



# Piloting results-based payments for agri-environment schemes in England

Executive Summary

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**YORKSHIRE DALES**  
National Park Authority



## Background to the project

There have been well documented questions about the effectiveness of conventional action-based agri-environment schemes (AES). These define specific management actions, often referred to as prescriptions, which are expected to result in a desired environmental outcome. There is widespread evidence that following prescriptions doesn't always guarantee results. Additionally, concerns about the ability to demonstrate that management actions have been adhered to have often resulted in bureaucratic evidence and record keeping requirements for participants in conventional schemes. Consequently, there is widespread interest in the potential for results-based approaches to be adopted more widely in AES to help address the limitations of action-based approaches.

The key characteristic of a result-based approach is that the value of the payment is directly linked to the level of environmental outcomes achieved, not to the management inputs/actions undertaken. Result-based approaches have a number of inherent strengths:



Common spotted orchid in a pilot scheme hay meadow  
© Helen Keep

- The link between payment and result focuses farmers on owning and understanding the results, rather than simply following prescriptions, promoting genuine behaviour change.
- Payment is only made when results are delivered, improving the cost-effectiveness of schemes. If payments are structured effectively farmers may be motivated to achieve higher environmental outcomes to secure higher payment rates.
- No need for evidence that lots of individual prescriptions have been fulfilled as payment is based on results not inputs/actions.
- Farmers can manage as they see fit to achieve outcomes in their specific location. Allowing them the freedom to use their own local knowledge and expertise. The lack of prescriptions provides flexibility at the field, farm, local, regional level – rather than a national 'one-size fits all' set of prescriptions. This can bridge the gap between the delivery efficiencies of a national scheme and local flexibility.
- The onus is on the farmer to seek advice and to improve their skills and knowledge to enable them to deliver the results.
- An opportunity to greatly simplify schemes focused around objectives (removing separate supplements and capital items as these become embedded as tools supporting the delivery of the objective rather than separate payment items).

Interest in result-based approaches is not new in England, for example the Peak District National Park Authority ran a small local project for hay meadows briefly during the 1980s. However, despite this longstanding interest the result-based approach has not been tested or adopted to any extent in England. To test how results-based AES could work in a range of different farming systems and for the delivery of different biodiversity objectives the European Commission provided 70% funding for a Results-Based Agri-Environment Pilot Scheme (RBAPS) in England. The project ran from January 2016 to December 2018. Co-funding and support was provided by the project partners – Natural England and the Yorkshire Dales National Park Authority. These partners have considerable expertise in AES design and implementation. The overall aims of the pilot were:

- To set up result-based agreements in 2 geographical locations looking at 2 environmental outcomes (broadly equivalent to conventional scheme 'options') in upland grassland and lowland arable farming systems.
- To assess the environmental performance of habitats under result-based agreements.
- To compare the result-based approach to control sites within the pilot boundary.
- To test the accuracy of farmer self-assessment of results.
- To test the cost effectiveness of the result-based approach.
- To explore agreement holder and stakeholder attitudes to result-based approaches.

Musk mallow flowering in a pilot scheme pollen and nectar plot © David Whiting



## Selection of biodiversity targets

The pilot tested the RBAPS approach in the delivery of 4 environmental objectives:

- Species rich hay meadows,
- Habitat for breeding waders,
- Provision of winter bird food,
- Provision of pollen and nectar resources for pollinators.

These targets were selected as examples of key priority biodiversity objectives in grassland and arable farming systems and where there is evidence of significant variability in their performance within conventional AES.



Pilot scheme hay meadow © Helen Keep



Scrape and scattered rush in a field for breeding waders © Helen Keep



Winter bird food © David Whiting



Crimson clover in a pollen and nectar plot © David Whiting

## Development and testing of results indicators

A key design principle of the pilot was to develop result measures that could be self-assessed by participants. The rationale for this was to develop ownership and understanding of the outcomes by the participants and enable this to directly inform their management decisions in a timely fashion, rather than relying on a periodic expert assessment (which would be resource intensive and have more limited scope to inform in-year management decisions). For the purposes of the pilot all sites were subject to participant self-assessment and independent expert assessment to enable analysis of self-assessment accuracy to be undertaken. A small proportion of expert assessments were also subject to independent review to test the consistency of the methodology.

Developing result measures for the hay meadow outcome was relatively straightforward. Species rich grassland has featured widely in results-based approaches developed elsewhere and these existing examples provided a strong starting point for a measure based on the presence of positive and negative indicator plant species. In this case the result measure is a direct measure. However, for the arable outcomes and the breeding wader habitat the result measures are necessarily proxy measures of intermediate outcomes rather than direct measures of bird or pollinator populations or wader breeding success (which cannot easily be measured at the farm or field level), and there are fewer existing examples to draw on. Table 1 summarises the result measures.

**Table 1. Result measures.**

Objective	Result indicator
Species rich hay meadow	Species richness score based on presence of positive and negative indicator species.
Habitat for breeding waders	Score based on positive and negative habitat structural characteristics/features.
Provision of winter bird food	Score based on number of specified seed bearing plant species present.
Provision of pollen and nectar resources for pollinators	Score based on number of specified flowering plant species present and in 2nd year after establishment % cover of specified species.

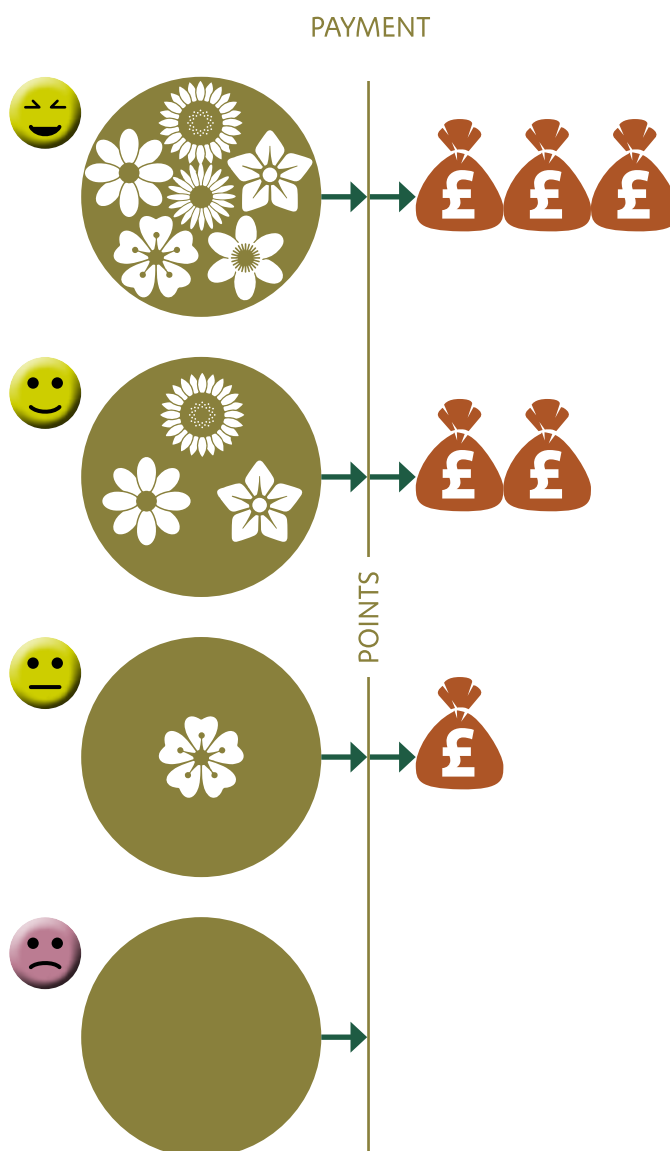
Survey quadrat in pollen and nectar plot © David Ward



## Setting payment rates to recognise and reward quality

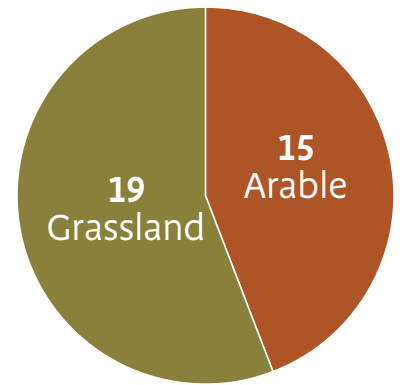
In action-based schemes, participants receive a fixed payment rate for all land enrolled in a management option, regardless of results. The results-based approach adopts a variable payment linked to the quality of the biodiversity results, which are assessed by the scoring system for results indicators. To establish payment rates the conventional approach of calculating the income lost and net additional costs incurred as a result of adopting the farming practices necessary to support the biodiversity targets was used. This establishes the net difference in income and costs between a conventional farming system, for the relevant land type, and the farming system necessary to deliver the maximum biodiversity results. Achieving the maximum results assumes that the participant has to incur the full range of potential costs. The calculations also made an allowance for the participant's time to undertake the self-assessment of results and time to attend training events. This approach to the calculation of payments ensures consistency with the WTO green box requirements for agri-environmental programmes.

The payment structure adopted equally spaced payment rates, based on five tiers (grassland pilot) or six and ten tiers for the two arable objectives which also include a zero payment. The payment for the top tier was based on the maximum rate calculated, the minimum rate was established based on assumed minimum costs incurred to deliver the lowest level of result indicator score and the intermediate rates as equal bands between. These payment tiers were mapped across to the result indicator scores to give points scoring bands related to each payment rate. The inclusion of a zero payment, making this a pure results-based approach rather than a hybrid (with a guaranteed base payment and result-based 'top-up'), was a deliberate decision to test attitudes towards potential risk associated with non-delivery under a result-based approach. The payment structure aimed to achieve a balance between incentivising farmers to deliver the highest possible score (and therefore payment) and limiting the sensitivity of payments to the scoring system as a result of minor changes in result scores. The number and value of the steps in a tiered system are important considerations as they are key drivers for encouraging farmers to produce better results and increase their payment. The project used evenly spaced payment tiers, primarily for simplicity and lack of strong evidence for an alternative approach. There is potential to explore how motivation changes with non-linear payment rates.



## Implementation and Farmer participation

A call for expressions of interest for participant farmers was made using a range of existing data sources within the target area boundaries. Those expressing interest were checked for eligibility against a range of published criteria. Those deemed eligible were then invited to submit an application. In total 34 farmers were recruited to participate with a total of 230 hectares of land enrolled in 2 year agreements. Details of the number of farmers and areas entered under each measure are shown below. Over the two year farmer contract period, the total spend for results-based measures was £117,800.



**Number of farms under agreement**  
(one grassland agreement holder left the pilot after the first year)

The participating farms represent a broadly typical cross-section of farms for their respective areas. The average size of the grassland farms is 84ha, ranging from 5-286ha, whereas the arable average is 288ha, ranging from 77-703ha. The farm types are a varied mix of large commercial farms, small farms, farms with a long history of involvement with AES (for the arable existing AES membership is a prerequisite) and some who have never previously participated. The majority of participants have been in farming for more than 20 years, with a small number of more recent entrants.



Total area under agreement **230.68 ha**

## Training and guidance to support results delivery and results self-assessment

Farmers were provided with extensive advice on how to achieve the best environmental outcomes. This was achieved through a range of guidance materials, 1:1 farm visits, farm walks and training events. The guidance documents included both detailed descriptions of the scoring methodology and scorecards and extensive good practice guidance on potential management interventions to support the delivery of the biodiversity targets. These materials have been published separately.

The majority of farmers attended the training events. These have been very well received and have also provided a valuable opportunity for participants to meet and share their experience with one another. This 'peer-to-peer' learning is a valuable aspect of a results-based approach, where farmers can share knowledge of how to achieve the best scores, and which has limited value in a prescriptive approach because of the inherent inflexibility in choice and timing of management interventions. The 1:1 advice, especially supporting the baseline result assessment process, and the provision of bespoke management advice based on these assessments was also highly valued and this is reflected in the higher proportion of participants who identified that they were quite or very confident about undertaking the self-assessments at the end of the project.

*"Realisation that advice and input from outside sources is key to improving the effectiveness of these conservation areas. With general agriculture we have so many magazines advising best practice; in conservation there is so little palatable, practical literature dealing with hows, whys and wherefores on an agricultural scale. The opportunity to talk shop with other farmer conservationists has been most valuable."*

**Participating farmer**

Grassland pilot farm in Wensleydale © Annabelle LePage



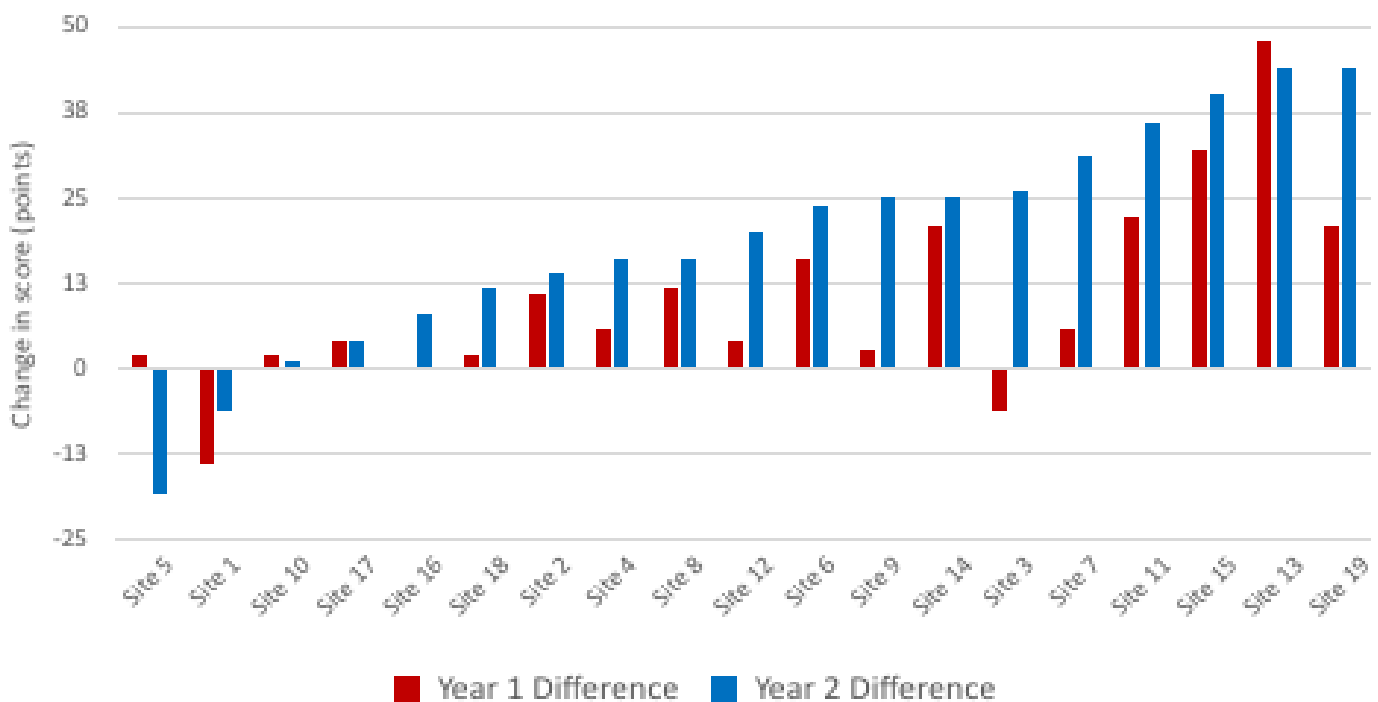


## Biodiversity Results

The environmental performance of all the results-based measures was better than their equivalent control sites. The winter bird food plots managed with a results based approach significantly outperformed conventional scheme control plots during both years of the pilot (43% higher scores). Pollen and nectar plots exhibited somewhat less difference but still performed better than the control sites (15% higher scores). The species rich meadow sites exhibited an average 24% increase in quality score over the 2 years with improvements on all but 2 sites (figure 1). Quality scores for the breeding wader habitat declined by 13% on average over the 2 years but this was still slightly better than on comparable control sites (-17%). In the case of both hay meadows and winter bird food the difference in performance between RBAPS and controls was statistically significant (P0.05).

Farmers have been motivated to carry out different management practices to improve the biodiversity results. Grassland participants responded to the results-based approach by carrying out around 4 new practices each such as reduced fertiliser, changes to grazing management and adding wildflower seed. Arable farmers have made different management decisions for their plots even compared to their conventional AES plots. These include seed bed preparation, choice of seed mix, fertiliser and plant protection product applications. In short they are paying greater attention to their result-based plots and carefully considering how to produce results and secure a higher payment rate. The short duration of the project means that it has not been possible to test whether the initial motivation wanes as participants develop experience of the approach (and are successful or otherwise).

**Figure 1. Species Rich Hay Meadows: change in score from baseline to years 1 and 2.**



This illustrates that the approach was effective at motivating the participants to deliver changes in management which translated into improvements to their quality scores, even within the very short timeframe over which the farmer contracts operated. However, developing and using simplified result/quality measures means that there is a risk of divergence between the desired outcome, as represented by the simplified result measure, and more sophisticated outcome assessments. The short duration of the project and limited resources means that comprehensive validation of the simplified result measures with more detailed assessments of the results has not been a priority. For example, a full bird survey and chick productivity assessment would be required to fully understand if the management undertaken by the farmers was having a positive effect on breeding wader numbers and importantly the number of chicks that are reared to fledging age.

The development of result measures which rely on intermediate/proxy results has highlighted particular challenges with this approach. For example, when developing the results criteria for winter bird food, seed production was the focus. As the results show the farmers have delivered well even during the exceptionally dry, hot season in 2018. However, what has become apparent is that focusing on seed production has resulted in some very tall dense plots that are difficult to assess and potentially may not be ideal for the birds to feed. Defining and measuring a good plot is not as simple as the amount of seed produced, other elements such as plot structure and habitat provision need to be considered further if this approach is to be adopted more widely.

Significant variations in weather conditions during the project have provided valuable testing of the approach under these circumstances and have highlighted that extreme weather events, outside normal fluctuations, can unfairly expose farmers to risk beyond their control.

Assessing results in a hay meadow © Annabelle LePage

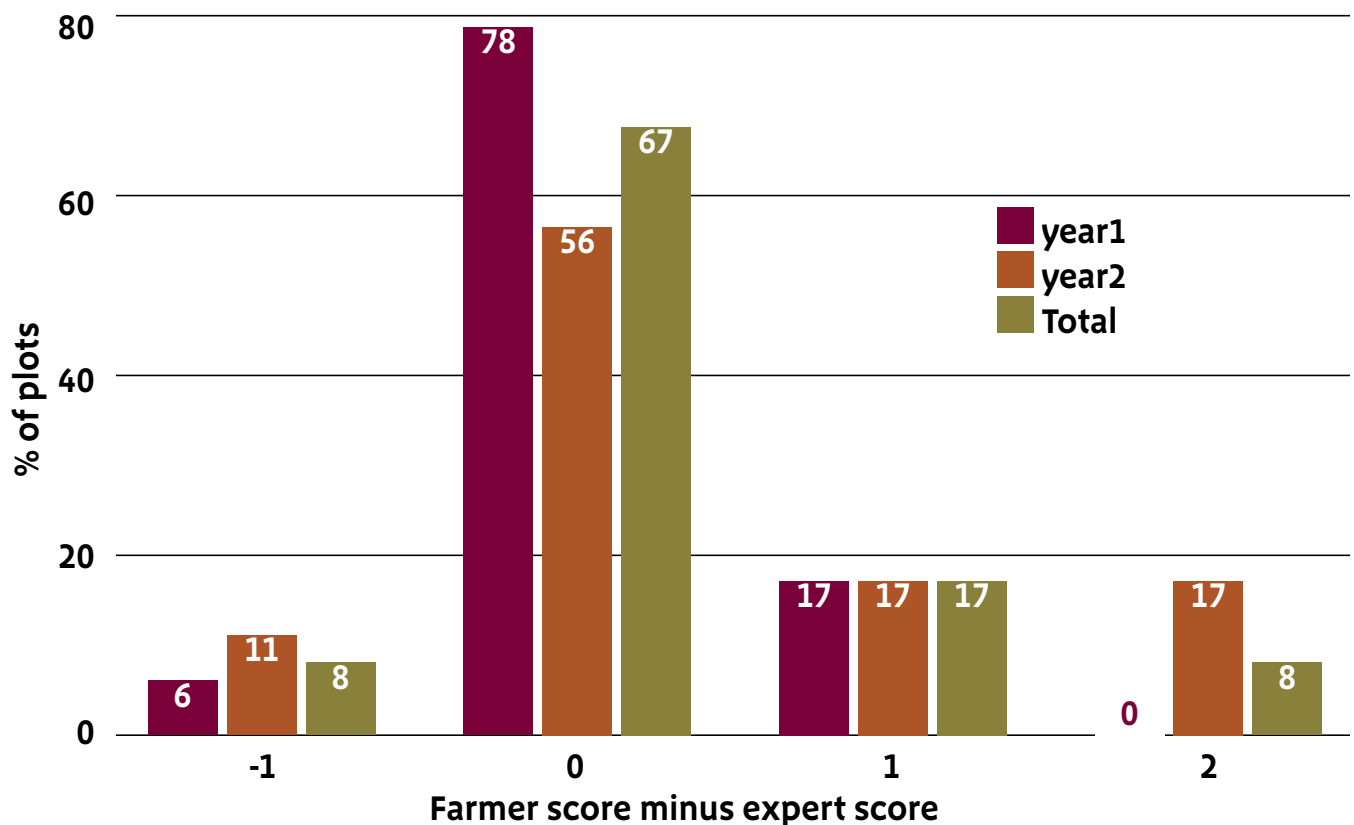


## Accuracy of self-assessment and verification of biodiversity scores

In terms of measurement of results, farmers have picked up survey skills rapidly and their results show a good correlation with the adviser's. For winter bird food provision (Figure 2), pollen and nectar provision and hay meadows the majority of adviser and self-assessments over the two years resulted in the same payment tier (67%, 68%, 66% respectively). The results for breeding wader habitat were significantly less consistent with only 36% of assessments agreeing on payment tier. Overall only a very small proportion of assessments resulted in more than a +/- 1 tier difference in result (predominantly for the breeding wader habitat). The results have shown that farmers have grown in confidence and ability with surveying techniques and plant identification. Assessment results which showed most differences were typically caused by:

- Species misidentification (both grassland and arable),
- Purposeful or unintended deviation from the fixed transect (Hay meadows),
- Interpretation of the 'representative stops' methodology (Arable),
- Measures based on assessments such as percentage cover were also found to be more subjective (Breeding wader habitat and Pollen and nectar provision).

Figure 2. Winter Bird Food: accuracy of farmer assessment, difference in payment tier.



## Farmer attitudes towards the results-based approach

Farmer attitudes towards the results-based approach, based on responses to questionnaire surveys, were almost universally positive. Farmers like the freedom to use their own local knowledge and expertise to manage without being 'told what to do'. A strong theme of equity emerged with widespread recognition that the approach fairly rewards knowledge, skills and effort rather than a flat rate payment regardless of results. The approach has also generated better understanding of the biodiversity outcomes. For example, grassland participants highlighted the value of learning about the national and international importance of the habitats and species on their farms and the role they play in protecting them.

Depending on a participant's attitude to risk, a pure results-based approach provides a positive motivation and/or a negative exposure to risk. The pure results-based approach and consequent £0 payment rate created much discussion, primarily in the arable element of the project where the objectives are delivered through annual measures with significant potential exposure to risk each year, unlike an established habitat. At the start of the project there was concern about the level of risk it exposed a farmer to; although it could be argued that all commercial crops are also subject to failure and so this is little different. However, the pilot has shown that none of the arable plots, even in the challenging weather of 2018, were anywhere near the £0 payment tier so this concern may be unsubstantiated in the longer-term. However, it might act as a significant barrier to initial scheme uptake, especially for those with lower levels of confidence/experience.

*"It directly rewards for skill, effort and care"*

**Participating farmer**

*"The more that you put in, the more that you get out"*

**Participating farmer**

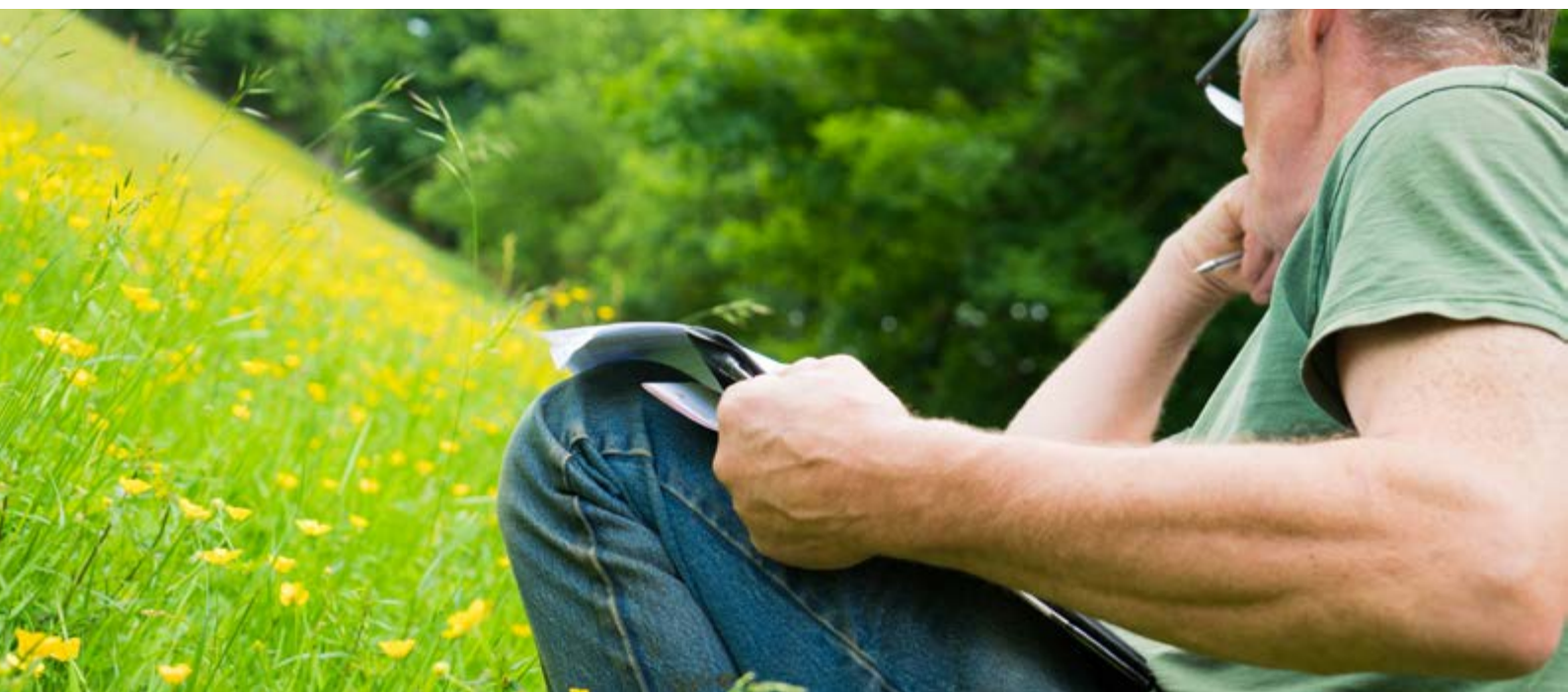
*"It has been a great learning process and a chance to have the freedom to experiment with the management of both WBF and P & N in order to work out what work best on my farm (still learning)"*

**Participating farmer**

*"risk provides focus"*

**Participating farmer**

Participating farmer surveying hay meadow © Andy Kay



## Administrative costs and scheme payments of RBAPS compared with management-based schemes

A full comparison of cost-effectiveness isn't possible without taking into account all the delivery costs, payments and environmental performance of both result-based and management-based approaches, which has not been possible. However, the estimates suggest that in terms of delivery costs the administrative simplicity of the RBAPS approach, which negates the need for the selection and tailoring to individual sites of multiple management based options and prescriptions, offsets the additional resource required to manage and support the ongoing implementation of RBAPS agreements in terms of advice.

In most other respects the processes involved in scheme delivery, eg expert baseline assessments, payment of claims, compliance monitoring, and environmental monitoring are the same so costs for these elements wouldn't be expected to differ significantly between approaches.

In terms of overall scheme payments the higher scheme payments associated with high levels of results delivery under a result-based approach may be offset against lower payments for under-performance/sites at the lower end of the payment range (which would have received a higher fixed rate payment under a management based approach), so the total value of payments is not necessarily higher for an equivalent area under management. Where payment rates under a result-based approach are somewhat higher on average than those on control sites under management-based agreements (for example the winter bird food and pollen and nectar payments were on average approximately 20% higher under the result-based approach) this corresponds to environmental performance improvements (scores increased by 43% and 15% respectively), which suggests that the additional benefits are likely to be at least proportionate to the higher scheme payments.



Millet in winter bird food © D Ward

## Conclusions

The England pilot has built on the available evidence and developed and tested result scoring assessments and tiered results based payments for four biodiversity objectives. A pure results-based approach provides an important motivation, and also a value-for-money safeguard to ensure payments are only made for performance above a defined minimum level. It is clear that the results-based approach has considerable potential to improve the performance of agri-environmental measures, and early indications suggest that delivery costs and scheme payments are unlikely to be significantly different to those of management-based measures, suggesting that the approach could deliver some efficiency gains. It is also clear that the approach could be applied to a wide range of biodiversity objectives and many other environmental objectives associated with land management practices.

In relation to the design and implementation of results-based measures the following conclusions emerge:

- Proxy indicators need to be extensively tested in the field to identify any potential unforeseen/perverse outcomes.
- Result measures require ongoing validation, comparing result scores with traditional habitat condition assessment methodologies/other direct measures using longer time series, to confirm that simplified measures are good proxies for their objectives and that there is no divergence over time.
- To limit the use of result indicators reliant on more subjective assessments, such as percentage of cover, and to recognise the greater variability in scoring that may result if they are adopted (eg by using fewer payment tiers, accepting that this may reduce the incentive effect).
- Weather is a significant factor that affects both agricultural and environmental results. Successful delivery of many biodiversity outcomes is closely linked to characteristics, such as wetness, which are affected by the weather. Result indicators which are very sensitive to weather conditions should only be used where potential management interventions are available to directly influence these characteristics. Provided that this is the case it is not unreasonable to expect farmers to make more interventions in some years to deliver optimum results (or accept a lower level of results, which would be no different to agricultural production affected by weather).
- The need for clear safeguards to apply if truly 'exceptional weather' is experienced so that land managers are not unfairly exposed to risk beyond their control and are aware of this when they enter an agreement. The pilot has explored a number of potential options for this and different approaches may be more suitable for different outcomes.
- Defined assessment windows are important to ensure any independent verification takes place as close to the self-assessment survey date as possible.
- Developing single result measures for species with different habitat requirements is challenging. This has been highlighted in the development of the breeding wader measure where 3 of the target species have broadly similar habitat requirements whereas the 4th (Lapwing) shares many similar requirements but also has some significant differences. This highlights the challenge of defining simple habitat condition objectives that can simultaneously satisfy the requirements of multiple target species.

## Further work and Mainstreaming

A number of priorities for further work to support future design and implementation, have emerged, specifically:

- A greater understanding of how farmer confidence and expectations develop over time as they engage with the approach. Especially whether their initial motivation wanes as participants develop experience of the approach (and are successful or otherwise), especially for those environmental objectives, such as habitat condition, that are typically very slow to respond to changes in management. Specifically for the pollen and nectar resource provision, which is a multi-annual sown mix and prone to deteriorate in quality over time, whether the RBAPS approach will encourage proactive management actions to be taken to maintain a certain quality/payment level.
- Testing how the number of payment tiers and the use of non-linear spacing of tiers affects farmer attitudes to risk and reward and their engagement with the approach.
- There are opportunities to explore the use of technology, especially to support the process of result assessment undertaken by farmers/land managers. Overall, technology may have two specific uses in this context. First, to support more accurate assessments of results by land managers at the field/farm-level. Here it is important that there is scope for real-time or rapid feedback from such tools to inform management decisions. Second is the potential for remote sensing to support effective targeting of site verification visits, recognising that independent verification of results will only be possible for a small proportion of sites.
- There is a need to develop a better understanding of the impact of annual weather differences, especially in the context of increasing variability driven by climate change, on indicator species visibility/counts through longer time series data.

*“It is an important step toward the future of agri-environment schemes for the first time quantifying environmental benefit”*

**Participating farmer**

Arable farmer carrying out self-assessment in winter bird food © David Whiting



Five particular challenges to mainstreaming the approach have been identified.

- 1** Concerns that the time associated with undertaking self-assessment of results by participants, on a larger number of plots/fields, across a wider range of environmental objectives, at a whole farm scale, could be considerable. The scheme payments include an element for the time required to undertake the assessments so the time itself need not be a barrier, however, if the timing of assessments for different outcomes were coincident and/or the timing of assessments were coincident with peaks of agricultural activities this could be a particular challenge. It would be anticipated that the time spent by participants on self-assessment would reduce as they develop the skills and confidence to undertake the assessments, and there is some evidence from the pilot of this happening. However, this clearly needs further consideration in the context of an overall scheme design although it might be possible to reduce the frequency of some assessments or to reduce the number of stops per plot, subject to further testing of the repeatability of different survey methodologies.
- 2** The need for extensive training and advice, especially in the early stages of implementation to support the self-assessment process. The approach is a big culture change for farmers, changing the scheme risk from non-compliance with prescriptions to non-delivery of results. Experience from the pilot shows the potential need for high levels of support in the early stages of adopting the results-based approach as farmers develop the necessary skills and confidence. This would be especially true across a scheme with a wider range of result based objectives. However, indications from the pilot suggest that farmers have developed the necessary skills and grown in confidence quickly and that this would predominantly be a temporary requirement in the initial stages of implementation.
- 3** The resource required to verify results. The pilot has necessarily employed 100% independent assessment of results annually. Translating such an approach into a mainstream scheme is unlikely to be feasible because of the volume of assessments required. However, the pilot has demonstrated a high level of accuracy of self-assessment results for most measures which indicates that such a level of verification is probably not necessary. For some measures less frequent independent assessments may be sufficient eg at end of agreement (which would also provide a new baseline for any future agreement), in other cases a risk-based approach focused on independently sampling a small proportion of sites each year could be adopted. Selection could be informed by factors such as significant changes in self-assessed scores, evidence from remote-sensed data suggesting a discrepancy between a self-assessed score and actual condition on the ground, or random.
- 4** Budget management. The potential variability in performance and consequent fluctuations in expenditure raises a potential concern for Managing Authorities. However, for most measures, such as habitat condition, it should be possible to accurately anticipate expenditure based on baseline condition assessments and assumed average rates of habitat quality improvement. Annual measures, such as the arable measures tested here, are potentially more prone to fluctuation but their performance has been broadly consistent across the pilot (even in a challenging growing season affected by drought) which suggests that average performance levels would emerge which could be used for budget planning purposes.



- 5 The development and testing of a much wider range of result measures. The pilot has only developed and tested result measures for 4 biodiversity objectives and following experience and testing some further development of these measures is still required. This is potentially a significant process which requires considerable technical expertise and extensive time for testing, especially for outcomes where the approach hasn't be tested before. Even for outcomes where there may be more experience to draw on, tailoring of proven approaches to specific local circumstances is still likely to be required. However, unlike management-based schemes which tend to develop multiple management options and prescriptions designed to address specific situations, a significant advantage of a results-based approach is that a tiered approach to payments can accommodate a wide-range of baseline starting conditions within a single measure and also subsume a range of payment supplements and supporting capital investments. A tiered payment approach could therefore potentially result in a very significant simplification of the potential number of measures required compared to a management-based scheme.

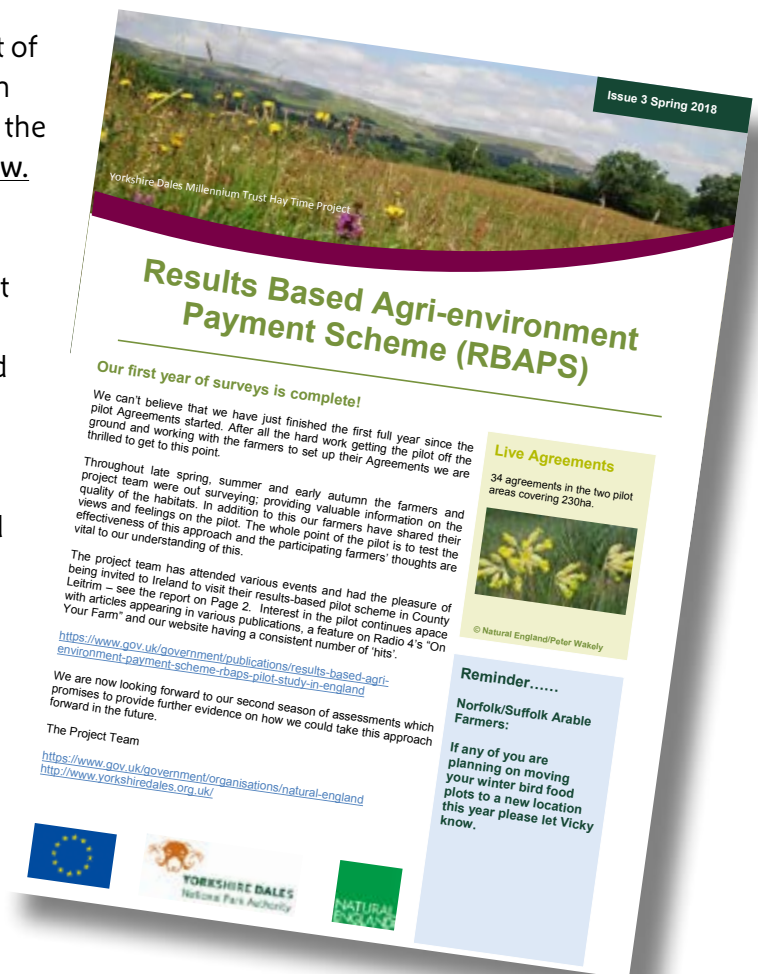
Clearly there is some further work that is required before the approach could be fully mainstreamed. However, experience from the pilot is very positive and suggests that the approach has considerable potential to improve the delivery of outcomes in the future.

Sunflowers in a plot of winter bird food © D Ward



## Dissemination and communication

The project has generated a considerable amount of interest and has been presented at conferences in England, Wales, Scotland, Belgium and Ireland by the project partners. The project website (<https://www.gov.uk/government/publications/results-based-agri-environment-payment-scheme-rbaps-pilot-study-in-england>) was updated during the project and an annual project newsletter was produced. Regular meetings were held with local groups and stakeholders in each pilot area and with national stakeholders via an existing group. The project has hosted numerous visits from organisations interested to find out more and many articles and interviews have been published or presented in local and national press/media to promote results-based schemes. Experience from the pilot has fed into the development of post-Brexit environmental land management policy in England, and Defra has agreed to continue funding the project for a further 2 years to enable further testing of the approach to inform future policy development.





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