trade-offs.

Biodiversity and low carbon: Biodiversity priorities were generally delivered in a similar way across the land-uses, but, as may be expected, these are associated most closely with areas managed for conservation, designated areas and native woodlands. Native woodland regeneration - an important policy priority for developing a low carbon economy – was delivered alongside the biodiversity priorities in areas managed for conservation in the NW, but fits poorly with the delivery of renewables. This highlights potential conflicts between national priorities for woodland expansion and increased renewable energy generation as routes to a lower carbon economy: trade-offs are needed on the ground between trees and renewables to achieve low carbon policy priorities. Peat restoration was not generally fulfilled by the management types in either region. This suggests a need for discussion on carbon accounting and more guidance for managers to explain the value of peatlands or incentives to ensure that peatlands are managed for biodiversity and carbon benefits.

Recreation: Of the recreation priorities, sense of wildness is most closely linked to sporting management, deer stalking in particular. In sharp contrast, public access and public education were considered to be poorly delivered by priorities linked with game management, such as sporting and cultural tradition. These are important priorities in the CH area, highlighting an area of tension

between public and private interests. Encouraging responsible public access to land as part of general public education was viewed as important to promote understanding of management practices and thereby prevent disruption of estate activities arising from what was viewed as irresponsible access. CH participants considered that government should take greater responsibility for public education and that it is currently inadequately represented in policy communications and guidance. These may not be important overall management goals, but play an important enabling role in the delivery of more definitive priorities or benefits.

Production: Priorities related to the production of food, water and timber were poorly delivered in both regions. In part, this will reflect the workshop focus on moorland environments and interests of the participants, for none of whom agriculture or forestry were main management objectives. However, the provision of drinking water may be not viewed by managers a wider public benefit directly derived from their management.

4. Enabling mechanisms for delivering multiple priorities

Managing the relative costs and benefits of land management for public and private interests was seen as a broad priority by national representatives. This was also raised during the regional meetings, particularly in the CH, in terms of the difficulty for private landowners to draw benefits from providing public goods, compared with the private costs of delivering these. Participants in both regions commented on the influence that grant availability has on levels of investment into native woodland regeneration and the development of renewables. In the NW, incentives to develop renewable energy were perceived to bring greater benefits due to the relatively low productivity and high costs associated with other forms of production, such as commercial forestry (which was deemed to deliver a relatively restricted range of priorities), livestock and game. For similar reasons, tourism also provides a valued income stream. By contrast, in the CH, these incentives were perceived as detrimental to and undervaluing commercial forestry and other land-uses which make positive economic or environmental contributions. In the Central Highlands, altering the make-up of current management to deliver more priorities would incur costs and require significant compromise due to the loss of productive and valued sporting income and tradition, making trade-offs towards policy interests a less favourable option.

All groups identified regulation and interference in private decision-making by public agencies as major costs to landowners and to long-term planning. Regional managers agreed that a long-term vision for land management would enhance the resilience of their estates, but changes in regulation that impact on management practices and the relatively short-term nature of funding incentives and support make it difficult for estates to undertake the long-term planning measures which are key to national and regional sustainability. The Scottish Rural Development Programme, for example, has a 5 year time frame, while activities like forestry and woodland planning need a much longer term view. Regional groups indicated that achieving landscape-scale management and minimising the bureaucracy required to negotiate grant funding and manage the impacts of national level priorities were important. The national group, on the other hand, discussed communication and the importance of collaboration, training and advisory services for land managers and the provision of public education as mechanisms for enabling planning and production. The use of scientific evidence and

ensuring that land was actively managed were the highest ranked enabling mechanisms included by the national group.

Evaluating the approach: lessons for best practice and wider applicability

Sporting activities play an important role in delivering regional and national benefits. The results presented here highlight a range of regional trade-offs and complementarities with other practices that need to be considered to translate national ecosystem policy into regional practice in a way that reflects the varied capacities and geographical conditions faced by upland managers. Finding ways of analysing and representing the complex interrelations between different forms of land management and the ecosystem values and services that they support will become increasingly necessary to develop practical ecosystem-based management strategies. The opportunity for structured discussion emerged as a valued attribute amongst regional and national level participants. Although multi-criteria analysis requires some simplification, it is one of few methods that can incorporate the complex diversity of values and objectives held by land managers. It can therefore represent regional variations in the economic, social and environmental benefits that are provided by current land management strategies in a transparent and systematic way.

Acknowledgements

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