Developing results-based approaches to supporting the management of common grazings – final report, volume 1

Robyn Stewart & Gwyn Jones

Braigh nam Bagh, Harris (M J Richardson, Creative Commons Licence)

European Forum on
Nature Conservation
and Pastoralism

Developing results-based approaches to supporting the management of common grazings – final report, volume 1

Robyn Stewart & Gwyn Jones

European Forum on Nature Conservation and Pastoralism
Penygraig, Llanfair Clydogau, Lampeter SA48 8LJ

2020

This project is part-financed by the Scottish Government and the European Union Outer Hebrides LEADER 2014-2020 Programme and by NS

Opinions expressed herein do not necessarily reflect those of the funders

Contents

List of abbreviations

AE	Agri-environment (scheme)
AECS	Agri-Environment and Climate Scheme
BPS	Basic Payment Scheme
CAGS	Crofting Agricultural Grant Scheme
CAP	Common Agricultural Policy
CC	Crofting Commission
CSM	Common Standards Monitoring
ESA	Environmentally Sensitive Area (first state agri-environment schemes in Scotland)
EU	European Union
FGS	Forestry Grant Scheme
GM	Gross margin
HNV	High Nature Value
JNCC	Joint Nature Conservation Committee
LFA	Less Favoured Area
LFASS	Less Favoured Area Support Scheme
LPIS	Land Parcel Information System
LU	Livestock Unit (1 LU is the equivalent of one cow)
NFUS	National Farmers' Union of Scotland
NGO	Non-governmental organisation
NM	Net margin
NS	NatureScot (formerly SNH)
NVC	National Vegetation Classification
R	(Payment) Region (in the context of BPS)
RBAPS	Results-based agri-environment payment scheme (and EU pilot relating to the same)
RPID	Rural Payments and Inspectorate Division
RSPB	Royal Society for the Protection of Birds
SAF	Single Application Form
SCF	Scottish Crofting Federation
SCU	Scottish Crofters' Union
SG	Scottish Government
SNH	Scottish Natural Heritage (former name of NS)
SSBSS	Scottish Suckler Beef Support Scheme
SUSSS	Scottish Upland Sheep Support Scheme

Executive summary

This is the final report of a LEADER and NatureScot (NS) funded project to develop a testable results- or outcomes-based approach to supporting the sustainable management of common grazings, focussing first and foremost on biodiversity, but having particular regard also to carbon storage and sequestration in blanket bogs.

Having examined the variety in the habitats found on common grazings in the Western Isles (Section 4) and having taken advice from experts (Section 2), the project developed or adapted four scorecards (Section 4):

- A bog card
- A machair card
- A breeding wader card
- A general card

The waders card is available for use on township parks which have been subject to agricultural improvement. The machair card is for use in the area covered by the SNH Sand Dunes Survey. Further work needs to be carried out to pin down the 'envelope' within which the bog card is appropriate; we have provided some guidance. The general card is to be used in all other cases.

The use of the general card – developed initially for inbye in Skye, building on the RBAPS Leitrim card - arose almost by accident from the Argyll POBAS project. It represents a holistic approach to the landscape which does not distinguish a priori between 'inbye' and 'hill' land.

As a result, creating a payment rationale of this general card was particularly challenging. It has to reflect the significant additional costs calculated for inbye systems (based primarily on the economics of a cattle system @ 0.5 LU/ha) and the higher costs of the very smallest holdings, while reflecting also the much lower income forgone figures calculated on the basis of a shift from sheep to cattle at low densities on the hill (@0.05 LU/ha). This has been done by a combination of steep degression after the first few hectares and non-linear relationships between score and payments – a rapid rise in the low scores for the first hectares and a rapid rise in the high scores at the other end of the scale (Section 5.3). The scores of each of the other cards have been aligned to those of the general card so as to avoid conflicting signals for potential scheme participants, advisors and administrators.

The results-based approach envisages a different pattern of interaction between the participant and other actors – the traditional roles of advisor and administrator/inspector would not survive unchanged (Section 6.1). The cost implications of such a change depend on the decisions taken regarding the implementation model; we reflected on the options.

We also looked at the additional costs arising from common grazings governance compared to sole occupier participation and we suggest how these could be approached (Section 6.1). To provide a background to this analysis, we investigated a number of highly variable characteristics of grazings and tried to ascertain whether and to what extent these might pose a challenge in terms of transaction costs or associated difficulties (Section 7). We were surprised to find that the only obvious pattern was that the very smallest grazings seem to be somewhat disadvantaged. On the

other hand, we found regional differences between the Uists and Lewis which we found difficult to explain and suggest more specific local issues being at play.

Finally, we drew up a list of uncertainties which we recommend should be the subject of further investigation in any NS-funded 'Phase 3' project (Section 8).

Figure 1. Bealach Heabhal, South Uist (Photo: Hugh Venables, Creative Commons Licence)

Acknowledgements

The project took place in a very challenging time of Covid and only got to the finish line with the help a number of individuals and organisations whose help we must recognise at the start of this report. Some were responsible for securing our funding; some gave invaluable expert input; others introduced us to key graziers. Some we paid, but we thank them for giving us real value for money; some interacted with us as part of their job, but they were engaged and supportive while others did little. But most of all we thank the crofters and others who, without any financial reward, gave us some time in their busy schedule to listen patiently and interestedly to us talking about a topic they had never heard about. We wish we could have met more of you out on your grazings; hopefully that will happen in the next phase of the work.

1 Introduction

This is the final report of the Outer Hebrides LEADER and NS (NS) funded project on results-based approaches to supporting common grazing, which ran from October 2019 to December 2020. The aims of the project were:

1) To evaluate and adapt existing results-based approaches to supporting positive management on common grazings so that they can be used in proposed NS/Scottish Government (SG) funded pilot implementation trials (so-called 'Phase 3'), hopefully commencing in April 2021
2) To set out the possibilities and limitations (ecological, agricultural, socio-economic, organisational, legal) on results-based approaches as a general mechanism for supporting positive management on common grazings, empowering, encouraging and increasing the viability of active crofting management and better delivering on a range of ecosystem services for the taxpayer

Since the start of the project, a third objective has emerged in practice:

3) To identify grazings and individuals graziers on them who would be willing to participate in any 'Phase 3' trials in 2021

The report first described the practicalities of the process we followed – who we spoke to and when. It sets out the limitations forced upon us by Covid and how we tried to work around them. It then looks at general principle which should guide the design of results-based payments, focussing in particular on aspects peculiar to common grazings. We turn then to the characteristics of Outer Hebrides grazings as seen through a scheme applicant or promoter's eyes – which, if any, of those variables would seem to have been obstacles to participation in AE in the past; obstacles which might need to be addressed in a new measure?

Then we turn to the heart of the project – designing a set of scorecards which have the potential to be applicable and useful on any and all of the archipelago's grazings. What are the potential targets and how can we identify their quality in a simple, repeatable way? Following on from the scorecards is the set of payment rationales and the payment matrices which were developed on those foundations.

We then look at issues of process and delivery. First we look at the general question of implementation models. Then we turn to common grazings specific questions, setting out some guidelines and potential best practice and estimating the additional costs faced by committees compared to sole trader applicants.

Finally, we look forward to a potential Phase 3, setting out some of the challenges to be faced and uncertainties needing further work.

2 What the project did and how we did it

The project started on 21/10/19. A project officer, Robyn Stewart, commenced her employment on the 18/11/19. Initially, the project was to end by 30/9/20; in response to the Covid lockdown, the funders have allowed an extension until 31/12/20.

We gathered together a steering group comprising Sally Reynolds (crofter, grazings clerk, Carloway Community Trust), Johanne Ferguson (NatureScot, Stilligary) and Donald Mackinnon (crofter, SCF).

Our approach was intended to be twin track, with expert input to reinforce our technical approach to the work on the one hand and engagement and awareness-raising with graziers on the other. Technical input was needed especially for understanding our range of targets and pinning down qualitative and quantitative criteria of quality for each and for working through the implications of crofting law and grazings governance realities.

On the technical side locally, we were dependent on a few very helpful individuals, without whom progress would have been very difficult. Ben Inglis-Grant of Peatland Action and Robin Reid and Jamie Boyle of RSPB were particularly helpful on multiple occasions throughout the project. We also brought in expertise – Joan Cumming for input on a whole range of fields; Ben and Alison Averis on plant ecology; Helen Bibby on the interaction of ecology, farming and scheme design; Janette Sutherland and Arthur Macdonald on crofting governance.

The engagement side of things was, in contrast, very significantly impacted by Covid. We gave a presentation in a Farm Advisory Service event early on and commenced what we intended to be a mix of group meetings where we had a good potential convener locally and individual meeting where we were not at that stage or where key graziers had been identified.

When Covid struck we had held two meetings in Harris and had held a series of short meetings over one day in Barra (due to a gale forcing the cancelling of a meeting). But in the Uists and Lewis, we had only met with individuals, and while the number of individuals met has increased over time, that remains the situation.

We also carried out engagement work with organisations, almost all of it virtually. We held workshops of various types online with NS and RPID staff, with Crofting Commission staff and commissioners and with SAC Consulting advisors.

Finally, in early December we held an end-of-project event on Zoom to which we invited all of the individuals with whom we had dealt over the previous year.

3 Key considerations for results-based approaches to common grazings

For a results-based approach to be both appropriate and well-designed, a number of criteria have to be met, including

- Having a clearly-identified target and a clear understanding of what defines quality with regard to that target in all its variety
- The target quality being closely related to farming practice and relatively immune to non-farming factors
- Having an easy-to-understand, reliable, repeatable set of scoring metrics which correlate well with the underlying understanding of target quality
- The features scored being open to change within the relatively short term (or the results-based approach being complemented by action based incentives)
- Designing a payment matrix which reflects real costs relating to the actual systems encountered on the ground
- The payments associated with the various scores reflecting the costs not only of being at that score, but of changing from one score to another (or the measure complemented by other payments, e.g. for 'capital works')
- The existence of a support and guidance function within the implementation mechanism which has the capacity needed in terms of both skills and scale; if that support has a cost to the farmer, that it is in no way prohibitive
- That there are clear mechanisms in place for dealing with any non-economic barriers which might impact on the achievement of the State's objectives vis-à-vis the chosen target
- Overall, there being a reasonable and transparent sharing of risk between the State and the scheme participant, and with a payment structure which fairly reflects the risk on the side of the participant

These criteria are applicable to all results-based measures, but common grazings pose additional challenges. They involve multiple actors with legal rights on the same area of ground, who interact with it in a range of different ways (inactive; claiming agricultural support payments; use for grazing by a variety of livestock and for different periods of the year; peat-cutting, and so forth), and who have a range of different interactions with each other (co-operative; obstructive; communitaire; selfish; open to change; conservative; collaborative; individualistic, and so on), and whose interactions are to some extent controlled and guided by a specific body of law and a statutory regulatory organisation.

As part of the project, we produced a set of principles and consequences for designing results-based measures for common grazings specifically, which we discussed with some relevant experts and set out here:

3.1 Higher level aspirations

- To better deliver public policy goals as they relate to the environment of crofting areas and common grazings in particular
- To ensure we have crofters available to manage these common grazings into the future through improved financial sustainability of grazing
- To ensure that those who deliver public goods are adequately rewarded

- Where the public goods delivery is not incidental to profitable economic systems, or where optimal delivery requires a change in management from the economically-optimal, have a mechanism through which the state intervenes to provide that adequate reward
- To ensure that the reward should go first and foremost to those who incur the costs/income forgone
- To ensure that grazings committees have the greatest flexibility possible to access that support, recognising that they also have transaction costs and allowing them to make their own assessment of risks and costs/benefits, while at the same time ensuring that the grazings committee acts equitably and reasonably and that there is an official fall-back for aggrieved parties
- To safeguard the rights of the currently active to benefit from their management activity, of the landowner to benefit from their management activity and, in so far as it is a factor, the ability of current and future shareholders (and landowner) to exercise in future their grazing or other rights and any monies which may be linked to that through participation in any scheme (this is not a major factor in results-based models – see 6.1 below). There should be no privileging of unused rights.

3.2 Targeting

The measure should therefore:

- Support change in management (and/or continuation in current management where such management is uneconomic and in danger of deleterious change) which directly impacts on the delivery of policy objectives relating to specified policy target features set independently of the measure itself
- Be designed to work at the same scale as the scale of the objectives for the target feature wherever possible (even at a scale wider than the individual grazings, but avoiding the 'perfect is the enemy of the good' trap)
- Give a clear message to the grazings committee on the current and desirable future condition of the target feature(s)
- Give a clear message on the relative priority to give to various target features
- Have penalties which apply only in the case of negligent or deliberate actions or inaction and whose scale are proportional to the severity of the impact on the targets in space and time

3.3 Relationship to management practice

The measure should therefore:

- Give messages and be designed to work at the scale of and with the patterns of current management practices or modifications of the same which can be reasonably considered achievable given the design of the measure and its incentives.
- Adequately reward any action assumed necessary to maintain or enhance such target features in general and in the case of capital works the actual target features in question, where 'adequately' means fully covering any costs which do not also have an additional commercial benefit and 'fully' includes paying the going skilled/unskilled wage rates as appropriate.
- In terms of payment, be clearly and explicitly linked to the costs or income forgone of the likely necessary actions (or continuation of actions)

- Separate out where possible the assumed costs or income forgone of various classes of actors in support of the principle that payment should be made first and foremost to those who incur those costs/losses
- Where the needs of the target feature require action or cessation of action by the landowner and failure to address the activities of the landowner would have a significant impact on the likely outcomes, allow the Dept. to refuse a proposal on the part of the grazings committee alone
- Where the target feature is under threat from the action of third parties and/or natural factors, provide a clear approach to how these will be dealt with and the consequences for payment, balancing considerations of natural justice with the results-based ethos of the measure, but up to and including full repayment and disbarring from the scheme

3.4 Safeguarding of rights

The measure should therefore:

- Allow the grazings committee to share some of the risk in terms of ability to participate vs. inability to deliver, using its judgement in assessing likelihood and impact of problems and being aware of the impact failure might have on payments. This means that committees do not have to secure universal consent, but may set out alternative thresholds based on their own assessment of risk. The approach of the committee in this regard should be set out clearly beforehand and notified to the Dept. and be consistent with crofting law in so far as it applies. Parties which can demonstrate that the proposed allocation of funds is disproportional to the pattern of actual income forgone or additional costs will be considered to have a prima facie valid basis for objection.
- Safeguard the rights of those not incurring any costs or income forgone at the time of signing the contract to enter into those commitments at any time in the future and to partake fully and promptly in the compensation for those costs or income forgone. These rights are inviolable irrespective of the method chosen to secure agreement on participation in the measure.
- Where those rights are thought not to be safeguarded adequately, the measure should provide for the aggrieved parties to appeal the proposal to the Crofting Commission in the first instance, with the Commission having the power to prevent participation until adequate provision is made for those rights. This should include consideration of peat cutting rights.
- Safeguard the rights of the landowner to the extent of their interests in the land; where those interests are not significantly impacted, there is no right of veto, but the landowner must be informed of the grazing committee's decision to participate and be given sight of the proposal.

Figure 2. The view east from Hecla, South Uist (Gordon Hatton, Creatve Commons Licence)

4 From landscapes to scorecards

4.1 The landscape of the Outer Hebrides

The Outer Hebrides consist of three main sets of islands: Lewis and Harris, the Uists, and Barra and Vatersay. Being on the western edge of Britain, these islands are subject to strong oceanic influences, high rainfall and wind speeds, and are largely treeless. The Outer Hebrides are highly prized for their outstanding natural heritage and landscapes, having many rare and important habitats and species with a significant proportion receiving national and international designations.

The Outer Hebrides are largely dominated by open moorland habitat, comprising 44% cover of heath and montane habitats and 25% of bog (Figure 3, Figure 4)[1]. The next most common habitat type is grassland, but CEH data does not differentiate clearly between improved, semi-improved and semi-natural grassland. A subset of this is the 3.8% or so of sand dune and machair, mapped separately by (Dargie 1998), which is restricted mainly to westward-facing areas and also contains most of the islands' arable cropping.

[1] LCM2015_percentage_land_cover_per_county.xlsx (ceh.ac.uk)

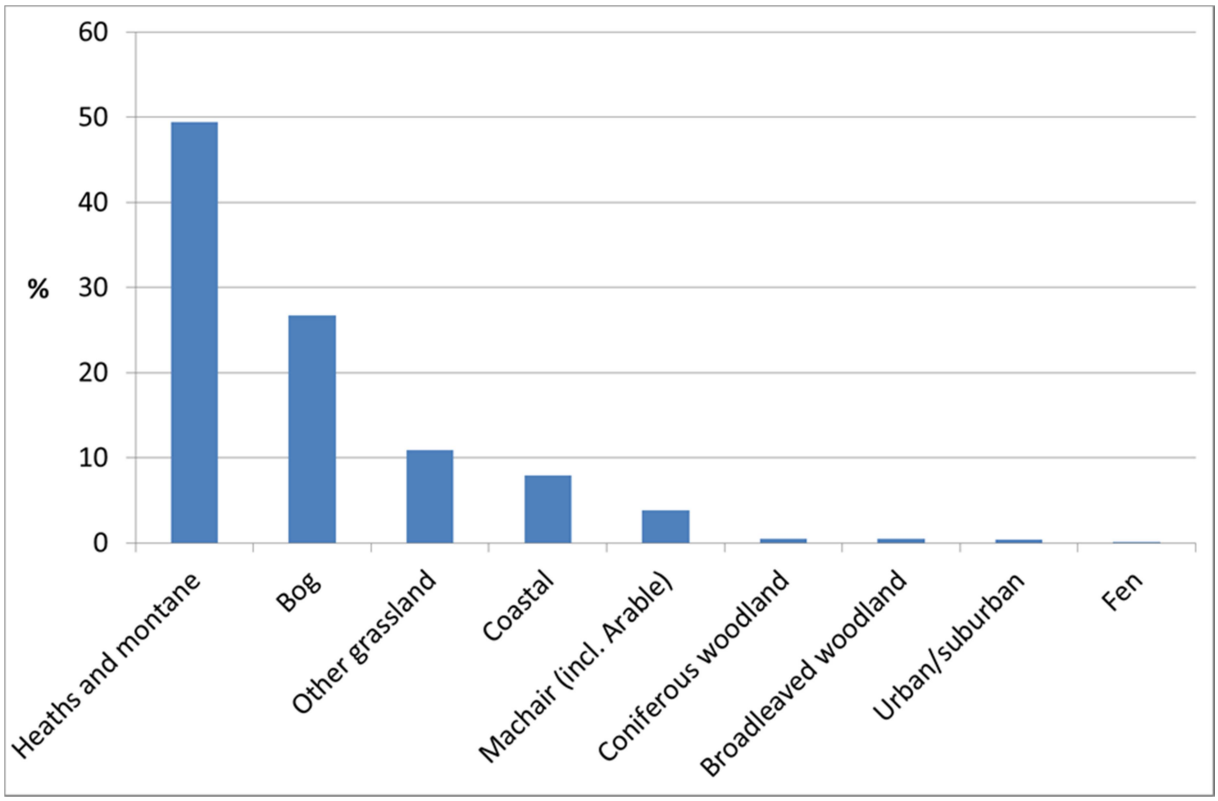

Figure 3. Percentage land cover in the Western Isles

The long history of crofting on the islands is thought to be intrinsically linked to the landscapes, habitats and biodiversity we see and value today. Crofting is typified by extensive, low-intensity agricultural management organised into townships consisting of individual crofts and their common grazing. The common grazing is a shared resource for the township and provides additional rough grazing. Traditional crofting management includes seasonal grazing, cattle and sheep grazing, and rotational cropping where machair is present.

Common grazings make up almost 70% of the land above high tide in the Outer Hebrides, including virtually all of the machair, the vast majority of the blanket bog and a substantial proportion of montane and heathland habitats. Given that common grazings are by far the dominant land use on the islands, it is cannot be overstated how important their management is in maintaining the landscapes, habitats and species of the Outer Hebrides.

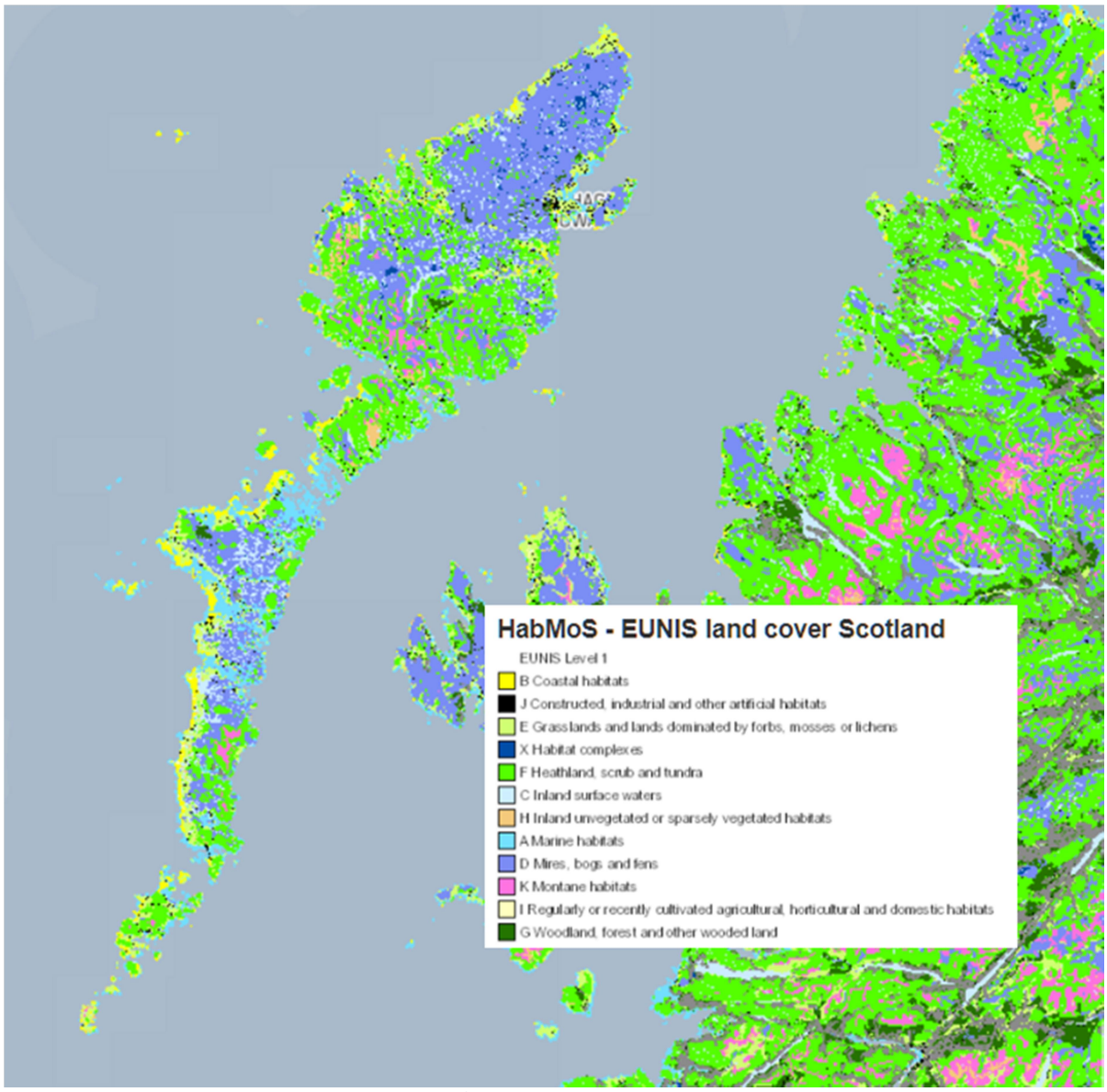

Figure 4. Land cover map of the Western Isles[2]

4.2 Moving from landscapes to targets: identifying environmental priorities for common grazings in the Outer Hebrides targets

The development of scorecards followed the same approach that has been successfully used across a range of results-based projects in Ireland e.g. Fresh Water Pearl Mussel EIP Project (https://www.pearlmusselproject.ie/). This approach adopts a scoring system on a scale of 0 to 10 for the achievement of a desired environmental result e.g. species richness. The prime function of the scorecard is to translate policy objectives into a repeatable, reliable way of measuring progress which can be used by crofters and others with the minimum amount of training. The process of developing scorecards must therefore follow the following steps:

[2] https://map.environment.gov.scot/sewebmap/?layers=HabVegSurvey1,saltmarshSurvey1,habmos-OtherLanduse,habmosNVCToAnnexIAndEUNIS,habmos-FreshWater,eunisLandCoverScotland,habmos-NativeWoodlandSurveyScotland,coastalVegShingle1&extent=-301028,528191,722972,1215192

1. Identify key environmental priorities and objectives, including, but not only, addressing the requirements of statutory designated sites
2. Collate information on habitats and species, their distribution, and especially their conservation status, trends and pressures and therefore the specific issues which the card needs to identify
3. Define clear potential results-based indicators which are representative of the condition of and potential pressures on the target habitat or species and sensitive to changes in crofting management
4. Select results-based indicators which are likely to be reliable and universally applicable in the target area (i.e., at least in the whole of the Outer Hebrides) and are easily implemented by the end users

First, it was necessary to decide what the environmental priorities should be for the Outer Hebrides. The main priorities for the Scottish Government, as outlined in the Scottish Biodiversity Strategy (https://www.gov.scot/policies/biodiversity/scottish-biodiversity-strategy/), are reducing biodiversity loss and tackling climate change and these were set as the over-arching environmental priorities.

With over 80 designations (Table 1), the Outer Hebrides has one of the highest percentages of designated sites within the U.K. These designated sites are either protected by national legislation (e.g. SSSIs), European Directives (e.g. SPAs) or international conventions (e.g. RAMSAR). Designated sites are selected because they support a high degree of biodiversity, unique habitats, or rare breeding and migratory populations. These specific 'qualifying interests' are identified during the designation process e.g. Lewis Peatlands has the following bird species as qualifying interests – dunlin, black-throated diver, red-throated diver, greenshank, merlin and golden eagle. Many of these habitats and species are also identified as UK Biodiversity Action Plan (BAP) priorities and Scottish BAP priorities.

Designation	Number	Area (ha)	% area of Outer Hebrides
Site of Special Scientific Interest (SSSI)	53	37,350	12.9
National Scenic Area	3	116,600	40.3
Special Area of Conservation (SAC)	11	32,959	11.4
Special Protection Area (SPA)	15	31,538	10.9
RAMSAR	4	71,305	24

Table 1. Environmental designations in the Outer Hebrides (Taylor et al. 2010)

The Outer Hebrides also contain internationally important reserves of peatland. Peatlands are the largest natural terrestrial carbon store globally and they play a crucial role in tackling climate change by sequestering CO_2 (Ferretto et al. 2019). Lewis is home to the second largest expanse of blanket bog in Europe and other significant peatlands are found throughout the Outer Hebrides, Mointeach Scadabhaigh in North Uist, for example.

While reducing biodiversity loss and climate change are useful general principles, they required further refinement in order to identify a singular "target" habitat or species for each scorecard. Targets were identified by using the following:

- Annex 1 habitats and species listed in the EU Birds (2009/147/EC) and Habitats Directives (92/43/EEC)
- "Qualifying interests" for designated sites (https://sitelink.nature.scot/)
- Natural Heritage Futures, a framework of guidance to inform future management of natural heritage towards 2025 (https://www.nature.scot/natural-heritage-futures-overview)
- Scottish Biodiversity List (https://www.nature.scot/scottish-biodiversity-list)

The distribution of priority species highlighted in the above list in the Outer Hebrides was verified by using the National Biodiversity Network database (https://nbnatlas.org/) and the local Biological Recording Centre (https://www.ohbr.org.uk/).

From this process the following targets were identified as high priorities:

Blanket bog

Blanket bog is one of the dominant habitats found in moorland in the Outer Hebrides. All bog habitats are of conservation importance and are UK BAP Priority Habitats and Annex 1 habitats under the EU Habitats Directive. Bogs deliver a multitude of public goods such as drinking water, water flow regulation, and are widely recognised for their crucial role in mitigating climate change via carbon sequestration. They are also important for biodiversity, having many bog-specialist species and provide habitat for rare populations of breeding birds such as waders and raptors. Migratory and over-wintering bird species also rely on blanket bog.

Machair

Two-thirds of the world's machair is found in Scotland, with the Outer Hebrides containing some of the largest and best preserved examples of machair globally. Machair is listed in Annex 1 of the Habitats Directive; intimately associated with it is a mosaic of different habitats including drift-line, foredune, stabilised 'grey' dune, which then transition through the machair plain with its own mix of dryer and wetter areas to saline lagoons and saltmarsh, or to calcareous lochs, acidic grasslands, heath or bog. Uniquely, the Outer Hebrides machairs also support a cereal/fallow arable cropping system, but in the Scottish agri-environment tradition, the individual cropped strips are treated as part of the individual crofts and so are not covered by our scorecard.

Machair has a high biodiversity value as it supports a wide variety of flowering plants, pollinated by invertebrates which in turn attract rare breeding birds. The biodiversity of machair is linked to traditional crofting management and machair has been managed in this way for hundreds of years. Machair is also an important stronghold for declining priority species such as the corncrake (*Crex crex*) and great yellow bumblebee (*Bombus distinguendus*) which are dependent on traditional management, and provides important habitat for over-wintering and migratory bird species.

Figure 5. Tobson common grazings on Great Bernera, Uig parish, showing a mosaic of habitats, including coastal heath, sand dune and machair (Photo: Robyn Stewart)

Heath habitats

Heath habitats cover almost half of the Outer Hebrides and are defined by the dominance of dwarf shrubs such as heather. Heath extends from sea level to exposed high ground and is influenced by bedrock, soil and other environmental factors like salt spray. Heath habitats are variable but they are recognisable by the presence of dwarf shrubs. Heath habitats include: wet heath, dry heath, coastal heath, and montane heath. Annex 1 habitats include North Atlantic wet heath with cross-leaved heath, European dry heath and, at higher altitudes, Alpine and boreal heaths. All upland heaths are classed as UK BAP priority habitats.

Heaths are important to an abundance of different species particularly given their extensive cover throughout the Outer Hebrides. Upland heath is important as nesting and feeding habitat for birds and the Outer Hebrides hold many significant UK populations of raptors such as golden eagle, merlin and hen harrier. The Outer Hebrides are also home to globally rare liverwort-rich heath which thrives on wet north-facing upland areas.

4.3 From targets to results-based indicators

Once the targets were identified, we then had to select the appropriate results-based indicators. This task was particularly complex because although we had a target habitat, each habitat contains within it a multitude of species which all have their own unique habitat requirements. Many of the Irish results-based schemes focused on a singular species which makes identifying results-based indicators more straightforward and minimises the risk of missing out key indicators for that

particular species. Therefore, within each target habitat we also identified the priority species which use that habitat and collated information of their specific habitat requirements.

In addition to this, we wanted to apply scorecards at a landscape-scale across the entire common grazing where possible because the majority of common grazings are managed as a single unit, being unfenced with livestock free to roam.

Given the high number of designated sites in the Outer Hebrides, we opted to adopt the Common Standards Monitoring (CSM) approach set out by JNCC, the governing body of protected sites (https://jncc.gov.uk/our-work/common-standards-monitoring/). CSM is an inter-agency approach adopted by the statutory nature conservation bodies for the U.K. (NS, Natural England, Natural Resources Wales, and Department of Agriculture, Environment and Rural Affairs for Northern Ireland) which sets out a nationally agreed framework for assessing the condition of designated sites. While not all common grazings are within designated sites, we believed that adopting these measures of habitat quality would guarantee the scorecards were fully compliant with the requirements for designated sites.

We then identified other measures of habitat quality by collating information from:

- Habitat guidance documents (e.g. Peatland Action https://www.nature.scot/peatland-action-peatland-management-guidance-grazing-and-muirburn)
- Habitat Impact Assessment (e.g. https://www.fas.scot/downloads/fas-guidance-habitat-impact-assessment/)
- Peer-reviewed studies, e.g. (Redpath-Downing et al. 2013)

Threats were based on JNCC Annex 1 site condition monitoring reports, NS's Natural Heritage Futures objectives and discussions with local experts e.g. SNH Area Officers, RSPB Area Manager.

4.4 The scorecard development process

Scorecards are designed to be a simple but accurate measure of habitat condition. As previously mentioned, particular consideration needs to be given to selecting results-based indicators, particularly where they are a surrogate for more fundamental measures of habitat quality. For example, waders require wet ground conditions and areas of standing water where they forage for their invertebrate prey. We therefore select results-based indicators such as the presence of easily identifiable plant species which favour damp soil, or rewarding large pools of standing water. We aimed throughout for results-based indicators which would:

1. Be quantifiable, measurable and related to management
2. Related to the delivery of public goods
3. The upper bounds of each indicator (i.e. for habitat scoring 10) must be clearly defined and described
4. Focus on habitat attributes and not the presence of species because the distribution of species is out with direct control of the common grazing
5. Be applicable across all islands in the Outer Hebrides but also allow for local distinctiveness
6. Take into account ecosystem dynamics e.g. successional changes on sand dunes

The other critical aspect of scorecard development is the weighting of the card i.e. how many points are allocated for each results-based indicator. Scorecards can use a mixture of positive and negative scoring in order to provide a clear message to promote positive management. By and large, positive scores are given for positive management and negative scores are given for negative management. For example, blanket bog is highly sensitive to over-grazing which can lead to damage to the vegetation layer and expose areas of bare peat. Bare peat is vulnerable to erosion by the action of wind and water, as well as trampling by livestock and vehicles. Therefore, overgrazing is scored negatively; we did not want to give the message that merely not damaging a habitat should attract a reward.

Some results-based indicators can receive a range of scores and can be assigned to a number of categories which describe the varying condition found within the measures of habitat quality. For example, Figure 6 is an excerpt from the machair card which aims to assess species richness. All species richness is rewarded to some degree with the lowest category receiving 15 points, moving up the scale to a maximum of 50 points for very high species richness. Each category has an incremental increase in score which clearly outlines what the desired result should be and what is required in order for scores to be improved.

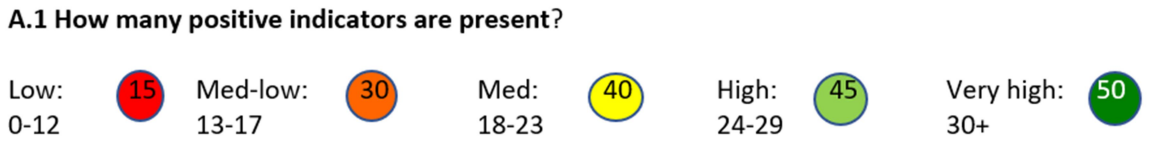

Figure 6. Excerpt from a scorecard

4.5 Initial findings and first drafts of scorecards

As a starting point, we tested a number of scorecards used for other results-based projects on common grazings to see how they performed, given their successful use in Ireland and the habitat similarities between Ireland and the Outer Hebrides. This provided us with a basic framework to start from. The cards we started with were:

- Peatland – Fresh Water Pearl Mussel Project; Irish uplands (peatland and heathland) RBAPS
- Breeding wader habitat – Shannon Callows RBAPS
- Coastal sand dunes habitat – Article 11 monitoring of machair in Galway, Ireland
- Bog/heath habitat for raptors – Hen Harrier Project

After testing the Irish scorecards on various sites throughout Lewis and Harris and Uist, and with feedback from colleagues in Argyll & Lochaber and Shetland, we took forward the following cards:

- Blanket bog
- Machair
- General
- Wader grazed grassland

4.5.1 Blanket bog

When testing the Hen Harrier Project and the Fresh Water Pearl Mussel Project peatland cards it became clear that a general peatland/heathland card would not be effective at assessing the

condition of blanket bog. The peatland cards include both blanket bog and shallower peat soils such as those found on wet heath and during initial site visits we found that even degraded areas of blanket bog scored highly using the general peatland cards and was not accurate measure of the condition of the habitat.

Given this, we developed the first draft of a specific bog card using the mandatory attributes outlined in the CSM guidance for blanket bog along with input from Ben Inglis-Grant (Outer Hebrides Peatland Action Officer), Mark MacDonald (Lewis and Harris NS Area Officer) and Robin Reid (RSPB Conservation Officer for Western Isles).

4.5.2 Machair

The Coastal Sand Dune Habitat Annex 1 card was found to work reasonably well on the machair sites visited, largely because it was based on the same CSM guidance. It was relatively straightforward to develop the first draft of our card, given that the management of machair is relatively well understood. The positive indicators list was compiled using the NBN database and OHBR to include species common to machair in the Outer Hebrides. Elements of the Breeding Wader Habitat card were also considered, particularly in reference to vegetation structure, given the importance of machair habitat for breeding waders.

The first draft of the machair card was developed using the mandatory attributes in the CSM guidance for machair with input from Johanne Ferguson (NS Area Manager Uist and Barra), Jamie Boyle (RSPB Balranald Reserve Warden) and David Muir (SCF).

4.5.3 Heaths

The first draft of the heath card was developed using elements of the Peatland cards for the Hen Harrier and Fresh Water Pearl Mussel projects along with the mandatory attributes in the CSM guidance for lowland and upland heaths. Input into the development of the heath card was provided by Robin Reid (RSPB) and Mark MacDonald (NS). It became quickly evident that the heath card was limited in its application on mosaic habitats and was replaced with the general card. This card, based originally on the Leitrim RBAPS species-rich grassland card, was developed by Helen Bibby and Gwyn Jones for the Argyll results-based pilot and adapted to be applicable also for the Outer Hebrides. This card covers heath mosaics, acid grassland, inundation grassland and other species-rich grasslands which are not machair.

4.5.4 The need for an improved grassland card for reseedings and township parks

It became evident through site visits that none of the draft scorecards covered improved, semi-improved and reverting grassland typically found in areas of reseeding and township parks yet this type of habitat was important for a number of breeding wader species such as lapwing. The first draft of this card was developed using the Shannon Callows Breeding Wader Habitat and Shetland Wader Card with input from Nathalie Pion (RSPB Conservation Advisor for Shetland).

Figure 7. An example of machair in good condition with high species richness. (Photo: Robyn Stewart)

4.6 Scorecard testing and further development

We had initially planned to test the drafts of the scorecards with both local experts and members of common grazings once we had established contact via community meetings, then going on to test later drafts with external consultants. Unfortunately, the outbreak of Covid-19 and subsequent national lockdown in March 2020 heavily impacted on these plans. Restrictions meant we could not arrange indoor or outdoor meetings, with travel limited to 5 miles from home.

Given an extension to the project by the funders, our new approach was to focus on continuing scorecard development by requesting key contacts test a particular scorecard on their own common grazing, or an area they could access locally within walking distance. By still moving forward with scorecard development, we hoped to produce a robustly tested set of scorecards which we could then test with groups when Covid-19 guidelines allowed. Our adapted approach included:

- Site visits
- Local scorecard testing and feedback from key contacts
- Scorecard testing by external consultants (this took place between July and September when Covid-19 guidelines allowed)

Through this approach we managed to test scorecards on a total of 60 sites across the islands, with feedback from 13 key contacts, and testing by 3 external consultants (Table 2). The external consultants were: Joan Cumming (testing scorecards on Lewis and Harris), Alison and Ben Averis

(testing scorecards on Uist), and Helen Bibby of SAC Consulting (testing scorecards on Barra). The bog and general cards were also tested and developed during the POBAS Phase 2 farm visits in Argyll & Lochaber.

Scorecard	Design and testing	No. of sites/common grazings
Blanket bog	Peatland Action NS RSPB External consultants Galson CG Arnol CG	15
Machair	NS RSPB SCF External consultants Balranald RSPB reserve Bragar CG Fivepenny Borve CG Luskentyre CG	15
General	NS RSPB External consultants Lower Bayble CG	25
Wader grazed grassland	RSPB External consultants	5

Table 2. Summary of field testing of the cards

4.7 The final scorecards

This section goes through each scorecard in turn, question by question, and provides the rationale for each results-based indicator and the number of points allocated. Clean versions of the scorecards are to be found in Volume 2 of this report.

The number of points allocated for each results-based indicator have been standardised across all scorecards i.e. the maximum negative score is roughly the same across the board. However, the maximum number of positive points will vary depending on the relative importance of a specific results-based indicator and how much we wish to incentivise it.

4.7.1 Blanket bog

Total number of amended versions: 8

Desired outcomes:

- To maintain or improve blanket bog biodiversity
- To increase the cover of peat-forming sphagnum mosses
- To remove invasive non-native plant species
- To minimise the occurrence of negative indicator species

- To maintain an open vegetation structure
- To prevent damage to the sphagnum moss layer and other vegetation by considering stocking densities and time of year of grazing
- To improve and maintain the "wetness" of bog habitat
- To minimise areas of pare peat and prevent further peat loss
- To identify and better manage areas of damage

Section A: Species diversity – max. 50 Points

A.1 How many positive indicators are present? (please circle all positive indicators recorded below)

Number of species:	Low: 0-2	0	Medium: 3-4	5	High: 5-6	10	Very high: 7+	20

Positive indicators: (look at all 3 vegetation layers)

Moss layer:	*Dwarf shrub layer:*	*Sedge/herb layer:*
1. Mound-forming sphagnums	5. Cross-leaved heath	7. Black bog-rush
2. Blanket-forming sphagnums	6. Ling heather	8. Common cotton-grass
3. Bog pool sphagnums		9. Deergrass
4. Non-crustose lichens		10. Hare's tail cotton-grass
		11. White beak-sedge

Negative indicators:

European gorse
Tufted hair-grass
Heath or Soft rush
Nettle

This question focuses on species diversity and specifically on positive bog indicators. Species diversity of blanket bog is typically low and the most important species are the sphagnum mosses which are the primary component of peat. Early versions of the scorecard had only generic sphagnum as a single positive indicator but it became obvious that we had to place more emphasis on the presence of sphagnum species within blanket bog as a measure of good condition.

Upon advice from external consultants we tested listing the four main bog sphagnums, *S. capillifolium*, *S. cuspidatum*, *S. denticulatum* and *S. papillosum*, because some species of sphagnum such as *S. fallax* can be tolerant of poor bog condition. This was deemed too problematic because of the difficulty associated with reliable identification of said species and lack of user-friendliness. Instead we adopted identifying different sphagnum species through their growth formations e.g. mound-forming (Figure 8). While this is not as exact as identifying a particular species, it does provide a more user-friendly measure of sphagnum species diversity.

Other positive indicators such as non-crustose lichens were included because they are a good indicator of trampling. The two dwarf shrub species, cross-leaved heath and ling heather, were included because they are an essential component of the vegetation structure of bog and provide valuable cover and nesting sites for bird species and invertebrates. Cross-leaved heath also prefers wet acidic peat so is a good indicator of wet conditions and is an important food plant for the large heath butterfly (*Coenonympha tullia*) with their caterpillars feeding on hare's tail cotton-grass. The large heath butterfly is listed as Vulnerable by the IUCN Red Data List, protected under the Wildlife and Countryside Act (1981) and is a BAP priority species.

A maximum of 20 points is available, and there is no negative scoring as species diversity is considered positive.

Figure 8. This photo has the presence of mound-forming Sphagnum (A.1) and a high combined cover of Sphagna (A.2) (Photo: Robyn Stewart)

A.2 What is the combined cover of *Sphagnum mosses* away from ditches? (positive indicators listed above)

Cover:	Low: 0-10%	0	Med-low: 11-20%	10	Medium: 21-30%	15	High: 31-40%	20	Very high: >40%	30

This question is straightforward and estimating sphagnum cover is relatively easy because the moss typically forms mounds or carpets, or is found in bog pools. The question specifically focuses on areas away from ditches in order to minimise the likelihood of encountering more disturbance-tolerant sphagnums like *S. fallax*. Initial versions of the scorecard had an upper threshold of >30% sphagnum cover for the highest score based on guidelines by Peatland Action where anything over 30% is considered high. During site visits however, we consistently found areas with sphagnum cover greater than 50% which prompted us to include an additional category for very high cover over 40% which receives a maximum score of 30 points. The reward for sphagnum cover is higher than that for overall species diversity to reflect how essential sphagnum is for bog health.

A.3 Presence of non-native species:

Present: -30 Absent: 0

CSM guidelines state that any designated site should have less than 1% cover of invasive non-native species. We have opted for a stronger stance of zero invasive non-natives with a high negative score for the presence of species such as Rhododendron, non-native conifers or Crocosmia. This is to provide a strong signal that invasive species should not be allowed to become established before they become an issue because they can be costly to eradicate when they do; sites with levels of infestation where the reward from the card is insufficient incentive for action require complementary policy interventions.

A.4 What is the combined cover of all negative indicators?

Cover: High: >25%: -20 Medium: 11-25% -10 Med-low: 1-10% -5 Low: <1% 0

The negative indicators listed are species which indicate disturbance, drying out or nutrient enrichment. These include European gorse, tufted hair-grass, soft or heath rush and nettle. Such species are rarely found on a blanket bog in good condition and a useful visual cue of issues with management.

Section B: Vegetation structure – max. 10 points

B.1 How is vegetation structure impacted by grazing?

Overgrazed	Moderate-high	Moderate-low	Good	Undergrazed
Uniformly short herb and dwarf shrub vegetation. Many other signs of excessive stock pressure e.g. hoof prints, dung and paths and of enrichment.	Uniformly short herb and dwarf shrub vegetation. Only localised other signs of excessive stock pressure e.g. hoof prints, dung, paths and of enrichment.	Herb and dwarf shrub vegetation a mix of tall and short over most of the site. Few signs of excessive stock pressure e.g. hoof prints, dung and paths and of enrichment	Herb and dwarf shrub vegetation a mix of tall and short over most of the site. No signs of excessive stock pressure e.g. hoof prints, dung and paths and of enrichment.	Herb and dwarf shrub vegetation uniformly tall; litter may be common in certain vegetation types; few or no signs of grazing
Score -25	Score -5	Score 0	Score 10	-5

This was the most challenging results-based indicator to get right and subject to amendment in all versions of the scorecard. Initially Section B was made up of two questions: one focusing on vegetation structure and the other on grazing impact. We found that while we had consensus on what was good vegetation structure, the terminology used was subjective and prone to be interpreted differently depending on the individual. We also found it hard to keep the two questions separate in our minds when assessing what was in front of us.

The length of descriptions in each category was also an issue, having multiple variables which did not always correlate, or terminology which seemed objective but was in practice relative. For example, if we describe good structure as being 'open with many positive indicator species present', this could still include blanket bog which has an open structure because the dwarf shrub layer has been overgrazed, yet still retains species such as cotton-grasses and deer-grass which are less palatable to livestock. 'Open' is in this case is relative both to a structure which is 'closed' for some reason and is regarded as less positive and a structure resulting from overgrazing which is in fact *more* 'open'.

The second question on grazing impact was straightforward, however, and performed well consistently throughout testing because it was based on Habitat Impact Assessment criteria.

In the end, we opted for merging the two questions because what we were actually using as our results-based indicator was the measure of grazing impact on vegetation structure. This resulted in a simpler and more focused question.

Section C: Integrity of bog function – max. 40 points

C.1 To what extent has modification impacted on bog hydrology?

Damaged/drained bog	Modified bog with significantly altered hydrology	Modified bog with slightly altered hydrology	Near natural bog with slightly altered hydrology	Near natural bog with intact hydrology
Free flowing drains/gullies allow rapid water flow away from most of the bog area causing significant impact on surrounding bog vegetation. Areas of flat bare peat with standing water or cracked surface may be present.	Evidence of rapid water flow from site at multiple locations e.g. extensive peat banks with seepage or drainage channels without vegetation to slow water flow. Areas of flat bare peat with standing water or cracked surface may be present.	Localised evidence of rapid water flow from site e.g. roadside ditch. Bog surface intact across over most of the site. Water flow in ditches/ gullies slowed by the presence of vegetation but movement of water still evident. Seepage evident on peat banks but cut banks are not numerous.	Negligible evidence of rapid water flow from site. Bog surface largely intact. If drains or channels present the flow of water is slowed by dense vegetation. If old peat banks are present they are localised and largely revegetated.	Minimal evidence of rapid water flow from the site. Intact bog surface with negligible evidence of past drainage or disturbance.
Score -30	Score -15	Score 0	Score 10	Score 20

Hydrology is fundamental to maintaining blanket bog in good condition - sphagnum species require a wet to waterlogged substrate to thrive. Anything which causes modification to the bog surface or causes water loss can be damaging. Signs that the bog surface is not intact are obvious and easily identified such as bare peat, peat haggs, and artificial drainage ditches - essentially any action that has removed the protective vegetation layer. Each category is based on the degree of damage and the rate of water loss from the site with a mix of positive and negative scores available.
We had initially based this question on the four types of bog outlined by the Peatland Condition Assessment used by Peatland Action – near-natural condition, modified, drained and actively eroding – but ended up including two options for the modified bog category after several site visits highlighted the degree of modification was variable across sites.

C.2 What is the height of the water table for most of the year?

Very poor	Poor	Moderate	Good	Excellent
Little evidence of high water table apart from small localised wet areas.	The ground is noticeably dry across multiple damaged locations. The water table is not high throughout or low for some of the year.	The water table is high in places although some areas of dry ground where surface is damaged.	High water table mostly throughout although some small localised drier areas.	High water table with ground obviously wet throughout.
Score -20	Score -10	Score 0	Score 10	Score 20

The earlier versions of the scorecard did not have a separate question on the height of the water table but site visits again highlighted the importance of maintaining wet ground conditions for

blanket bog which resulted in this question being added. The height of the water table is easily judged by eye without any training and, combined with an assessment of the movement of water from C.1, will be a reliable indicator of blanket bog condition. C.1 and C.2 combined have 40 points available to clearly show the importance of bog hydrology.

Section D: Threats to site – max. 0 points

D.1 Select from the table below the most serious category of damage, considering the indicators of damage which occur.

High	Medium	Low	Negligible
Areas of bare and eroding soil (>5%) e.g. large peat hagg/gully systems OR Peat cut by machine OR Significant damage caused by vehicle tracks with multiple areas of bare soil from rutting and/or extensive damage to moss layer (>2%)	Small areas of bare and eroding soil evident (1-5%) across the assessment area OR Small peat hagg/gully system starting to form OR Active peat banks with steep bare peat "cliffs" with vegetation layer not replaced OR Small areas of damage to soil and/or moss layer from vehicle tracks (1-2%)	Bare soil evident along more frequently used routes but (<1%) but no peat hagg/gully system present OR Few areas of bare soil although some old peat bank 'cliffs' evident. OR Vehicle tracks causing limited erosion and/or damage to moss layer (<1%).	Little or no bare soil across the entire assessment area. Some bare patches at 'pinch' points (e.g. gateways) is acceptable providing there are no signs of erosion. AND Vehicle tracks are restricted to established tracks only.
Score -50	Score -30	Score -10	Score 0

This question focuses specifically on activities which cause damage to the moss and peat layer and has wide-ranging examples which have been observed on site, highlighted as issues by NS or included in CSM guidelines. Damage to the moss layer will limit or potentially prevent sphagnum growth which, as previously mentioned, is a key component of a healthy functioning bog. Damage to the peat and areas of bare peat can be very difficult to manage once they occur, as peat is vulnerable to erosion once the vegetation layer is removed. The aim of the way the question is phrased is to focus on the greatest threat first. All categories are scored negatively to provide a strong incentive to minimise or actively deal with issues before they become damaging.

D.2 Is there evidence of damage to vegetation, soil or water from other activities? (if yes, list them all below)
Examples can include: burning, dumping, pollution to soil/water, inappropriate herbicide use, litter, etc

Cover:	High: >10%	-50	Med: 1-10%	-20	Low: <1%	-10	Absent:	0

This is a catch all question for any other damaging activities. Burning is included in the list but it is important to mention that we have stated in the guidance for blanket bog (see Volume 2 of this report) that participants in the scheme must adhere to the Muirburn Code, which forbids burning on blanket bog.

4.7.2 Machair

Total number of amended versions: 8

The machair card started as a general machair card which would include both wet machair and dry machair. Upon advice from external consultants, it was split into two separate cards - wet machair and dry machair – based on the rationale that wet machair naturally has a higher diversity of plants compared to dry machair and that dry machair should not be penalised for having a lower number of positive indicators. However, this led to difficulties in when to apply each card as most areas of machair can be a mix of wet and dry. In the end we opted to merged the two cards again in order to remove the potential ambiguity.

Desired outcomes:

- To maintain or improve the diversity of flowering plants and other machair plant species
- To maintain or increase the cover of flowering plants and other machair plant species
- To maintain or improve the seed bank in soil by allowing flowering plants and other machair species to set seed, even late-flowering species
- To remove invasive non-native plant species
- To minimise the occurrence of negative indicator species
- To maintain an open sward with a high degree of structural variation in order to provide optimum habitat for species such as waders, corncrake, twite and great yellow bumblebee
- To minimise disturbance to nesting birds during the breeding season
- To provide nectar sources for pollinating insects
- To minimise soil erosion
- To improve and maintain wet features such as flushes and machair lochans
- To identify and better manage areas of damage

Section A: Ecological integrity – max. 100 points

A.1 How many positive indicators are present?

Low: 0-12	15	Med-low: 13-17	30	Med: 18-23	40	High: 24-29	45	Very high: 30+	50

Species richness is the most important indicator of condition of machair i.e. only well managed machair will support a high number of positive indicator species. Based on this reasoning, a total of 50 points are available for question A.1 although all species richness is rewarded. Earlier drafts of the machair scorecard had a maximum of 20 points for this question but this was increased in order to provide a clearer signal of the value of species richness. The positive indicators are listed in a separate table which has boxes next to each species so they can be ticked off during the assessment. The table has over 60 positive indicator species and the thresholds for each category were tested at sites with both dry and wet machair in order to set fair cut offs.

A.2 What is the combined cover of the positive indicators throughout? (refer to Table 1)

Cover:	Low: <20%	5	Med-low: 21-40%	10	Med: 41-60%	15	High: 61-80%	20	Very high: >80%	30

Another results-based indicator of the condition of machair is the combined cover of positive indicator species. Machair that is managed with traditional methods will have a very high cover of positive indicator species. High combined cover is also important for pollinating insects because it provides nectar and food plants for a wide variety of species throughout the year. Machair supports several rare pollinators such as the northern Colletes bee (*Colletes floralis*), and the great yellow bumblebee, both of which are listed as Vulnerable in the Europe Red Data List and a UK BAP priority species.

A.3 Are late-flowering species (devil's bit scabious*, harebell*, knapweed*, red clover*, yarrow*, yellow composites*) present with flowerheads?

Absent or recorded at only one stop:	0	Present at a several stops:	10	Present at numerous stops:	15	Present at more than half of stops:	20

This question relates to summer stocking density and a summer grazing break. Machair should not be heavily grazed during the summer months as this can prevent flowering plants from setting seed and building up seed stores in the soil for the next year. Therefore, if species which flower later in the year such as devil's bit scabious or knapweed are present when the assessment in carried out (we have recommended a six week assessment window from July to August outlined in the machair guidance note) this is a good indicator of reduced stocking density or a summer grazing break. This also benefits ground-nesting bird such as waders because their nests are less likely to be disturbed or trampled at lower stocking densities.

A.4 What is the combined cover of the following potentially dominating species in the assessment area: common daisy, meadowsweet, ragwort, creeping or spear thistle, white clover, Yorkshire fog?

High	Medium	Low	Negligible
Abundant throughout the assessment area (31-50%).	Occur in multiple larger patches or found frequently throughout the assessment area (16-30%).	Occur in multiple smaller patches or found in small numbers throughout the whole assessment area (6-15%).	Occur in small localised patches at most (<5%).
Score -15	Score -10	Score -5	Score 0

The species selected can indicate issues with management such as nutrient enrichment in the case of Yorkshire fog, disturbance in the case of common daisy or overgrazing in summer for ragwort. Once these species become established they can quickly dominate an area and out-compete other slower-growing positive indicator species. The limits set for the combined cover are based on the DAFOR scale which is a commonly used metric for plant abundance.

A.5 Are invasive non-native species present (e.g. crocosmia, Japanese rose, etc)?

Present	-30	Absent	0

The same rationale applies to this question for machair as it does for blanket bog with a strong stance on invasive non-natives.

A.6 What is the combined cover of negative indicators in the assessment area (Table 2)?

High	Medium	Low	Negligible
>10% of assessment area with negative indicators.	Negative indicators with combined cover of 1-10% across the assessment area.	Less than 1% or 0.1ha (whichever is smallest) of assessment area affected by negative indicators.	Negative indicators are negligible across the assessment area.
Score -30	Score --20	Score -10	Score 0

These species include bracken, common dandelion and bramble. Similar to A.4, the occurrence of these species on machair in significant quantities indicates there are issues with management. Although tolerated in small amounts, they can be difficult to manage once they become widespread, hence the strong negative scores for higher covers.

Section B: Habitat structure – max. 0 points

B.1 Does *summer* grazing negatively impact on the following sand dune species: marram, lyme-grass or couch grass?

Heavily grazed	Moderately grazed	Lightly grazed	Not present
Flowering suppressed; poaching to dune system in multiple locations.	Some plants in flower; limited damage to dune system from poaching.	Plants mostly in flower; little evidence of damage from poaching.	Dune system not present.
Score -20	Score -5	Score 0	Score 0

This question focuses on a physical over a biological attribute and is included in CSM guidelines. Sand dunes are important because they provide protection from the sea and are an essential component of the machair system. They are formed by the stabilisation of wind-blown sand by the roots of marram, lyme-grass and sand couch grass. If the vegetation on sand dunes is heavily grazed during the summer to the extent that it prevents flowering, this is likely to be accompanied by damage to the roots, which can destabilize the dune system making it vulnerable to further erosion through the action of wind and waves. It is recognised that not all machair has a dune system most likely because it has been lost historically – the absence of dunes is not penalised in the scoring system.

B.2 What is the quality of vegetation structure?

Very poor	Poor	Moderate	Good
Vegetation is overgrazed (<5cm) and uniformly short throughout. Flowering plants suppressed. *or* Vegetation is rank throughout with negligible signs of grazing.	Vegetation is heavily grazed in multiple areas with large areas of uniformly short (<5cm) vegetation but some stands of taller umbellifers or tussocky vegetation present occasionally. Flowering plants supressed in places but not throughout.	Vegetation height varied throughout with localised areas of uniformly short vegetation (<5cm). Taller umbellifers or tussocky vegetation frequent. Flowering plants occurring across at least half of the assessment area.	Vegetation height varied throughout with negligible areas of uniformly short vegetation. Stands of tussocky species or umbellifers common. Flowering plants common to abundant throughout.
Score -30	Score -15	Score -5	Score 0

The question combines aspects of both vegetation height, variation in vegetation height and whether flowering plants are being suppressed i.e. too heavily grazed. A high degree of variability of vegetation structure provides cover and nest sites for a wide range of breeding birds. Scoring is either 0 or negative here because of the assessment window from July to August which should find machair in optimum condition.

Section C: threats to site – max. 0 points

C.1 What is the extent of damage to soil caused by livestock across the assessment area?

High	Medium	Low	Negligible
Extensive damage from heavy poaching/trampling clearly causing erosion with multiple large areas (>100m²) of bare soil; new tracks may be forming.	Bare soil at multiple locations or one single large area (≤100m²) e.g. around a ring feeder but damage not extensive; new tracks may be forming.	Some small localised areas of bare soil at pinch points e.g. around gates across; no evidence of new tracks forming.	Some hoof prints, dung and tracks evident but limited bare soil; no new tracks forming.
Score -40	Score -20	Score -10	Score 0

This question focuses specifically on poaching and trampling by livestock. Again, because the assessment should be carried out in July to August when machair is in optimum condition we allocate a high negative score to damage by poaching. This, of course, does not mean that the area cannot have signs of heavier poaching at other times of the year i.e. during winter.

C.2 Is there evidence of damage to vegetation, soil or water from other activities? (if yes, list them all below)
Examples can include: drainage, vehicle tracks, human trampling, sand extraction, dumping, pollution to soil/water, inappropriate herbicide use, litter, etc.

Severe impact: -50 Moderate impact: -30 Local impact only: -10 Negligible: 0

This is a general catch-all question designed to highlight other activities we would wish to discourage such as drainage, sand extraction, etc. Scoring is negative and increases with severity and the area of damage.

4.7.3 General card

Total number of amended versions: 3

Desired outcomes:

- To maintain or improve biodiversity
- To maintain or increase cover of positive indicators
- To remove invasive non-native plant species
- To minimise the occurrence of negative indicator species
- To improve and maintain appropriate soil condition
- To minimise areas of bare soil
- To identify and better manage areas of damage

Section A: Ecological quality – max. 100 points

A.1 What is the number of positive indicators in the field? Circle all positive indicators present from List A.

PI no.	Low: up to 5	Low: 6-10	Medium: 11-15	High: 16-20	Very high: >20
Score	*0*	*5*	*10*	*15*	*20*

List A - positive indicators

1	Birds-foot-trefoils (Common & Greater) & Kidney Vetch	21	Milkworts
2	Black bog-rush	22	Mints - all species
3	Blaeberry	23	Mountain everlasting
4	Bog Pimpernel	24	Orchids - all species
5	Bushy lichens	25	Ox-eye Daisy (not common daisy)
6	Common mouse-ear	26	Pale butterwort
7	Cowslip & Primrose	27	Ragged Robin
8	Crowberry	28	Ribwort plantain
9	Devil's bit scabious	29	Rushes, Woodrushes, Spike Rushes, **not** soft/cong. rush
10	Eyebrights - all species	30	Sedges - all species except star sedge
11	Harebell	31	Selfheal and Bugle
12	Juniper	32	Small umbels - Pignut, Yarrow, Sneezewort or Wild Carrot
13	Knapweed	33	Sorrel - Common & Sheep
14	Lady's bedstraw	34	St John's Worts (not Tutsan)
15	Lady's Mantle	35	Tormentil
16	Lady's Smock - also known as Cuckooflower	36	Vetches/vetchlings - Meadow, Bitter, Tufted etc.
17	Large Umbels - Angelica, Valerian & Common Hogweed	37	Violets - all species
18	Lesser spearwort	38	White-flowered bedstraws (heath, marsh)
19	Louseworts - Common & Marsh	39	Wild Thyme
20	Marsh Cinquefoil or Marsh Marigold	40	Yellow Composites which are not dandelion
42	Marsh Pennywort	41	Yellow-rattle - also known as Hay Rattle
43	Meadowsweet		

The 43 positive indicator species listed were selected to cover the range of species found within wet heath, dry heath, coastal and montane heath, as well as acid grassland, inundation grassland and non-machair species-rich grassland. We have included a high number of possible positive indicators, all of which are easily identifiable, to reward areas with a high diversity of flowering plants, shrubs, lichens and some sedges and rushes. Many of these species are important for a wide range of pollinating insects and other invertebrates, which in turn support numerous other species.

A2. Frequency of positive species and structure of vegetation

		Structure of the vegetation				
	This column first (Answer each question in turn from the top) All questions apply to the main body of the assessments area (i.e. Away from running water, rock outcrops and tracks) ↓	**Then this row →**	Uniformly short vegetation with many signs of **very heavy grazing** throughout.	Vegetation mostly a **mixture of tall and short**, judged at a scale appropriate to the species present; dead litter from previous years is insignificant/ minimal.	Vegetation is characteristic of being for **hay/silage or deferred grazing**, i.e. Relatively uniform and dead litter from previous years insignificant/ minimal	Dead litter is common, vegetation generally rank, assessment area may have signs of recent grazing, but clearly **undergrazed**
Frequency of positive indicator species from List A	1 or more species from A.1 **present**?	If no →	-10	0	0	-10
	If yes, 5 or more species from List A **present**?	If no →	0	5	5	0
	If yes 5 or more species from list A **common**?	If no →	5	30	30	5
	If yes 1-5 species from List A **abundant**?	If no →	10	50	50	10
	If yes >5 species from List A are **abundant**?	If no →	10	60	60	20
		If yes →	15	80	80	35

This question assesses grazing levels, species diversity and vegetation structure by showing the correlation between species diversity and structure on the basis that our qualitative judgement of vegetation structure is unavoidably positively biased towards areas with a high number of species. The scores are presented as a matrix, which increase with both species diversity and vegetation structure which can be achieved by grazing at the appropriate stocking density.

A.3 Native woodland and scrub in the mosaic.
If the score for A.2 is within the green rows, go to A.4. Otherwise:

What is the combined canopy cover of native woodland and scrub as a % of the assessment area (do not include bog myrtle or any negative species listed below)?

	Negligible: >1%	Low: 1-5%	Medium: 6-14%	High: 15-20%
Score	*0*	*5*	*10*	*15*

If it is present, is the woodland and scrub cover sustainable?

Any regeneration present is below 15 cm tall, clear browse line	Limited number of young trees/bushes and unbrowsed saplings	Good spatial distribution of trees/bushes of all ages - equivalent to at least 10% of the wooded area is regenerating
-5	*5*	*15*

This question is targeted at low scoring parcels with a lower frequency of positive indicator species in the first three rows of the matrix (the rows not coloured green in A.2). The aim is to reward the common grazing for scattered native scrub or woodland that would be more typically found in relatively species poor areas of heath. For example, some heaths such as dry heath can be in good condition but have a limited number of positive indicators which may end up giving them a low score within the A.2 matrix. A.3 gives the possibility of a "top up" for such areas, recognising wider SG priorities. The upper limit is for 20% cover in order to comply with CSM guidance for heathlands.

A.4 What is the combined cover of the following potentially-dominating species: bracken, soft rush, brambles, tufted hair-grass, European Gorse?
(Do not count sparse bracken nor any areas of any of the species showing signs of mechanical control in the year of survey)

	High: >50%	Med-high: 21-50%	Med-low: 11-20%	Low: 6-10%	Negligible: <5%
Score	*-40*	*-25*	*-15*	*-10*	*0*

As with the blanket bog and machair cards, this question and its scoring rationale focuses on potentially-dominating species which may indicate issues with management.

Section B: Indicators of damage – max. 0 points

The indicators of damage (B.1 – B.5) include the presence of invasive non-native species such as rhododendron and other exotics, as well poaching, artificial drainage and other damaging activities. It follows the same rationale as the blanket bog and machair cards.

B1. Is rhododendron present?

Yes	No
-50	*0*

B.2 What is the combined cover of the following negative indicators: other exotic species, docks, cotoneaster Crocosmia, nettles, spear or creeping thistles, ragwort, self-seeded non-native conifers?

	High: Is it common over 10% or 5 ha (whichever largest)	Medium: Is it Common over 5-9% or 0.5 to 2 ha (whichever largest)	Low: Is it common over more than up to 4% or 0.5 ha (whichever largest)	Absent or negligible: Less than 1% or 0.5 ha (whichever is the smallest)
Score	*-40*	*-25*	*-15*	*0*

B.3 What is the impact of artificial drainage on the habitats?

	High: Drains are delivering sediment to the natural watercourse and having clear impact on the habitats	Medium-high: Drains either significant in terms of sediment or impact on surrouding habitats	Medium-Low: Drains present but have limited or highly localised impact on habitats	Absent or negligible: Drains absent or having negligible impacts on habitats
Score	*-50*	*-30*	*-5*	*0*

B.4 What is the scale and impact of supplementary feeding?

	High: Some feed sites are impacting >0.5 ha each and/or are impacting directly on watercourses in terms of poaching or disturbed vegetation	Medium-high: No feed sites are impacting directly on watercourses but some sites impacting >0.5 ha in terms of poaching or disturbed vegetation	Medium-Low: No feed site impacting >0.5 ha in terms of either poaching or disturbed vegetation	Absent or negligible: Minimal or no damage from feed sites
Score	*-50*	*-30*	*-5*	*0*

B.5 What is the scale and impact of any other damaging activities in terms of their impact on soil or water?

	High: Either soil or water being severely affected in terms of either seriousness or scale	Medium-high: Either soil or water being affected in a limited way	Medium-Low: Occasional and localised impacts	Absent or negligible impact
Score	*-50*	*-30*	*-5*	*0*

4.7.4 Wader grazed grassland

Total number of amended versions: 3

The wader grazed grassland card is the only card which does not have 100 points allocated, instead the maximum score is 80. This is to fit the scorecard into the overarching payment structure that has been developed.

Desired outcomes:

- To manage vegetation structure to maintain an open sward
- To manage vegetation structure to provide optimal vegetation heights for waders
- To manage rush cover
- To remove invasive non-native plant species
- To maximise foraging habitat by maintaining wet ground conditions and shallow pools and/or wader scrapes during the breeding season

- To provide suitable cover and site conditions for adults and chicks
- To minimise disturbance from livestock during the breeding season
- To manage predator habitat such as scrub and rank vegetation

Section A: Quality of habitat – max. 40 points

A.1 What is the height of vegetation* during the breeding season (April-June)? *not including any vegetation cut within the previous year

Poor	Moderate	Good	Excellent
Vegetation across the assessment area is uniformly one height e.g. all tall (>20cm) or all short (<5cm).	Vegetation across the assessment area is mostly tall (>20cm) or mostly short (<5cm) with some localised areas with intermediate heights.	Vegetation across the assessment area has distinct areas with different heights i.e. a mix of tall vegetation (>20cm), short vegetation (<5cm) and intermediate heights.	Vegetation across the assessment area is a mosaic of varying heights throughout. Some localised areas of bare ground or tall vegetation present.
Score 0	Score 5	Score 10	Score 20

Different species of wader show a strong preference for specific heights of vegetation for nest site selection. For example, lapwings prefer areas of short vegetation, ideally <5cm tall, whereas species such as curlew and snipe prefer longer vegetation along wetland margins. This question rewards a mosaic of vegetation heights which in theory will provide the greatest number of nesting opportunities to a wide range of waders. This question is scored positively because even areas with short vegetation, a characteristic we would more commonly consider an indication of poor quality, will benefit lapwing.

A.2 What is the combined cover of dense cover of soft/conglomerate rush?

Cover: High: >50% -40 | Medium: 21-40% -15 | Med-low: 10-20% -5 | Low: <10% 0

Soft and conglomerate rush are a type of tall vegetation which grows in damp to wet soil which is ideal for waders. However, they are fast-growing and can become very dense, coming to dominate an area if they are not controlled. While some waders favour longer vegetation for nesting, they avoid very dense vegetation because it is difficult to move through and may harbour predators. We are tolerant of up to 10% of dense cover but give negative scores above this limit.

A.3 What is the combined cover of sparse rush cover?

Cover: High: >70%: -10 | Low : <70% 0

This question aims to promote active monitoring of rush cover in order to prevent it from becoming dense. Areas with an existing high cover of sparse rush will be more likely to end up with dense cover if not managed appropriately. The question is intended to encourage rush management at this stage rather than what is outlined in A.2.

A.4. At how many monitoring stops are positive indicators recorded (List A)?

Absent or recorded at only one stop: 0 | Present at a several stops: 10 | Present at numerous stops: 15 | Present at more than half of stops: 20

List A: Positive indicators

1. Bogbean	6. Marsh pennywort
2. Cuckooflower	7. Marsh willowherb
3. Devil's bit scabious	8. Ragged robin
4. Lesser spearwort	9.Ribwort plantain
5. Marsh cinquefoil	10. Sedges – all species

While this question is rewarding the number of positive indicator species present and may at first glance seem to be rewarding species diversity, we have actually selected all the positive indicator species because they favour damp to wet ground conditions. Areas with damp to wet ground conditions are ideal feeding habitat for waders. The total score available in the positively-scoring A questions are in line with those given by the general card for similar situation to avoid 'competition' between the cards.

A.5 Are invasive non-native species present (e.g. rhododendron, giant rhubarb, Japanese rose)?

Present: -30 | Absent: 0

The same rationale applies to this question, as with all previous cards, with a strong stance on invasive non-natives.

Section B: Ground conditions and artificial drainage – max. 40 points

B.1 What is the height of the water table during the breeding season (April-June)?

Low	Moderate	Good	Excellent
Water table is low and ground conditions are dry	Water table is high in some small localised areas	Water table is high across distinct larger areas	Water table is high across most of the assessment area
Score -20	Score 0	Score 10	Score 20

A high water table and wet ground conditions provide ideal feeding habitat for adult waders and their chicks. Scoring is designed to reward all wet ground conditions with a clear incentive to increase the height of the water table across the whole area.

B.2 Are shallow open pools or scrapes >20m² present during the breeding season (April-June)?

Absent: 0 | Present but < 20m²: 5 | Present and ≥20m²: 20

Wader scrapes are shallow depressions in the ground which can be created using machinery and provide valuable feeding areas for waders. As a results-based indicator, wader scrapes are quick to create and are a straightforward way to increase the overall score.

B.3 What is the condition of artificial drainage?

Very poor	Poor	Sub-optimal	Good
Drains have none of the following features: 1. shallow sides 2. vegetated channel 3. adjacent open wetland vegetation	Drains have only one of the following features: 1. shallow sides 2. vegetated channel 3. adjacent open wetland vegetation	Drains have at least 2 of the following features: 1. shallow sides 2. vegetated channel 3. adjacent open wetland vegetation	No drains present OR Drains have all 3 following features: 1.shallow sides 2. vegetated channel 3. adjacent open wetland vegetation.
Score -20	Score -10	Score -5	Score 0

Drains can be valuable for waders if they are shallow-sided, vegetated in the main channel and have adjacent wetland vegetation. These conditions provide valuable feeding areas particularly for chicks because they provide good access and cover. Chicks, because of their small size, require shallow-sided drains to be able to climb in and back out.

B.4 What is the extent of bare ground caused by livestock during the breeding season (April-June)?

High	Medium	Limited
Multiple areas of bare soil caused by poaching e.g. along tracks and around hay rings (combined area >0.1ha).	Hoofprints and piles of dung present but areas of bare soil caused by animals are isolated and not excessive (no areas larger than 0.1ha).	Hoofprints and piles of dung present but little of no areas of bare soil. Some bare patches at 'pinch' points along regularly used routes (e.g. gateways).
Score -30	Score -10	Score 0

This question is to promote a reduced stocking density during the wader breeding season in order to minimise disturbance and trampling. Some hoof prints and dung is acceptable or positive but bare ground caused by poaching is negatively scored.

Section C: Threats to site – max. 0 points

C.1 Is the assessment area impacted by scrub encroachment or rank vegetation (e.g. European gorse, bracken, bramble, creeping thistle, etc)?

Large or widely scattered areas of scrub and/or rank vegetation: -30

Localised small areas of scrub and/or rank vegetation: -15

No scrub and/or rank vegetation: 0

This question focuses on areas which can provide potential cover for predators. Waders prefer open areas with little tree cover or scrub in order to reduce the predation risk to chicks. If scrub or trees become established it is highly likely to result in a decline in wader numbers because they will avoid that area. The strong negative scores allocated are to incentivise prompt action to deal with encroachment.

C.2 Is there evidence of damage to vegetation, soil or water from other activities? (if yes, list them all below)
Examples can include: vehicle tracks, dumping, pollution to soil/water, inappropriate herbicide use, litter, etc

This is a general catch-all question designed to highlight other activities we would wish to discourage such as damage by vehicle tracks, dumping, etc. Scoring is negative and increases with severity and the area of damage.

4.8 Which scorecard to apply where

Selecting the correct scorecard(s) to use during the assessment of a common grazing is essential. This is relatively straightforward when there is existing information and maps which outline the distribution of different habitat types. For example, machair and sand dunes have been mapped by NS in the Vegetation Sand Dune Survey of Scotland and this information is open access online[3]. These maps can be overlaid with the map of a common grazing to ensure the machair card is applied appropriately.

Selecting the correct scorecard becomes more difficult when this information is not available as it can take some degree of knowledge or training to identify habitat types. Each habitat has a characteristic plant community which is commonly used to differentiate between different habitat types. In the scorecards we use these plant communities to identify the habitat type, often using the characteristics species as positive indicator species. Some plant communities can transition into another depending on the ground and soil conditions meaning that detecting boundaries between different habitats is not always clear cut.

In addition to this, some habitats can exist in degraded states depending on their management history or other environmental influences. This could potentially make selecting the scorecard(s) for a common grazing tricky, especially if there are several habitat types present, or these habitats form a mosaic or are degraded. Providing training in habitat identification and where to use the scorecards will be an important factor in the implementation of the results-based approach.

This is particularly true for blanket bog habitat which has a characteristic plant community dominated by sphagnum mosses, cotton-grasses, deer-grass and dwarf shrubs such as cross-leaved heath. Blanket bog is often defined as having deep peat >50cm depth and is typically found on flat or gently undulating ground, which allows deep peat to accumulate. However, in some instances where peat has been removed the peat depth can be less than 50cm but many characteristic blanket bog species remain. In this case, the blanket bog can still be considered active providing the peat removal is not extensive. While it may be considered degraded, it can go on to deposit peat in the future because it still retains peat-forming vegetation like sphagnum mosses. This will be true on common grazings where peat cutting, either by hand or by machine, has occurred. Evidence of deep peat will remain in the form of peat banks or peat haggs, even though there may be some change in

[3] https://map.environment.gov.scot/sewebmap/?layers=HabVegSurvey1&extent=-298028,475191,719972,1268192

bog species in the area directly affected such as lower sphagnum cover, or a dominance of dwarf shrubs.

In other instances, the characteristic blanket bog vegetation may be absent but this does not necessarily mean deep peat is no longer present e.g. at the base of erosion gullies. It is unlikely that this situation would extend across an extensive area however, and it should be apparent from the indicators of damage why the characteristic bog vegetation is missing.

Our approach is to class even degraded blanket bog as blanket bog habitat meaning the blanket bog scorecard should be used. This approach is in line with CSM guidelines and reflects the global importance of peat for carbon sequestration. As a general guide to identifying whether to use the blanket bog scorecard follow the flow chart below (Figure 9).

There is the possibility of some overlap in the use of the blanket bog and the general card, particularly if deep peat is not immediately obvious, or if there are small pockets of what may be blanket bog within a mosaic. In this instance, we would recommend that specialist advice is sought from an organisation such as NS or SAC.

The wader grazed grassland card is designed for use only on semi-improved to improved grassland found in townships parks and areas of reseedings. Such areas tend to be noticeable by their bright green vegetation and occurrence of grasses favoured by agricultural improvement such as Yorkshire fog and perennial ryegrass. Most townships will be aware of areas within the common grazing that have been improved historically or currently improved.

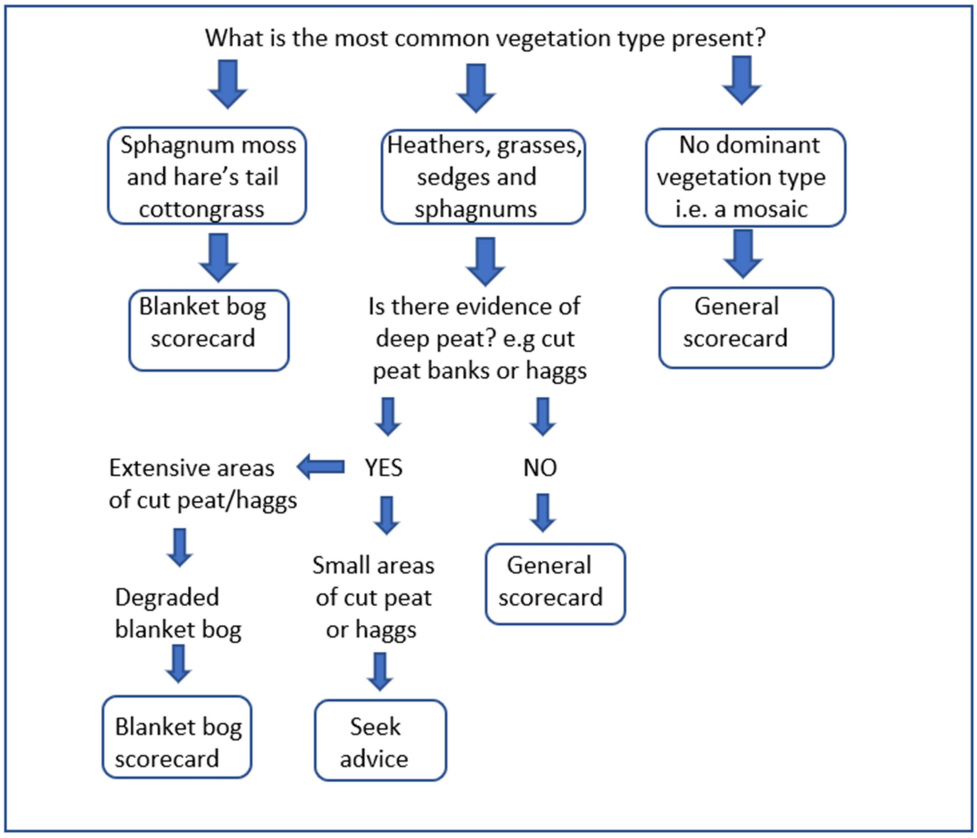

Figure 9. Flowchart to guide the selection of the bog scorecard

The general card, as its name suggests, is designed to cover a broad number of habitats, encompassing wet and dry heaths, coastal heaths and montane heaths, as well as acid grassland or grassland with salt spray inundation. This card should be selected once the presence of blanket bog has been eliminated and should exclude areas of wader grazed grassland or machair.

5 Area payment rationales and structures

The result of the decisions taken on the scorecards (Section 4 above) have the potential to provide a seamless set of non-overlapping signals or incentives to grazings committees and individual crofters (and farmers) alike. However, in getting rid of measure boundaries which have in the past proved problematic for applicant, agent and administrator alike – that between inbye and rough grazings in particular- this approach opens up a potentially even greater challenge, namely designing a payment rationale and structure which works across that huge range of scales and intensities.

In this section we set out how we approached that task, what assumptions we made and what data we use. In doing so, we will have to describe inbye situations of apparently marginal direct relevance to common grazings. However, we will also show how doing so can potentially tie together all four of our cards.

5.1 Assumptions

5.1.1 General ('mosaic') card

The payment rationale is built on the following assumptions:

- For inbye, that a high score is likely to reflect a stocking density of around 0.5 LU/ha (Chapman 2007) (McKnight 2014)
- For rough grazings, that a high score is not unlikely at the stocking density which a combination of BPS rules and economics tends to make the default, namely 0.05 LU/ha (This is in fact a conservative approach – choosing a higher would result in more potential income being forgone)
- That it is more beneficial to have cattle than sheep grazing in all cases

5.1.2 Bog card

The payment rationale is an explicitly interim one which is built on there being no differential in payment with the adjoining heathland, if at all possible (i.e. a good bog and a good dry heath gets the same payment).

This allows us to tie together the bog and general cards for the time being. Meanwhile, there has been some discussion of an alternative payment rationale in which the ongoing management costs and/or income forgone associated with stopping carbon oxidation and recommencement or reinforcement of carbon sequestration are rewarded. This could have the potential to better recognise the increased value being placed by society on the carbon store represented by peat and on its ability to add to that store; by contrast, starting from the economics of the grazing system is always likely to result in low payments. Such a rationale awaits full development however.

5.1.3 Machair card

The payment rationale of this card is the same as that of the inbye aspects of the mosaic card.

5.1.4 Wader card

The payment rationale of this card is also the same as that of the inbye aspects of the mosaic card.

5.1.5 Hourly rate for labour

We assumed an hourly rate of £15/hr for unpaid 'family' labour. This is to some extent a compromise between what might be considered the minimum reasonable rate – the statutory 'living wage' or minimum agricultural wage – and what might be a realistic alternative in the wider economy, where crofters might have available to them a very wide range of hourly rates (from lawyer, accountant, senior civil servant at one end of the spectrum to labourer, shop worker or state pensioner on the other). More helpfully perhaps, it reflects a common hourly rate which crofters pay each other, for example for a 'man with a dog' at a gather and fank.

5.2 Data sources

The core data sources were the SRUC Farm Management Handbook (2019/20 edition as updated)(SRUC 2019) and QMS Cattle and Sheep Enterprise Profitability in Scotland (also 2019 edition) . Support payment rates were updated to be correct in mid-November 2020.

In general we chose to use FMH data, since it has a specific crofting focussed section. However, labour requirement data was only available in the QMS publication; we chose systems which best reflected the variables pertaining in our area (e.g. lambing percentages, livestock densities). Fixed costs are a 'known unknown'. The focus in the main body of the publications on 'commercial' holdings meeting minimum economic size thresholds is something which makes poorly-considered direct transfer of data unwise. It is also quite clear from the limited breakdowns provided in the reports that some formally 'fixed' costs are really quite 'variable' in character, but how to deal with this issue is something for consideration in Phase 3

Additional data on the labour requirements of small sheep flocks were provided by Iain Murdo Macmillan of SAC Consulting in Stornoway. Estimates on the time requirements of common grazings applications to agri-environments and their associated governance processes were provided by Janette Sutherland of SAC Consulting in Portree.

5.3 Calculations

The tables underlying all of the calculations below are provided in the Annexes at the end of the report. In each case only the FMH-derived data is given; QMS-based calculations were also made but are not provided as they were not used subsequently.

5.3.1 Inbye aspects of the general card

The basis of the inbye calculations has to be whatever (realistic) arithmetic which leads to the smallest number, so as to avoid overcompensation. In the case of inbye, Region 3 land is exceptional, but in any case attracts lower support payments and thus yields a higher additional cost figure than Region 2. Region 1 on the other hand only attracts one coupled payment in the form of LFASS; unless and until BPS Region 1 payments are coupled, they should not be used in the calculations (indeed, grazing such land, being inherently loss-making, would itself lead to a forgoing

of BPS income). Similarly, we assumed an LFASS band which will be higher than that applying to some potential applicants.

	Inbye R2 cattle 0.5	Inbye R2 sheep 0.5
NM/ha incl. family labour	-£216.11	-£131.07
Est. NM/ha incl. family labour, 1st cow or 10 sheep	-£1450.48	-£739.57

Table 3. Figures underlying the basis for calculation of the inbye payment and cattle top-up

Given the considerable additional costs of 'the first cow' compared to 'the first few sheep', a decision was taken in the Skye POBAS pilot that the basic payment would be based on sheep, but with a specific top-up for actually having cattle for the first 2 LU (paid over the first 2 and subsequent 3 ha respectively).

For a score of 10 there are therefore three 'anchors' – a high payment for the first hectares *of the holding* of about £740/ha (based on the sheep calculation), which degresses into a standard figure of around £200/ha; and an associated top-up for the first hectares for actually having cattle, based on the difference between the sheep and cattle figures of £700/ha. It was decided to perform the degression in four steps – First 2 ha; between 2 and 5 ha; between 5 and 10 ha; between 10 and 20 ha; and over 20 ha. The first two divisions correspond to those which can attract the cattle top-up.

The initial proposal in Skye was for the payments to increase in equal steps from 1 to 10, as in Figure 10. While this structure was potentially workable, there was some concern that its low rates for low scores gave very little incentive for participation, and subsequent possible improvement in performance, by applicants with predominantly low-scoring parcels.

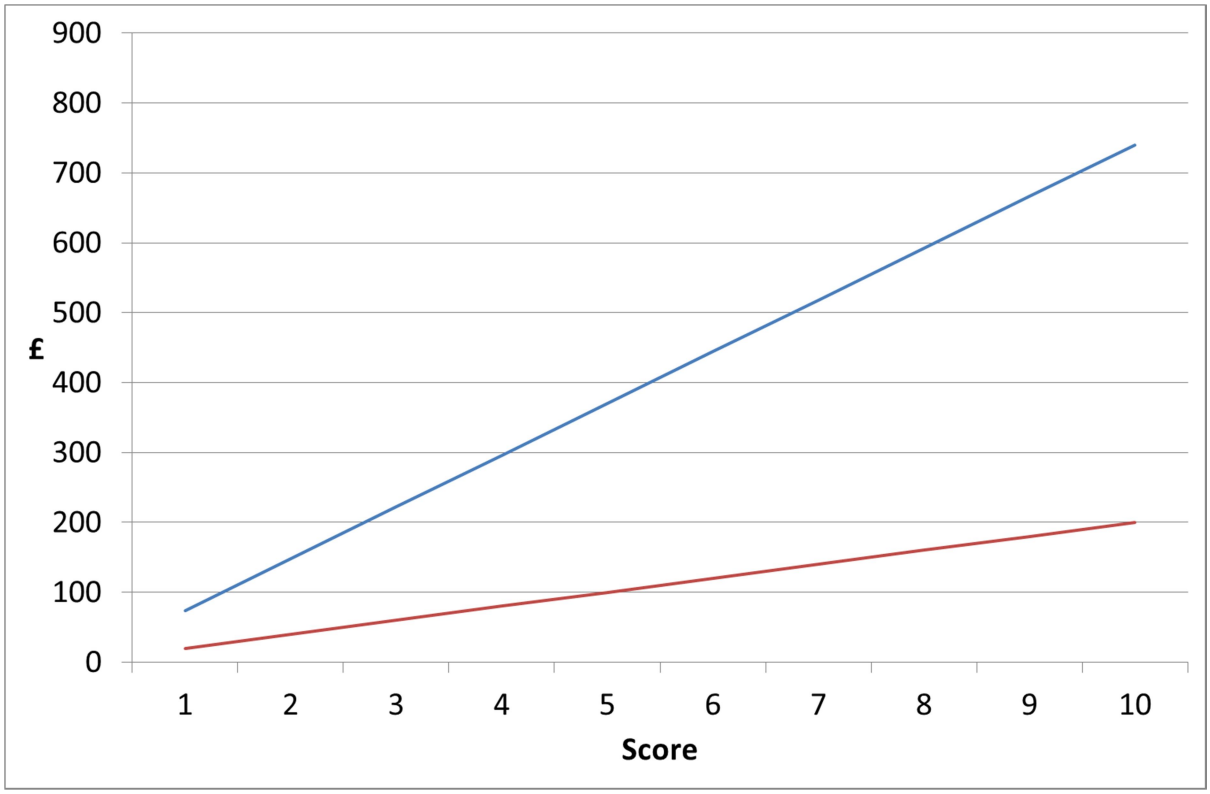

Figure 10. Original proposal for inbye payment structure (highest and lowest rates only shown)

One question which legitimately arises in the case of common grazings is on what basis do we justify paying a higher rate for the first few hectares, since the increased payment relates to the diseconomies of scale of keeping the first few animals? This is a legitimate objection; we propose that this amount be justified rather on the basis of the additional transaction costs which are unique to common grazings and which recur annually (see 6.1 below).

5.3.2 Rough grazings calculations as a secondary 'anchor'

For rough grazings we similarly chose to use R2 figures, since R3 pays lower support payments (significantly so in the case of cattle). At low stocking rates, keeping livestock is apparently profitable, but this figure is overwhelmingly dominated by the support payments (the incentive is to keep only whatever animals are necessary). The basis of calculation is therefore the lower profitability of cattle, which we assume are preferable, compared to sheep (Table 4). The difference amounts to around £10/ha.

	Hill R2 cattle 0.05	Hill R2 sheep 0.05
NM/ha incl. family labour	£22.30	£32.82

Table 4. Figures underlying the basis for calculation of the rough grazings payments

5.3.3 Bringing inbye and rough grazings together into a payment matric

Looking again at Figure 10, we now find that the payment calculated as reasonable for, say, a dry heathland rough grazings in good condition of £10/ha falls way below even the lowest payment modelled for a score of 1.

We therefore propose a payment structure which addresses both the perceived under-incentivisation of participation and better management for low scoring parcels of inbye and which avoids the over-rewarding of large areas of rough grazings. To place our rough grazings 'anchor' we assume that a good species-poor heath would attract a score of 5, and so would get £10/ha.

We propose also that because of the need for finer resolution at low scores (a score of 2 is 100% higher than a score of 1, while a score of 9 is only 12.5% more than a score of 8), half points are scored in the lower half of the scale.

Note that intermediate values were determined by smoothing the curves by eye in Excel.

5.3.4 Tying in the bog card

This last innovation also helps tie the bog card into the general card. We propose that the payments for the 10 steps at the bottom end of the general card (i.e. 0 to 5 in increments of 0.5) are considered, for now at least to correspond to scores of 0 to 10 on the bog card.

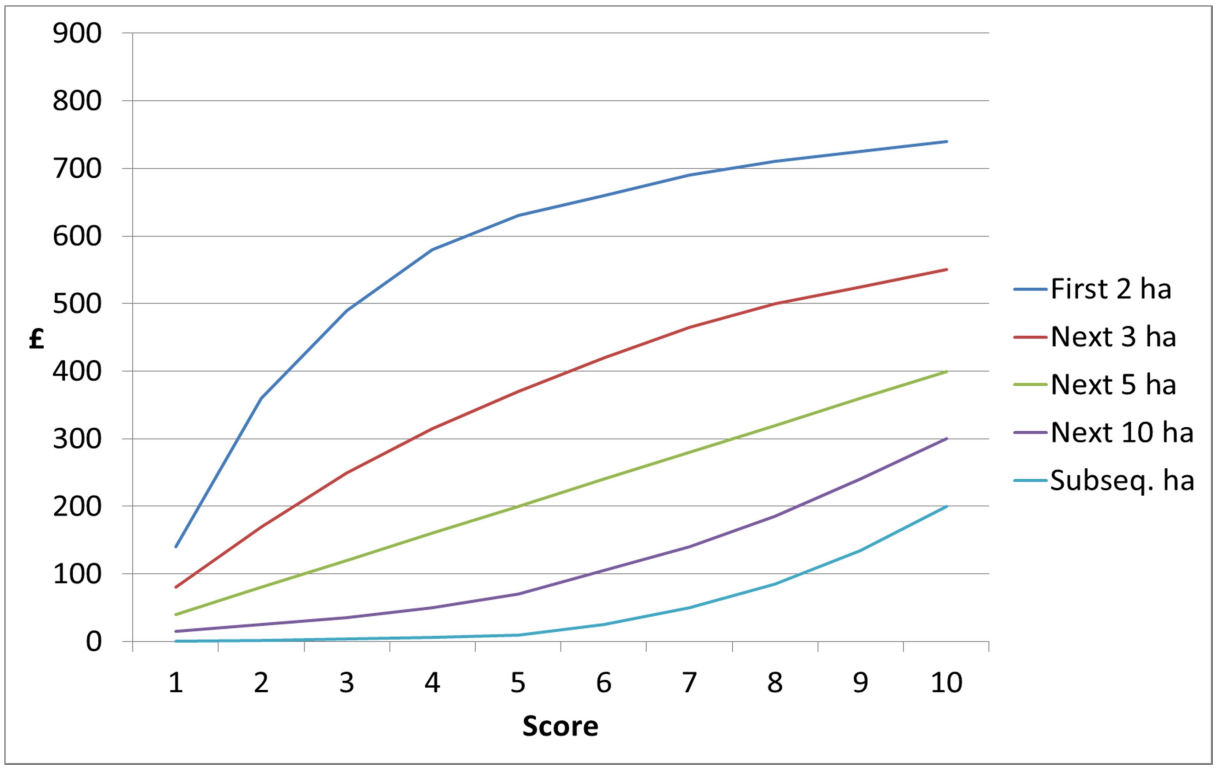

Figure 11. Proposed payment structure for the general (mosaic) card

5.3.5 Tying in the machair and wader cards

In the case of the machair card, we propose following exactly the basic payment structure of the general card – the assumptions are the same; the main reason for having the card is not a different set of agricultural economics, but rather the need to recognise the naturally higher scores of even poorly-managed machair.

In the case of the wader card, we don't propose a different rationale; our main concern here is to modulate the maximum score possible both within the proposed overall system (i.e. how much reward would we give the best wader grassland compared to the best machair or the best species-rich meadow?) and when set alongside the AECS grassland for wader payment. We consider the wader card to be more demanding than AECS; AECS would offer its standard payments to parcels of apparent lower quality for breeding waders.

Taking both factors into consideration, we propose that the wader card maximum score should be fixed at 8, given that that corresponds to a proposed payment of £85/ha.

5.3.6 Tying in the cattle topup

For the sake of completeness, we will describe the proposed approach to the cattle top-up, while noting that we assume:

- That if the measure is available more widely, it would not be payable on common grazings, except where there is a separate cattle enterprise on the grazings comparable to a sheepstock club
- That if the measure is only available on common grazings, it would be reasonable to make it available to the grazings (and we would recommend that the implications of the payment and who it should therefore be paid to is made clear by the committee from the outset)

The proposed structure of the cattle topup is also a compromise. We were convinced by our field visits that cattle are or would be of benefit to biodiversity on a whole range of holdings. This would suggest that it is counter-productive to reduce the top-up to a small amount in the case of low-scoring holdings – this is where cattle might make the most difference, after all. That in turn suggests a fixed payment with no results-based element, paid as a separate measure complementary to the results-based payment (there would be no question of double funding arising). On the other hand, it seemed wrong to offer a fixed payment to the worst cattle keeper which would be equivalent to the very best results-based reward. We propose therefore a high starting level for the top-up, but nevertheless one where the payment increases with score in a way which mimics the base payment.

5.4 The order of scoring parcels

Given the degressive nature of the payment calculations, the order in which parcels are scored can make a difference to the total payment and so contributes to the overall message which any score card gives. For example, in the Freshwater Pearl Mussel Project in Ireland, the lowest scoring parcel receives punitive scores and is counted first in the payment calculation; this reflects the extreme sensitivity or low tolerance of the target species to any water quality challenge, whether in the form of dissolved pollutants or suspended silt.

When we thought we were dealing with inbye alone in the Skye pilot, our feeling was that really good species rich fields are rare and disappearing, and so we should mark our appreciation of them by scoring them first. In the case of rough grazings, neither approach seems obviously the best nor clearly deficient, so we propose initially that we reward the best parcel first, with the proviso that this should be evaluated during Phase 3.

Figure 12. View from Beinn Tairbeart, South Uist, towards Benbecula (Rupert Fleetingly, Creative Commons Licence)

Bog card score		***Score 1***	***Score 2***	***Score 3***	***Score 4***	***Score 5***	***Score 6***	***Score 7***	***Score 8***	***Score 9***	***Score 10***					
General card score		**Score 0.5**	**Score 1**	**Score 1.5**	**Score 2**	**Score 2.5**	**Score 3**	**Score 3.5**	**Score 4**	**Score 4.5**	**Score 5**	**Score 6**	**Score 7**	**Score 8***	**Score 9**	**Score 10**
	Cumulative ha															
Baseline payment																
First 2 ha	2	20	140	260	360	430	490	540	580	610	630	660	690	710	725	740
Next 3 ha	5	18	80	130	170	210	250	285	315	340	370	420	465	500	525	550
Next 5 ha	10	12	40	60	80	100	120	140	160	180	200	240	280	320	360	400
Next 10 ha	20	10	15	20	25	30	35	45	50	60	70	105	140	185	240	300
Subsequent ha	20+	0.5	1	1.5	2	3	4	5	6	8	10	25	55	100	155	220
Cattle top-up																
1st LU, first 2 ha	2	42	295	320	443	466	531	551	592	606	626	646	666	680	690	700
2nd LU, next 3 ha	5	18	79	86	112	118	141	149	165	170	185	203	219	232	241	250

Table 5. Proposed payment matrix for all four score cards (all values in £/ha)

* 8 is the maximum possible score for the wader card

6 Implementation models, law and governance

An easy trap to fall into is one which sees a results-based approach as just a different coloured brick which can be substituted easily for a corresponding action-based measure within an otherwise-unaltered wall of roles, processes and governance requirements. Nothing could be further from the truth. Results-based approaches involve a completely different pattern of commitment and decision-making over time, and a transformed set of relationships between the various actors in the process.

In this section we explore those differences from two points of view: those of the delivery infrastructure (what are now 'agents' and 'administrators/inspectors') and those of process, especially from the unique perspective of grazings committees.

6.1 New process; new framework for delivery

By far the most important lesson to emerge from the Irish experience is the importance of the way measures are delivered. It has proved possible to deliver local adaptedness even with measures which are suitable for widely geographically separated areas (e.g. in the Hen Harrier Project and Pearl Mussel Project). But all of the initiatives have locally-based, locally-invested expert teams which not only implement the narrow agri-environment measure and associated capital investments programme but carry out a whole range of necessary supporting activity – facilitation, negotiation, demonstration, experimentation and so on.

The implementation of traditional 5-year actions-based contracts involves a number of roles and actors:

- Administrators
- Inspectors/auditors
- Providers of advice
- Participants

The administration and inspection function are strictly separated from the provision of advice. RPID staff are meant to make a distinction between general guidance, which they are allowed to give, and specific advice, which in theory they are forbidden from imparting.

In the current scheme model, providers of advice may or may not strictly speaking be agents and they may or may not be paid by the applicants, but in any case their role is usually confined to the start-up phase. Their focus is on imparting the information the applicant needs before and during the submission of the application, including its implications in terms of commitments and payments, and possibly guidance on aspects of governance and internal negotiation between shareholders.

Once the scheme starts, the 'ideal' is for there to be no need of further advice and no unforeseen interactions with RPID, with any inspection passing without any difficulties. Roles fall into place more or less sequentially: advisors > inspectors > administrators (> auditors). The role of the inspector is to ensure initial compliance with expectations and rules and subsequently to catch any breaches and penalise them. Note that most participants have no interaction with anyone engaged in monitoring or evaluation, and that the approach involves no day to day mechanism for reflecting on the success of the actions undertaken.

The results-based model is completely different. The aim of the measure is to achieve or move towards certain objectives by incentivising or rewarding farmers to deliver good and better performance and disincentivising poor or worse performance. There are no actions or inactions which constitute a 'breach' beyond those which apply through GAEC or through normal statutory requirements. All actors are working to the same end; there is an oversight role for administrators and auditors, but it is focussed on ensuring that scoring and the calculation and delivery of the subsequent payments are done correctly and efficiently on behalf of the taxpayer.

There is no particular reason why the routine work with the participants should be done by 'administrators' while higher level advice and discussion is carried out by 'advisors'. In Ireland, the model is almost the opposite – independent advisors carry out the basic annual work on farm, but advice and innovative experimentation communicated directly to farmers usually originates in the project team who also administer the measure. Indeed the project team has the role, and budget to support it, of doing whatever is necessary for the success of the measure. Whatever the mechanism, someone will be needed on the ground on each farm/croft/grazings every year.

It is far from clear what models of delivery would be considered in Scotland. At present neither NS nor RPID are set up to provide the type of scheme implementation with dedicated staff that the results-based approach demands. Meanwhile, the Scottish Government considers at present that SAC Consulting's work on agri-environment is best run through a purely commercial model (one which is very expensive for applicants). RSPB provides free advice in some areas, reflecting their own particular priorities, but a charitable model is hardly a sustainable basis for broad scale implementation.

In Ireland, the current suggestion is that the agri-environment measure is developed as a 'central' measure, perhaps with local variation, but that the local implementation of the measure, including any necessary package of complementary actions, is let out to tender on a sub-regional basis (e.g. parts of counties, mountain ranges, catchments, as appropriate). The tender would ask for a business plan setting out those complementary actions and their approximate cost, but with the understanding that funds could be moved between actions as circumstances changed. In Ireland, this would not need to involve local advisors, who the project team would have the role of training, certifying and controlling.

Any number of models is possible; the current model of breach-orientated administrators and commercially-constrained agents is not one which sits very easily with the results-based approach.

6.2 New process; new pattern of consent and decision-making

It might be thought that a well-functioning results-based measure would make much the same demands on common grazings governance and self-organisation as an action-based scheme. This is however far from the truth. A results-based approach necessitates a rethink on the question of consent and a reframing of the notion of ongoing commitments on the part of graziers and grazings committee.

The traditional prescriptive approach currently comprises a five year commitment/agreement to do (or not do) certain things in return for a fixed amount of money each year. There is a small chance of being inspected, but any penalties applied are for non-compliance with the scheme's dos and don'ts. Applicants for the most part try to 'work round' the demands of the chosen options, hopefully getting their head round any adjustments they need to make. There is an annual claim process, but this is a purely administrative exercise. Only the erection of fences or other one-off 'capital works' necessitates any variation to this general pattern.

Figure 13. Borve machair, Berneray (Gordon Hatton, Creative Commons Licence)

This model puts great weight on the pre-application process. Decisions taken at that time (possibly adjusted in response to RPID or SNH feedback) govern everything that happens for the next five years. A strict set of rules needs, rightly, to be put in place to ensure that the details of the proposed undertakings and of the proposed use and distribution of funds, as well as of any associated costs, are properly disseminated to all of the shareholders and that the written consent of a majority of those ordinarily resident in the locality is obtained. Decisions taken at the start are assumed by RPID to bid potential successors, or at the very least the grazings committee, into the future. And while this has never been tested in court against crofting law, procedures are in place to try to insure the process against such apparent breaches of undertakings. Agents or other advisors (RSPB, for example) are called upon to ensure the best possible chance of success and sometimes to advise on what makes for a fair distribution of the monies.

A results-based approach works in quite a different way. Its essence is *annual* scoring and payment calculation; the initial application is little more than an expression of interest. With the exception of 'capital works', there is no real forward commitment made at any point – the scoring is rewarding *current* condition and, implicitly, *past* management. Indeed, there is no inherent need for any multi-annual contracting; in Ireland, the measures aim to be year-by-year (but nevertheless have very low

drop-out rates). A 'one-sided' commitment by the State could combine the best of both worlds – RPID would commit to making the payments available for a fixed number of years, giving the graziers confidence to make changes to their system or to invest in infrastructure, while the applicant is free to leave at any time. Ireland's experience is that while such an arrangement encourages participation, it results in very low exit rates – feeling that they can leave at any time makes participation less risky, and thus encourages continued participation.

Taken together, this implies a very different pattern of decision-making, consultation and consent. While any grazings committee worth its salt would surely try to estimate the scores its grazings would attract, and work out a framework for payment distribution, the receipts could vary from year to year. They might rise in response to a concerted effort by all of the active graziers, or they might rise due to the actions of an individual. How would this be reflected in that year's payment distribution? The committee would need to have the agreement of graziers to a set of principles they should apply in such circumstances. Equally, scores might fall as a result of, for example, one individual's reckless use of a quad. Shouldn't that individual bear the brunt of the reduced payments? The principles leading to the answer would need to be decided and agreed beforehand.

Figure 14. South Uist from Hecla (Rupert Fleetingly, Creative Commons Licence)

Such questions, as well as how to respond in terms of management to whatever score was adjudged for the year, would arise every year. On the other hand, the decisions need only apply to *that* payment; all of the relevant issues are known. Any proposals to adjust the management of the grazings would similarly be for the following twelve months only – there is no 'binding of successors' or 'disadvantaging the new entrant'.

How and when would the need to consult widely and obtain written consent of shareholders arise under these new circumstances? Every year? Initially for a set of broad principles? Every time some expenditure is proposed?

It seems clear that agri-environment mechanisms should enable common grazings committees to avoid the demanding procedures set out in the Crofting Act for improvements and resumptions. There is no loss or amendment of rights; there is (hopefully) no multi-annual commitment on the part of the applicant. And the Crofting Commission is, at least informally, very clear that it doesn't want to get involved if it can avoid it.

On the other hand, it is equally clear that having an annual requirement to consult with all shareholders and to evidence that process would be a heavy burden on committees. A reasonable compromise, and one that reflects the much more year-to-year character of the mechanism itself might be an initial proposal sent out for general agreement containing elements which include:

- Commitment to ask again for consent after a certain number of years
- Setting out how income is to be distributed including
    - How the initial 'baseline' estimated payment will be distributed (with explicit and clearly set out link to the elements of the payment rationale)
    - How any increase or decrease in payment will be treated, with clear link (or not) to increased relevant activity or damaging actions
    - How any shareholders becoming active or ceasing activity during the year are to be treated
    - Any measures to be taken vis-à-vis cashflow to avoid the need for contributions from individual shareholders

One key to avoiding the improvements procedure is that there is no need to gather in monies from shareholders. That would be necessary in two possible situations – when the expenditure item is not covered by the income from the scheme, or when the expenditure item is covered but the cashflow is negative. Two items in particular might fall into those categories:

- Advisory input. Assistance would probably be needed from some source or other at the time of expression of interest and annually at the time of scoring and distribution of monies. The former is uniquely demanding for common grazings because of the need for some level of prior agreement (see above) and comes 12 months before the first annual payment. Were advice to be provided commercially (see below for discussion of that issue), there is a good justification for covering the cost of this, if only to put common grazings on a level playing field with other applicants. For the annual assessment, any commercially-provided advisory input could be built into the calculation for a common grazings-specific additional payment.
- Capital items. The tradition in Scotland is for agri-environment capital costs to be (in theory) 100% funded. The issue is then primarily one of cashflow. This is one area where freedom from EU rules could be positive – there is no reason in principle why a substantial advance might not be paid which, if combined with a prudent plan for the retention/distribution of income, could cover any potential cashflow issues. One model might be to offer an advance

which corresponds to the CAGS rate, with the balance being paid at the year end; that way, a common grazings which chooses to leave the scheme has had no favourable treatment.

This leads us to a number of recommendations:

- Mechanisms should be designed, as far as possible, to allow participation by grazings without needing to invoke the statutory procedures set down for improvements or resumptions or crofter forestry. In particular this means steering clear of elements of the mechanism which would require the raising of monies from shareholders.
- For the start-up process, there should be a fixed payment of £1000 payable on submission of an application accompanied by an internal agreement setting out the principles by which monies would be distributed or retained, and without the need for invoices or receipts. This should not be linked to acceptance into the scheme.
- For the annual work, grazings where there is no common flock or herd (i.e. no sheepstock club), the higher payment for the first hectares which normally recognise the diseconomies of scale for sheep flocks and cattle herds should instead cover the annual transaction costs of scoring and distribution of monies. Where there is a common flock or herd, an additional £1000 would be paid annually on receipt of the claim/scoring information.
- Any capital work should be funded partly in advance, with the total advance being no greater than the CAGS rate for that item where it would be covered by CAGS and 80% otherwise; the balance would be paid with the area payment for that year.

6.3 Estimating the transaction costs of a common grazings applicant

With the assistance of data from Janette Sutherland, SAC Consulting, Portree, we estimated the likely initial and annual transaction costs for a grazings committee. We made a number of underlying assumptions, as follows:

- Hourly rate for clerk/committee: £15/hr
- Hourly rate for advisor (see discussion below): £80
- That informing a shareholder officially costs £1 per shareholder
- We assume a 'standard grazings committee' of 5 members

6.3.1 Pre-participation (initial) costs

We assumed that the committee, with support from a project officer or advisor, would need to:

- Estimate the likely score(s) and the resulting payment(s)
- Understand the logic of the payments and which costs they should be directed to cover, including any payment for preparatory work
- Set out clearly how the payments would be allocated at the end of each year, including rules for shareholdings which had changed hands or become actively used or had ceased to be actively used during the year
- Set out clearly how those allocations would change were the score to change, i.e. how would changes in individual effort be recognised or any reduction in payment due to individual neglect or deliberate action be reflected in payment allocations
- Hold at least one grazings meeting to discuss the scheme
- Consult formally by mail (as per current AE scheme rules)

If we assume an advisory input of a minimum of 1 day per grazings of 100 ha, plus another day for each additional 1000 ha, then costs are of the following order for a grazings with 1000 ha and 20 shareholders:

First year (before money due)			
	hr.	Cost	
Preparation	5	£75	=5 x 15
External advice	14.25	£1,140	=(7.5 + ((1000-100)/1000 x 7.5)) x 80
Drawing up case and holding meeting	10	£150	=10 x 15
Contacting shareholders - time	2	£30	=2 x 15
Contacting shareholders - printing & post	20	£20	=1 x 20
		£1,415	

Table 6. Estimated initial costs of a results-based application for a common grazings

Note that the cost does not vary much by the number of shareholders, but does vary considerably by area: we suggest that the latter is taken into consideration when such a payment is calculated, perhaps by the use of size bands.

On the other hand, the bulk of the costs are in the form of external advice; a project officer implementation model, or a model where the costs of advisors are borne directly by Government would have a very large impact on the outgoings of the committee.

6.3.2 Annual (year-end) costs

Costs are similar, but the advisory input in terms of walking the ground would be less – we have assumed a minimum time allocation of 3 hours for the first 100 ha, plus 4 hours for each 1000 ha after that.

Annual costs during participation			
	hr.	Cost	
Coordination/claims etc.	2	£30	=5 x 15
Participating in annual assessment	15	£225	=15 x 15
External advice	6.6	£528	=(3 + ((1000-100)/1000 x 4)) x 80
Drawing up case and holding meeting	10	£150	=10 x 15
Contacting shareholders - time	2	£30	=2 x 15
Contacting shareholders - printing & post	0	£0	=1 x 20
Administration of funds	4	£60	
		£1,023	

Table 7. Estimated year end costs for a common grazings participant in a results-based scheme

In this case, the costs for grazings are higher than that for individual applicants, but not otherwise unique. We propose that the degressive element is used to pay for this in the case of common grazings; the sums involved are of a similar order.

7 The common grazings of the Outer Hebrides – are any non-ecological variables important for measure design?

7.1 Basic data

There are approximately 269 grazings in the Western Isles, extending to just short of 200,000ha, and split per parish as shown in *Table 8*. This is around 29% of the 918 or so grazings in Scotland and about 33% of the 590,901ha of common grazings in the country as a whole (Jones 2011).

Parish	Grazings	% of all grazings	Current area (ROC with additions)
Barvas	29	10.8	35402
Uig	38	14.1	34259
Stornoway	27	10.0	31655
Lochs	21	7.8	20145
Harris	44	16.4	29360
N Uist	35	13.0	14176
S Uist	54	20.1	22655
Barra	21	7.8	5995
Total	269	100	193646

Table 8. Common grazings per parish

A major task in an exercise to design a more results-based measure is to address the way it works on the ground for a successful applicant – does it give a clear message in terms of the objectives and how they will be measured; how well do these map onto higher level policy aims; are the payments fair and well-designed in terms of crofting law and the needs of auditor, and a host of similar questions.

Such considerations are however not the only ones of relevance. The proposed measure must also be not only easily accessible, but equally accessible to all of its 'target audience', other things being equal. More than that, it should be equally attractive to all, other things being equal, not just accessible in principle. Any barriers to participation should be the result of deliberate policy decisions, not accidental results of design failure.

If the current and recent agri-environment support measures are evaluated purely in terms of uptake, recent work suggests that they can hardly be deemed a success (Jones 2011) (Jones 2012) (Jones 2018). Even when considered against broader outcomes - Natura 2000 objectives on Uist machairs, for example - the level and pattern of uptake seems surprisingly patchy and at least superficially unsatisfactory.

Such patterns can of course derive in part from the deliberate targeting as part of the design of the measure; while open to political criticism, this is entirely appropriate and expected, given the limitations on the public finances and the need to ensure value for money. But they can also result from a failure to consider properly the possible impediments to participation during the design of the scheme.

Failures in the design process are often paralleled, as the previous work cited above also highlighted, by a weakness in policy evaluation. How do we know that the intended target participants are applying successfully for the measure? Is the measure reaching everyone it should, or are some types of applicant being excluded? Could and should the measure be adjusted to accommodate such potential participants?

This section tries to assess, if possible with quantifiable metrics, some of the main possible impediments to participation by particular common grazings committees in an outcome-focussed agri-environment measure. It complements the work on the habitats present which we present in Section 0 below. We are not looking here at factors which can (and have in the past) relate to targeting by policy – the presence of designated areas on grazings, for example. Neither do we look at general questions applicable to all grazings; rather we focus on factors which show considerable variation within the overall population of grazings. We ask whether some groups of grazings are already showing signs of being particularly challenged and what challenges could arise in future.

Our aim then is two-fold. First we look for potential weaknesses which might be considered and addressed during the design of measures. And second, we point out the kind of segmentation which might prove useless during the ongoing evaluation of any measures which might be implemented.

This section draws on a range of data sources, particularly the Register of Crofts, the Crofting Register and Rural Payments data. We are particularly grateful to Iain Murdo Macmillan and David Mackay of SAC Consulting in Stornoway and Benbecula for their invaluable help with the last named. Thanks also to John Toal in the Crofting Commission for information on grazings committees in office.

7.2 Area of the grazings

We had a choice of data sources. We found the Register of Crofting data to be worryingly unreliable. While we lacked LPIS data for half a dozen grazings, and there are instances where some merging (or possibly even overlapping) of data occurs, it was felt that that this data source is in broad terms reliable.

For most grazings we also had a choice between using gross and net area. We chose net, as being the best estimate of the land which is agriculturally useful, but we recognise that for some considerations (time needed for gathering, for example), gross area might be more meaningful. In the few cases where net area was not available, we substituted gross area.

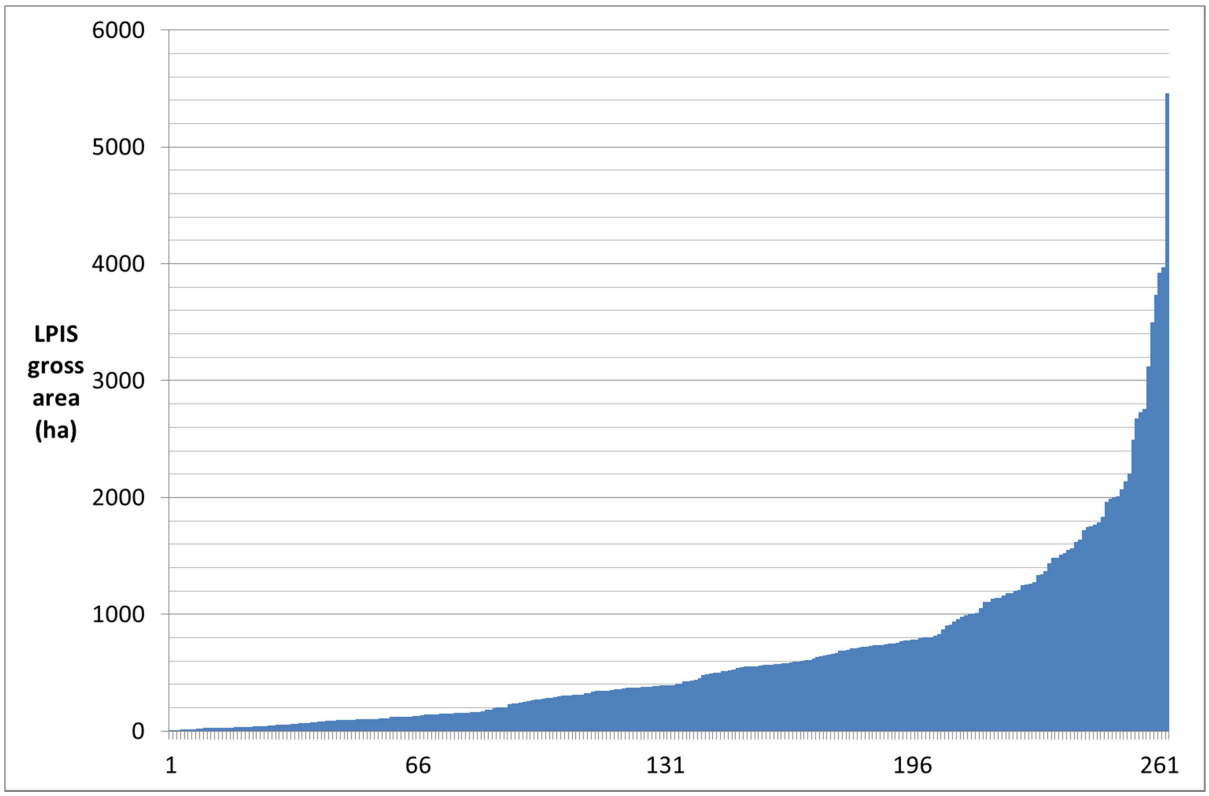

Figure 15. Variation in net LPIS area of the grazings

	Minimum	Lower quartile	Median	Upper quartile	Maximum	Mean
Area (ha)	3	126	392	784	5456	651

Table 9. Summary data, all parishes: net LPIS area per grazing

Why might it be a consideration during measure design and a variable to control for during evaluation?

Grazings with a small extent might find a measure designed for the 'average' grazings unattractive in terms of the balance between the effort and cost of applying and participation compared to the reward.

Does this appear to be a limiting factor just now?

While there is certainly a tendency for more of the larger grazings to have a committee in office (*Figure 16*), this pattern is strikingly weak, with committees in office over the whole range of grazings area, including some of the very smallest.

Participation in agri-environment seems somewhat more skewed towards larger grazings (*Figure 17*). However, participation is almost entirely governed by whether or not part of the grazings area is designated (see Section 7.8 below); the grazings which fall within the Lewis Peatlands Natura site are almost all, by the geography of the area, large in area.

Figure 16. Committees in office by grazings net LPIS area[4]

Figure 17. Participation in AECS by grazings net LPIS area

However, when the net is widened to include not only forestry schemes (where designation is if anything a negative factor) but also CAGS, the size effect is still visible, but less so (*Figure 18*). (And it is also noteworthy that 45% of agri-environment participants have also claimed CAGS in the last two years). Turning the same information on its head, there are dozens of smaller grazings where there are committees in office without the rationale of desiring to avail themselves of RDP finance.

Figure 18. Participation in any RDP measure by grazings net LPIS area

Similar patterns can be seen when the same exercises are carried out using the proportion of Region 3 or Region 1 land as variables. In other words, the pattern is no stronger when the focus in on the apparent land capability, or lack of it, of the grazings.

In summary, it is by no means clear that size is currently of overwhelming significance when it comes to capacity for grazings governance, nor is it an impediment to measure participation, though evidence on the latter is limited.

What questions should be asked during Phase 3?

- Is this measure attractive for the grazings committee of a grazings <100 ha in area?

7.3 Number of shareholdings

Under this heading we mean the number of separate shareholdings listed on the Register of Crofts. This is the only measure of the number of interests we have available for (almost) all of the grazings. We recognise that this is not the same as the number of different shareholders, as some may hold multiple shares. We do have some data on that also, but only for a subset of grazings; we present this information in section 7.5 below.

[4] We have used this unusual but effective form of diagram to illustrate various features as they are distributed across the range of grazings. In this case the lines represent the grazings which have committees in office, while those without are blank; the grazings are ordered from right to left by increasing net LPIS area in this case

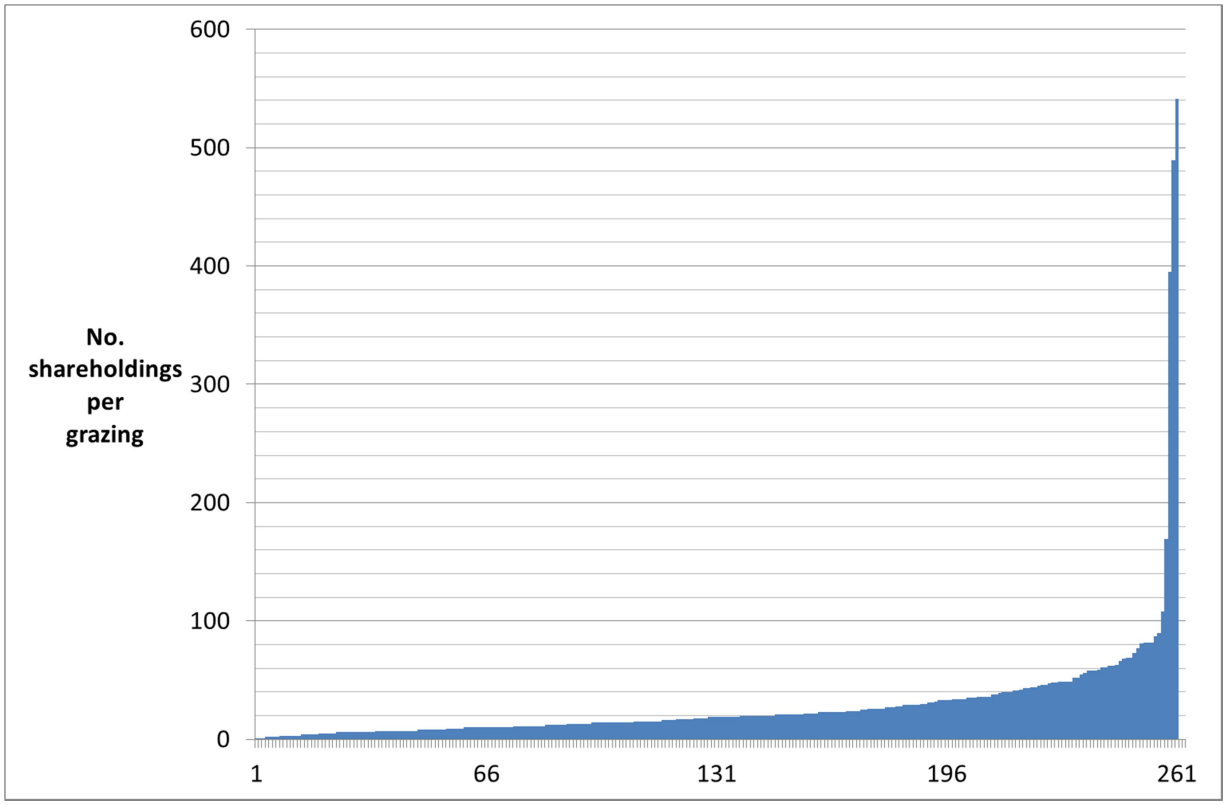

Figure 19. Variation in shareholdings per grazings

	Minimum	Lower quartile	Median	Upper quartile	Maximum	Mean
Shareholdings	1	10	19	33	541	29

Table 10. Summary data, all parishes: shareholdings per grazings

Why might it be a consideration during measure design and a variable to control for during evaluation?

The extra transaction costs of a common grazings compared to a hill farm are the social costs of reaching agreement and of working together – they are the costs of dealing with other people. It is not inconceivable that these costs increase with the number of interested persons.

Does this appear to be a limiting factor just now?

We showed in a previous report (Jones 2012) that common grazings are significantly less likely to participate in agri-environment schemes than sole traders. We noted also how this often seems also to be the case even when the grazings are designated and could, in theory, gain access to the measure; South Uist is a case in point, for example. We are not dealing with this broader (and important) question here – see section 7.8 for this discussion.

When it comes to having committees in office, the pattern for shareholdings is much like that for net area – there is a thinning out at the very bottom end of the scale, but otherwise surprisingly little variation (*Figure 20*). In the lowest quartile (up to 10 shareholdings), one could well imagine self-organisation and negotiation being able to happen without a formal structure and the involvement

of the Commission; as such, this is not necessarily an indication of lack of capacity or of significant impediment.

One reassuring thing to note is the high frequency of committees at the upper end of the scale, where the transaction costs could be some of the highest.

Figure 20. Committees in office by shareholdings per grazings

Unsurprisingly, participation in AECS also follows more or less the pattern by net area, and undoubtedly the underlying factors listed there are also manifested here (Figure 21). If anything, participation is lower at the bottom end of this spectrum, i.e. small area seems to be less of a deterrent factor than having a *low* number of shareholdings, despite a low number of shareholdings being notionally liked to higher transaction costs. It is not clear what implication should be drawn from this.

Figure 21. Agri-environment participation by shareholdings per grazings

Overall, the same pattern of smaller grazings finding it not worthwhile bothering with agri-environment schemes suggests itself, especially when set against the slightly better uptake of RDP measures in general (Figure 22).

Figure 22. RDP scheme participation by shareholdings per grazings

What questions should be asked during Phase 3?

- Is this measure attractive to grazings with <50 shareholdings?

7.4 Area of grazing per share

For this variable we combined the previous two – net LPIS area and shareholdings per grazings. Note that the data relates to the 'official' shareholdings – it is likely that many shares are used 'by word of mouth' by other shareholders, not least for the claiming of BPS and LFASS through the submission of form PF27 annually.

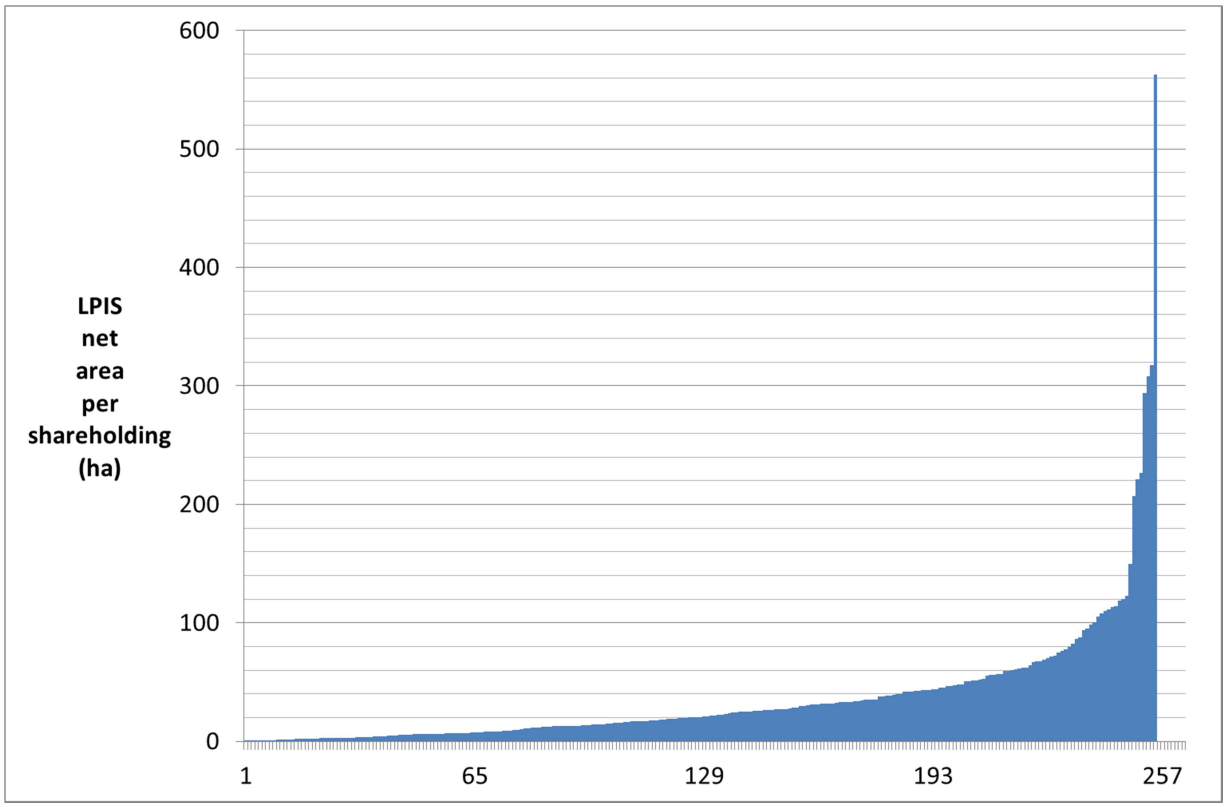

Figure 23. Variation in net grazings area per shareholding

	Minimum	Lower quartile	Median	Upper quartile	Maximum	Mean
Area per share (ha)	0.60	7.28	20.32	43.11	562.97	20.48

Table 11. Summary data, all parishes: net LPIS area per shareholding per grazings

Why might it be a consideration during measure design and a variable to control for during evaluation?

While the overall cost-benefit assessment for a grazings deciding whether or not to respond to certain incentives (or indeed the capacity to make that decision) might conceivably have some relation to the overall size of the grazings or the number of individual interests represented on it, there may also be factors which operate at the individual level.

One of the more impersonal of these is the net area per share. The hypothesis here is that for an individual the question of whether or not to give the time to achieve a certain end depends not only on the overall balance of effort and reward, but the balance of personal effort and personal reward. And that the potential personal financial reward is not unrelated to the net area of grazings per shareholder. This would be particularly the case where the tradition on the grazings is to share out any gains immediately; the dynamics could be different where the first call on income was investment on the grazings, for example to co-fund CAGS-aided items.

Does this appear to be a limiting factor just now?

Once more, there seems to be hardly any pattern visible when it comes to whether or not a grazings has a committee in office. The thinnest representation is at the very largest area per share, interestingly (*Figure 24*).

Figure 24. Committees in office by net LIPS area per shareholder

There is no correlation between net LPIS are per shareholder and participation in an agri-environment scheme, which might be thought the thing where most individual benefit might accrue (*Figure 25*). For the broader range of schemes, if anything the pattern is that fewer grazings with large areas per shareholder have lower participation levels – the opposite of what was postulated, and a difficult phenomenon to explain (*Figure 26*).

Figure 25. Agri-environment participation by net LPIS area per shareholder

Figure 26. RDP scheme participation by net LPIS area per shareholder

What questions should be asked during Phase 3?
There seems to be no significant issue to be borne in mind in this case.

7.5 Number of shareholders

As discussed in section 7.3 above, a better measure of social complexity than theoretical shareholdings would be the number of actual shareholders, i.e. taking account of multiple croft tenancies or ownership. Such information could be obtained by detailed analysis of the Register of Crofts, but this is not possible with ease using the data currently publicly-available.

For a subsample of 87 common grazings who are clients of SAC Consulting, it has been possible to compare the number of shares and the number of shareholding individuals (i.e. crofters). In most cases the numbers are very similar – the average number of shares per shareholder is just 1.03. But seven grazings have >1.3 shares per shareholder:

This suggests that while multiple croft-holding may be significant in some townships, these are exceptional; using data on shares is therefore a realistic approximation for all but the most detailed of analyses.

Grazings	Shares	Shareholders	Shares/shareholder
Rushgarry (Harris (Berneray))	21	16	1.31
Torlum (S Uist (Benbecula))	21	16	1.31
Baleshare (N Uist)	20	14	1.43
Sandwick Hill and North Street (Stornoway)	49	34	1.44
Gress (Stornoway)	47	30	1.57
Upper Bayble (Stornoway)	63	36	1.75
Tong & Aird Tong (Stornoway)	68	33	2.06

Table 12. Grazings with the highest shareholdings per shareholder

A very closely-related calculation – shareholdings per crofter on a parish basis - was done as part of the preparation work for *Support for Crofting*. As *Table 13* shows, the pattern varies significantly, even at parish level, with no simple pattern emerging; it is more than likely that the pattern is similarly complex between grazings.

Parish	Mean no. of shares/crofter
Barvas	2.09
Stornoway	1.43
Uig	1.50
Lochs	1.18
Harris	1.15
North Uist	1.46
South Uist	1.37
Barra	1.52

Table 13. Mean no. of crofts per crofter by parish

Note however that the mean shareholding per shareholder figure from the SAC Consulting – 1.03 – is significantly lower than the parish averages calculated for shares per crofter from the Register of Crofts. Since these are parishes where crofts without a share in common grazings are a very rare exception, the patterns should be similar. The obvious explanation is that there is a bigger propensity to have multiple croft occupancy *between* townships than within townships. Why this might be or whether it has any wider significance are matters beyond the scope of this report.

What questions should be asked during Phase 3?

Even if this variable could have an impact in theory, the variation in practice is likely to be too low to make a difference in practice.

7.6 Number of active shareholders

Without asking each grazings in turn, it is not possible to give an accurate picture of the number of active graziers. A first estimate, and an indication of a certain engagement with support payments at least, is the number of BPS claims submitted per grazings. This data is accessible to RPID, but was only available to this study for the 87 SAC Consulting client grazings – possibly a subset with an above-average level of engagement.

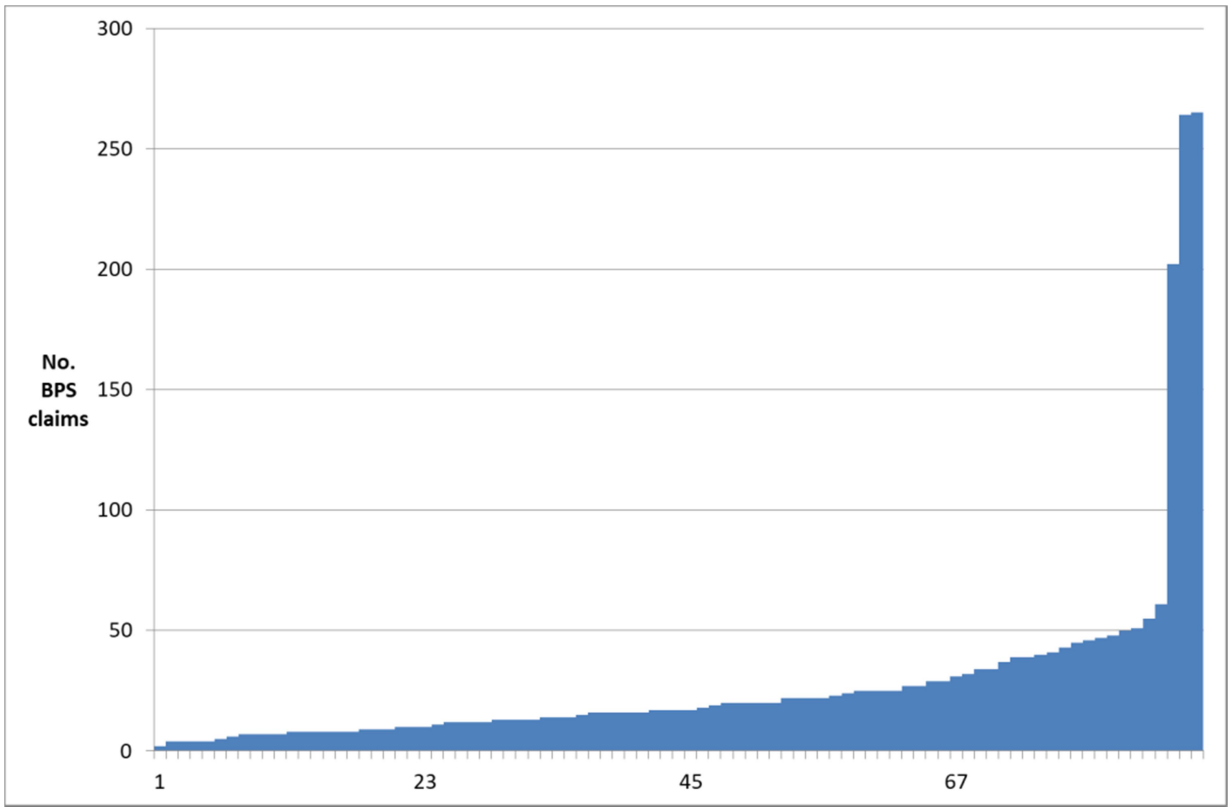

Figure 27. BPS claims per grazings, SAC Consulting client subsample

It should be made clear that the data is actually of shareholders with a BRN – this does not indicate a BPS claim incontrovertibly, but is highly likely to do so. It does not imply that the other shares are not claimed by someone on a 'word of mouth' basis (i.e. by means of form PF27).

	Minimum	Lower quartile	Median	Upper quartile	Maximum	Mean
BPS claims/grazings	2	10	17	29	265	28

Table 14. Summary data, SAC Consulting client subsample: BPS claims per grazings

For the 87 grazings in the SAC subsample, it is possible to show graphically (Figure 28) the relationship between shareholders (individual Business Reference Numbers (BRN) or crofts not linked to a BRN), 'shares claimed' (shareholders minus shares not associated with a BRN) and 'BPS claimants' (individual BRN).

As logic would suggest, the general pattern is shareholdings>shares claimed>claimants, but the scale of variation is very unpredictable, as illustrated by the ups and downs of the second and third curves. There is no real pattern (and it is one which is difficult to show meaningfully on a diagram, since the % values available for grazings with small numbers of shareholders are limited and can distort the picture).

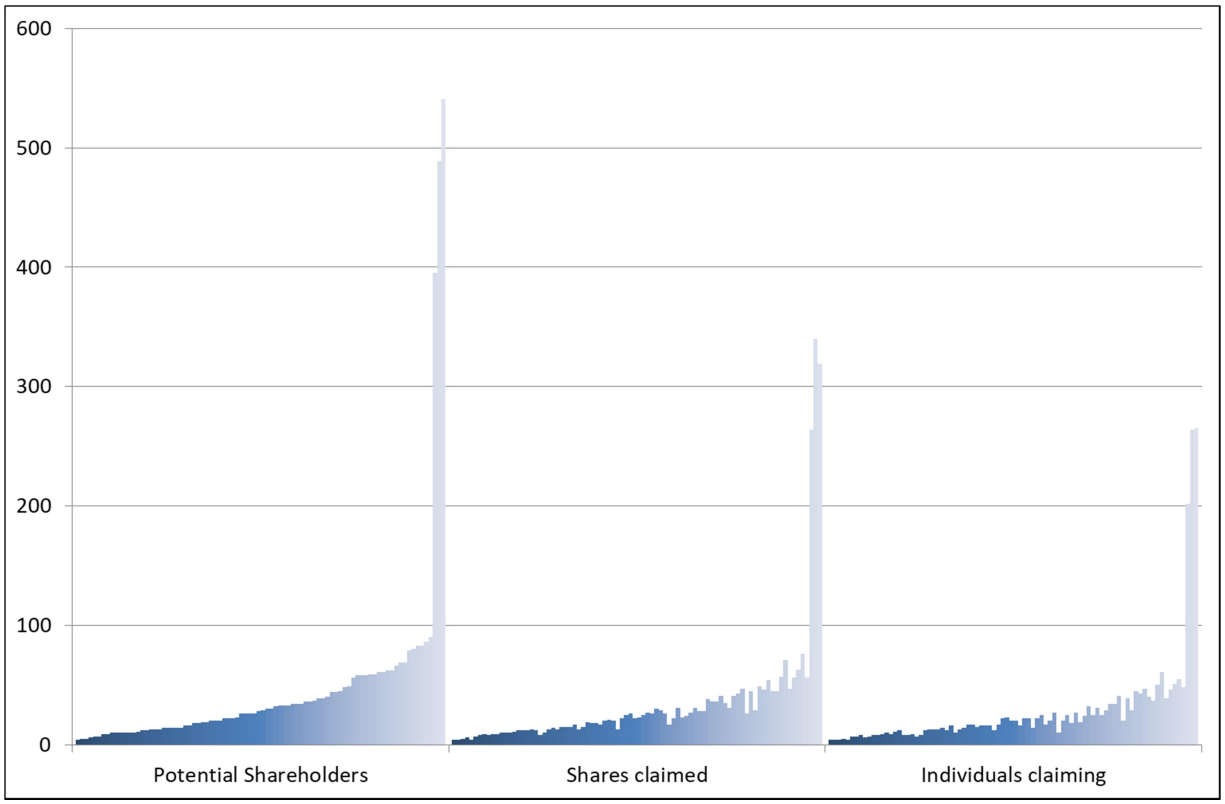

Figure 28. Relationship between shareholders, shares used to claim BPA and individuals claiming on grazings in SAC Consulting client subsample. Grazings ordered by no. of shareholders.

Overall, for this subset of grazings as least, the distribution of claiming shareholders as a proportion of the total (Figure 29) is fairly evenly spread in the 50-90% range (mean: 59; median: 69).

A few grazings have a significantly lower participation rate. The lowest two are in Point and the eastern suburbs of Stornoway, but the surprise is perhaps more that they are SAC Consulting clients than that they have a low participation rate. It would be very surprising if these did not give some indication of the more general pattern in more challenging areas. An indication of the scale of the challenge is given in Table 15. Note that both of the parishes with the lowest levels of claims have more productive areas which will lift the percentages (e.g. Eoligarry, the townships of the Back area).

What questions should be asked during Phase 3?

- What mechanisms can be put in place to secure the agreement or avoid the objections of shareholders who are not active? (See also section 6.1)
- How should the consent documents describe the measure so as to allow for both the rewarding of active graziers fairly for their activity over the whole of the area they use and the safeguarding the rights of the inactive to become active at any point? (See also section 6.1)

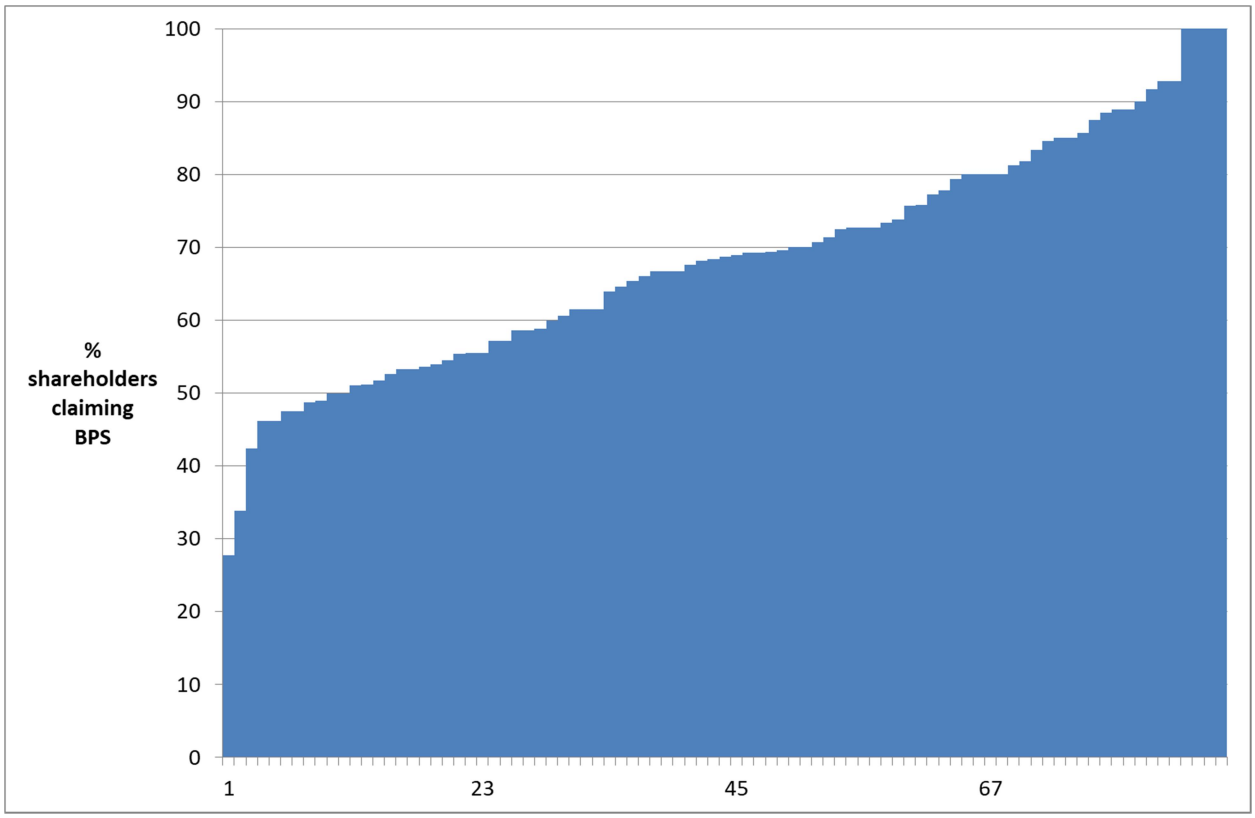

Figure 29. Percentage of shareholders with BRN by grazings, SAC Consulting client subsample

Parish	% of LFASS claims with CG area	Shareholdings (ROC)	Potential claimants	No. of LFASS claims with CG area	% Claims/ potential claimants
Barvas	95.3	1882	900	284	31.6
Stornoway	95.3	1744	1220	261	21.4
Uig	93.2	797	531	234	44.1
Lochs	95.8	583	492	227	46.1
Harris	92.7	554	481	203	42.2
North Uist	89.1	508	349	188	53.9
South Uist	93.1	1009	734	390	53.1
Barra	92.6	601	395	87	22.0
Average/Total	93.7	7678	5102	1874	36.7

Table 15. Percentage of crofters claiming LFASS on grazings shares by parish (2010 LFASS data; current ROC data)

7.7 Measures of capacity in grazings committees

The previous sections have looked at general variables and assessed whether or not they appear to have significant impacts on the 'rural development performance' or 'rural development capacity' of grazings using three very crude measures – having a grazings committee in office, participation in RDP schemes in general and participation in AECS in particular. In this section we look more closely at such 'capacity' measures to see if other patterns of interest and possible concern emerge.

177 of the 270 or so grazings had a grazings committee in office on 15/07/20 – around two thirds of the total. There is quite some variation by parish, but the underlying pattern is very difficult to

discern. All of the Lewis parishes do better than all of the rest; the Uists are bottom of the pile (*Figure 30*).

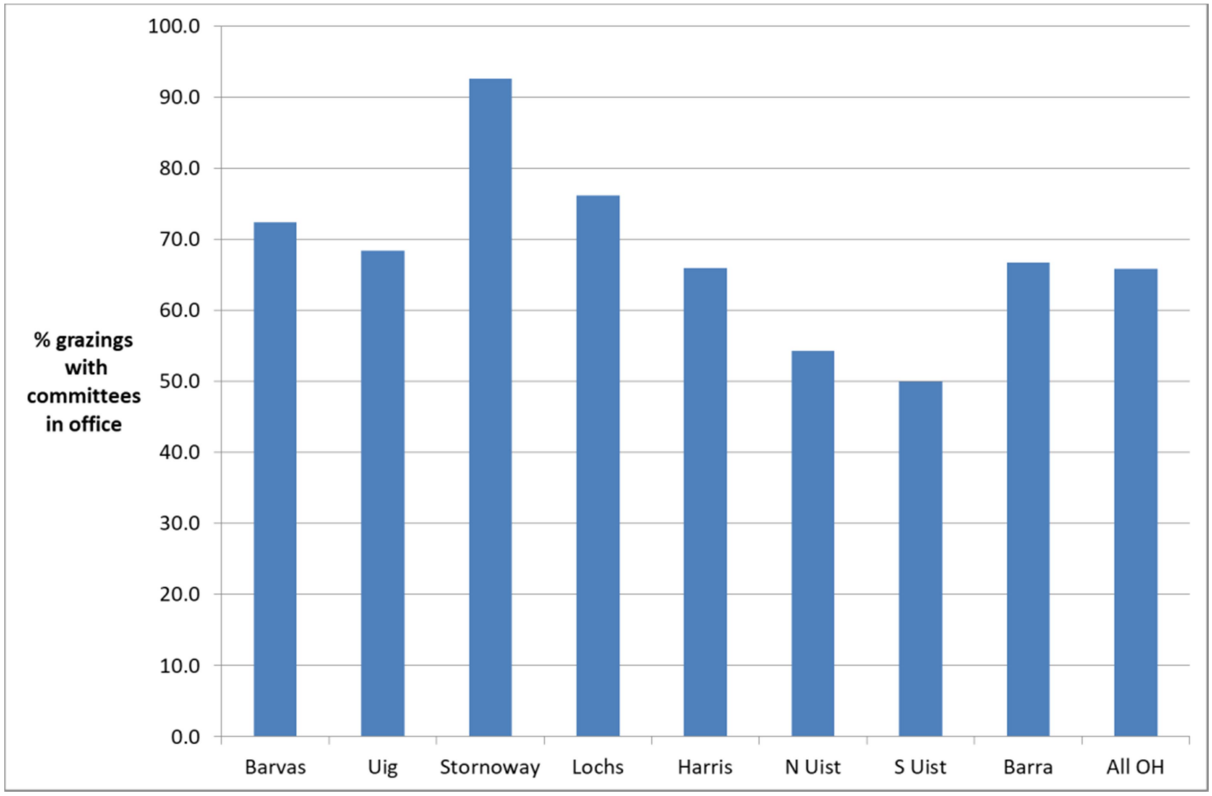

Figure 30. Percentage of grazings with a committee in office in July 2020

What of higher level indicators of capacity? We know from publicly-available CAP Payments data which grazings received an RDP payment in 2018 or 2019 (from AECS, a forestry scheme or CAGS) and we know from SAC Consulting data what grazings are currently using them as agents (though this understates the use of SAC services by active shareholders, clerks etc., acting as individuals but nevertheless able to access information on upcoming opportunities for the grazings).

Altogether we can show that 113 grazings (around 4 in 10) were demonstrably 'plugged in' to 'the system' by one or other of those two measures. Of these, 87 had SAC Consulting as formal agents, while 91 had received an RDP payment in 2018 or 2019.

The two are closely related, but not perfectly so – 26 of the grazings in receipt of RDP scheme payment income do not currently have SAC as an agent. In the Uists, many of these were agri-environment participants, suggesting that other bodies or individuals are acting as agents or advisors for applicants. Elsewhere they were almost exclusively CAGS claimants, suggesting that grazings had sufficient capacity within the community to apply for the grant.

Here again, stark geographical discrepancies are to be seen (*Figure 31*). The prominence of Stornoway parish is extraordinary – is this a reflection of a combination of good AECS potential (designated sites) and the influx of windfarm monies which have been used to co-fund CAGS, or of advisory effort, or perhaps a combination of both? The low figures for Harris and Barra, even compared to Lochs and Uig, are perhaps not so surprising – with some exceptions, grazings are both

agriculturally unpromising and undesignated. But the low numbers for North and South Uist are once again somewhat of a mystery (see also section 7.8 below). In North Uist, the large holdings with good agricultural conditions and lots of AECS money available could conceivably mean that it isn't worth the effort of bothering with schemes on common grazings. But is this also true for South Uist with its much smaller holdings? Why is South Uist worse than Lochs?!

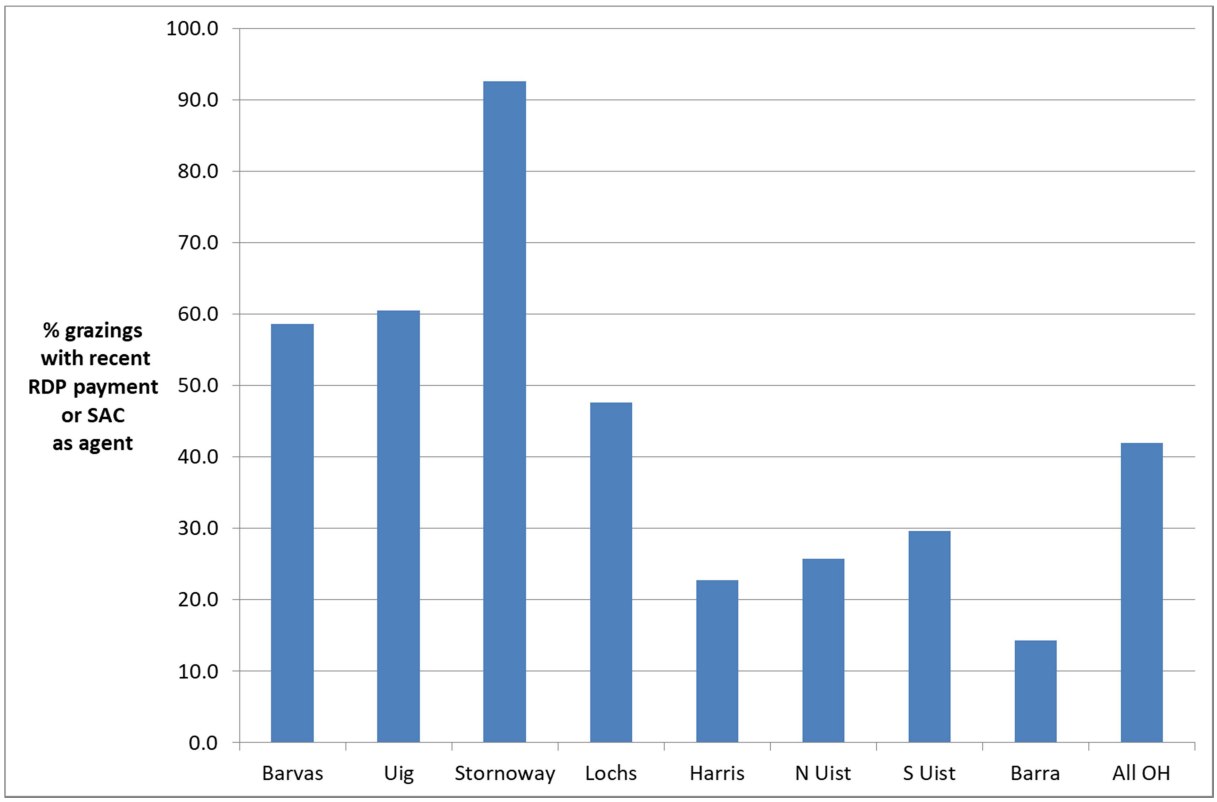

Figure 31. An indication of grazings 'capacity' - percentage by parish in recent receipt of an RDP payment or with SAC Consulting as an agent

In passing, it was noticeable how many agri-environment participants were also investing through CAGS. 64 grazings were in receipt of agri-environment payments (just below a quarter of the total, but, interestingly, more than were in receipt of the much more accessible CAGS), 29 of those (45%) were also in receipt of CAGS, compared to 54 out of the whole population (20%).

A respectable 83 grazings were not recent scheme participants and did not have SAC Consulting as agents but nevertheless had a committee in office – having a committee in office is most definitely not just a phenomenon associated with 'scheme-chasing'.

That leaves 70 or so grazings; the exact number is unclear due to the uncertainties associated with the Register of Crofts. Interestingly, 23 of those were entered into the Crofting Register (there are 113 such grazings in total currently), though that may reflect a triggering event which does not originate with the committee - the submission of a request for apportionment, for example - which can be a sign of any number of things. Their distribution as a percentage of all grazings in the parish is shown in *Figure 32*.

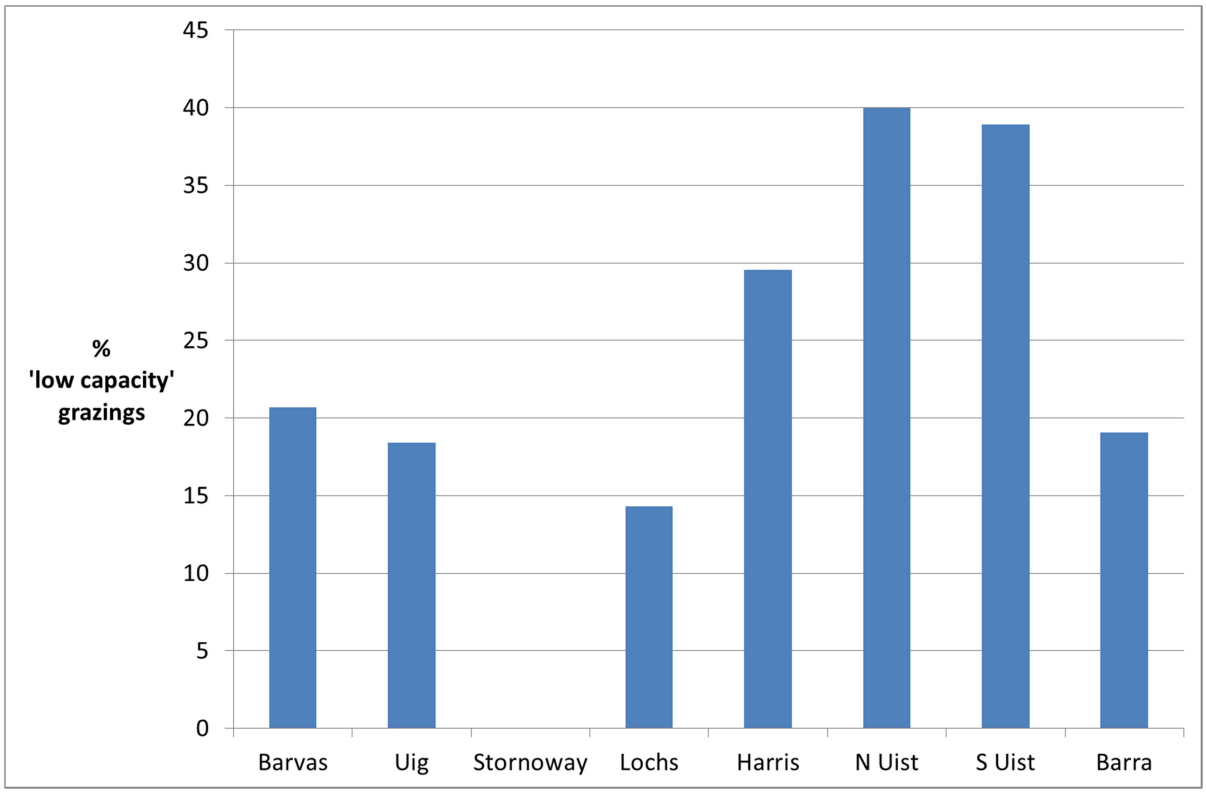

Figure 32. Percentage of grazings by parish with neither a committee in office nor a recent RDP payment nor having SAC Consulting as an agent

Note that Stornoway has no such grazings – again, quite extraordinary. Barvas is complicated by the unclear demarcation between Ness General and township grazings (how many grazings 'should' there be?). Once again, Harris is understandably high, but the mystery is the Uists.

7.8 The apparently uneven impact of designation

We turn then to look specifically at the impact of designation (*Figure 33*) - is it the fundamental and reliable determinant of agri-environment participation, with all that flows from that, from giving a reason for graziers to work together in a committee to the ability to co-fund CAGS?

As shown in *Figure 34*, the number of grazings which are designated is very similar in Lewis and Harris on the one hand and the Uists and Barra on the other, but the number participating in AE is much higher in the former than the latter. And while it is true that a much higher proportion of designated grazings are able to access AE, participation by both grazings with designation and grazings without is much higher in Lewis and Harris, with participation levels by *non*-designated grazings there being not much lower than participation by designated grazings in the southern islands.

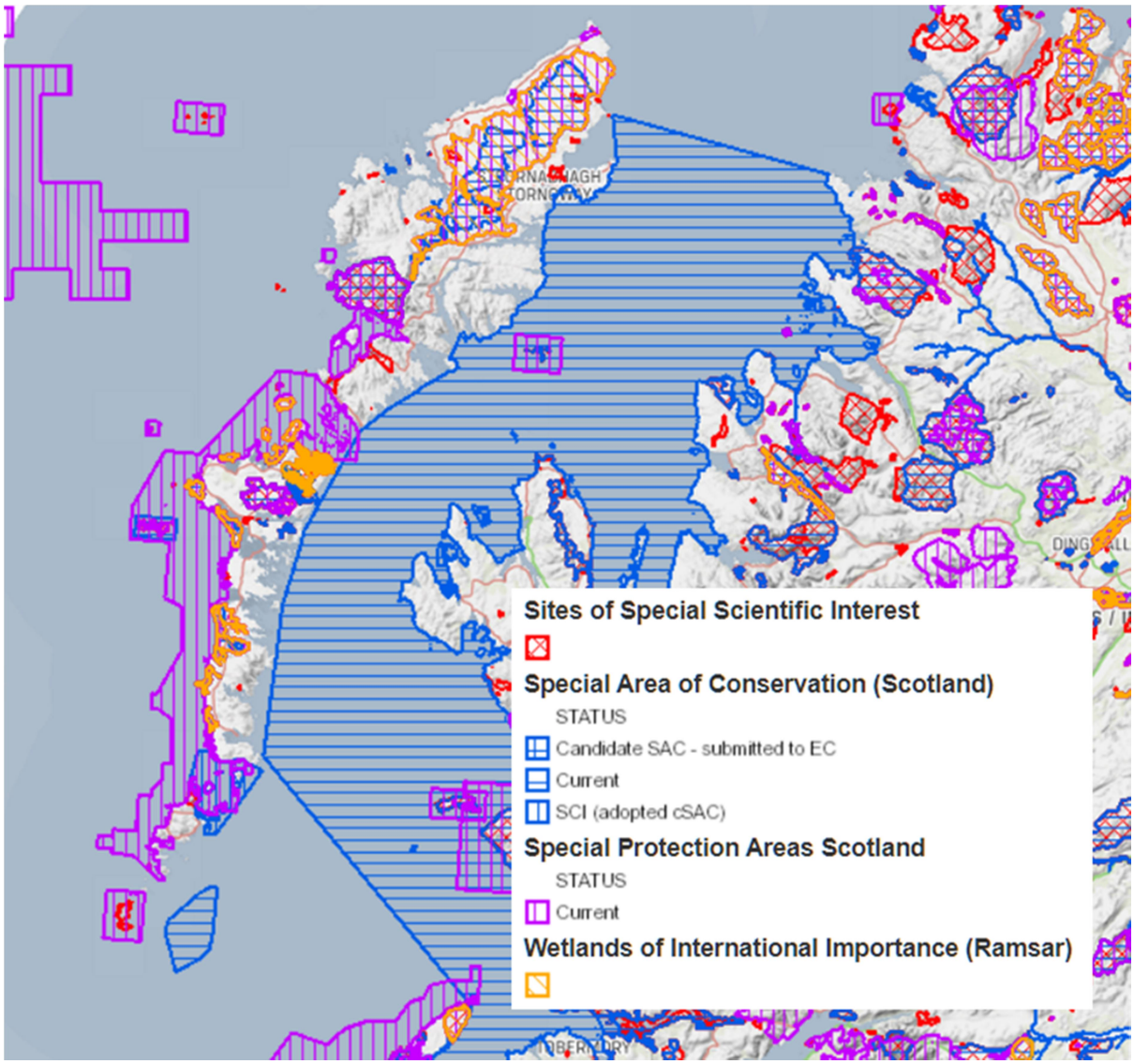

Figure 33. Conservation designations in the Outer Hebrides

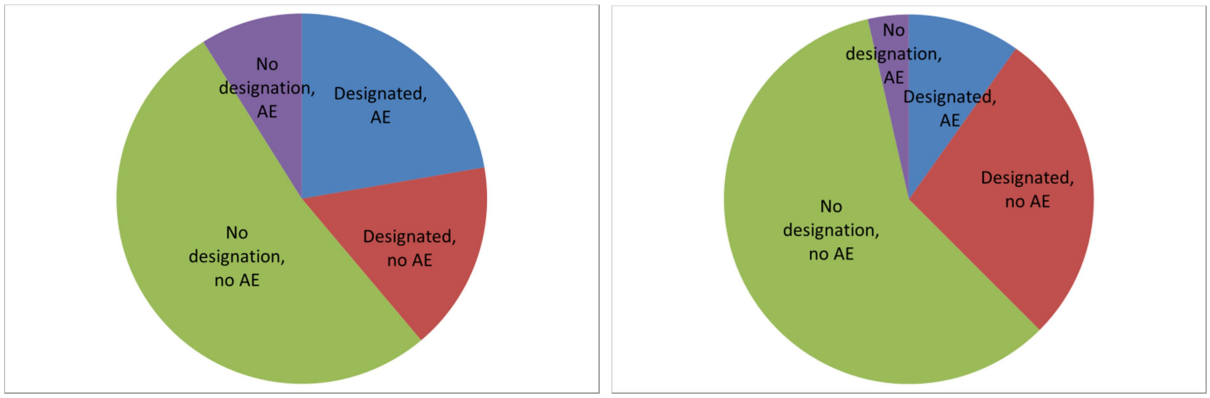

Figure 34. Interaction of designation and agri-environment participation for Lewis and Harris (left) and Uists and Barra (right) grazings

Looking at the same evidence in terms of percentages in each parish, a similar pattern emerges (*Figure 35*). Lochs, Stornoway and Barvas have the best uptake, followed by Harris, with Uig arguably

performing worst in the northern isles, and poor uptake overall in the Uists. Barra has few designated grazings, but all the same, the small number of AE participants were not on those designated sites.

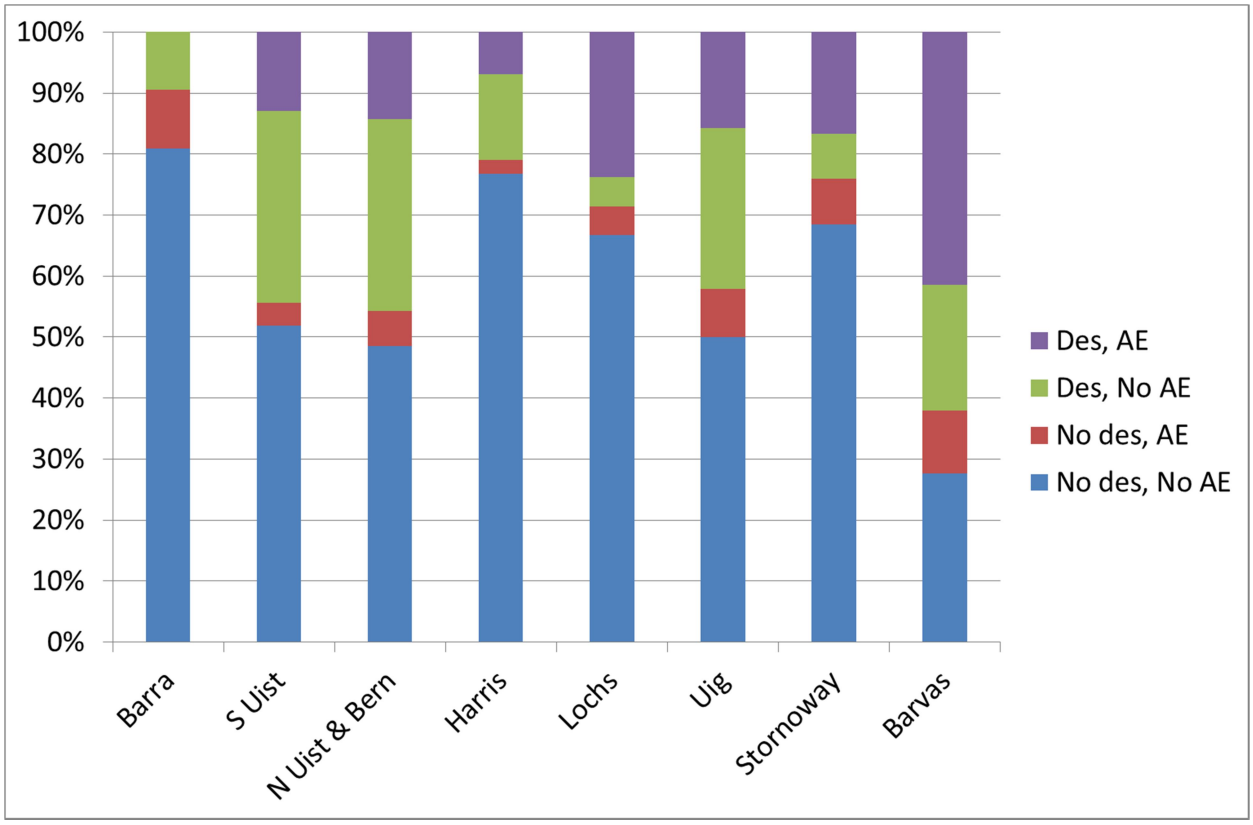

Figure 35. Proportion of grazings designated and in AE schemes by parish

It seems clear that the issues on the Uists go way beyond the design of a 'scheme' per se, and we can only guess at some of the factors at play. One of the more benign possibilities is that the ease of entry into AECS for crofts (including cropped machair strips) on the west of the Uists means that there is no incentive for crofters, grazings clerks or their advisors to go through the organisational torture of an application by a grazings, with its associated pitfalls of personal rivalries and animosities. By contrast, few Lewis crofts are designated and few have the scale and potential to garner entry points by some other means, so the common grazings are the only way crofters (and agents) can derive additional income. On the other hand, previous data gathered by Jones has suggested that uptake rates for crofts are also surprisingly low in the Uists.

Data for the wider Crofting Counties show that Lewis is unusually participative, while the Uists are similar to Tiree, probably for the same reasons (*Figure 36*). (Note however that Tiree has the highest participation rate for individual holdings of any crofting parish.). Whether poor uptake is a significant policy issue which needs to be addressed probably depends on the perceived impact of non-participation on the condition or change in condition of the target features.

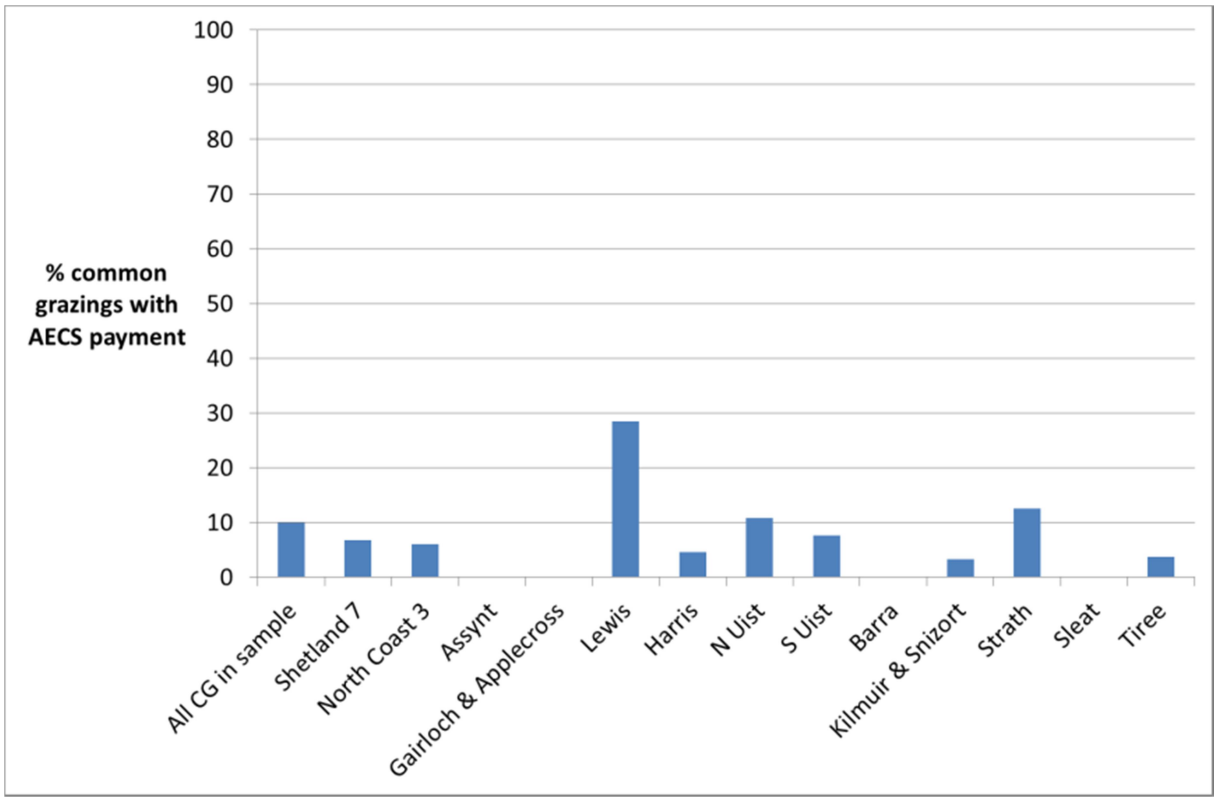

Figure 36. Percentage of all common grazings receiving agri-environment payments in 2016 (CAP payments data)

8 List of items for further consideration in 'Phase 3'

Despite reaching a point where there are an apparently comprehensive set of scorecards and an accompanying apparently coherent payment structure and underlying set of rationales, this is very much a work in progress. The inability to spend time in the field with graziers has been a particularly significant constraint. Irrespective of any advance in knowledge which might need to be incorporated at some later stage, we know already of many issues which remain to be ironed out or further evaluated during the proposed 'Phase 3' from 2021 onwards, including:

8.1 Scorecard issues

- Are the results-based indicators workable in practice across the whole range of habitat conditions on common grazings on the Outer Hebrides (and further afield)? Does the balance of positive and negative scores within and between questions need to be adjusted? Are the indicators, even if relevant in principle, able to detect changes in condition in practice?
- Do they and the relevant guidance deal successfully with the range of scales encountered, and in particular the landscape scale?
- Are the results-based indicators consistent with the needs of the large majority of priority species within those habitats and are they likely to deliver benefits for those species?
- How well does the card cope with low-scoring circumstances, and in particular situations where a remedy is identified but is unlikely to change the results-based score, even if implemented, within a reasonable timeframe?

- What ‘bolt-on’, e.g. species-specific, measures (perhaps results-based, perhaps action-based) would be necessary to make up any deficiencies?
- Are the guidelines for the choice of scorecard both appropriate to public policy objectives and clear for the end user?

8.2 Payment issues

- Can the figures used for fixed costs be improved in a way which is relevant across the range of scale with which the general scorecard needs to be able to cope?
- Does the intended complementarity of payments (and therefore of related scores) between the three habitat-specific scorecards and the general card work in practice?
- Are the total payments at parcel and holding level fair and reasonable across the range of scores and scale?

Figure 37. Sgallairidh and Leinis, Barra (Hugh Venables, Creative Commons Licence)

References

Chapman, Paul. 2007. “Conservation Grazing of Semi-Natural Habitats. SRUC Technical Note 586.” SRUC. https://www.sruc.ac.uk/download/downloads/id/1128/tn586_conservation_grazing_of_semi-natural_habitats.pdf.

Dargie, Tom. 1998. “Sand Dune Vegetation Survery of Scotland: Western Isles (3 Vols.).” 96. SNH Research, Survey and Monitoring Report. Scottish Natural Heritage.

Ferretto, A, R Brooker, M Aitkenhead, R Matthews, and P Smith. 2019. “Potential Carbon Loss from Scottish Peatlands under Climate Change.” *Regional Environmental Change* 19: 2101–11. https://doi.org/10.1007/s10113-019-01550-3.

Jones, Gwyn. 2011. “Trends in Common Grazing – First Steps towards an Integrated Needs-Based Strategy.” http://www.efncp.org/download/Trends-in-Common-Grazing3.pdf.

———. 2012. “Supporting Common Grazing through Agri-Environment – Lessons from an Ex Post Evaluation.” http://www.efncp.org/download/SRDP-CG-report.pdf.

———. 2018. “Support for Crofting.” Crofting Commission. https://www.crofting.scotland.gov.uk/consultations-and-publications?q=support%20for%20crofting.

McKnight, Gillian. 2014. “Moorland Grazing - Guidance for Upland Grazing Management. SRUC Technical Note 659.” SRUC. https://www.sruc.ac.uk/downloads/file/2637/tn659_moorland_grazing_-_guidance_for_upland_grazing_management.

Redpath-Downing, N A, D Beaumont, K Park, and D Goulson. 2013. “Restoration and Management of Machair Grassland for the Conservation of Bumblebees.” *Journal of Insect Conservation* 17: 491–502. https://doi.org/10.1007/s10841-012-9532-x.

SRUC. 2019. *The Farm Management Handbook 2019/20*.

Taylor, W A, D B Bryden, S R Westbrook, and S Anderson. 2010. “Nature Based Tourism in the Outer Hebrides.” 353. Scottish Natural Heritage Commissioned Report.