Developing a results-based approach to supporting the management of Fairwood common

Gwyn Jones and Helen Barnes

Image: Google Earth

European Forum on
Nature Conservation
and Pastoralism

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Figure 1. NE section of the common looking along the B4271; recently-burnt area to the left of the road. Photo: Simon Mortimer, Creative Commons Licence

Acknowledgements

Executive summary

This report details work carried out under the FLOW project, part-funded by Swansea LEADER and co-funded by EFNCP. Focussed on Fairwood common on Gower, the project was designed to fully field-test a results-based payment element which could inform or complement a wider management package which could be offered by NRW to the graziers.

The project used the scorecards developed previously by EFNCP; amendments were made to those cards as a result of the work[1]. The sampling and mapping methodology was revisited; the currently recommended technique is to use a grid sample, with 5 minutes of recording within a 10m radius of the sample point. We suggest a sampling rate of 15 points per 100ha and that a scoring rate of the order of 20 points per day is feasible.

An analysis was carried out to estimate the potential improvement in score which was possible through the actions of commoners (i.e. not linked to an increase in indicator species number or diversity) and the numbers were broken down by frequency of occurrence and effect on the total payment.

The common received a low score and we discuss the inter-relationship of 'capital works' and area payments in a hybrid results-based package of measures. We conclude that in this case, the overall financial implications are no greater than those of the current Glastir Advanced scheme.

Next steps are briefly discussed, including possible evolutionary paths both local and national. The need for a proper pilot is clear.

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[1] Copies of the current versions are not given here as they are still evolving; for copies, please email gwyn@efncp.org

Crynodeb gweithredol

Mae'r adroddiad hwn yn manylu ar waith y prosiect FLOW, a ariannwyd yn rhannol gan LEADER Abertawe ac a gyd-ariannwyd gan EFNCP. O weithio ar gomin Fairwood ar Benrhyn Gŵyr, nod y prosiect oedd rhoi prawf trylwyr yn y maes i'r dull talu-am-ganlyniadau, fel y gallai fod yn rhan o neu gyd-redeg â chytundeb rheoli ehangach y gallai Cyfoeth Naturiol Cymru ei gynnig i'r porwyr.

Defnyddiodd y prosiect y cardiau sgorio a ddatblygodd EFNCP eisioes; gwnaed gwelliannau i'r cardiau hynny yn sgil y prosiect[2]. Edrychwyd eto ar y fethodoleg samplo a mapio; erbyn hyn, argymhellir defnyddio samplo grid, gyda 5 munud o recordio mewn cylch 10m o amgylch y pwynt samplo. Argymhellir amledd samplo o 15 pwynt i bob 100ha; ymddengys bod cyfradd sgorio o tua 20 pwynt y diwrnod yn bosib.

Ceisiwyd amcangyfri'r cynnydd posib yn y sgôr y gallai'r cominwyr ei achosi'n uniongyrchol (h.y. heb gynnwys cynnydd yn nifer neu amledd y rhywogaethau dangosol), gan edrych ar amledd y gwahanol achosion a'u heffaith ar gyfanswm y taliad.

Derbyniodd y comin sgôr isel, a thrafodwn rhyng-berthynas 'gwaith cyfalaf' a thaliadau arwynebedd mewn pecyn hybrid o fesurau sy'n cynnwys taliadau talu-am-ganlyniadau. Down i'r casglaid nad yw'r oblygiadau cyllidol, o leia yn yr achos hwn, ddim mwy na rhai'r a gynigia cynllun Glastir Uwch.

Trafodir yn fyr y camau nesa, gan gynnwys dau lwybr posib, sef y lleol a'r cenedlaethol. Mae'r angen am beilot go iawn yn glir.

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[2] Ni chynhwysiwyd copïau o'r fersiynnau cyfredol yma o herwydd eu bod yn esblygu o hyd. Os am gopïau, ebostiwch gwyn@efncp.org

1 Introduction

This is the interim report of a Swansea LEADER, EFNCP co-funded project called FLOW whose purpose is to convert the general work carried out in a previous LEADER/NRW cooperation project (Jones et al. 2021) into an 'oven-ready' proposal for Fairwood common on Gower, to carry out that work in consultation with graziers, the owner of the soil (Swansea Council) and NRW, and to publicise the work to the wider stakeholder community. It reports on progress to the end of August 2022 and will form the basis of the final report.

The report briefly touches on the background to the work, both nationally and locally. It then sets out the practical side of the survey work in some detail – the preparatory phase; the methodology used; amendments made and lessons learnt. Then it sets out the results of the survey and links the scorecard points to the payment structure. After that, it discusses the implications and starts to look at the interaction with so-called 'capital works' incentives. It lays out the current state of play with the graziers and wider stakeholders. And finally it describes the current interaction with the Welsh Government (WG) team developing the Sustainable Farming Scheme (SFS) and outlines, in as far as is known, any funding possibilities beyond NRW management agreements.

2 Background to the project

2.1 Policy background

The Welsh Government's (WG) post-Brexit agricultural policy, still under development, is meant to be based on an increased emphasis in the outcomes or results of the measures employed, whether those results are seen in the context of 'public goods', as per the early consultation documents or, as it has been expressed more recently, in terms of 'sustainable land management outcomes'.

The European Forum on Nature Conservation and Pastoralism (EFNCP), perhaps naïvely, interpreted that as implying the increased use of 'results-based' or 'outcomes-focussed' payment mechanisms, i.e. ones which depart from the traditional prescriptive, obedience-based approach and centre rather on scorecards which measure the performance of farmers and have the potential to free them to use their skills and experience to respond flexibly to the variable incentive linked to the scores. While such an approach has been well-received by farmers in Ireland, and seems likely to deliver as good or better outcomes for policy, it requires careful development and testing.

Alongside the need to think through any wider use of results-based methodologies, EFNCP also saw the need to place common land front and centre in the design process. This is because commons, while disproportionately important for public goods delivery, are full of pitfalls for the policy developer and are therefore usually to be found on the back burner during scheme development, to the detriment of policy delivery in the long term.

Given the apparent lack of thinking time devoted to these issues within WG at the time, EFNCP therefore sought funding to take forward both topics simultaneously. Following on from LEADER-funded preparatory work, a 13 month project was funded by 6 LEADER Local Action Groups and NRW to develop a results-based approach which could work on commons in a wide area of southern Wales from Gower in the west to Pontypool in the east and from Llantrisant in the south to the river

Usk in the north. This was published as (Jones et al. 2021). Subsequent funding from Neath and Port Talbot LEADER allowed us to develop budget estimates for both a trial and full Wales-wide roll-out; this was published as (Jones and Barnes 2022).

Early in the cooperation project we were told by a then-leading civil servant in the WG scheme development team that there was 'no way we're going to have the Burren approach' (i.e. scorecard-based results-based payments) in Wales; it seemed as if the EFNCP work would have limited impact, and any impact it did have would be outwith the main agricultural support framework (see next section).

As a result of an NRW-funded study visit to some of the Irish projects in May 2022, and a second visit in September, this has now changed completely. All the attendees were highly impressed by the work and by its reception by farmers. We return to the interaction with policy in section 10 below, including the possibility of Fairwood being included in some sort of national pilot of results-based packages.

2.2 Local background

The call for small fast-track applications for funding from Swansea LEADER came in the period before the Irish study tour. The local NRW team have been supportive of the results-based work throughout, including by funding the May study tour. There was a feeling within the team that even if the results-based approach had no future in Welsh agricultural policy, it at least had some potential for encouraging the sustainable management of designated sites through NRW management agreements.

One site where such a management agreement is seen as desirable is Fairwood common, part of the Gower Commons Special Area for Conservation (SAC). Extending to around 411ha of grazed common, the area, while in some senses a 'gateway' to Gower and a highly public example of a designated site, faces a range of challenges and is in far from favourable condition (Countryside Council for Wales 2011). It is crossed by a number of busy roads where drivers frequently ignore the speed limit and kill livestock, and which gives easy access to arsonists. Cattle grazing is also challenged by tuberculosis – the disease itself, but also the knock-on implications of any outbreak due to the way the animal health regulations work (Douglas et al. 2021). Graziers' self-governance is weak to non-existent.

With the encouragement of NRW, an application was therefore made to Swansea LEADER which proposed essentially going through the results-based payment scheme (RBPS) process – surveying the common with a scorecard, working out payment rates, discussing everything with NRW, graziers and Swansea Council (the owner of the soil) and working out what additional support would be needed. The output would be something which, without too much additional work, and when combined with a suitable package of 'capital works' and ongoing support, could be converted into a management agreement between NRW and the graziers.

The survey work, reported below, was carried out in summer 2022; the discussions building on that work were carried out in autumn 2022.

3 Preparatory phase

3.1 Making the scorecard field-friendly

The scorecard produced in the cooperation project was set out on an Excel spreadsheet. While it was explicit in that the user was very clear how the card was generating the score (the card literally told the user what to do next), it used few of the opportunities afforded by the program for automation and calculation. As a result, it was 'clunky', particularly for the first-time user, who had to navigate back and forth through its many sheets, making the process appear more complicated and long-winded than it was in reality.

In an attempt to address this, the original LEADER project had also subcontracted an IT specialist to produce an app which followed the spreadsheet's logic in a more user-friendly manner, doing the calculation as it went. The initial intention was to refine this app, made with the Epicollect5 program, to mimic all of the spreadsheet's functioning in a way which was extremely user-friendly. After some days of effort, it became clear that the options available in Epicollect5 were too limiting and this line of work was abandoned.

The project met with more success in making more use of the potential of Excel itself (use of tick boxes and how to count them; conditional formatting; drop-down boxes; the various logical functions….). While it is still being improved, what we call the 'calculating' version of the scorecard is now a very useable, quite user-friendly tool. We have, alongside it, continued to maintain and update the original or, as we now call it, 'explicit' version so that those who want to critique or improve the substance of its content can do so easily.

The project team intended to use tablets for data entry when doing the work in the field; neither of us had paid for MS Office on our devices but one of us had access to Office programs online. The other had access to Google Drive and its corresponding programs, so a version of the spreadsheet was also produced in Google Sheets. Unfortunately, the transfer process was not as smooth as might be hoped, with several Excel features not working in Sheets (tick boxes which could be counted, for example) and workarounds had to be found. The result is entirely workable, but if a choice is available, we would recommend using the Excel version. Changes made to the scorecard during or after the field work are outlined in Section 5 below.

3.2 Sampling strategy and preparation

In the original project, we had many discussions regarding the best sampling strategy – how to make sure than all parts of the surveyed area receive the appropriate amount of attention, such that the resulting scores are truly reflective of the condition of the habitats. As was becoming clear by the end of that work, it would be well-nigh impossible to choose sample points without being biased in some way. That left two options – random sampling and grid sampling. For ease of use, we used a grid, reasoning that there were unlikely to be many linear features which might make the results unreliable.

Using a grid also meant that we didn't have to go through a process of designating blocks of habitat – the final scores could be expressed at particular points or, through simple multiplication, as a commons-wide average.

We used QGIS vector tools to produce a grid of squares (not lines) of a selected area of the screen view, then to produce a set of centroids for those squares. The centroids were then clipped to the shape of the commons boundary polygon (NB - not the other way round). This data set could be exported in a format which could then be imported into Google MyMaps and viewed in the field against a satellite imagery background. Similarly, the coordinates could be uploaded into a bespoke hand-held GPS unit.

Where we had unwanted centroids – centroids relating to commons other than Fairwood, or centroids relating to areas of the common which are outwith the grazed area, for example beyond the cattle grids at Three Crosses and Upper Killay – we found it easiest to delete those in GoogleMyMaps and then to reimport the file back into QGIS.

As an aside, note that while the boundaries of the initial rectangular selected area were not 'random',they were not in particular fixed locations either – they just had to include all of Fairwood common. Doing so a second time would probably result in a slightly different set of boundaries and therefore produce a slightly different set of centroids. We consider this to be a positive aspect which makes a 'gardening at the stops' response to the scores pointless – the location of the grid would change randomly each time. On the other hand, anyone wanting to check a score can still access the original coordinates.
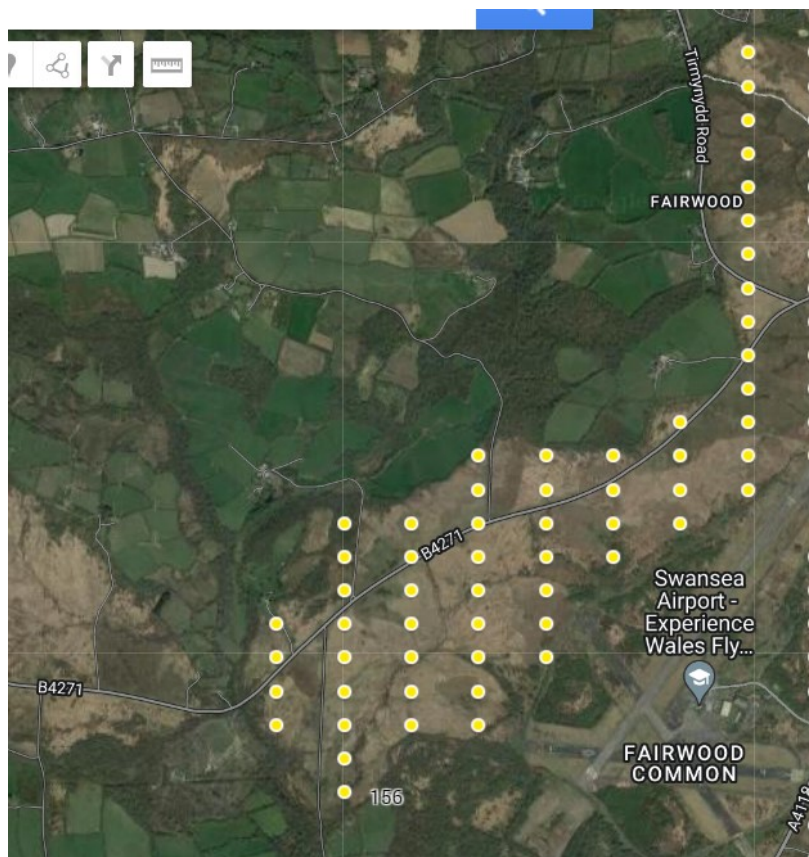

Figure 2. The 2022 survey points

The intention was to sample at a rate we were confident would be too high so as to be able to test the effect of, for example, discarding half the data. We therefore chose to produce a 200m x 200m grid. However, on starting surveying it immediately became apparent that our funding was too limited to allow us to visit the almost 300 stops that would imply. We therefore decided to sample every other column of stops; our stops were therefore at a 400m E-W spacing and a 200m N-S spacing. Was this 'enough'? We discuss this further in the results section, 9.1 below.

Before we went out into the field we prepared copies of the scorecard numbered with the stops. Given the immense frustration accidentally saving the master scorecard with scores added can cause, we recommend never using the master in the field (going so far as to recommend it not be accessible on the device used when surveying!).

We also took into the field a table where we could enter the letter P(resent), F(requent) or A(bundant) against the number of the spot, and another with a space for the score for each question against the spot number, along with a paper copy of the 'explicit' version of the scorecard. These could be pressed into service in the event that the electronic version proved too difficult to use (no signal; too bright, etc.), with the data being entered electronically on return to the office. On occasion we did use this paper recording method and found it to take as little or even less time than the electronic version. However the *total* processing time for the paper version, when transferring to an electronic form later was taken into account, was longer and is not recommended except for when the time available for survey is limited or conditions are particularly unfavourable for the use of electronic devices.

4   Survey work

We carried out the survey on 7 different days in June and July, with 5.5 days of solo effort and 2 days working as a two person team. We started on the 1st of June (having first tried out the card with NRW on the 20th of May) and completed the work on the 27th of July. Having surveyed 134 stops, we consider that 20 stops a day is extremely good going in difficult terrain and with no motorised transport (but with relatively easy initial access from public roads). Working as a team speeds up the process at a stop, but not sufficiently to make up for the extra manpower expense.

We did not experience any significant difficulties in indicator recognition during that two month window, though Lady's smock was probably under-recorded even in the first weeks of June. Devil's-bit scabious was only flowering latterly, but its leaves were clear to see throughout. Orchids were not identifiable to species level by the end of the window, but the card does not require this degree of detail.

We did not have access to a handheld GPS device (Garmin or similar); we relied on our phones/tablets. One of us found that the phone was relatively reliable both in terms of service availability and accuracy; the other found that the mobile signal was rarely usable and ended up not using it. Were we to do it again, we would however have purchased or borrowed a Garmin unit. As it was we were able to use the stop locations shown against a Google Maps background quite effectively despite not having the device show the observer's location reliably.

The quality of Google Maps images for Fairwood made it relatively easy to find most of the points without GPS; this might have been a different matter had image quality been poor. We were prepared to use Bing Maps images alongside Google MyMaps for the centroid grid, but it proved not to be necessary. Had we used Bing, we would still have had to compare with Google, as the point locations could not be uploaded to Bing. It was interesting to note that Google images for Fairwood were taken in winter and Bing ones in summer and that it was much easier to locate the edges of woodland or the location of the only area of true bog encountered during the survey on the latter.

At each point we stuck a cane in the ground and used a 10m colour tape to indicate the radius of the circle to be surveyed. We adhered to the 5 minutes survey time and did not feel overly constrained by it.

Despite the strong sunshine during our survey days, we didn't find glare to be an issue with the spreadsheets. It did however make viewing Google MyMaps challenging on occasion and we took a dark item of clothing out to make a 'tent' where we could view the screen in darkness for this reason.

At each point we took a photo. Initially these were rather random, but we settled on a fixed protocol of always taking the picture facing north (never subject to glare) and always taking it from a position to the south of the cane marking the spot, so that the spot itself would feature in the image as well as the wider landscape. These photos, which have geolocation data, can also in principle be uploaded onto Google MyMaps.

5 Changes to the scorecard during fieldwork

5.1 Additions to ease use of the card
We immediately saw the need for a summary sheet at the end of the spreadsheet, which we later added to by indicating which of the 'habitats' had in fact been scored and a warning when multiple habitats had been scored on the one card by mistake (the result of bitter experience!).

5.2 Changes to reflect sampling method
The initial scorecard stemming from work in Scotland assumed a W-shaped walk through the parcel (or habitat block). Even if observation time is limited and even if the surveyor does their best to be representative in the route chosen, this method is likely to produce a longer list of species than the 'within 10m of a pre-determined spot' method we decided to use in Fairwood. This means that the thresholds for the first two questions need to be lowered somewhat in order to give the same score.

5.3 Addition of definitions to question 2
It became apparent that there was a need for thresholds for 'Present', 'Frequent' and 'Abundant', and that simple 'one-size'-fits-all' numbers were not appropriate (100 hogweed plants are very different to 100 eyebright plants). We therefore distinguished between plants taller or shorter than 30cm.

5.4   Limiting the possible scores for less species-rich habitats

One of the principles behind the card is that while (well-managed) species-rich habitats get high scores without asking any further questions, less species-rich habitats get a 'second (and sometimes third) chance' to gain points by demonstrating the characteristics of good heathland and/or in some cases by the presence of trees and natural regeneration.

The assumptions of the payment rationale are that the total points available for heathland nevertheless lie in the middle of the overall range, while the reward for trees in the appropriate place lie in the upper middle part of the spectrum.

What we found was that the total possible score was in fact too high; we adjusted both the scores in the second question and the additional score available under the heathland and trees questions.

5.5   Recognising the importance of Sphagna on wet heaths

In the kick-off field visit with NRW, we were told that the presence of a significant cover of Sphagna was one of the characteristics of a wet heath in good condition, whereas our cards only looked at Sphagnum if the habitat fell into the 'Bog' category. We therefore introduced a new question in the heathland section, adjusting the cover/structure of dwarf shrubs downward to compensate, while adjusting the diversity of dwarf shrubs score upward so as not to disadvantage dry heaths.

5.6   Removing the reward for the presence of trees on dry acid/neutral mosaics

Having consulted NRW, the small reward for the presence of trees on dry acid or neutral mosaics was removed in order better to reflect the needs of the dry heath priority habitat. The only (and significant) incentive for the expansion of tree cover remaining is for dense bracken or European gorse areas. If and when the card is used on other areas, consideration should be given to the possible need to differentiate between grasslands which might be considered 'degraded dry heaths' and others, possible using a zero reply to the '% of dwarf shrubs' question as a criterion.

6   Processing and presentation of data

This was the aspect of the methodology which was most 'clunky' and would need expert attention in a large scale roll-out. For this project, we copied and pasted by hand the single line of data from the summary sheet of the spreadsheet for each spot into a master table. We could manipulate this table to produce graphs and diagrams and to work out average scores, payments etc.. This was entirely satisfactory, but would benefit from automation.

Less satisfactory was the presentation of results on Google Maps or QGIS. We found that we needed to separate manually the longitude and latitude location data for each individual point before adding additional information (scores etc.). This was extremely laborious (though the fact that the points were in a grid did allow for some shortcuts), to the point where it seemed hardly worth the effort.

7   Results of field work

7.1   Habitat mix

The breakdown of the 134 stops into the scorecard habitat classes was as shown in Figure 3. There were no representatives of the saltmarsh, other rushes, coastal or calcareous habitat types. Bog and jointed rush had one case each. The common is dominated by habitats with >50% cover of Molinia.
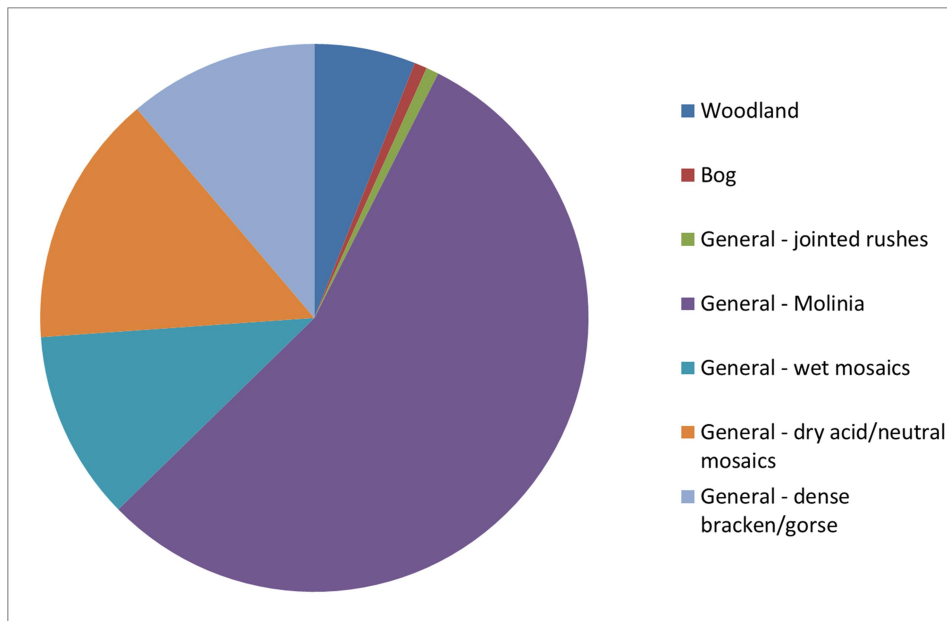

Figure 3. Breakdown of stops by scorecard habitat types

Although the classes are somewhat different, the overall pattern reflects the detailed NRW survey work quoted in (Douglas et al. 2021) and shown graphically in Figure 4 below.
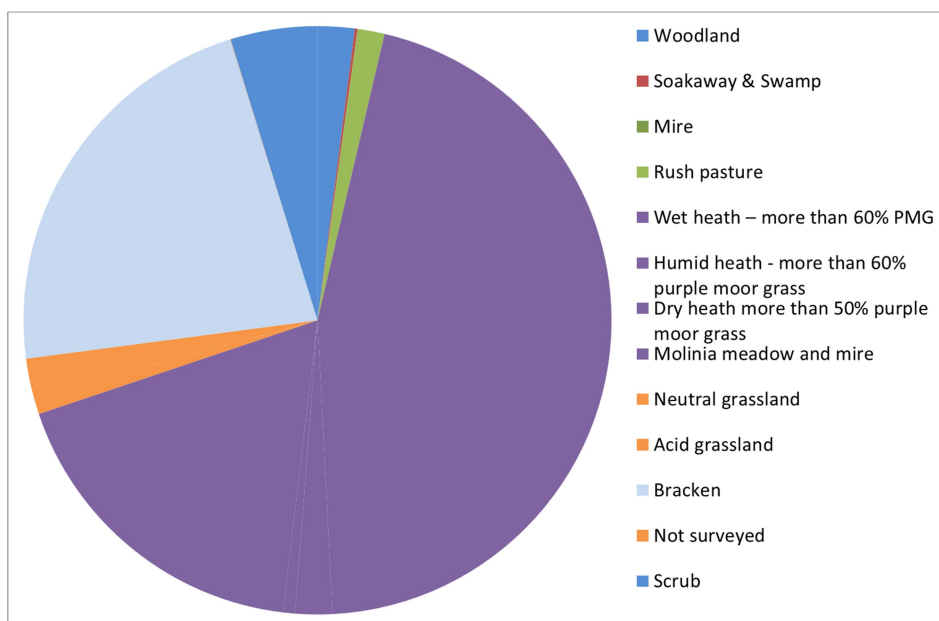

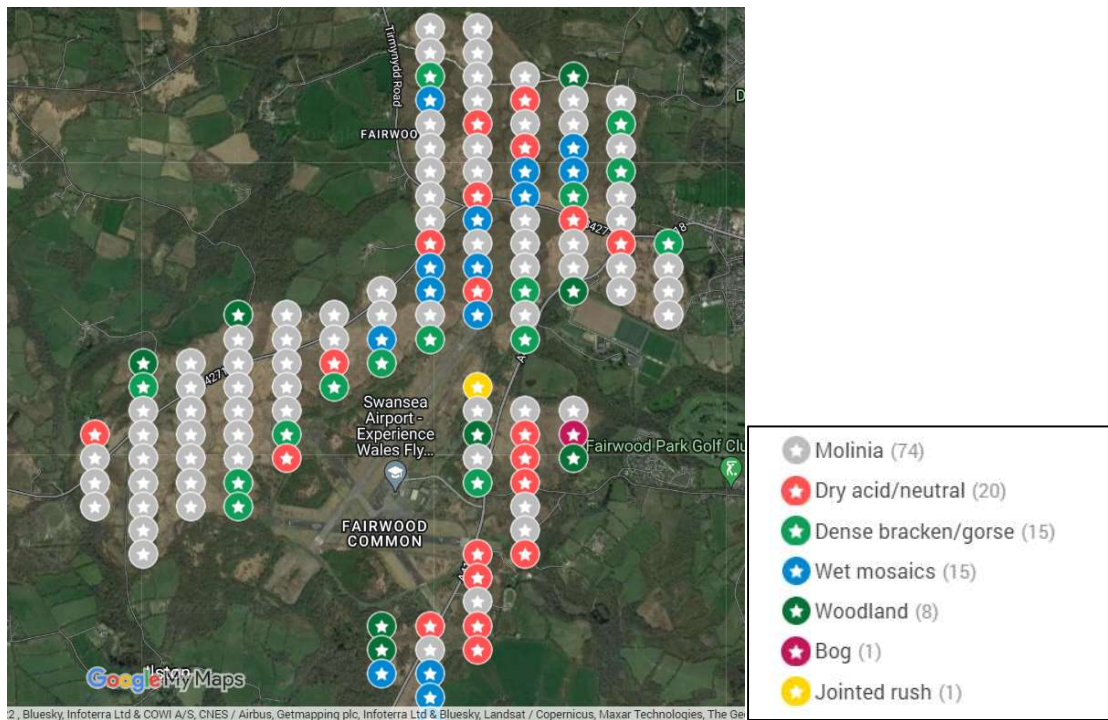**Figure 4. NRW habitat survey data quoted in Douglas et al. (2021)**

Molinia (74)
Dry acid/neutral (20)
Dense bracken/gorse (15)
Wet mosaics (15)
Woodland (8)
Bog (1)
Jointed rush (1)

Figure 5. Scorecard section used for scoring

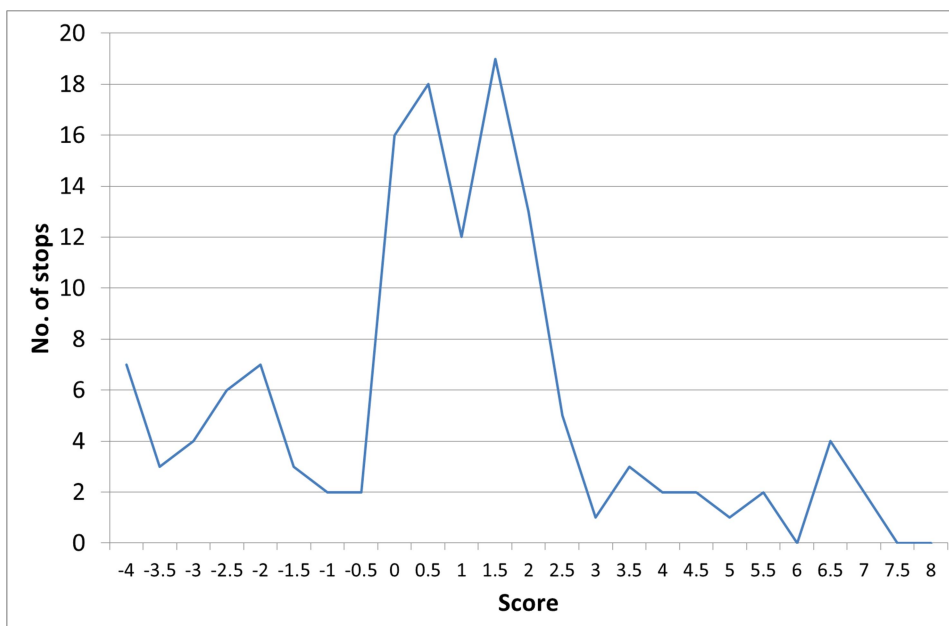## 7.2   Variation in scores

Figure 6. Variation in frequency of scores

The mean score for the common as a whole was just 0.653 points, with the bulk of scores lying between 0 and 2.5 (Figure 6). There were however a significant number of both low and high scores, the latter associated largely with the woodland and single bog stops, with the former more widely dispersed between the remaining habitat types, reflecting mainly the presence of expanding undesirable species.

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Figure 7. Actual scores recorded 2022

Note that single plants of Rhododendron ponticum were seen on 5 instances; our current methodology would require dealing with those plants before any further payments could be claimed. Similarly for the Japanese knotweed we noted invading from the airport.

Figure 8. Potential increase in scores from improved management

7.3   Variation of scores within land cover types

The land covers had very different score distributions, as shown in Figure 9. Molinia was all species-poor (we saw some small species-rich areas, showing what would be possible over time, but none fell within the sampled areas).   The variation in score was largely related to the presence or otherwise of spreading undesirable vegetation.   Similarly for dense bracken or European gorse patches.

Woodland was largely given a good score, while mosaics showed a larger variety. Wet mosaics were as a class the most reliably species-'rich', whereas drier mosaics displayed a large variation in species-richness, including some of the most species-rich areas encountered. However, dry areas are also extremely vulnerable to encroachment by a large variety of species, from gorse and bracken to brambles and various species of trees. Dry areas also showed the greatest variation in grazing pressure, with some areas exhibiting signs of intense grazing pressure.
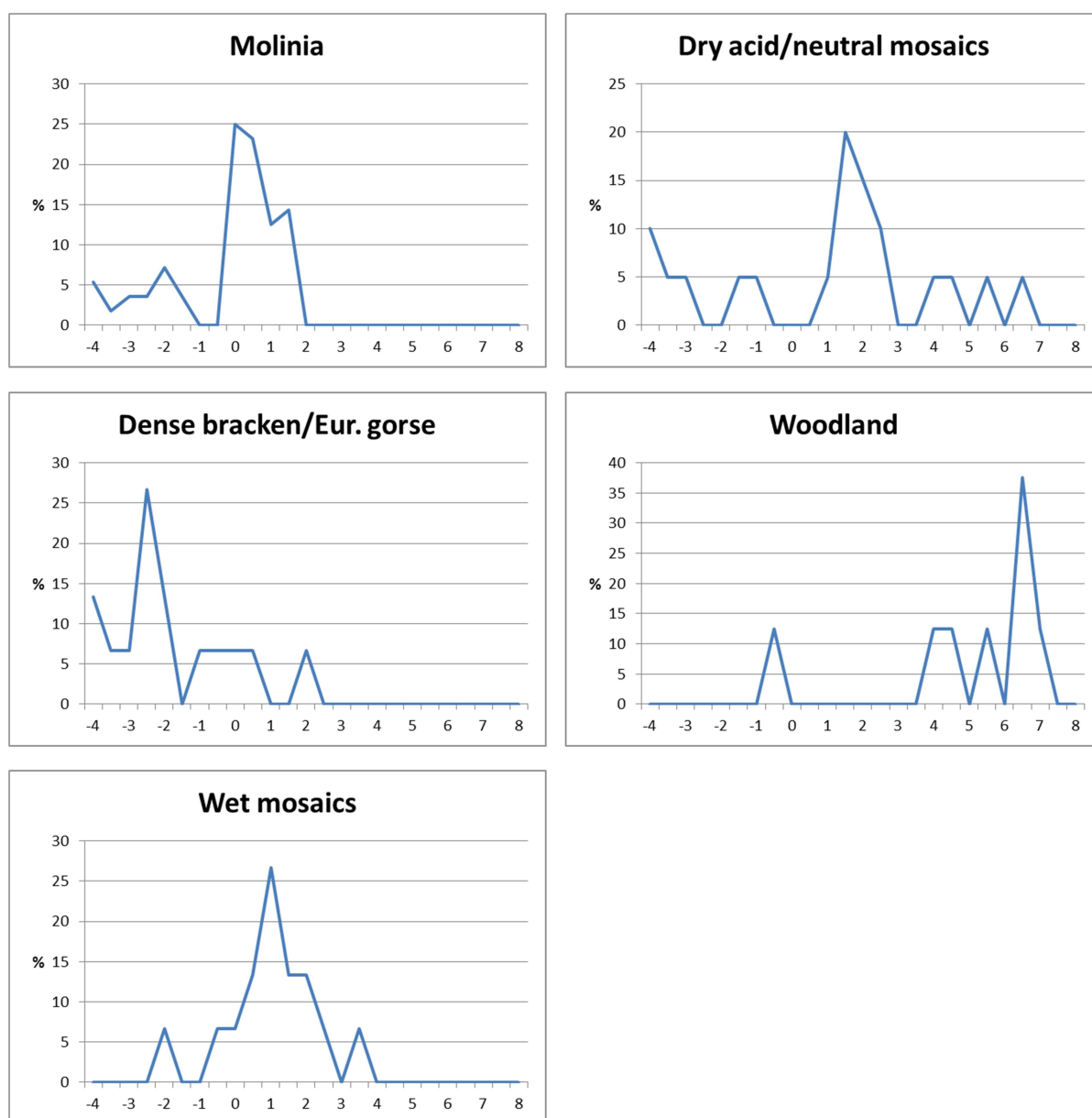

Figure 9. Variation in score frequency by land cover type

7.4   Frequency of vascular plant indicator species

The common was in general strikingly poor in vascular plant species (Figure 10). Some areas with much higher species richness were encountered – patches of 'Molinia meadow', of more base-rich marshy grassland and of dry more base-rich grassland – but were so small that few fell into the spots sampled. There was a lovely orchid-rich neutral grassland in Upper Killay, but it fell on the ungrazed side of the cattle grid, clearly being managed by mowing only. In the case of the Molinia meadow habitat in particular – areas which had escaped recent burning - these spots can be taken as an indication of how much of the common might look in the medium to long term.
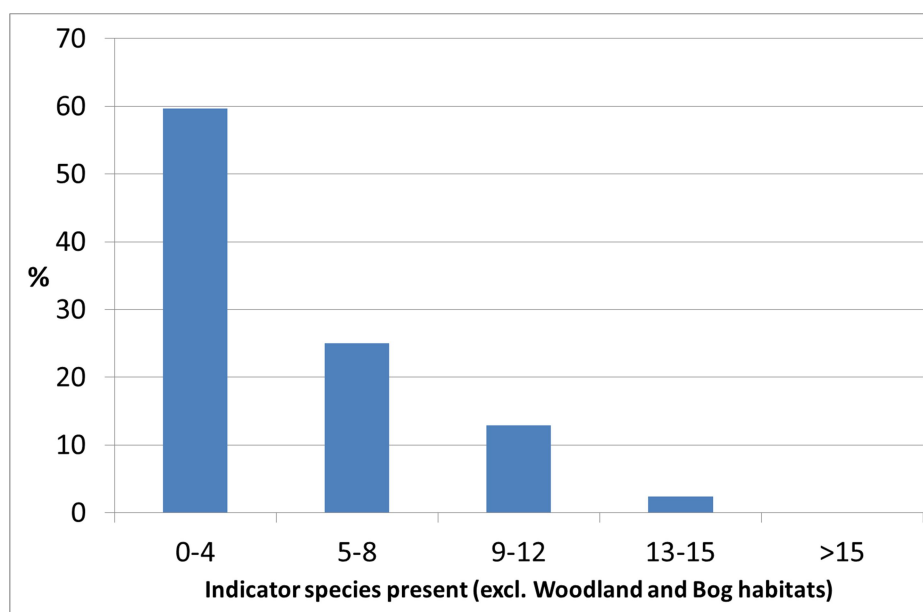

Figure 10. Distribution of indicator species scores per stop as a proportion of 'General' card habitats (corresponding to a score of 0, 0.5, 1, 1.5 and 2 respectively)

7.5   Potential for improvement of scores

What then of the potential for improving the score? Some elements of the scorecard – species diversity and frequency in particular – are not within the immediate control of graziers, but are likely to improve over time with better management. Others are more amenable to change by targeted action:
- Eradication of rhododendron before anything else happens
- Control of expanding species. The scorecard
  - Is blind to stable bracken, European gorse and bramble patches, but penalises examples where they are clearly expanding
  - Penalises high cover of Western gorse
  - Penalises the presence of trees and scrub on certain habitats and discourages natural regeneration everywhere except woodland and dense European gorse or bracken
- Improvement of structure, as variously defined, is possible on all habitats except dense European gorse or bracken
- On some dense European gorse or bracken both the presence of trees and natural regeneration is also encouraged.

We went through each stop's scores to evaluate the potential for increasing scores under each of these headings. We estimate that the mean score could be raised over time to as high as 2.94, with the bulk of the points scoring between 1 and 4.5 (Figure 11).
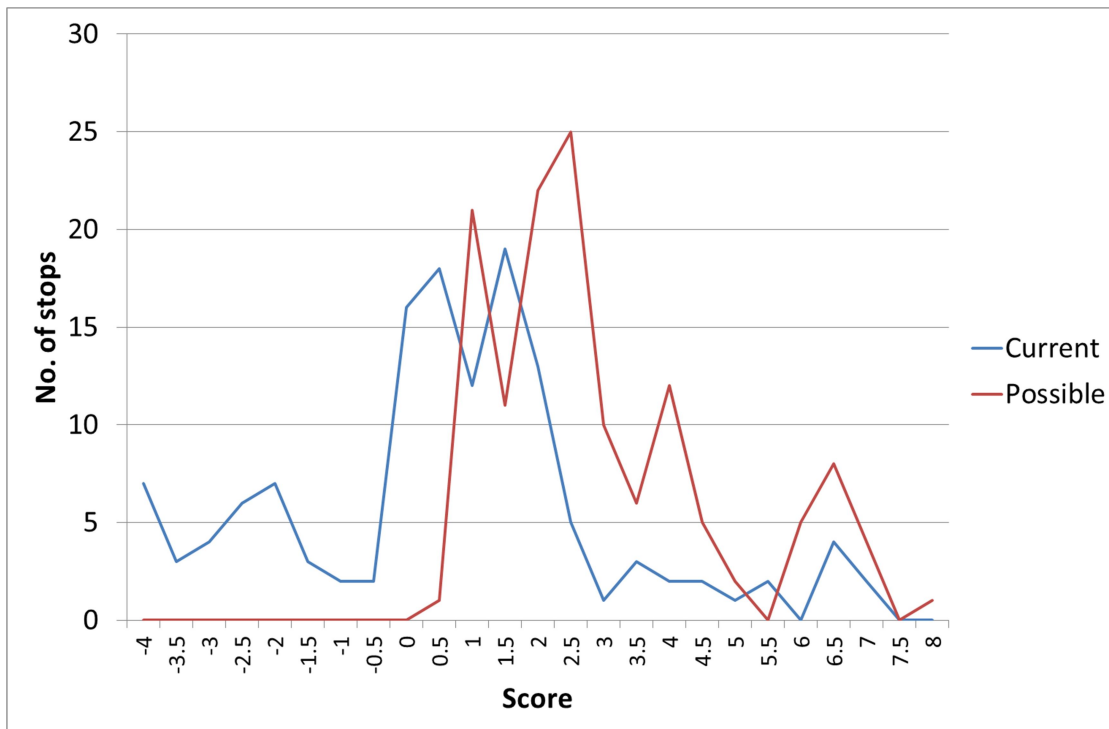

Figure 11. Variation in frequency of estimated potential scores compared to current score distribution

The range of potential improvement in scores at the points surveyed ranged from 0 (only around 10% of points) to 8 (areas of dense European gorse or bracken with expanding undesirable species, no trees or natural regeneration and wholly inadequate levels of grazing), with the bulk of spots in the 0.5-1.5 points increase range (Figure 12).
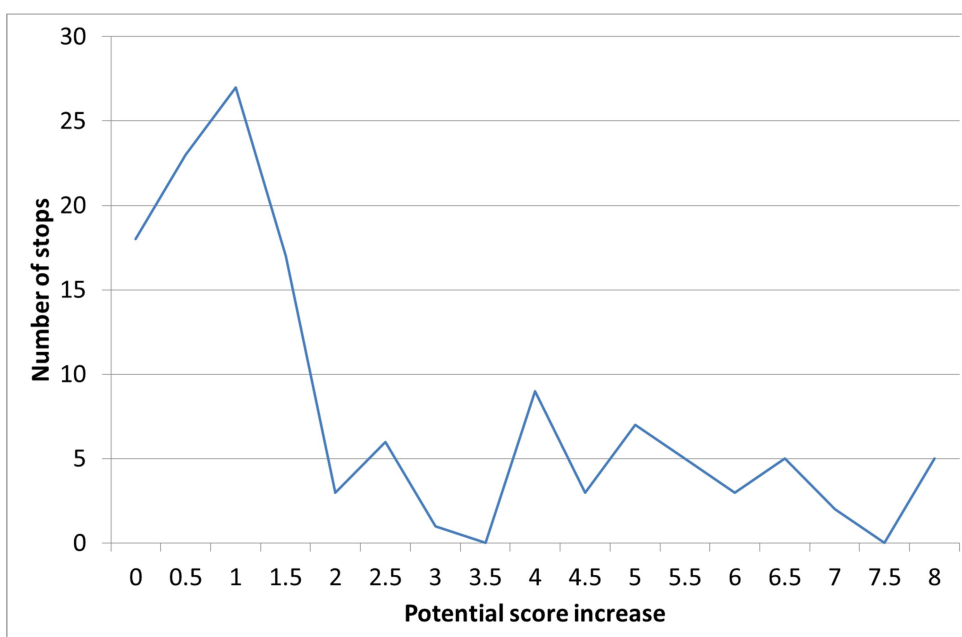

Figure 12. Variation in frequency of potential score improvements

The potential for improvement varies considerably by habitat, as might be expected (Figure 13). For the reasons outlined above, dense bracken or European gorse – the only habitat with a negative mean score at present – had the highest potential for improvement. The one bog stop was in good condition, while the woodland not only had high scores but had limited scope for improvement in most cases. The other open habitats were all rather similar in their potential, with dry mosaics having slightly more potential (0.5 points where it applied) due to the potential reward for having scattered trees which was not on offer to the other land cover classes.
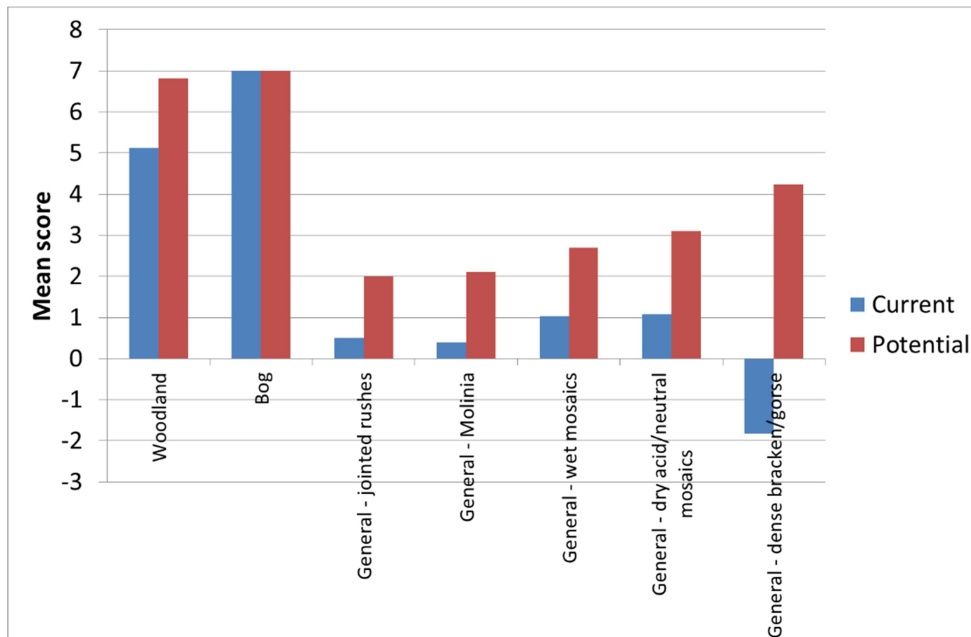
Figure 13. Variation in estimated potential for score improvement by scorecard habitat class

Looking at the actions incentivised by the card, improving vegetation structure was by far the commonest, followed by tackling invasive native species (Figure 14). The frequency of instances where trees were encouraged reflects the frequency of the dense European gorse or bracken class.
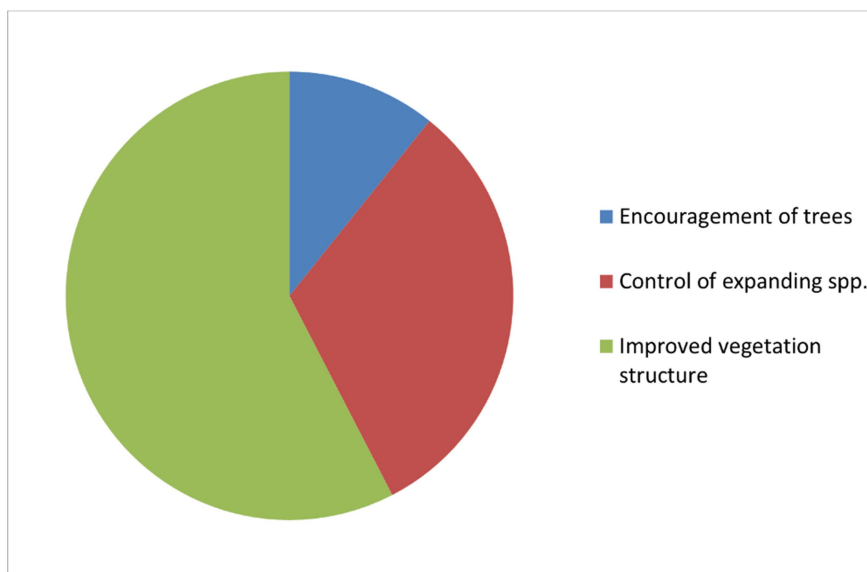
Figure 14. Types of action with potential to increase scores by frequency of occurrence

Looking beyond the frequency of the signals to act, which have the potential to make the most impact on scores? In this case (Figure 15), things are reversed: tackling expanding species would have the highest potential impact on the points scored, with improving vegetation structure coming second.

Figure 15. Types of action with potential to increase scores by proportion of potential score increase

The potential therefore is to increase the total points scored over the common as shown in Figure 16.

Figure 16. Breakdown of elements in estimated potential mean score

8   Conversion of scores to payments

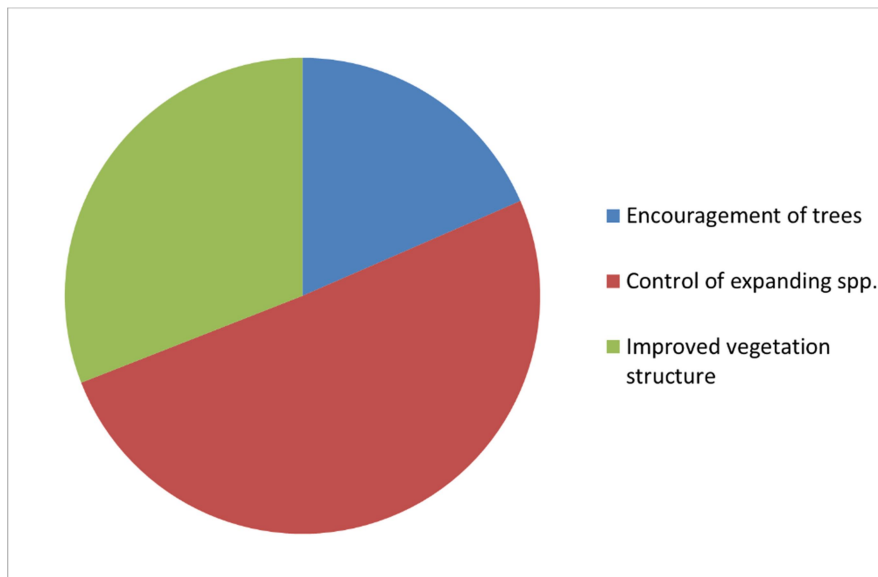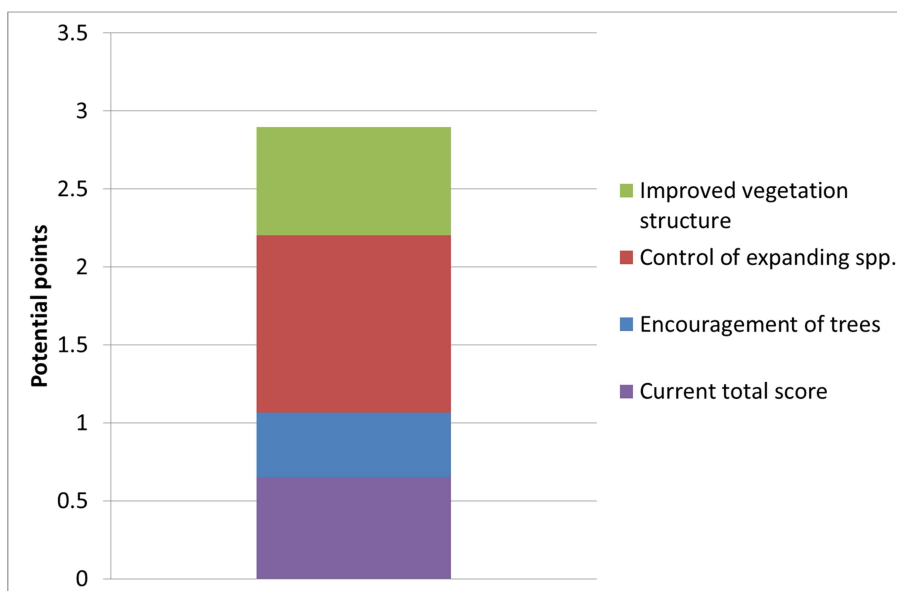As set out in (Jones et al. 2021), the payment matrix is based on three main and one secondary anchors:

1. An assumption of broadly the same budget
2. The calculated cost of the conservation-appropriate management of 0.3 livestock units on hill land (c. £230), which is tied to a score of between 4.5 and 5.5.
3. The principle that a minimum positive score (which we set in the calculation as 0.5) crosses the Good Agricultural and Environmental Condition threshold and, as long as it is being delivered by 'active farming' should receive the equivalent of the universal payment or, as it is at present, the general BPS rate (£121/ha)
4. As a secondary consideration, higher scores must be of the same order as the higher rates in the various elements of Glastir

Criterion 2 is a political one, or rather is one which aims to stick to the status quo unless and until a political decision is made to change that status quo, e.g. by changing the balance of funding between the 'universal' element (BPS at present) and the 'optional/collaborative' (mostly, but not only, Glastir).

The effect of the current balance between those two elements is that the amount of money available for the results-based element of the payment is modest. On the other hand, doing anything is costly, and it would be unacceptable for low scores to receive way below the actual costs, especially if the costs or timescale involved in responding to the signals given by the scorecard were significant.

Applying the current payment rationale and scoring matrix to the average points per hectare on Fairwood yields a payment per hectare of £122.84, but given that BPS is £121/ha, the net results-based payment which could be offered while BPS exists is only £1.84/ha – a total of £660.

Were all of the potential improvements to be implemented, the payment could increase to £149.52/ha or £11628 after BPS is taken into account. The increase relating to each element could be as much as:

-   Control of expanding spp.   £5549
-   Better structure   £3395
-   More trees   £2084

9 Issues for discussion

9.1 Sampling frequency

The sampling frequency used was dictated purely by expediency – what we could do in the time available to us – and the fact that we only decided to reduce the total number of points once we had started. Otherwise we would have chosen e.g. a 300m or 250m square grid rather than the 200 x 400m we ended up using. Was this number of samples 'enough'?

The sense we had was of the points tending to converge on an average over time. We can illustrate this by taking the points in numerical order and plotting how the mean changes with each additional stop added to the total. We did the same but taking the stops in reverse order. As can be seen in Figure 17, the values converge after around 65 stops, which is about one stop per 6.3 ha of common. There is further convergence as more stops are added, but note that the precision of the initial scoring is only ±0.5 points and an extra 0.1 points on an average score adds only £3/ha.

We therefore tentatively suggest that a scoring frequency of 15 stops per 100 ha – a sample of around 0.2% by area – seems to be meaningful and repeatable within the precision of the overall approach.
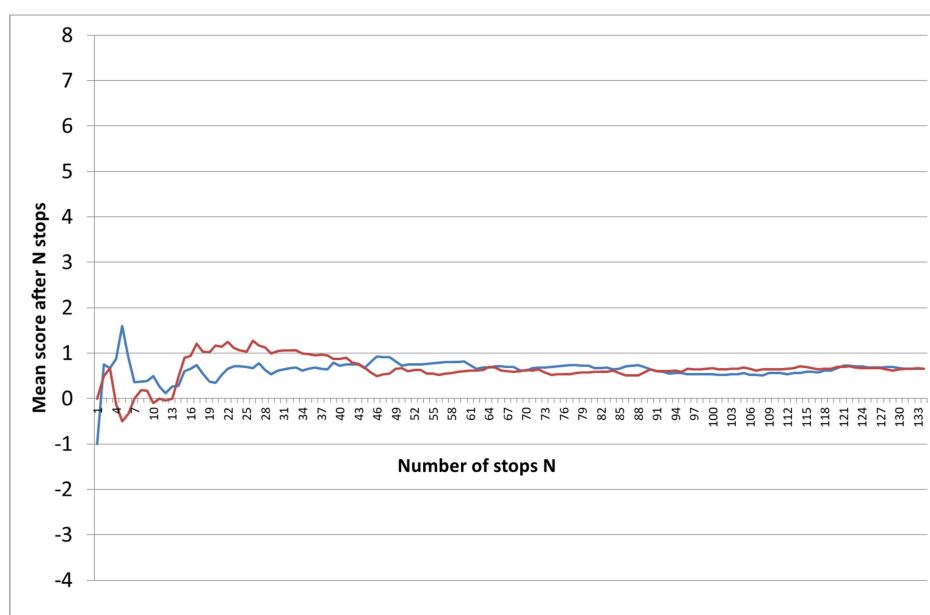
Figure 17. Illustration of progressive convergence on a mean by increasing sample size. Examples used were non-random, viz. samples in numerical order and in reverse order.

We do note however that this convergence is somewhat variable between habitats (Figure 18; note the variation in the X axis), with Molinia, woodland and wet mosaics all settling down after very few sample points. Acid/neutral mosaics are more diverse in terms of scores and take longer to settle down, but nevertheless still do so after around two thirds of the points were sampled. Subsequent work on other sites would need to be sensitive to the possible need to increase sample sizes for certain habitats or habitat mosaics.

Figure 18. Illustrative example of convergence on average scores by habitat

9.2   Messages from the scorecard set against impressions of the project team

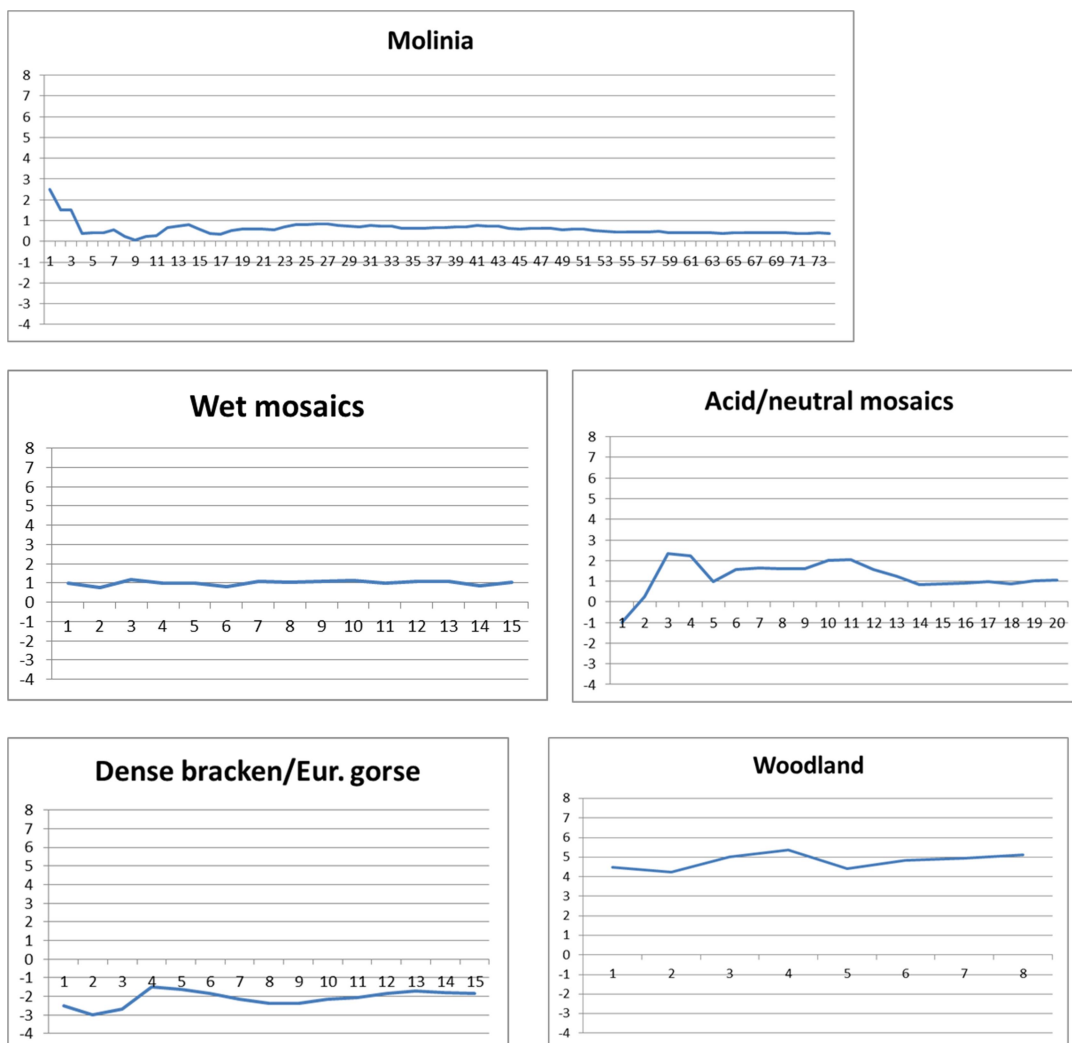The project team formed the following impressions:

- The majority of the common is surprisingly species-poor, seemingly the result primarily of repeated burning
- Small areas of similar, but species-rich, habitats remain, mostly in the unburned patches, providing an illustration of what might be possible
- While the rejuvenating effects of mowing and to a lesser extent scrub management was very evident across the common, the impact of follow-up grazing on those areas, let alone on unmown areas, was minimal in most cases; the amount of mowing does not appear to be the main issue at present, but rather the lack of livestock grazing which might lengthen the mowing cycle
- Dense Molinia, often mixed with western gorse is a real barrier to livestock accessing large areas of the common for grazing, and contributes to animals lingering on the sides of roads and probably is a factor in the high number of traffic casualties
- There are significant areas of established woodland, but trees are also spreading onto priority habitats in many areas, as well as into some of the bracken and European gorse patches

- Bracken is limited to dry patches, but because it has completely taken over many such areas, there are few patches which are expanding significantly
- Bracken patches are one area where the expansion of bramble seems to be taking place at a significant rate
- European gorse is also expanding, often in conjunction with brambles
- Exotic invasives are not a large-scale problem at present – a few small Rhododendron ponticum bushes were encountered, as well as some patches of Japanese knotweed expanding out from the airport. However, they need to be tackled urgency to prevent a small problem turning into a large one.

The card, as modified during the exercise, identifies all of these issues. In its insistence on seeing signs of grazing, it moves beyond the superficially positive signs of a mowing-only regime to shine a light on more long-term sustainability. The grid sampling method brings out the serious impact of fire in a way that continuous recording would struggle to do. The main issues where there was some dubiety – how to deal with scrub encroachment on dry species-poor habitats – are ones where the underlying policy messages themselves are a matter of discussion.

9.3   Some considerations for graziers in their possible response

How might the graziers respond to the signals given by the card? The card is trying to tell them to:
- Clear any rhododendron as a first priority
- Prevent the further encroachment of bracken or dense European gorse and, in some cases trees or natural regeneration
- Get the structure right, with clear signs of grazing throughout the most common habitats (not rewarded in the case of bog or woodland, but they have to be in the grazed area if they are to attract the payments)
- Allow and encourage scattered trees and regen. on certain habitats

The strongest signal concerns the prevention of encroachment – see Figure 15 above – but this would almost certainly in each case require intensive manual or mechanical intervention. The signal which covers the largest area is the one for improving vegetation structure – see Figure 14 above. In this case, there will often, but not always, be a need for mechanical intervention, but probably at a lower cost per hectare. It may be that graziers will consider the cost per hectare of mechanical operations per point of score improvement may not be so different.

In both cases the importance of following up with cattle or pony grazing is clear. Our payment rationale assumes a need for 0.3LU/ha or over 120 LU for the common. What would it take to get to that number, even over time? Would the payment on offer be sufficient incentive? Even if it were sufficient once the score had been improved, would the prospect of it be enough incentive to increase numbers without some support? Is there a strategy which could lead to incremental and progressively increasing scores which is economically realistic for graziers? How much 'activation energy' would be needed on the mechanical and stock management side to act as an incentive/facilitation to get to a self-sustaining system supported by results-based area payments and what form should that assistance take?

9.4 Interaction of overall budget, universal element and results-based incentives

It might occur to policy makers, having read Section 0 above, that one way of adapting policy would be to reduce the amount of money available in the universal element (i.e. starting payment for any positive situation) relative to the optional (i.e. results-based) element.

To model this we assumed that the universal (currently BPS) element was £121 (the same as BPS); £100 and £90/ha and recalculated the payments for the same scores (Table 1). Note that the rate of increase of the results-based payments is higher, the lower the universal element (since it is moving from that starting level toward, and beyond, a fixed payment around the middle of the scoring table), but note however that the *total* payment received is smaller (and would be until that reference payment/score is reached, if ever).

	Universal = 125	Universal = 100	Universal = 90
Total universal payment	49826	41100	36990
RB payment current	660	880	943
RB payment potential	11628	13676	14653
Total potential payment	61454	54776	51643

Table 1. Payments calculated using different universal payment

It could be argued that the current situation low scores arise in part because the common is so undergrazed, and that therefore a significant discount on BPS is not unwarranted. However, even if and when stock numbers were to be increased, an increase in scores would take some years. On the other hand, too much of a disincentive in the form of a steeply-sloping payment curve could very possibly prove to be a deterrent to action.

9.5 Role and scale of 'capital works' vs. results-based area payments

What might be a realistic assumption in terms of results-based payments, assuming graziers were able to respond to the initial payment indication of £660 communicated to them well before the growing season of their first year of participation?

How long, realistically, might it take to get the full benefit of management in terms of score response? An increase of 0.5 points each year would be very ambitious, but potentially achievable, meaning that the process would take 5 years. Over the 5 years, there would need to be management operations over 370 of the 411ha of the common, mostly involving mechanical work. Livestock numbers would probably need to double from the current 30-60 LU to 120 or so ((Douglas et al. 2021) suggest a summer grazing complement of around 100 cattle, 200 ponies and 100 sheep).

Achieving that would require a large number of additional NoFence collars and, judging by the summer of 2022, possibly the provision of water, as well as at least the continuation of the mowing effort of recent years. In other words, the bulk of any funding would be on the 'capital' side for some years into the future, with the area payment only gradually rising as the management system hopefully becomes increasingly self-sustaining.

9.6 What type of accompanying measures?

The (Douglas et al. 2021) report sets out a number of investments and other support which would be likely to go some way towards addressing the issues they identify as barriers to sustainable grazing, including:

- traffic calming infrastructure (or fencing roadside)
- reflective collars
- widening a footbridge to be more cattle-friendly
- installing a culvert at a difficult stream crossing
- mowing of Molinia
- control of invasive species (gorse, bracken, scrub woodland, brambles)
- animal location collars
- geofencing collars
- help with costs of additional TB tests
- help with purchasing of livestock

Some of these are modestly-priced (reflective collars, cost of TB testing) and could be easily covered by the area payments once the scores rise; whether they need to be covered initially is something to consider.

Others – specifically the traffic calming proposals - are major changes involving a number of legal, political and administrative challenges. If workable alternatives which can be implemented more quickly exist, they should be explored; in any case, most seem unlikely to fall within the capacity of either a management agreement or a Welsh Government scheme to deliver.

Yet others – help with purchasing cattle - have State Aid implications, even if they fall well below the threshold at which the rules bite. Again, this is something which could be self-funding were the scores to be high, but when scores are low, a different approach might be necessary. Loans would be less of a subsidy, but might be administratively quite challenging.

9.7 Estimating the possible scale of accompanying measures

Given the number of designated sites and of interested third parties (NRW, National Trust, Swansea Council/Gower AONB...), it is no surprise that there is a wealth of experience of funding 'capital works' on Gower commons, providing some idea not only of current expenditure and unit costs, but of the scale of need and capacity to deliver over the whole area.

We also get the strong feeling from our observations during the field survey that for the Molinia area in particular, the problem seems not to be insufficient mowing per se but that follow-up grazing is at a scale insufficient to reduce the overall fuel load and to extend the length of the mowing cycle over time. It appears that the immediate need is to maintain the level of mowing and to increase the number of cattle (or horses?).

If there is an aspiration for all cattle to be geofenced, this implies supplying an additional 60 or so collars at a rough cost of the order of £16,000 in terms of purchase price and around £8500 of annual fees (NoFence data, but for smaller numbers of collars).

Recent spend on mowing by various public bodies has been on the order of £3500 annually (Iona Graham, NRW, pers. comm.). The costs of a bridge and culvert would need to be worked out on a bespoke basis.

Are these 'large numbers'? Had the common been in Glastir Advanced, they could potentially have accessed annual funding of >£24,000 without necessarily having any significant impact on the condition of the habitat. Seen in those terms, the 'results-based package' has the potential to offer excellent value-for-money for the taxpayers.

10 Potential next steps

10.1 Local implementation by NRW

One potential evolutionary path is for the approach to be used by NRW in a management agreement with the commoners. Discussions are taking place internally to ascertain whether results-based payments are consistent with the current rules governing such agreements, if so, whether they are seem as desirable and if not, whether those rules could and should be amended. There would need to be a period of capacity building and familiarisation of NRW staff, whether land agents, specialists or members of local teams.

10.2 Potential for mainstreaming in SFS

A second potential evolutionary route is towards some element of mainstreaming in agricultural/rural development funds, specifically in the forthcoming Sustainable Farming Scheme SFS. The current position (Phil Roberts, WG, pers. comm.) is that

- The Welsh Government is exploring how a results-based approach could be incorporated in the Sustainable Farming Scheme.
- The results-based approach fits in well with the aims for the SFS to be less prescriptive, offer farmers more flexibility and rewards the maintenance and creation of sustainable farming practices.
- This will be a completely new approach for the Welsh Government and Welsh farmers. For this reason, the Welsh Government will take its time to develop it properly.
- WG wants to learn from the relatively small-scale projects in England and the 'Tir a Môr' Llŷn project. It is also engaged with those delivering projects in Ireland.

It seems clear now that WG itself has no funds set aside to run pilots before 2025 and that it envisages a piloting programme of some sort starting then as BPS is gradually scaled down. While the details of this general picture are only emerging slowly, the situation vis-à-vis common land is still very unclear. As has been noted previously, it would be difficult to introduce a small 'universal' element on commons without recreating a set of inactive commoners who nevertheless feel entitled to payments, thereby weakening the targeting of support to active managers of the common and raising questions about the justification for public spending (the 'money for nothing' argument quite rightly used against 'slipper farmers'). In this, commons are quite different from sole use farmland.

For this reason, as well as the need to keep the positive momentum going, EFNCP continues to look for funding for a large-scale pilot of the results-based hybrid approach, including making payments to graziers. Work is currently focussed on the potential of the successor to the Sustainable

Management Scheme, to be called the Integrated Natural Resources Scheme INRS. That work involves speaking to commoners and other interested parties on a range of commons all over Wales who are not participating in Glastir Commons.

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