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Report

Farmers' Experiences of RBAPS in Wensleydale: Changing Management Practices and Perceptions of Environmental Public Goods

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1. INTRODUCTION

This report outlines the key changes in management practices which were implemented by farmers taking part in the Results Based Agri-environment Payment Scheme (RBAPS) pilot in Wensleydale. It details farmers' perspectives about which particular management practices were important to undertake for the quality of their RBAPS land parcels, and discusses lessons learned from this pilot for the broader development of Environmental Land Management Schemes (ELMS).

The research aimed to identify management changes for the fields entered into the RBAPS pilot over the course of the project (2016 – 2020 inclusive), as well as the farmers' stimuli and motivations for undertaking specific management or making changes. Management changes could include a range of activities such as fertiliser/ lime use, meadow cutting dates, timing of grazing, number of livestock and/ or type of livestock, machinery use, rush cutting in wader fields, approach to weed control, creation or enhancement of wet features for wading birds, spreading wildflower seed or green hay or planting plug plants, and predator control. Questions also covered any adjustments made in response to extreme weather events, knowledge of beneficial management to increase RBAPS score and levels of disappointment associated with less encouraging results.

The final part of the report draws out some of the key insights that these management practices, and the associated decision-making processes, may have for future iterations of a results-based payment approach in other developing schemes.

2. METHOD

For this report, nine semi-structured interviews were conducted with farmers who participated in the Wensleydale RBAPS Pilot in January 2021. The interviews lasted on average for approximately 1 hour 30 minutes, with the shortest interview being just over 1 hour and the longest being 2 hours and 30 minutes. The interviews took place either online via video call (on Skype, Microsoft Teams, Zoom or WhatsApp) or over the telephone. Some participants have unfortunately been unable to be interviewed yet but remain eager to participate when interviews can safely be conducted in person, as was originally planned before increased COVID-19 restrictions came into effect in November 2020.

The interviews were structured into three broad sections. The first section covered 'Transaction Costs'- these are the economic costs, time and other investments made by farmers in collecting and considering various factors to become sufficiently informed and prepared to take up the RBAPS scheme. The second section focused upon the changes in management practices that farmers undertook over the pilot scheme period to promote the delivery of the habitats. For this section, a timeline was populated during the interview utilising the online visual interactive platform Mural. For the online interviews, the timelines were shared onscreen by the interviewer so that the population of the timeline with practices was a live and coproduced output which aimed to accurately reflect a comprehensive overview of the farmer's land management.

The timelines were enhanced using management practice prompts supplied by the Yorkshire Dales National Park Authority (YDNPA), and helpfully enabled farmers to consider how these practices changed both before and during the timescale of the scheme. In the third and final section, farmers were asked about their broad impressions of RBAPS, both as a standalone pilot and to ascertain what elements of the payments by results approach farmers would be keen to see in future broader agri-environment schemes, namely the upcoming ELMS currently under development.

Limitations of the methodology included that farmers had to rely on their memory when reporting management and changes over the last 4-5 years, so they may have been a year off when recalling a dry spring or what year they scattered wildflower seed. There was also uncertainty in numbers with regard to how many scrapes were put in or how many sheep were in a particular field for what periods. In some cases, information gaps may be filled by matching with data from previous surveys of participating farmers' attitudes and effort (time) invested for monitoring carried out by Natural England and the National Park's farm team.

3. OVERVIEW AND MANAGEMENT PRACTICES SUMMARY

3.1. Farmer profiles (forthcoming)

Alongside the development of this report, 'farmer profiles' have been compiled which offer an overview of each farmer's key messages and impressions of the scheme, alongside key data on their broad score changes, mentality towards results and some of their more notable management changes. These profiles will also include a comprehensive 'timeline' of management changes undertaken by the farmers, which was developed during the interviews alongside farmers through the interactive online platform Mural. Final consolidation of these timelines is ongoing.

3.2. Management changes overview

In this section, the main farming practices identified by the RBAPS farmers as important to their parcel management are described. The pilot scheme offered two options: farmers could enter the option for species rich hay meadows, or the option for improving wading bird habitat. The interviewees included 7 farmers enrolled in the meadows option and 5 in the waders option, with 3 farmers taking part in both (Tables 1 and 2). Management changes will be discussed separately for hay meadows and wading bird habitat, summarising the main points for each activity.

3.2.1. Hay meadows

The **cutting** time for hay meadows varies between farmers but only one had changed their cutting regime. Farmer B no longer takes a second crop: while before they cut end of June and mid-August, they now cut only once into July. Mid July is the typical cutting date (with two farmers cutting end of June) but all farmers emphasised how this is determined by the weather, i.e. how dry or wet it is and how much the grass grows. Three farmers now make (or try to make) hay instead of haylage or silage (Farmers A, B and E). Farmer A tries to leave it as late as possible. Some commented on the type of bales: where farmers depended on contractors they had little influence on the baler and it tended to be big round bales (Farmers A, B, E and H) or big oblong quadrants (Farmer I); when they had their own machinery they used medium sized tractors and produced small square bales.

Farmer H preferred round bales, arguing that this helps spreading wildflowers as more seeds roll out when feeding in other fields. In contrast, Farmer E was strongly in favour of small bales that should be stored in field barns to achieve the coupled benefit of avoiding plastics and maintaining the barns as cultural heritage. Several farmers were now considering machinery size more than before entering the scheme but were limited by their use of contractors (Farmers A and B).

Changes in **grazing** were also mainly a year on year adaptation to weather and varying growing conditions, with the farmers aiming to utilise the available grass well. Stocking densities are determined based on how much grass there is in a field. All commented on taking stock out of a field if the ground got to wet to avoid poaching. However, this was seen as taking care of any field, regardless of being in a scheme. Farmer A had replaced cattle with a rare breed sheep to try and reduce the thickness of the sward and enhance growing conditions for yellow rattle. Two farmers (C and F) commented that they now move the sheep out of the meadows 2-3 weeks early (beginning of May) in order to allow wildflowers a longer growing season but stressed that this was only possible because they had pastures available, and that it was weather/ flooding dependent. Only Farmer H had intentionally reduced the number of sheep (2 instead of 3/ha) and also took sheep off the meadow even earlier (20 April).

Very little change was reported with regard to **spreading farmyard manure** (top dressing). The majority spread muck yearly, usually late winter to early spring (Jan-Mar) when mucking out buildings. One specified they want frosty weather to avoid compacting the soil with the heavy muck spreader; another spreads in the small window when sheep are indoors for lambing. Where farmers have less manure available, they spread muck in alternate years or on alternate fields. Only Farmer H spreads muck in July. Farmer A experimented used manure only before and in year 1 to see the effect and reported reduced output (about a bale per field less) but no observable effect on species richness as that was already high. Farmer B has reduced the amount of manure and confirms that without manure the feed value of the crop would be a lot less. While some farmers reject the use of chain harrowing altogether (Farmers B and I) because of the risk of destroying bird nests, others will use them occasionally to spread mole hills or muck (Farmers E, F and H), especially when it is slow to break up (Farmer F).

With regard to **fertilising with nitrogen** or compound fertilisers, three farmers reported a reduction of the amount of fertiliser. Farmer B no longer carries out a second application of fertiliser and has changed from straight nitrogen to a compound fertiliser; Farmer I had already stopped applying nitrogen 2 years before entering the scheme, and Farmer H stopped applying nitrogen fertiliser altogether once he entered the scheme. Two farmers carried on without fertiliser (Farmers D and F); one of the fields was actually in a steep location so had never been fertilised or intensively used.

Whether farmers undertook **liming** on their fields was determined by whether the field needed it (soil test), the money available, and the right weather conditions. Two farmers had not limed during the period under consideration (Farmers A, B and H), one had limed once in 2018 (3), one had put “a bit of lime on some of the meadows” (Farmer E) and a further stated to have limed every second year in April since entering the scheme (Farmer F).

A common management change with regard to **weed control** was the change from blanket spraying to spot spraying and/ or reducing the amount sprayed (Farmers C and F). Others carried on spot spraying using a knapsack as they had done before (Farmers A, B and E, by bike Farmer H). This was normally done April-June, on and 'as needed' basis for docks, nettles, creeping thistle. Farmer A also sprayed thistles in their new field in Sep/Oct. Only Farmer B made the connection between his score decreasing slightly and the fact that he had run out of time to spray the year before.

Predator control for meadows tends to occur on a regular basis throughout the year and concerns trapping moles (Farmers A, B, C, E) and shooting rabbits (Farmers A, E and F). Only farmer A traps stoats and weasels, whereas Farmer E refers to a 'well-keepered' farm which means they do not have to look after those predators. Farmer H tries not to wipe out all moles as they see the benefit moles have for soil management and doesn't bother about the few rabbits and hares.

The activities to enhance the numbers of wildflowers by **seeding and plug plants** vary widely among interviewees. All scattered seed by hand, when given packs from the National Park team. Several tried spreading specifically along the transect line. While some only scattered the seed, others used 'aggressive' chain harrowing before spreading seed to help establishment (Farmer C). The latter interviewee reported seeing new species the following year, while another said "nothing grew. A waste of time." (Farmer E). The timing of seed spreading varied from Dec-Feb, Oct, to "after hay cutting". Farmer A propagated some plug plants recently but has not planted them out yet, while Farmer H planted 2,500 the first year, and an additional 100-150 every year after. The others used no plug plants. Farmer A claimed that scoring would not improve without seeding and plug plants, and to get a significant increase in score a complete ploughing and reseeding would be the best option. In year 4, Farmer C also experimented with a wheeled hay rack to manage seed return and light manuring.

3.3. Wading bird habitat

Approaches to **rush management** vary considerably between farmers, depending on the amount of rushes in their fields, use of the fields and attitudes. Farmers implement combinations of rush cutting and spraying. For example, Farmer B did not spray before and mowed at the end of September, and now does not mow but will target machine spraying at rush patches in June, doing a quarter of the field every year. Farmer D did some rush cutting in the second year, because it was too boggy in the first year. Farmer H undertakes strategic and less intensive rush cutting for livestock bedding in late August with the aim of leaving a mosaic of rushes for wind protection for bird nests (combined with leaving a fence to provide chick cover). Farmers E and G did not change their management after entering the scheme and continued tractor spraying in June, with the exception of 2020 where Farmer G did not have another field with enough grass to shift the livestock into. Farmer I used grazing for rush management rather than cutting.

Grazing management is determined by grass growth, ground conditions and types of livestock and farmers have changed very little after entering the scheme. It is a matter of trying to time the grazing right, having enough grass but not too much (Farmer G). Only Farmer H has reduced the stocking density of sheep. One farmer has no housing for their sheep on the farm so sheep stay outside year round and have to be rotated around fields to meet their needs. Dry springs are not seen as a problem but farmers respond to wet weather by taking livestock out of fields.

Fertiliser use has remained unchanged for three farmers (Farmers A, E and G). One farmer reduced their fertiliser use by about half (Farmer I) and another one stopped using (compound) fertiliser after realising that the chicks may have been feeding on the pellets (Farmer H). None of the farmers changed their application of farmyard manure. Farmer E emphasised that it is important to get cow muck harrowed into land at the right time, and Farmer G was aware of the risk of squashing nests but continued adding manure to increase insects.

Liming was not seen as an important management practice to influence wader habitat by the majority of interviewees. Two farmers have not applied lime (Farmers B and I), one applied lime once on one field several years before entering the scheme (Farmer E), one limed before entering the scheme and in 2018 albeit without the expectation of an impact (Farmer G), and another had the soil tested showing that the field would benefit from liming but has not done this yet (Farmer H).

Two of the farmers reported to have adjusted their **weed management**: Farmer B started machine spraying while Farmer I no longer blanket spray but moved to spraying spots or patches from the bike which has reduced their spray bill by about 30%. This farmer has also changed their attitude and see nettles and creeping thistle as important source of cover so they experimented with controlling patches rather than eliminating weeds altogether. Spraying tends to take place May-June before seeding but is weather permitting. Docks get pulled out, and one farmer explained their technique of 'stubbing' bell thistles.

Activities for **predator control** vary, with some farmers undertaking no predator control (Farmers D and H), others relying on gamekeepers from neighbouring estates to control stoats, carrion crows and foxes (Farmers E, G and I), and two undertaking some control of moles, rabbits and crow (Farmers B and I). Several farmers feel strongly about the importance of predator control to benefit wading birds as illustrated by Farmer E "if it wasn't for the gamekeepers, it'd be a waste of time." There was a concern raised that keepers needed to be stopped from shooting the wrong birds (snipe).

Creating wet features is promoted by the scheme's assessment criteria. None of the farmers have blocked drains purposefully, however, some have chosen not to repair blocking or broken drains (Farmers E and I), left features to develop (e.g. from land bevels from feeders or pool remaining after a bath was removed). Blocking drains on purpose was suspected to create other problems (Farmers B, and D). Some farmers have created scrapes of varying sizes (Farmers B, D, G and H) and maintained them as needed by clearing ditches or pulling out grass. One interviewee plans to experiment with reducing the elephant grass tussocks in their field. One enthusiastic farmer demonstrated an active approach by carrying water to a scrape hole when they were dried out, although this was on a field that was not entered into the scheme (Farmer H).

3.4. Directional score changes in first four years

Figure 1 and Figure 2 provide a summary of the farmers' broad score changes over the first four years of the pilot study (only including parcels in the trial for all four years). These tables provide an aggregate 'directional change' in the scores for each farmer in comparison to the previous year, rather than each individual contracted parcel. These tables therefore provide a broader visual aid which demonstrates that, despite the slight downturn in scores which has been noted by advisors over the last two years, in general the scores have generally stayed fairly level across the pilot. Where some have fallen slightly, they have often begun to recover again, even if not yet to previous highest scores.

We have also included in these tables the general 'mindset' of farmers as either aiming to improve or maintain their habitat quality. We explore these different 'mentalities' towards RBAPS in more detail (see section 4.1) yet in general their inclusion here also demonstrates that an 'improver' mindset does not significantly lead to a more positive directional change in habitat score than those farmers who aim to maintain their habitat quality.

Farmer	Mentality	Baseline	Year 1	Year 2	Year 3	Year 4
A	Improve	→	→	→	↓	↑
B	Maintain	→	→	↑	→	↓
C	Maintain	→	→	↑	→	→
D	Maintain	→	→	↑	→	↓
E	Maintain	→	↑	→	→	→
F	Improve	→	→	↑	↓	→
H	Improve	→	→	↑	→	→

Figure 1 Broad Score Changes for farmers in Hay Meadow Pilot.

Farmer	Mentality	Baseline	Year 1	Year 2	Year 3	Year 4
D	Maintain	→	→	↓	→	↑
E	Maintain	→	→	→	↑	→
G	Maintain	→	→	→	→	↓ [1]
H	Improve	→	→	→	↑	↓
I	Improve	→	↓	↑	→	→

Figure 2 Broad Score Changes for farmers in Wading Birds Pilot.

Broad Score Direction	Symbol
Remains same as previous year	→
Scores generally go up from previous year	↑
Scores generally go down from previous year	↓

[1] Minor dip from top tier in most recent year

4. KEY FINDINGS AND POLICY IMPLICATIONS

4.1. The envisioned 'result' in land management: improving versus maintaining

In determining the farmer's main attitudes and expectations regarding changes to their habitats as a direct result of their management, one of the key recurring factors within the interviews was a distinction between 'improvers' and 'maintainers'. Some farmers considered it their role to 'improve' or enhance the habitat, and therefore increase their score and payments, where others considered their role or objective as to primarily 'maintain' the standard of the habitat which already existed. A 'maintain' mentality might reflect an already high score, where the farmer aims to maintain this rather than necessarily experiment to increase it but also risk decreasing it. However, some participants with lower scoring fields also reflected this mentality. An 'improve' mentality tends to be linked to a more proactive attitude and approach, with the farmer often undertaking additional management to increase the habitat quality.

4.1.1. Scheme duration and farmer attitudes towards habitat quality

The short-term character of the RBAPS pilot was frequently mentioned as a factor affecting farmers' attitudes towards maintaining rather than improving their habitat quality. Several respondents mentioned the uncertainty of the pilot's continuation, and the longer-term scale necessary to see meaningful improvements to their habitats, particularly with reference to hay meadows (Farmers A, B, C and H), and to a lesser extent the condition of wader habitat.

For instance, Farmer C said that the uncertainty in terms of the likelihood of short-term improvement affected their willingness to invest more in meadow improvements:

"I've always thought that it's a very slow process to change the species mix in a meadow cos what's growing there is what's suited to the management that has been for the last however many years, isn't it? … So that's why I didn't spend a lot of money on doing any over-seeding or expensive methods of over-seeding or anything because I didn't know that I was going to get a response at all. So I did it low cost with low expectations. And it has worked, it has improved things, it has resulted in higher payments." (Farmer C)

This view is also reflected by Farmer H, who noted:

"you can [either] not do anything and just stay as you are or try and improve. But when we've tried to improve, maybe one or two of us in the scheme have tried to improve, but it's long--, it's not just like a quick fix sort of thing (…) This scheme has just been too short really. For all we've done--, we'd have been better off financially if we'd just taken the money and not done anything to be honest (…) It's going to be a long process to grow these wildflowers, to get them established. We can grow them in plug plants but (…) we've transferred them in twice now and we've hit two droughts in the last five years. So (…) going by what we've read, as long as the roots are in the ground they should actually come back. They can stay dormant for up to sixty years some of these wildflowers."

These comments emphasise that their mentalities might be open to change with a guaranteed longer time frame in a fully-fledged scheme, as opposed to the uncertainty and shorter opportunities to achieve results within a pilot.

4.1.2. Moral choice for improving habitats

The recognition above by Farmer H that they would have been financially 'better off' to just take the money and maintain the habitats indicates the mentality which has been common among 'Improving' farmers; that it was perceived as a moral choice rather than a financially-motivated decision.

Further emphasising the moral dimensions to the approach of those farmers who attempted to improve their habitats, Farmer I emphasised that the improvements they made were for the benefit of the birds, and that this did not necessarily correlate with improvements in the habitat score. This farmer's scores were consistently marginal, between two payment tiers, and generally stayed level across the period despite their explicit ethos of aiming for improvement. They attributed this outcome to their focus on the optimum habitat for the birds rather than the optimum habitat for the scores. For example, they changed their management of weeds within the fields in ways which provided sympathetic cover for the birds, rather than removing weeds entirely and utilising rush spots as cover:

"If you spray the ones that have got on the bigger side (…) and you get that partial kill, but then it starts to recover and I think that provides cover again for any late nesting birds, any chicks that are there later on. I do think, even the earlier ones that are only up the size of your fist, they haven't fledged or anything, it provides a lot of cover for them if you do it on a patchwork quilt kind of way of looking after it from a spraying point of view. It doesn't look terribly pretty (…) but I do feel it helps from the survivability of these birds which is what you're trying to do." (Farmer I)

The strength of this moral commitment to improvement was mediated by several interrelated management factors. Farmer A highlighted the scale of improvements, level of financial investment, and the intensive nature of the management which would be necessary within the existing timeframe to go up a score tier/ payment band:

"we had hoped for an increase, yeah definitely. But we didn't get one… …I don't think our score would have changed throughout the period of the scheme because looking at it I think for it to change this dramatically without you investing and spreading a lot of--. So my view of it in summary is that you need to spend a lot of money on it to get, or spend money on it to put a lot of seed in to increase your--. Just letting it happen naturally you won't see any results over, well, we haven't seen anything over the period that we've been in the scheme… …I can see the improvements because I see the presence of the species that we've scattered like the oxeye daisy and the knapweed, but the banding hasn't changed at all throughout the duration of the scheme even though we've made minor changes to the management methods." (Farmer A)

4.1.3. Distinguishing habitats suitable for 'maintaining' or 'improving'

Several farmers commented on their rationale for either maintaining or improving particular habitats which goes beyond their own management or the scheme administration, instead reflecting attitudes and understandings of a given habitat's character.

Farmer A made a distinction between the public and environmental value of long-existing hay meadows and 'new' hay meadows. This raises some more important questions about the value of 'native' or pre-existing landscapes, which we may want to maintain as fundamental heritage assets or more gently improve with significant investment over longer time periods, versus the creation of 'artificial' hay meadows which may be possible in shorter time periods in other parts of the UK.

"It's interesting cos we've discussed this quite a bit between us and said if you were starting from a field that had been heavily fertilised, you know, where you're cropping it three times a year or more for grass, the only way you would establish that as a hay meadow is to actually start again and create a hay meadow. If you left it naturally to evolve and not fertilise, it would take you absolutely- probably a lifetime to get any results from it… … the only way that these things can be created is artificially really. And I know I've discussed with [the advisor] about ours cos she said it would be interesting to do some analysis on it to see how old some of those seeds are, if you can indeed do such a thing, because obviously ours is a traditional hay meadow, it's been there for years, but to improve it you [would] have to throw money at it. It doesn't just happen by just leaving it and not putting any muck on it. That's not made any difference to us whatsoever." (Farmer A)

Should a higher value be placed on these older hay meadows which have continued to exist in upland landscapes with the same economic, environmental and public value as 'artificial' meadows created from previously cultivated fields? Parallels could be drawn here between restoration or protection of native ancient woodlands and new tree plantations.

In contrast to this perspective, some other farmers indicated that where habitat quality could not be further environmentally 'improved' as it was already in a good condition and unsuitable for modern cultivation, it should not be in the scheme. For example, Farmer B suggested that RBAPS should not be targeting land parcels which are not in production anyway, emphasising that they understood the scheme as a means to improve the environmental quality of land, rather than to pay farmers for the quality of land that they already owned but could not cultivate commercially anyway:

"I don't think that should be in because that cannot be--, you cannot plough it out, you cannot do anything else apart from what he's always done with it. As I say, apart from plant trees on it definitely. But I don't think certain areas should be in." (Farmer B)

This potential disparity in perspectives between RBAPS farmers who feel that they should be compensated for inevitably unproductive land parcels with intrinsic environmental heritage value, and those who feel payments should only be made to incentivise more environmentally sympathetic use of land with a higher productive capacity, warrants additional study. It will benefit policy makers and conservation organisations to better understand how farmers perceive the rationale and operationalisation for the enhancement of environmental public goods to explore this further, both within the pilot and the farming community more broadly.

4.1.4. Distinctions in management rationale for Improvers and Maintainers

Those farmers who considered the habitats to be of a sufficiently high standard already, viewed their management practices to serve the purpose of maintaining habitat quality. Farmer D stated that:

"I don't recall we did anything different. In fact, you see, we were really lucky, we had really good hay meadow already, so we didn't have to do anything different … Cos for us it's been more about maintaining what was already there rather than having to create something." (Farmer D)

Similarly, in deciding whether to join the RBAPS pilot, Farmer E recognised that the aims of the pilot aligned well with the management practices they were already undertaking. They stated that

"(…) straight away it sounded a good scheme cos it wasn't going to affect us a lot you see. And basically, all it was there was going to be a bit of time just checking our flowers in the meadows and counting the birds and whathaveyou. Obviously, we haven't done much with the meadows different, except we've maybe limed some fields cos they came out to sample the soil and some were borderline so we put a bit of lime on some of the meadows. And as far as the birds, up in the higher ground we didn't do anything different really. Cos that's how we farm."

For Farmer E, then, the RBAPS payments were perceived to be a 'bonus' for maintaining their existing management practices as already environmentally friendly livestock farmers:

"(…) we're farmers, we're livestock farmers. That's where we make our money. This was just to us, it's a bit like a bonus payment because we're not doing anything different really and so we went along with it because it was a bonus payment. (…) we've never done anything different. This is why we originally went into the scheme because it suited us down to the ground." (Farmer E)

4.1.5. Positive-passive management practices

Another of the most consistent features of management practices which emerged throughout the interviews was a theme of reduction. There was a reduced number of grass cuts within a year, which is logical where we consider that there has also been a reduction in the concentration of nitrogen spread on fields. Farmers also noted the reduced intensity of weed control, opting for spot spraying over the more aggressive use of pesticides to reduce unwanted weeds.

Also significant in terms of reduction has been the conscious choice by farmers to reduce their own interventions: for instance, Farmer I allowed for the growth of certain weeds such as thistles and nettles to create another area and type of cover for ground nesting birds. They also noted other effective passive choices, such as electing not to repair blocked drains, or re-flatten areas of soil with pooling where land was unsettled by feeding troughs, so as to enable wet features to develop in these spaces which birds would then occupy.

These approaches by some farmers are a sharp contrast from the more conventional 'proactive' approach that we might have anticipated most farmers to uptake in a results-based approach. The notion in results-based approaches that 'the more you put in, the more you get out' does not necessarily always hold true across all farms and habitats. Though we have certainly seen evidence of the effective returns for farmers who went to considerable efforts from proactive improvements, such as the plug plants or reseeding in hay meadows, there have also been good results from the more 'passive' choices taken by farmers as noted above. Therefore, there is an important strategic nuance to environmentally effective management practices which should not be oversimplified as a binary of proactive and passive farmers, where passive equates to inactive. The passive approaches as identified here are in fact also an active, conscious, and responsible choice by farmers with their habitat quality as the main motivation.

From these insights, results-based management practices can be understood as a range of strategic approaches which vary across a proactive – passive positive management spectrum. Improver/ maintainer mentalities also do not neatly map on to proactive/passive approaches. The case of Farmer I highlights exemplifies this more complex relationship between attitudes and approaches to habitat management, where a 'improver' farmer has effectively employed passive practices. These insights emphasise that positive and effective environmental land management comes in many forms, and results-based assessments need to ensure that they do not slip back into rewarding particular practices conventionally understood as more efficient (see below for further comments made by farmers regarding scores for scrapes). Both proactive and passive practices can be undertaken as positive management changes for the benefit of habitats.

4.2. Out of our control: RBAPS scores and weather conditions

One of the most significant factors identified by farmers as an explanation for unanticipated deteriorations in habitat scores has been the impact of the weather, including extreme flooding or conversely, unexpected dry spells. Almost all of the farmers made several comments about the negative effect of the weather, particularly when this was combined with differing assessment timings, upon their habitat scores. For instance, Farmer B noted that

"It depends on when you go round to do your score. It's alright, I know there are wet patches, but when you get same as [the advisor] going round and they're bone dry and rock hard, she doesn't know that they're normally wet, if you know what I mean? It's alright I can say yes, it's always a wet patch is that, but if it's not looking a wet patch when she goes round, well, it ain't a wet patch on her list. So that's how it impacts us."

Farmers note that advisors have often been understanding about these issues, which emphasises the importance of a consistent relationship and open dialogue between administrators and the farmers in successful schemes. Nonetheless, a monitoring system which can anticipate some of these foreseeable discrepancies in score would be beneficial to future schemes to ensure continued scheme satisfaction and a sense of fairness among farmers and advisors.

The inevitability of the weather's impact is seen by farmers as something that they cannot, or would not know how to, counteract. An example is this exchange with Farmer D:

Interviewer [I]: And if the winter had been really wet or the spring very dry, do you take any actions specific to enhance the RBAPS score in the wader fields?

Farmer [F]: No, we haven't, no.

I: Ok. If you didn't take any changes in seeing that impact, why did they decide not to make any changes to try and rectify that?

F: Cos we wouldn't know what changes to make.

I: Ok.

F: **We can't make it rain [laughing]. Do a rain dance maybe?**

In answering the questions regarding whether they attempted to change their management to help habitat scores after particularly bad weather (either in terms of seasonal changes or extreme weather events) some farmers noted that this was a much more multifaceted decision than considering only the scores: the only land management changes were ones they would make anyway, most significantly the movement of stock to maintain field quality. Farmer A states that:

*"Well, **we wouldn't have done it directly for the score, we would have done it because there wasn't enough grass** cos if it was dry, that's probably why we moved them in April this time because it wasn't growing very much because it was a really dry spring in this April, so we moved them out then because there was just no grass for them and the meadow would never have grown if we'd have left them in 'til May, we'd have had nothing to cut. And similarly, when it was really wet, we'd probably move them for a few weeks again just so that they didn't chew up the land."*

Furthermore, though perhaps somewhat obvious, it is important to acknowledge that the weather impacts not only the habitat itself but management which can be undertaken. Farmer B explains *"we might have got a bit less score due to the fact that we hadn't been able to do any control nettles, dockings cos it's just been too wet, you know, you need a couple of days together to do it."*

4.3. Trade-offs between agricultural value and habitat value

Existing research has addressed the perception among some farmers of a 'zero-sum' relationship between productivity and environmental quality, arguing that for one to improve the other must suffer. In general, the farmers interviewed shared this perspective that changes in management to increase the score or quality of their habitat would result in a reduced agricultural yield.

This distinction, however, can also be in part attributed to the methodology: the interview questions specifically aimed to identify changes in management practices in order to a) improve habitat conditions, results score and ultimately payment, and b) to improve the agricultural value of the field. Farmers did not separate management under these two perspectives, but instead identified the direct trade-off between amount and feed value of the crop (hay, haylage, silage) and the biodiversity value of the meadow (Farmers A, B, E, F and H). Farmer F explained when grasses do well, there is a higher amount and better-quality crop, but to the detriment of wildflowers; in turn when the grass growth is affected and yield is small, the wildflowers thrive because there is less competition. Farmer B also identified the trade-off between no fertiliser and a (potentially) higher score and less feed value.

However, there were some practices which farmers identified may have a beneficial impact for both the habitat and productivity. For instance, Farmer C stated that after soil testing they added lime to their fields in the second year (summer 2018) for the purpose of "increase[ing] yield and palatability of grass as well as increase the meadow species as well...Well, the pH needed lifting. And it seems to have worked". Nonetheless, these benefits must be considered in relation to the whole impact of all associated management practices. Lime spreading involved the use of an agricultural contractor with a very large tractor, which would have been a larger tractor than the one for everyday use on the farm, with a resulting impact on soil compaction.

Furthermore, Farmer C also noted a clear separation between approaches to land management in his environmental and agricultural land parcels:

"So basically, I've split the meadows on the farm into wildflower scheme meadows and more productive meadows, based on the meadows that didn't qualify for the wildflower scheme, well, I'll target and try to get a little bit more crop off them to make up for the shortfall out of the scheme meadows and just maximise how it works there."

Where the ideal balance lies, i.e. "a meaningful level" is different for each farmer. Farmer C 'intensified' the use of other fields (e.g. applied slurry for extra fertilisation) that were not entered into the scheme to make up for the shortfall in production from hay meadows in the scheme; where in contrast, Farmer I discussed at lengths the risks that this might happen on farms.

Farmer B, who generally maintained scores in the highest tiers, emphasised the economic balance being made in utilising scheme participation. They utilise the scheme as the only tolerable means of income outside of their farming, which they make clear they would not wish to sacrifice:

*"Well, yeah, it's money, isn't it? It's all money related. But we have got money out of somewhere where we wouldn't normally have got it. If we haven't got our land in some sort of scheme we ain't going to make it pay here. We can't diversify into anything else****. It's sheep or cattle or nothing basically, or trees, and that's about it****."*

Farmers always consider the economic viability of their whole farm, which means that there would need to be more financial incentive beyond income foregone, as we see in current schemes, to enable farmers to find further reduction in the production value of meadows acceptable. These perspectives also emphasise that the current approach to income forgone as cost neutrality as the basis for scheme payment is not holistic enough; it does not cover the entirety of the costs that the farmer understands to be a result of their scheme participation. The farmer attributes the cost of additional fodder, the time needed to arrange and distribute that fodder to all costs of scheme participation. Broader research has outlined that farmers weigh up the financial, administrative and also social burdens of scheme participation, and so 'cost-neutral' as income alone is, for many, an insufficient incentive.

In further consideration of the agricultural / environmental nexus, Farmer E suggested that if payments were higher for meadows to enhance the wildflowers, they could buy in fodder, but with lower payments they have to balance that they still produce enough hay for their animals, i.e. add more fertiliser and grow more grass. Such approaches will need to be balanced in future schemes with reduced restrictions on outdoor feeding.

Only two instances were mentioned where the higher environmental value aligned with the higher agricultural production value: the hay from the hay meadows was perceived as better quality, small bales and 'gets more attention', which also benefits the flowers (Farmer F) and spraying of rushes enhances grass and hence grazing area which benefits livestock.

Future schemes which utilise Land Management Plans may aim to ensure that the farm maintains a net positive contribution to environmental public goods through whole farm plans. Particularly on larger farms with relatively high productive capacity but good environmental potential, a holistic plan will help to discourage unsustainable or environmentally degrading practices on parcels perceived as 'productive' with the tokenistic entry of small parcels into high paying schemes.

4.4. Administration in RBAPS: lessons for broader schemes

4.4.1. Expectations and issues around assessment and scoring

Interviewees seemed pragmatic about their scores and did not express a great deal of disappointment with scores not improving as perhaps expected. The interviews indicated that the majority of farmers had a general mentality of 'maintaining' what they already had (Tables 1 and 2), either because the quality of the habitat was already high, or because they felt they could not justify the additional expense (also in terms of time). Four interviewees approached the pilot with the aim to make improvements, which was reflected in their attitudes and management practices. Only two interviewees with an improver mentality (F and H) were affected by the scenario of scores first going up and later dropping again.

Among those with an improver mentality, almost none went to great expense over and above what they would have spent on management anyway, which may explain why there was little sense of disappointment or loss. There was one exception: Farmer H admitted they would have been better off financially just to take the money and not invest, but they felt bad about taking public money and not doing anything for it. They were also intrinsically motivated by their interest in wildflowers. The disappointment was related more to the plug plants suffering from the drought rather than a decreased score (this participant had maintained or increased their score).

4.4.2. The importance of simplicity in scheme administration

As has been highlighted by Natural England and the National Park Authority in their existing summaries and assessments of the pilot so far, farmers have highlighted one of the key benefits of the RBAPS approach has been the relative administrative simplicity. In contrast to their experiences with existing schemes, farmers found that the RBAPS approach was *"Easier to write down. Not too much paperwork"* (Farmer G). Farmer H emphasises the difficulties of the existing HLS and their unsuitability for farmers: *"I can do the paperwork for [RBAPS] rather than High Level Stewardship (HLS). [For HLS]* ***you've got to be a brain surgeon to understand some of the questions even****."*

When asked what parts of the pilot Farmer H would want to see in ELMS, they continued: *"The main one is the paperwork. Easy to understand. Just like it used to be in the 80's, you filled your claimed form in and nothing has changed from what you agreed to. It's like when these forms come there's a 20-odd page dossier and you can't fill them in and you just end up making a mistake, whereas the pilot scheme is like it used to be in the old ESA, you're just agreeing to what you've agreed to. Nothing's changed and you haven't broken any rules.* ***It's just simple to understand****."*

Farmer H also identifies a pragmatic barrier to scheme uptake which should be considered in future approaches, relating to the additional and unaccounted for costs which farmers incur when the paperwork is too complicated: "*You've to get a land agent to do it and your land agent charges you £500 and you get maybe £700 back. The difference is massive really."* It is therefore understandable that farmers are disinclined to pursue the more paperwork-heavy existing schemes when the financial benefit is decimated by additional administrative costs.

4.5. Insights from farmers' management practices for future scheme development

Several farmers have developed some truly innovative management practices which blend together their existing knowledge of the landscape, their farm and the local community with the environmental knowledge developed over the RBAPS pilot. Here we will identify some key lessons for future schemes that can be taken from farmers' management changes and knowledge development over the course of RBAPS.

Natural England and YDNPA have already documented that farmers reacted very positively to the removal of many restrictions upon their land management that are prevalent in many of the existing agri-environment schemes. However, it is also important to highlight for scheme developers that the reduced restrictions do not necessarily equate to an increase in environmentally harmful practices. This relationship is evidenced most clearly from our analysis in the case of grass cutting. Prescriptions around cutting times are a conventional part of many existing agreements, yet they did not take into account the seasonal changes and appropriate weather conditions of a changing climate and the huge variations we see in weather across UK landscapes, and even across valleys in parts of the Northern uplands. Farmer D emphasises the overbearing and nonsensical perception of these restrictions:

I: Why do you think it was that you would cut late before this scheme?

F: Well, because that was how the countryside stewardship would work because with that one it was like we don't care whether you've got flowers or not, we just want to know that you're--, well, that's a bit crude, but you know what I mean, it was a different approach, prescriptive wasn't it? **It was thou shalt not cut until whatever of July**.

Several farmers note that these overbearing timelines have been a significant factor in their decision not to uptake those previous schemes. However, what is crucially learnt from RBAPS is that even without these restrictions, there has been a reduced intensity in grass cutting. For instance, Farmer B noted that they did not take a second crop, and Farmer F has accepted a reduced yield for the benefit of flowers.

Also significant with regards to cutting timings and restrictions is the environmental benefits associated with certain crops. As noted above, Farmer E was heavily in favour of producing hay from hay meadows, rather than haylage or silage, both in principal and for the environmental and cultural heritage benefits. To produce hay in this region, farmers need more flexibility in their cutting times in order to have the best chance at securing sufficient warm days together for the grasses to dry. In relation to RBAPS, the environmental benefits of producing hay as opposed to haylage should not be understated; the smaller baler, and therefore smaller tractor, have less compaction impact, there is (usually) less need for plastic wrapping, and the capacity to naturally re-pollinate the land from dried seeds is increased. Indeed, Farmer C described an innovative but “low tech” approach to repurposing hay seed from his neighbour’s hay mew as a means of reseeding the meadows with local species.

Even within the wading bird parcels, one farmer utilised innovative cutting practices to create bird cover from grasses:

“We don't mow it all. We just mow it in like a pattern. What I was seeing after the first year was the wind was blowing straight through so I put some diagonal ones in so it was like a wind break if you like. So there was like a big bit of bedding, and I put some swerves in so it was a bit S bend-y if you know what I mean?... To protect them from wind so there's shelter in every direction in more than one part of the field rather than just walls.”

In the management practices overview, it was noted that there are some strong and often diverging opinions among farmers regarding the role of gamekeepers in the control of predators and the broader impact of their own management upon wading bird populations. Both the benefits of gamekeepers for the wading bird populations, and conversely the possible risks encountered where vulnerable species are identified, are vital to consider when planning for the upscaling of RBAPS to whole farm or indeed landscape scales. These comments highlight the potential benefits to bird numbers if scheme administrators can successfully and consistently also engage gamekeepers as key indirect land managers and sustain a dialogue around the scheme's aims and needs. Keeper support in predator control and responsible shooting could be potentially incentivised if they are included in the smaller 'top up' payments for target species bird numbers.

In asking questions about their changing impressions of RBAPS over the pilot's duration, one farmer raised some questions about how truly 'based on results' this scheme is, where particular management practices have become paid-for, and so 'coercively incentivised', such as the creation of wet features. Where, as previously noted, some farmers did create scrapes as it is rewarded by the scheme's scoring system, other farmers elected to use less conventional approaches not formally recognised by the scheme to develop wet features. As noted in 4.1.5, some farmers consciously and responsibly allowed for the passive development of wet features by choosing not to repair features such as blocked drains or flatten out feeding areas, enabling birds to occupy these areas as wet features within the habitats.

This positive-passive approach can almost be considered as a micro-scale regeneration, or 'rewilding', and framing such developments in this way could promote positive dialogue between farming and conservation groups as ELMS is developed. However, through their more passive approach rather than intervening in the land, farmers recognise that they may lose out on higher scores despite considering their approach as better for the habitat and the birds on their farm.

5. CONCLUSIONS AND FINAL CONSIDERATIONS

5.1. Local and consistent support from managing bodies

A key message from the farmers has been their sincere appreciation for the level of support provided by the Yorkshire Dales National Park Authority and Natural England staff who have been most intimately involved in RBAPS' development and implementation. This consistent, thorough and personable dialogue with farmers has had a very positive impact on the scheme's success, yet questions remain about how to best upscale and rollout a comparable style (if not the same level) of support into broader schemes. Our material from the 'Transaction Costs' section of the interviews provides some valuable information regarding the value that farmers placed upon the significant assistance provided as a part of the pilot (can be provided upon request). Farmers' acknowledged that the 'pilot' approach had significantly higher levels of support, training and information, and that this would not be realistic to expect at a wider scheme scale.

5.2. Final impressions: do more to get more or do less to get enough?

Whether farmers have considered their role within RBAPS as one to maintain or to improve the quality of their habitat, they have all carefully adopted or continued to utilise management practices which they consider to be for the greater benefit to the environmental quality of their land parcels.

Though we may have expected a proactive style of management to emerge as a key feature in improving habitat scores within a payments-by-results scheme, several mitigating factors play a role. Firstly, the timescale and uncertainty of the pilot's continuation has impacted the ambitions of farmers to 'improve' habitat scores within the scheme. Secondly, there remain many farmers who see their fundamental role in 'maintaining' their habitat rather than improving it in any case. Moreover, this distinction in mindset has arguably not had a significant impact on scores' directional change.

Finally, on closer examination of motivations and management practices within the pilot, we find that many of the farmers' more passive approaches have also been identified as a key factor and a 'change' in land management (not only the proactive approaches). It has been the **positive passive** management practices, the reductions, which have been the most consistent management features within the scheme: one less cut, less fertiliser, a little less livestock in fields at a time, less 'tidying' of mole hills or similar interventions, less aggressive treatment of weeds and of course (crucially) less paperwork. Even in the creation of wet features, for several farmers it was the passive act of letting drains remain blocked, or land remain uneven which allowed for these spaces to grow. These acts of more 'passive' farming are not a mark of lowered standards or lack of care, but instead reflect the farmers' conscious and responsive land management decisions to allow species to flourish.

As previously mentioned, these practices are somewhat reminiscent of the same strategies utilised in rewilding approaches to land management. This reframing provides the capacity for a new shared terminology which highlights the importance of farmer's local knowledge in practicing land, time, and context-sensitive management changes in Environmental Land Management. This approach could provide a positive space for farmers and conservationists to enter into constructive dialogue around RBAPS, as the pilot continues to develop innovative solutions for farmers and for nature.

APPENDIX

Interview guideline

There are two habitat types in the scheme: species rich meadows and habitat for breeding waders. If the farmer has both habitats in their PBR agreement the questions need to be explored for each habitat type separately. NB the answers may even be different for individual fields of the same habitat on the farm.

Key questions:

1. Since entering the pilot scheme in 2016, have you been managing the meadow / breeding wader habitat differently to before it was in agreement **to improve the habitat condition/results score/payment** from your RBAPS agreement?

Where possible please get an idea of when during the 4 year period they carried out different actions so we can distinguish between more recent and earlier activity.

Follow up questions:

a) What work did you carry out to improve the habitat condition and when? (one-off in year x or carried out repeatedly?)

(Please use prompts to ensure we get a comprehensive response – fertiliser/lime use, meadow cutting dates, timing of grazing and/or number of livestock and/or type of livestock, machinery use, rush cutting in wader fields, approach to weed control, creation or enhancement of wet features for wading birds (incl. blocking drains), spreading wildflower seed or green hay or planting plug plants, predator control). NB some may respond that they haven't changed management as it is already optimum for the environmental objectives – if so please record this and use the prompts to record the pre-existing management which they've maintained.

b) Have you had to alter your management in response to extreme weather events? If so, how? Prompts - e.g. drought in summer prompted an early / late cut or dry spring prompted a lighter grazing regime in both habitats (but most importantly meadows)

c) Did you know which management would be the most effective in improving the habitat condition (or maintaining a top scoring field)? (prompts – was this provided by adviser or own knowledge or guidance)

d) Did you hope for an increase in habitat condition score the following year?

(or over what sort of timescale if not by the following year?)

NB for wader land only, if they are already in the top tier then it's assumed their ambition would be to maintain it at that level, so this question should be re-phrased to find out whether they expected to be able to maintain a site in top tier condition the following year)

e) If you were hoping for the habitat condition score to improve in the following year, did you achieve this and did it lead to a higher payment tier?

If yes, do you think this is directly down to a change in your management approach or something else?

If no – why do you think it hasn't changed (or even gone down)? Were you disappointed that you had put in effort but the score did not change or perhaps went down? Do you think there were other reasons behind the score going down? Do you think there were other actions you could have undertaken to ensure the score increased? (prompt – see list above of likely actions)

2. Since joining the pilot in 2016, have you undertaken any different management from previous years in the meadow / breeding wader habitat **to improve the agricultural value of the field**? (by value I mean its palatability / grass growth / value to the livestock / more bales etc)

Follow up question:

a) Did you consider whether this would affect the habitat condition score and RBAPS payment? (prompt - draw out any thoughts on where they see the balance lies between production income vs RBAPS income)

3. Do you think the winter conditions and spring conditions since the start of the pilot in 2016 have affected the results in your wader/meadow habitat? If yes, how?

4. If the winter has been really wet or the spring very dry, do you take any actions specifically to enhance (or maintain) your RBAPS score in the meadow or wader fields? What do you do differently (stocking rate, timing of grazing, applications of manure etc)?

If not, why not?