



Baseline Analysis of Actions under GLAS: Full Report

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Background to GLAS Evaluation

The Green Low Carbon Agri-Environment Scheme (GLAS) is a measure funded by the Rural Development Programme (RDP; 2014 to 2020) that promotes interventions to address the preservation of priority habitats and species and the issues of climate change mitigation and water quality, in support of sustainable Irish agriculture. It aims to do so by supporting the delivery of targeted environmental advice and encouraging more sustainable production practices at farm level in the context of Food Wise 2025. It also underpins a range of over-arching environmental objectives within the framework for environmental sustainability as set down in various EU Directives, as well as under a number of National and International Strategies and conventions, including the EU Climate Change and Renewable Energy Package and the Paris Agreement, the Water Framework Directive, including the Groundwater Directive and the Nitrates Directive and the Convention on Biological Diversity, Habitats Directive, Birds Directive and the EU and National Biodiversity Strategies.

The overall purpose of the evaluation is:

- a. to assess the effectiveness of GLAS as a contributory measure towards sustainable Irish agriculture under the RDP 2014-2020;
- b. to assess its contribution towards the achievement of wider environmental objectives; and
- c. to fulfil, in part at least, Ireland's commitment towards the monitoring and evaluation requirements set out in the RDP.

Evaluation is formally reported to the EC through an Enhanced Annual Implementation Report (EAIR) in 2017 and 2019 and the ex-post evaluation in 2024. This requires quantification of programme achievements, in particular through the assessment of the complementary result indicators and answering a set of common evaluation questions (CEQs).

The evidence is required to evaluate the impact of GLAS on 2 RDP priorities, Priority 4: Restoring, preserving and enhancing ecosystems related to agriculture and forestry and Priority 5: Promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors. For these priorities CEQs are based on a number of associated scheme Focus Areas, namely 4A, 4B, 4C, 5D & 5E. The associated CEQs are:

4A: CEQ8. To what extent have RDP interventions supported the restoration, preservation and enhancement of biodiversity, including in Natura 2000 areas, areas facing natural and other specific constraints and HNV farming, and the state of European landscapes?

4B: CEQ9. To what extent have RDP interventions supported the improvement of water management, including fertilizer and pesticide management?

4C: CEQ10. To what extent have RDP interventions supported the prevention of soil erosion and improvement of soil management?

5D: CEQ14. To what extent have RDP interventions contributed to reducing GHG and ammonia emissions from agriculture?

5E: CEQ15. To what extent have RDP interventions supported carbon conservation and sequestration in agriculture and forestry?

The baseline field survey is one of three components of the GLAS monitoring programme and will largely contribute to evidence on biodiversity (CEQ 4A). Impacts on water quality and climate are difficult to measure directly and are evaluated through a modelling approach. A further analysis will evaluate attitudinal change, capturing the impact of participation in GLAS on attitudes towards sustainable land management and environmental actions and feedback on scheme access and operation. The attitudinal survey relates to the field survey sample of over 300 farms and is supported by a counterfactual sample of 100 farms outside the scheme. These complementary studies are reported separately and will be brought together for the 2019 evaluation.

Approach to the field survey

This report represents a summary evaluation of the first year of ecological monitoring for the GLAS agri-environment scheme, and represents the baseline year condition of the sample sites against which future observations will be compared. 26 actions from the scheme have been analysed.

The methodology for the field survey was developed in consultation with DAFM within Task II of the requirements of the contract, which specified a longitudinal (5 year) field-based evaluation of the GLAS actions contributing to biodiversity, climate and water quality objectives. It was agreed that climate change and water quality impacts would be addressed through modelling and that the field-survey should focus on biodiversity (designated areas, other priority habitats, and both target and non-target species). The survey was required at three points (baseline survey plus monitoring surveys in 2018 and 2020) and was required to cover a specified number of bird and habitat actions.

The research team and DAFM agreed that a sample size of 30 sites would be sufficient for the majority of the bird and habitat actions to capture the baseline condition and monitor change over the survey period. A lower sample size (10 sites) was deemed to be sufficient for the purposes of monitoring the Commonage habitat areas. For some actions involving the creation or maintenance of specific features, a construction and maintenance survey was required on all sites (bee boxes, bird boxes, bat boxes and traditional stone walls). For the other actions there was little reason to survey the site at inception, so a telephone check only was carried out to establish whether and when the action was implemented (arable margins, bee sand piles, fallow land, orchards, tree groves, and hedgerow actions). Protocols were developed by the research team and agreed iteratively with DAFM and signed-off ahead of the baseline survey. The surveys and implementation checks were carried out by the Scott Cawley field survey team during the survey window specified in Table 1 below. Reports were uploaded to an ADAS database for tabulation and analysis.

The sites comprising the sample for each action were selected to represent where possible the distribution of the uptake across Ireland. However, many actions were geographically constrained due to known species range, the Natura 2000 network and other environment conditions, so the location of sample sites also reflects this. To improve the cost efficiency

of monitoring, farms which had implemented a number of actions were preferred, as were sites that were within reasonable geographic proximity to each other. The final sample ranged from 28 to 31 per action (except for commonages) as some farmers dropped actions or dropped out of GLAS altogether, and it was not always possible to find substitute sites. The full survey comprises 751 individual reports covering 313 farms and 650 parcels.

Table 1: List of Actions Included in Baseline Analysis

Action	Year 1 Reporting Style	Sample Size	Survey Window
Arable Margins	Implementation Check Only	28	May - Oct 17
Bat Boxes	Construction/Siting Survey and Phone Check	30	Mar – Oct 17
Bird Boxes	Construction/Siting Survey and Phone Check	30	May – Nov 17
Breeding Waders	Field Survey	30	Apr - May 17
Chough	Field Survey	30	Apr -May 17
Commonages	Field Survey	10	Jun – Sep 17
Conservation of Solitary Bees (Boxes)	Construction/Siting Survey and Phone Check	30	Apr – Sep 17
Conservation of Solitary Bees (Sand)	Implementation Check Only	30	May – Nov 17
Coppicing of Hedgerows	Implementation Check Only	30	May – Nov 17
Corncrake	Field Survey	30	Apr - May 17
Environmental Management of Fallow Land	Implementation Check Only	28	May – Sep 17
Farmland Habitat	Field Survey	27 Grassland; 4 Heathland	Apr – Aug 17
Geese and Swans	Field Survey	30	Jan 17
Grey Partridge	Field Survey	30	Apr 17
Hen Harrier	Field Survey	30	Apr - May 17
Laying Hedgerows	Implementation Check Only	29	May – Oct 17
Low Input Permanent Pasture	Field Survey	30	Apr - Jul 17
Planting a Grove of Native Trees	Implementation Check Only	28	May – Aug 17
Planting New Hedgerows	Implementation Check Only	30	May – Nov 17
Protection of Watercourses from Bovines	Field Survey	30	May – Sep 17

Action	Year 1 Reporting Style	Sample Size	Survey Window
Riparian Margins	Field Survey	30	Apr - Sep 17
Traditional Stone Wall Maintenance	Construction/Siting Survey	30	Apr - Sep 17
Traditional Hay Meadows	Field Survey	28	Apr - Jul 17
Traditional Orchards	Implementation Check Only	29	May – Nov 17
Twite	Field Survey	30	Jun - Aug 17
Wild Bird Cover	Field Survey	30	Feb – Mar 17

Approach to monitoring and measures of success

For each of the actions, a set of measures of success was agreed. These have been derived from the specific management requirements for individual actions, and are intended to provide an overall indication of the success or otherwise of the action in relation to the individual parcel. These management requirements are themselves based on a knowledge of the individual ecology of the species or habitat. The measures are intended to be easily monitored and evaluated to facilitate comparison with future surveys at each sample site to assess extent of change with time, and across the whole sample set, to understand variations in findings across space.

For example, in the case of the Chough action, it is widely recognised that this species requires a short, tightly grazed sward, with little scrub or bracken encroachment. This is because it is these conditions that allow the species to feed effectively. Therefore, the management requirements state:

- Produce a suitable sward by developing an appropriate grazing plan to maintain a tightly grazed short sward throughout the year on the areas within the GLAS contract; and
- Heather, bracken and scrub where present must be controlled where appropriate taking cognisance of other habitats and species that may exist onsite, but only between 1st September and 28th February annually.

So, in order to effectively gauge how well these management requirements have been met, measures of success have been selected on the basis of sward height and scrub encroachment (as well as other measures). The approach to monitoring has been designed to collect data that would inform measures of success for the individual action. So, in the case of Chough, this meant collecting data that related to sward height and scrub encroachment.

In most cases, indicators are captured as percentages (e.g. the percentage of sampling points without scrub) as these allow relative comparisons between sites whilst maintaining the continuity in the underlying data that allows finer detail of change to be observed at subsequent survey points. However, in some cases they have been expressed as binary values where this is more logical (e.g. the presence of goose/swan droppings, the presence of stock or whether or not rush cutting has taken place).

Some indicators are more complex. For example, in the case of Hen Harrier, a varied sward height across the parcel was deemed to be a measure of success, because tussocky unimproved ground provides ideal foraging opportunities for this species. In order to measure this criterion effectively, a number of height measurements throughout the parcel sward were collected (one per sampling point location, at each of 30 sample points). These were then assessed against a range of height categories designed to assess the variation in height of the sward.

Presence of sufficient target fauna (where management is for a specific species or group) is not a mandatory measure of success as target species abundance at the point of survey could be reflective of many factors outside the scope of the management itself. However, where feasible, surveyors have also recorded the presence and quantity of the target species themselves.

Interpretation and evaluation of findings – Overall Summary

The report provides an overview of the implementation of these actions at the sites sampled, identifying the extent to which measures of success have been met and highlighting where improvements could be made. Further detail is provided in the individual action summaries that follow.

Measures of Success

At an overall level, the baseline survey found that sample sites scored reasonably highly on the individual action measures of success.

Where the year 1 monitoring concerned only the yes/no implementation check (arable margins, bee sand, hedgerow actions, fallow land, orchards and groves), the measure of success was met in the vast majority of cases – see Figure 1. Only 3 out of 235 farms surveyed had failed to complete their action; a further 6 had completed the action but after the date specified in the protocol.

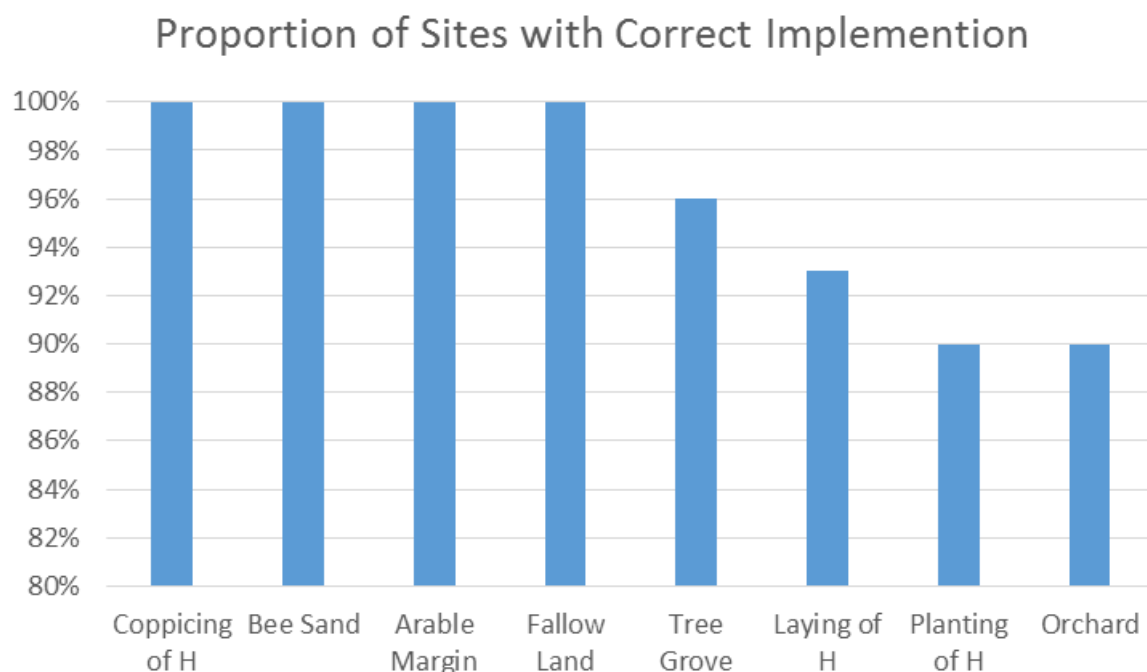


Figure 1: Proportion of sample sites meeting implementation check

Where the monitoring concerned a construction/siting survey, the quality of the work (bat/bird/bee boxes and stone walls) this was almost always done to the desired prescription – see Figure 2. However, there were a small handful of cases across the sample where implementation was not perfect (e.g. the boxes' physical location did not match the GLAS agreement).

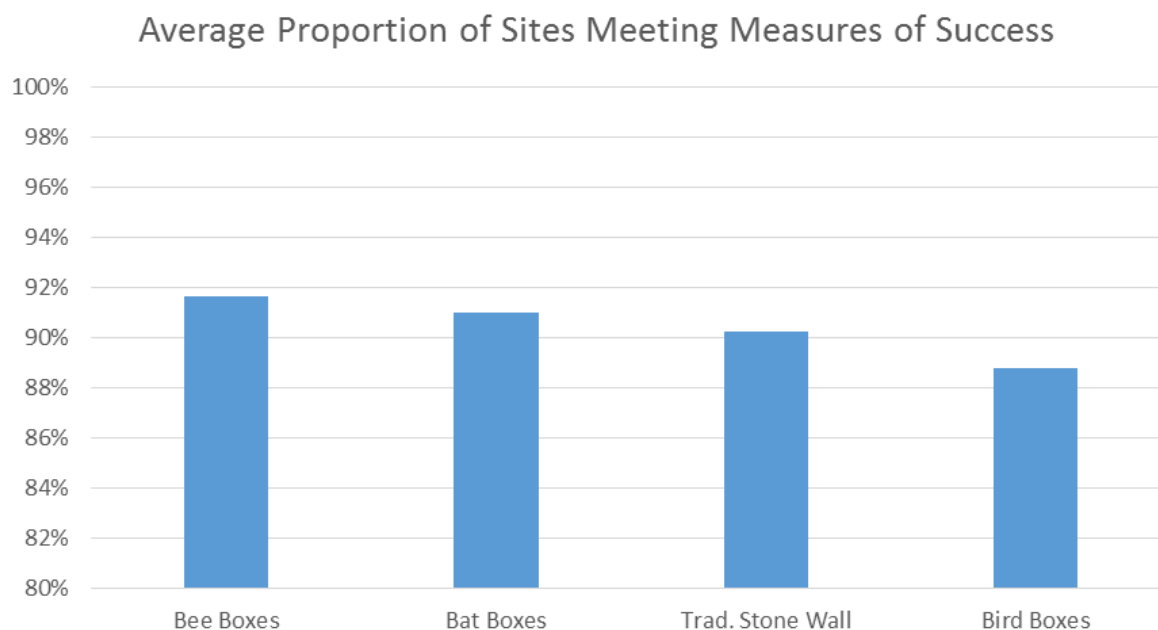


Figure 2: Average proportion of sites meeting Measures of Success met across the sample – Construction/siting survey actions

Figure 3 shows a headline summary of the baseline for the watercourse exclusion and habitat actions. Implementation appeared to be very good on the two watercourse stock exclusion actions (fencing and riparian margins) with only a few sites not fully meeting management criteria; the exceptions being gaps in fencing or evidence of stock access. Vegetation quality for these actions was also generally high, with most sites showing presence of positive indicator species and avoiding negative indicators.

Implementation of the more straightforward habitat actions (low input permanent pasture and hay meadows) was also very good with most sites meeting criteria for vegetation management and sward composition. Not all the floral diversity and scrub criteria were met for low input permanent pasture, but with continued management they could demonstrate improvement at subsequent surveys. There were also some issues with grass diversity for hay meadows but these should also improve from the baseline with continued management. The ten commonage sites sampled also generally met the sward height and composition criteria, though a number of sites showed relatively high levels of bare peat.

Baseline scores for the more complex habitat actions (Natura grassland and heathland) were more mixed: undesirable species and rush were well controlled, but scrub encroachment is currently an issue as is sward diversity for grassland. The scrub problem should ameliorate with appropriate management, but there may be insufficient time for species diversity to change much within the life of the scheme.

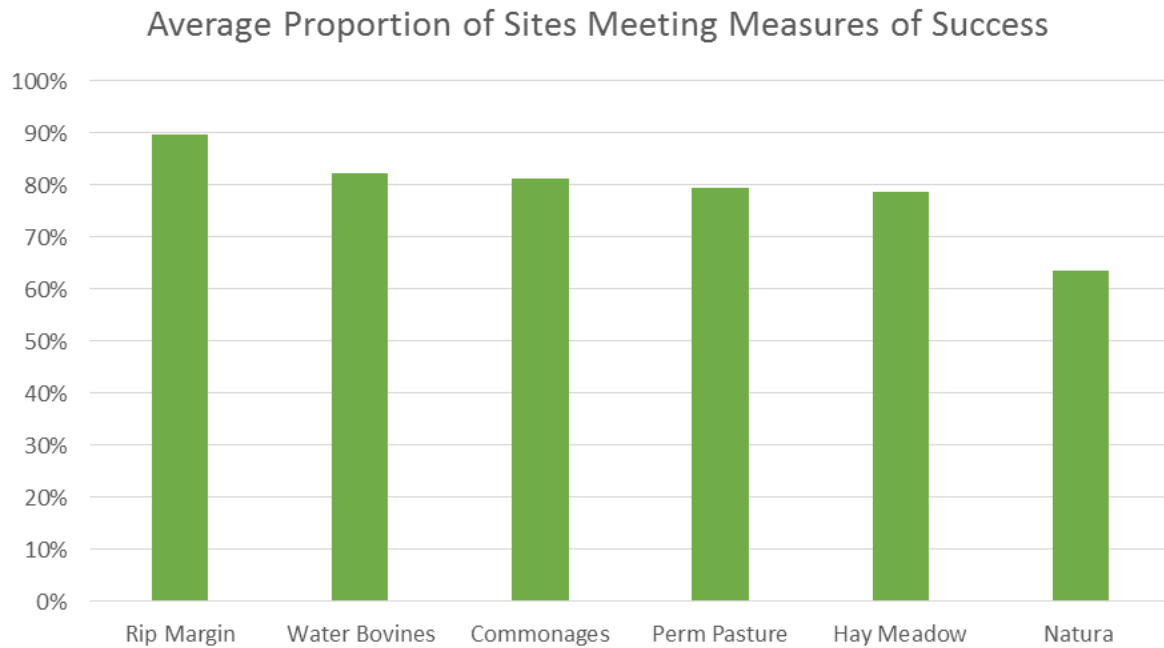


Figure 3: Average proportion of sites meeting Measures of Success across the sample - Watercourse exclusion and habitat actions

Figure 4 shows a headline summary of the baseline for the bird actions. In general they were well implemented. Almost all Twite and wild bird cover sites met the sward height criteria, as did most of the breeding wader, Geese/Swans, Hen Harrier, and Chough sites. However, only a few Corncrake sites met the height criterion. By far the majority of the scrub criteria for individual actions were met, indicating that there was little scrub encroachment.

As with the habitat actions, the baseline sward composition for bird sites were more varied. Chough, Grey Partridge and Geese/swan sites generally scored well indicating the presence of the right type of plant cover. However, Hen Harrier and breeding waders have more exacting requirements and several sites were deemed either to be too improved overall to be suitable (i.e. too much low growing monocultures of rye-grass and/or white clover); or else excessively dense in terms of thick rush cover and/or gorse. Few wild bird cover or Twite sites met the requirements for the desired species composition. Corncrake sites have insufficient herb, nettle and rush cover, and the survey was unable to inform sufficiently about the state of the early and late cover which is so critical for this species.

Management prescriptions should be able to address the rush and gorse issues for Hen Harrier and breeding waders as well as the cover issues for wild birds and Corncrake in time for subsequent resurveys. Similarly, such management may have a positive effect on small bird and mammal numbers, which in turn will provide a greater number of prey items for Hen Harrier. However, where sites are currently too improved, any material changes in sward composition indicators may not necessarily be detected within the resurvey window. This is less of a concern for Chough and Geese/Swans and indeed, a degree of improvement can provide these species with greater foraging opportunities.

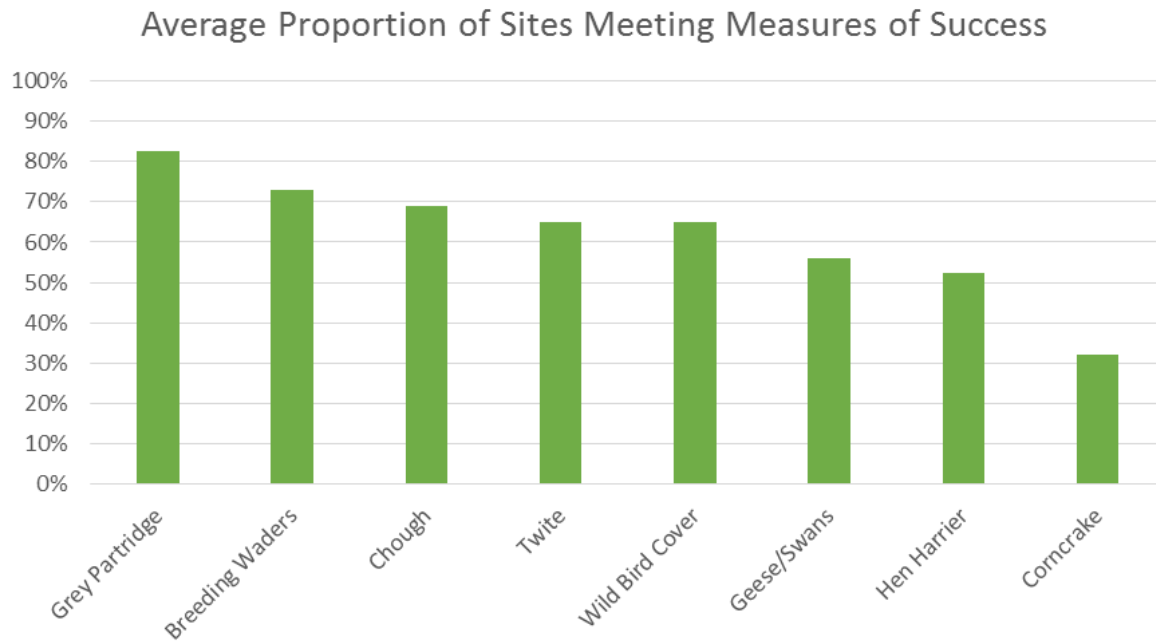


Figure 4: Average proportion of sites meeting Measures of Success across the sample - Bird actions

Observation of target birds is not a measure of success for the baseline, but surveyors did note birds at some of the sites for all the relevant actions – see Figure 5. Most birds (breeding wader, Chough, Corncrake, Geese/Swans, and Hen Harrier) were noted on around 10-20% of sites not including anecdotal observations. Birds were recorded at all wild bird cover sites in spite of the non-optimal crop cover. The numbers of finches and buntings using some of the wild bird cover areas was striking, particularly with respect to yellowhammer and reed bunting which are red-listed species. Clearly, small scale interventions such as the planting of bird food ‘crops’ can make a dramatic difference to the numbers of birds found in a particular area and presumably have a very positive benefit for small bird survival over the winter. Grey Partridge were only observed on two sites, in spite of high adherence to measures of success. Twite were only noted on one site. Scores for these bird species may reflect other site specific factors beyond the management regime; or else that the current distribution of the two bird species is limited and more time is needed to see colonisation of former or new areas.

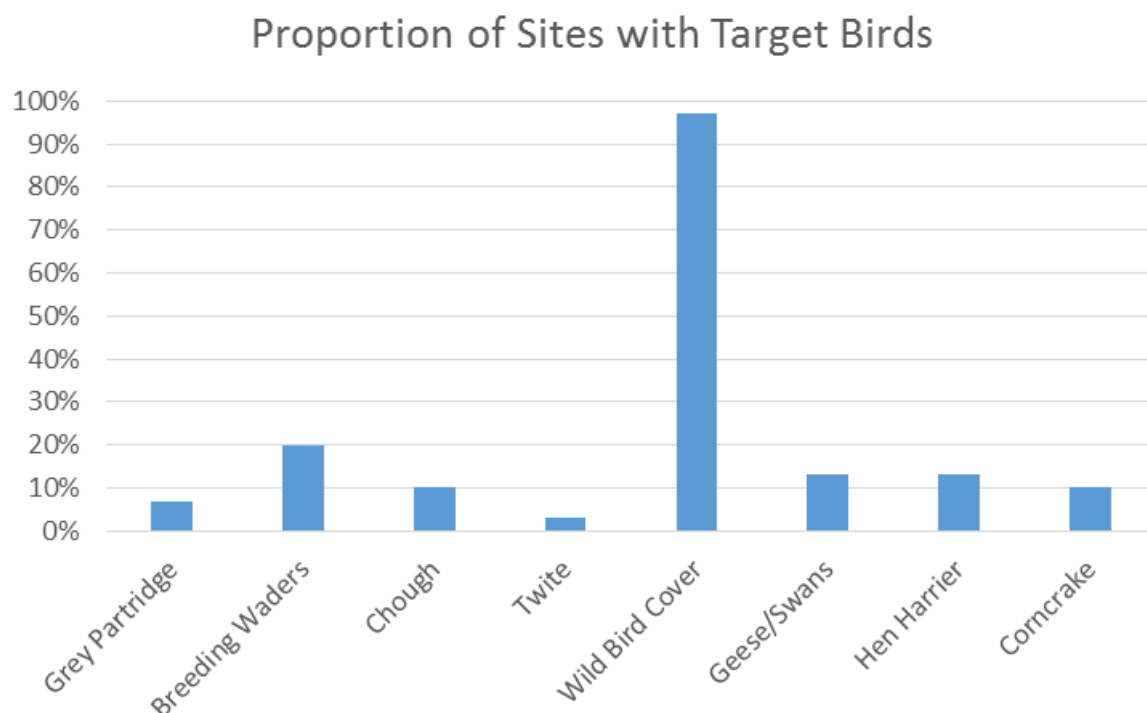


Figure 5: Proportion of sites recording target birds

Otherwise, failure to observe any of the target birds could simply be attributed to unlucky survey timing: many landholders commented that the target bird had been seen in the past on those parcels and the species was occasionally noted by surveyors in adjacent fields. Results for these species, and particularly those for breeding waders, Corncrake, Twite, Grey Partridge and Hen Harrier, must also be viewed in the context of overall declines.

Site Selection

The sites surveyed are only a sample of the overall agreements and it is too early to draw conclusions about the effectiveness of the targeting in the GLAS scheme. However, the observations about the baseline conditions on the sites visited do provide some insight into the site selection process for the bird actions that will be of use to the subsequent phase of scheme evaluation.

The sample sites surveyed appear to have been appropriately selected in terms of location: Hen Harrier sites are in or close to Special Protection Areas (SPAs) established for this species; Chough, Corncrake and Twite sites are on the west coast (with some samples for the inland Chough population in Leitrim); and the Geese and Swans sites are in known areas for wintering populations of light-bellied Brent Geese, Barnacle Geese, Greenland white-fronted Geese and Whooper swan. Within these broad geographical areas the individual actions were appropriate in terms of the actual parcel habitat, barring isolated examples where existing land cover was not amenable or suitable to the desired management regime. These are identified in the tables and accompanying commentary below.

Landholders' understanding of requirements (surveyors)

Landholders' attitudes towards the scheme have been established formally through a separate attitudinal survey. However, site visits have been able to capture some preliminary impressions of landholders' awareness and understanding of scheme requirements. For the most part, understanding of individual requirements for species seemed to be good across the actions overall with most sites surveyed demonstrating correct implementation of the work concerned.

Surveyors only noted a small number of cases where farmers/landowners did not appear to understand the scheme requirements and objectives. For example, at some of the sites for wild bird cover, the 'crop' had barely established or only consisted of a single species. There were also a few sites where management being applied for the habitat or birds in question appeared to be inappropriate. But these cases are very much exceptions and may be reflective of inappropriate selection of that parcel for the action in the first place, rather than a failure of understanding of the management requirement by the landholder.

The appreciation of the requirements for individual species in the bird actions was helped by the fact that a good number of landholders appeared to be highly aware of the species in question. Farmers frequently mentioned Hen Harrier, Chough, Corncrake, Grey Partridge and Geese/Swans to be using parcels or at least being in the general area, often when these weren't present at the time of survey. The only exception to this generally good awareness of target species appeared to be Twite. Farmers did not appear to be familiar with this species, though this is perhaps not surprising given its small size and rather dull plumage.

Individual Action Reports

Arable Margins

The monitoring requirements for this action were for an implementation check only. 28 sites were assessed by means of a phone call to the landholder. The action had been completed on all sites, though implementation for three pre-dated GLAS and have been subsequently incorporated into the scheme. The results are in the table below.

Table 2: Arable Margins: Implementation Check Results

Criterion	Summary Results		
Implementation	Valid responses	28	
Implemented by the date specified	Sites meeting criterion	28	100%
Site	Implemented (date)	Not implemented	
1	✓ May 15		
2	✓ Oct 15		
3	✓ April 16		
4	✓ March 16		
5	✓ April 17		
6	✓ May 16		
7	✓ April 17		
8	✓ June 16		
9	✓ March 16		
10	✓ April 16		
11	✓ April 16		
12	✓ May 16		
13	✓ April 16		
14	✓ May 16		
15	✓ March 17		
16	✓ April 16		
17	✓ March 16		
18	✓ March 16		
19	✓ Sept 16		
20	✓ before GLAS (but incorporated in scheme)		
21	✓ March 16		
22	✓ May 16		
23	✓ May 16		
24	✓ March 16		
25	✓ Sept 16		
26	✓ Autumn 16		
27	✓ Oct 16		
28	✓ before GLAS (but incorporated in scheme)		

Bat Boxes

The Year 1 surveying protocol required an implementation check against the siting and construction criteria only. Occupancy will be assessed at subsequent surveys. Of the 30 sites for which data has been provided, 25 could be fully assessed based on actual survey or according to information provided by the landowner. Boxes had been implemented at four of the remaining five sites, but information is only available to assess some measures. Criteria have been interpreted and reported as follows.

Table 3: Bat Boxes Measures of Success: Overall Summary

Criterion	Summary Results		
Implementation	Valid Responses	30	
Implemented by the date specified	Sites meeting criterion	29	97%
Siting	Valid responses	26	
The location of the bat boxes must match the agreement	Sites meeting criterion	19	73%
Bat boxes must be located on a tree or post or external farm wall	Sites meeting criterion	25	96%
Between 3 - 15 boxes per group	Sites meeting criterion	23	88%
Individual bat boxes in each group must be orientated in a variety of directions	Sites meeting criterion	23	88%
Bat box construction	Valid responses	25	
Bat boxes must be made of wood or Woodcrete and draught free	Sites meeting criterion	25	100%
Bat box occupancy	Valid responses	25	
Confirmed occupancy rate should increase from year 1	Sites meeting criterion	N/A	

Implementation of the action appeared to be good, with all boxes located on a tree, post or external wall of a building. Virtually all sites used the correct number of boxes per location and boxes were orientated in a variety of directions. All boxes were made of the correct materials. In the majority of cases occupancy was not assessed given the relatively recent implementation of the action. Landowners appeared to have a good grasp of the purpose of the action. In one or two cases however (e.g. #21), the boxes were situated too low to the ground. It should also be noted that in a number of cases (7) the location of the boxes did not match the agreement document.

Table 4: Bat Boxes Measures of Success: Site Analysis

Measures of Success

Site	Sited as on agreement	Location on tree/post / building	No. per group	Total no.	Variety of directions	Wood or woodcrete	Draught free	Field signs	Comments
1	Y	Y	3	9	Y	Y	Y	N/A	Further boxes on reserve parcel
2	N	Y	3	6	Y	Y	Y	N/A	One box on ground (broken branch). Location is slightly different from approval summary
3	Y	Y	3	15	Y	Y	Y	N/A	
4	Y	Y	Varies	15	Y	Y	N	N/A	Phone check only
5									Phone check only. Implemented Jan 2017
6	N	Y	3	6	N/A	Y	Y	N/A	
7	N	Y	3	15	Y	Y	Y	N/A	Phone check only
8	N/A	Y	8	15	Y	Y	Y	N/A	
9	N	Y	5	15	Y	Y	Y	N/A	Location different from approval summary
10	Y	Y	3	6	N	Y	Y	N/A	
11	Y	Y	3	15	Y	Y	Y	N/A	February 2017
12	N/A	Y	2	15	Y	Y	Y	N/A	July 2016
13	Y	Y	5	15	Y	Y	Y	N/A	March 2016
14	Y	Y	3	15	Y	Y	Y	N/A	May 2016
15	Y	Y	3	3	Y	Y	Y	N/A	March/April 2016
16	Y	Y	3	6	Y	Y	Y	N/A	Quite low to ground
17									Phone check only. Implemented March 2016
18	Y	Y	3	15	Y	Y	Y	N/A	March 2016
19	N/A	Y	3	15	Y	Y	Y	N/A	Good location and condition
20									Phone check only. 2 erected in Feb 2017
21	Y	Y	Varies	15	Y	Y	Y	N/A	Many too low to ground
22	Y	Y	3	15	Y	Y	Y	N/A	Possible occupancy
23	Y	Y	Varies	6	Y	Y	Y	N/A	
24	Y	Y	3	3	Y	Y	Y	N/A	Possible bird nesting
25	Y	Y	3	15	Y	Y	Y	N/A	One broken
26	Y	Y	3	6	Y	Y	Y	N/A	March 2016
27	Y	Y	3	15					Implemented May 2016
28	Y	Y	3	10	Y	Y	Y	N/A	Well situated
29									Phone check only. Implemented May 2016
30	Y	Y	3	15	Y	Y	Y	N/A	Two boxes had bats

Bird Boxes

The Year 1 surveying protocol required an implementation check against the siting and construction criteria only. Occupancy will be assessed at subsequent surveys. Of the 30 sites 26 could be fully assessed based on actual survey or according to information provided by the landowner. Boxes have been implemented at the two of the other sites but no further information was available against which to assess the action. Criteria have been interpreted and reported as follows.

Table 5: Bird Boxes Measures of Success: Overall Summary

Criterion	Summary Results		
Implementation	Valid Responses	30	
Implemented by the date specified	Sites meeting criterion	29	97%
Siting	Valid responses	27	
The location of the bird box must match the agreement	Sites meeting criterion	20	74%
Bird boxes must be located on a tree or post or external farm wall	Sites meeting criterion	26	96%
A maximum of one box per tree or post	Sites meeting criterion	21	78%
Bird box construction	Valid responses	26	
Bird boxes must be made of wood or Woodcrete and draught free	Sites meeting criterion	26	100%
Bird box occupancy	Valid responses	26	
Confirmed occupancy rate should increase from year 1	Sites meeting criterion	N/A	N/A

In common with the bat box action, implementation of this action appeared to be good, with almost all boxes located on a tree, post or external wall of a building. Most sites used the correct number of boxes per location (1). However, in a number of cases, several boxes were located on the same tree. Indeed at one of these sites (#26) the farmers were advised to re-site the boxes. All boxes were made of the correct materials. In the majority of cases occupancy was not assessed given the relatively recent implementation of the action but surveyors concluded that birds were potentially breeding in at least six of the boxes. The difference between this and the occupancy rate of the bat boxes is attributed to birds being more ready to take to boxes than bats. In general, landowners appeared to have a good grasp of the purpose of the action. In one or two cases however (e.g. #15), the boxes were situated too low to the ground. At site 21, all boxes (15) were positioned on two posts facing each other (8 on one and 7 on the other). It should also be noted that in a number of cases (6) the location of the boxes did not match the agreement document.

Table 6: Bird Boxes Measure of Success: Site Analysis

	Measures of Success
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Site	Sited as on agreement	Location on tree/post/building	No. per tree	Total no.	Wood or woodcrete	Draught free	Occupancy	Comments
1	Y	Y	1	15	Y	Y	N/A	Too late in year to assess occupancy. All boxes are tit boxes
2	N	Y	1	5	Y	Y	N	April 2016 (only 5 out of 6 found)
3	Y	Y	1	4	Y	Y	Poss	Nov 2015
4	Y	Y	1	8	Y	Y	Poss	
5	Y	Y	1	4	Y	Y	N/A	One loose
6	N	Y	1	10	Y	Y	N/A	
7								Phone check only. Implemented May 2016
8	N/A	Y	1	15	Y	Y	N/A	Phone check
9	N	N	2	15	Y	Y	N	Slight difference to approval summary
10	N	Y	Varies	10	Y	Y	N	10 on approval form, only 9 found
11	Y	Y	1	3	Y	Y	N	
12	Y	Y	1	15	Y	Y	N	Phone check June 2016
13	Y	Y	1 or 2	15	Y	Y	N/A	Feb/March 2016; some boxes on same tree
14	Y	Y	1	15	Y	Y	N	Phone check Jan 2016
15	Y	Y	1	4	Y	Y	N	Boxes quite low
16	Y	Y		15	Y	Y	N	June 2016
17	Y	Y	1	5	Y	Y	Poss	Feb 2016
18	Y	Y	1	8	Y	Y	Poss	March 2016
19	N	Y	1	10	Y	Y	Y	Feb 2016. Area overgrown, difficult to find
20								Phone check only. Erected in Feb 2017.
21	Y	Y	N/A	15	Y	Y	N	All boxes on two posts. 8 on one and 7 on the other
22								Phone check only. Erected in May 2016
23	Y	Y	1	12	Y	Y	Poss	Good positioning but maybe territory overlaps
24	Y	Y	3	3	Y	Y	N	All 3 very close together
25	Y	Y	1	15	Y	Y	N	Well-positioned
26	Y	Y	2	6	Y	Y	N/A	Advised farmer to relocate 3. Will do so after bird nesting season
27	Y	Y	1	15	Y	N/A	N/A	Phone check May 2016
28	Y	Y	1	10	Y	Y	Poss	Droppings, downy feathers
29								Phone check only. Erected in May 2016
30	Y	Y	1	15	Y	Y	Unsure	Erection date unknown

Breeding Waders

30 sites for breeding waders were analysed with 30 quadrats sampled at each site for habitat criteria. In four cases there is incomplete data this is because surveyors found

breeding birds present and decided that it was not possible to carry out the full survey without causing disturbance.

Table 7: Breeding Waders Measure of Success Overall Summary

Criterion	Summary Results		
Sward Height	Valid responses	26	
At least 20% samples \geq 20cm	Sites meeting criterion	19	73%
At least 10% samples \geq 30cm	Sites meeting criterion	18	69%
At least 10% samples \leq 5cm	Sites meeting criterion	13	50%
At least 20% samples \leq 10cm	Sites meeting criterion	16	62%
This measures how varied the vegetation structure is; all of the above conditions to be met	Sites meeting ALL criteria	6	23%
	Sites meeting 3 of 4 criteria	3	12%
	Sites meeting 2 of 4 criteria	16	62%
	Sites meeting 1 of 4 criteria	1	4%
Scrub Presence	Valid responses	28	
Presence of scrub on unit boundary (no target)	Sites with no scrub on boundary	11	39%
Presence of scrub within unit. Scrub should not increase from baseline.	Sites with no scrub within unit	19	68%
	Average scrub for valid samples	1.3%	
Machinery Operations	Valid responses	28	
There should be no machinery operations between 15th March and 15th July	Sites meeting criterion	27	96%
Rush Cutting (whole feature)	Valid responses	28	
Rushes must not be cut between 15th March and 15th July. The use of a weed wiper for control of rushes is permissible.	Sites meeting criterion	28	100%
Wet Features (whole feature)	Valid responses	26	
Assess if parcel contains wet features i.e. scrapes, standing water, ground that is permanently wet between March and July. Categories: <ul style="list-style-type: none"> • None, • < 5% of parcel • 5 to 50% of parcel • > 50% of parcel No target	Sites with "None"	10	38%
	Sites with "<5%"	11	42%
	Sites with "5 to 50%"	4	15%
	Sites with ">50%"	1	4%
Presence of breeding waders	Valid Responses	30	
No of sites where breeding waders present		6	20%

At six of the 26 sites where recording took place the vegetation height criteria were completely met, and in a further three sites, the criteria were 75% met. In the majority of cases (16) at least two of the height criteria were met. In these cases, the sward was either too tall throughout or too short. Thus, either the lower height categories or the higher

height categories were met but the sward was not sufficiently tussocky so that all categories were met. In a number of these cases, the sward was improved grassland and therefore not suitable in the first place (reflecting inappropriate parcel selection). Over two thirds of the sites (19) had no scrub within the site, and of the remaining nine scrub was at 5% or less. A single site (#17) had evidence of machinery operations where a tracked machine appeared to have been used to gather gorse.

Breeding waders were recorded on six sites. Whilst this may appear to be a low percentage of sites, it is perhaps more a reflection of the paucity of breeding waders generally in Ireland. Certainly, the habitat conditions appeared to be suitable on the majority of the sites surveyed.

Table 8: Breeding Waders Measures of Success: Site Analysis

Measures of Success										
Site	No of samples where sward height...				Overall % Scrub / Bramble cover	Mach. Ops (Y/N)	Rush cutting (Y/N)	Wet features	Breeding waders present	Comments
	>= 20 %	>= 10 %	<= 5%	<= 10%						
1	23	9	0	1	0.5	No	No	< 5%	N	
2	29	25	0	0	0.0	No	No	< 5%	N	
3	28	25	0	1	1.5	No	No	< 5%	N	
4	17	7	2	6	5.0	No	No	None	N	
5	15	12	7	12	1.0	No	No	< 5%	N	
6	14	5	0	4	0.0	No	No	< 5%	N	
7	20	10	0	1	0.0	No	No	None	N	
8	18	7	0	2	0.0	No	No	None	N	
9	n/a	n/a	n/a	n/a	0.0	No	No	5 to 50%	Y	Redshank, snipe, lapwing
10	30	20	0	0	0.0	No	No	None	N	
11	22	2	0	5	0.0	No	No	< 5%	N	
12	11	7	2	5	0.0	No	No	< 5%	N	
13	28	27	0	2	5.0	No	No	None	N	
14	8	4	6	15	0.0	No	No	5 to 50%	Y	Snipe, Lapwing
15	0	0	15	25	0.0	No	No	< 5%	N	
16	2	0	6	20	5.0	No	No	< 5%	N	
17	6	2	17	22	3.0	Yes	No	< 5%	N	
18	14	3	3	6	0.0	No	No	> 50%	N	
19	0	0	30	30	0.0	No	No	None	N	
20	14	9	8	12	5.0	No	No	5 to 50%	N	
21	11	8	2	12	3.0	No	No	5 to 50%	N	
22	7	3	4	16	0.0	No	No	None	Y	Dunlin, Lapwing

Measures of Success										
Site	No of samples where sward height...				Overall % Scrub / Bramble cover	Mach. Ops (Y/N)	Rush cutting (Y/N)	Wet features	Breeding waders present	Comments
	>= 20 %	>= 10 %	<= 5%	<= 10%						
23	0	0	20	28	0.0	No	No	n/a	N	
24	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Y	Snipe
25	13	8	8	16	0.0	No	No	< 5%	N	
26	2	0	22	27	5.0	No	No	None	N	
27	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Y	Snipe, Lapwing
28	n/a	n/a	n/a	n/a	0.0	No	No	n/a	Y	Lapwing
29	4	3	2	9	0.0	No	No	None	N	
30	1	0	5	18	0.0	No	No	None	N	

Chough

30 sites for Chough were analysed with 10 quadrats/sampling points taken per site. Criteria have been interpreted and reported as follows:

Table 9: Chough Measures of Success: Overall Summary

Criterion	Summary Results		
Sward Height	Valid responses	30	
On average, sward no taller than 7cm	Sites meeting criterion	15	50%
At least 20% of the sward 4cm or less	Sites meeting criterion	15	50%
	Sites meeting at least one criterion	18	60%
	Sites meeting both criteria	12	40%
Sward Species	Valid responses	30	
At least 80% of the sample points to be grasses or herbs	Sites meeting criterion	20	67%
Sward Composition	Valid responses	30	
Combined cover of scrub/bracken should not increase from baseline year	Average combined scrub/bracken cover	2%	
Individual site should not contain more than 20% of scrub/bracken	Sites meeting criterion	30	100%
Presence of Chough	Valid responses	30	
No of sites where Chough present		3	10%

A clear majority of sites met species and composition requirements, but many sites did not meet the height criterion. At least 20% of the sward needs to meet the height criterion to make it attractive to Chough, only around a half of the sites would be deemed suitable. However, this may simply reflect the point in the normal grazing cycle when the survey took place, and that the sward height may have been more suitable at other times. In any case it does not appear that the sward height criterion is such a critical factor as two sites (#23, #28) failed the 4cm height criterion for every quadrat but Chough were present and feeding.

Species and sward composition appear to be more important criteria. Parcels that are dominated by bracken, scrub and/or willow are clearly unsuitable for Chough feeding. The willow dominated parcel (#27) was also not suitable for management (as good habitat in its own right) and action would be better re-directed to adjacent parcels which are suitable. A number of parcels appeared to be too rushy (e.g. #4) for this species and these would need to be managed accordingly (i.e. rushes cut and potentially treated).

Chough were only recorded feeding in three of the parcels surveyed but were recorded on 15 other sites in the vicinity of the parcel or were reported by the landholder as being regular visitors. However, only seven of these other sites would be considered suitable. Otherwise, site selection was largely considered to be good both in terms of broad

geographical location (as evidenced by the frequency of Chough recorded at or close to the sample sites) and in terms of the specific parcels selected.

Table 10: Chough Measures of Success: Site Analysis

Site	Measures of success					Chough Present	Comments
	Average sward height (cm)	% of sward <=4cm	Sward Species (% of quadrats with D grasses/herbs)	Average bracken / scrub cover (%)	% of quadrats without bracken/scrub		
1	6.3	30	100	0	100	N	
2	5	40	100	0	100	Y	
3	15.6	10	40	0	100	N	
4	17.7	0	0	0	100	N	Chough nearby; parcel sward unsuitable
5	12.3	0	90	0	100	N	Chough nearby; parcel sward unsuitable
6	14.6	20	20	19	40	N	Chough nearby; parcel sward unsuitable
7	14.7	50	50	0	100	N	
8	16.1	10	40	0	100	N	
9	11.5	40	10	0	100	N	Used in winter (landowner)
10	5	60	40	0	100	N	
11	3.6	70	100	0	100	N	Regular use (landowner)
12	4.4	90	100	0	100	N	
13	2.4	100	100	0	100	N	Chough nearby; parcel sward suitable
14	8.9	0	100	0	100	N	
15	4	60	70	0	100	N	Chough nearby; parcel sward suitable
16	4.1	70	20	15	0	N	Chough nearby; parcel sward unsuitable
17	1.8	100	90	0	100	N	Chough nearby; parcel sward suitable
18	1.2	100	100	0	100	N	Chough nearby; parcel sward suitable
19	2.2	100	100	0	100	N	Chough nearby; parcel sward suitable
20	19	0	30	16	84	N	
21	9.8	0	100	1	99	N	
22	14.9	0	100	0	100	N	
23	8.3	0	100	0	100	Y	
24	15.4	0	90	5	50	N	Chough nearby

Measures of success						Chough Present	Comments
Site	Average sward height (cm)	% of sward <=4cm	Sward Species (% of quadrats with D grasses/herbs)	Average bracken / scrub cover (%)	% of quadrats without bracken/scrub		
25	6.8	0	100	0	100	N	Chough nearby
26	8.7	0	100	0	100	N	Chough nearby
27	5.6	0	100	0	40	N	Chough nearby; parcel sward unsuitable
28	6.6	0	100	2	10	Y	
29	7.4	10	100	0	100	N	
30	4	70	100	0	100	N	

Commonages

Due to their large size (and often complex habitat mosaics), a smaller sample of commonages (ten) were monitored than for other habitats. Within each commonage site, a homogeneous area of habitat was targeted which included heath, bog, scrub/bracken and grassland. In a number of cases habitat mosaics were present, comprising mixes such as heath and bog. This was an unavoidable consequence of the nature of upland habitats but it did not have a material effect on the monitoring programme, as the parameters recorded (including indicator species) were applicable to both habitats.

10 sites for commonages were analysed and 20 quadrats were used at each site to gauge presence and absence of positive and negative variables. Two variables (bracken/scrub, bare peat) were assessed at a wider scale (20m x 20m) whilst ditch maintenance was assessed at whole feature scale. Criteria have been interpreted and reported as follows:

Table 11: Commonages Measures of Success: Overall Summary

Criterion	Summary Results		
Sward Height	Valid responses	10	
Average sward height to be at least 8 cm	Sites meeting criterion	10	100%
At least 20% samples \geq 20cm	Sites meeting criterion	9	90%
At least 10% samples \geq 30cm	Sites meeting criterion	8	80%
Sward composition	Valid responses	10	
A minimum of 2 positive indicator species should be Frequent and 2 Occasional for each habitat present	Sites meeting criterion	7	70%
The combined cover of undesirable species should be $< 5\%$	Sites meeting criterion	10	100%
The cover of <i>Lolium</i> sp. should be $< 5\%$	Sites meeting criterion	8	80%
The combined cover of <i>Trifolium repens</i> , <i>Bellis perennis</i> & <i>Ranunculus repens</i> $< 10\%$	Sites meeting criterion	10	100%
Habitats diversity should not decrease	Sites meeting criterion	N/A	
The combined cover of Bracken & scrub should not increase from baseline year	Sites meeting criterion	N/A	
Land Management	Valid responses	10	
Bare peat should be recorded at $< 5\%$ of stops	Sites meeting criterion	3	30%
The number of maintained ditches should not increase	Sites meeting criterion	N/A	

Monitoring of the commonages action is only able to provide a 'snapshot' of the overall condition of the commons habitats. Only single areas are monitored within what are often very large areas of land. Despite this caveat, the results for commonages were generally very positive with the majority of criteria met for most of sites.

Virtually all sites showed little signs of improvement in terms of *Lolium* and other indicative species cover: only site 6 was found to support significant levels of these (41.5%). Sites were also generally acceptable in terms of bracken cover: the exception being site 8, which comprised very dense bracken with associated scrub. This could easily be remedied with greater management intervention. Undesirable species were also at very low levels across the sample. In addition, seven out of the ten sites met the criteria for indicator species. Sites 6 (improved grassland) and 8 (dense bracken) were obvious exceptions.

The results for presence of bare peat and maintained ditches were more mixed. Half the sites supported maintained ditches. The 'desirable' situation in terms of these habitats is to have unmaintained ditches i.e. not draining water-based habitats. The criterion for bare peat was only met on three sites. However, this can be viewed as a relatively strict criterion and there were only two sites where bare peat was deemed to be a particular issue (#3 and #9). The first of these had been burnt and the second had been heavily poached by cattle leading to large areas of bare peat. In another case (#1), the bare peat was more localised, and the relatively high percentage recorded a coincidence of quadrat location rather than a genuine issue. This conclusion is reinforced by the fact that species diversity was high at this site.

Table 12: Commonages Measures of Success: Site Analysis

Site	Measures of Success										Comments
	Sward Height			Sward Composition					Land Management		
	% of samples \geq 20cm	% of samples \geq 30cm	Mean (cm)	Positive indicators	Un-desirable species cover (%)	<i>L. perenne</i> cover (%)	<i>T. repens</i> , <i>B. perennis</i> and <i>R. repens</i> cover (%)	Bracken cover (%)	Stops with bare peat (%)	Maintained ditches	
1	50	25	20	Pass	0	0	0	14.3	25	Yes	Bare peat localised. Good quality habitat with <i>Schoenus nigricans</i> and <i>Rhynchospora alba</i> frequent
2	50	25	20.95	Pass	0	0	0	0	30	Yes	
3	72	46	31.2	Pass	1.96	0	0	0	56	No	Burning has taken place, therefore lots of bare peat
4	50	25	20.95	Pass	0	0	0	0.5	10	Yes	
5	10	0	11.05	Pass	0	0	0.05	0	25	Yes	Heavily grazed, breeding waders present
6	30	0	17	Fail	0.45	41.5	7	10	0	No	Largely improved

Measures of Success											
Site	Sward Height			Sward Composition					Land Management		Comments
	% of samples ≥ 20cm	% of samples ≥ 30cm	Mean (cm)	Positive indicators	Un-desirable species cover (%)	<i>L. perenne</i> cover (%)	<i>T. repens</i> , <i>B. perennis</i> and <i>R. repens</i> cover (%)	Bracken cover (%)	Stops with bare peat (%)	Maintained ditches	
											grassland
7	80	65	41.6	Pass	0	0	0	0	0	No	V. good diversity of grassland species
8	60	30	19.55	Fail	0	0	0	86.75	1.5	No	
9	60	45	34.15	Fail	2.25	0	7	13.75	55	No	Bare peat result of poaching by cattle
10	85	55%	29.25	Pass	0	0	0	0	5	No	Sheep-grazed, though only light

Conservation of Solitary Bees (Boxes)

The Year 1 surveying protocol required an implementation check only to assess presence or absence of the box and to establish its physical location and extent on a map. This indicated that for all sites checked the action had been implemented. At 18 of the sites a physical inspection with respect to siting and construction criteria was possible because the surveyor had visited anyway to survey another action. Results have been interpreted and reported as follows.

Table 13: Conservation of Solitary Bees (Boxes) Measures of Success: Overall Summary

Criterion	Summary Results		
Implementation	Valid Responses	30	
Bee box established	Sites meeting criterion	30	100%
Siting	Valid responses	18	
The location of the bee box must match the agreement	Sites meeting criterion	14	78%
Bee boxes must be located on a tree or post	Sites meeting criterion	17	94%
One box per tree or post	Sites meeting criterion	16	89%
Bee boxes must be protected from livestock or out of reach of livestock	Sites meeting criterion	16	89%
Bee box construction	Valid responses	18	
Bee boxes must be made of timber	Sites meeting criterion	18	100%
Bee box occupancy	Valid responses	18	
Confirmed occupancy rate should increase from year 1	Sites meeting criterion	N/A	

To a large extent, the results for the bee box action mirrored those for the bird boxes (at least for the 18 for which data was available). Implementation of this action appeared to be good, with almost all boxes located on a tree or post. Most sites used the correct number of boxes per location (1). However, in a small number of cases (e.g. Site 13), more than one box was located on the same tree. All boxes were made of the correct materials (i.e. timber). In the majority of cases occupancy was not assessed given the relatively recent implementation of the action. However, at one site (#28) bees were found to be using one of the boxes. In general, landowners appeared to have a good grasp of the purpose of the action. In one or two cases however (e.g. #3), the boxes were situated too low to the ground and within reach of cattle. At two other sites (#1 and #21) the boxes were suspended from trees and not securely attached. In a small number of other cases boxes were broken or had fallen out of a tree or were lying on the ground. These cases were few however. It should also be noted that in a number of cases (4) the location of the boxes did not match the agreement document. In the case of site 28, the box appeared to have been put in a preferential location and bees were actually using it.

Table 14: Conservation of Solitary Bees (Boxes) Measures of Success: Site Analysis

Site	Measures of Success							Comments
	Imple- mented	Sited as on agreement	Location on tree/post/ building	No. per group	Out of reach of livestock	Made of timber	Total number	
1	Y	N/A	Y	1	Y	Y	2	Suspended from tree
2	Y	N	N	0	Y	Y	3	3 not 5. Different location from approval summary
3	Y	Y	Y	1	N	Y	5	Access to cattle; below 6 foot
4	Y	Y	Y	1	Y	Y	5	2 knocked out of tree by wind
5	Y	Y	Y	1	Y	Y	5	
6	Y	N	Y	1	Y	Y	3	2 on trees; 1 on ground face up
7	Y	N	Y	1	Y	Y	5	All 5 on reserve. Should be 2 on reserve and 3 on priority.
8	Y							Phone check. Spring 2016
9	Y							Phone check. April 2016
10	Y							Phone check Jan/Feb 2016
11	Y							4 in total not 3
12	Y							Phone check. May 2016
13	Y	Y	Y	2	N	Y	5	Phone check only
14	Y	N/A	Y	1	Y	Y	5	Phone check. July 2016
15	Y	Y	Y	1	Y	Y	5	Feb 2016. Vegetation covering
16	Y	Y	Y	1	Y	Y	5	Within small wooded area
17	Y							Phone check. April 2016
18	Y	Y	Y	1	Y	Y	5	On post and wire fence. June 2016
19	Y	Y	Y	1	Y	Y	5	On trees; north-east facing
20	Y							No date; erected in reserve parcel
21	Y	Y	Y	1	Y	Y	1	Suspended from tree
22	Y							Phone check. April 2017
23	Y							Phone check. May 2016
24	Y							Phone check. March 2016
25	Y	Y	Y	1	Y	Y	5	Well-built bee boxes
26	Y	Y	Y	1	Y	Y	5	
27	Y	Y	Y	1	Y	Y	1	Well-built and installed
28	Y	N	Y	1	Y	Y	5	Sited in better location than on approval summary. In use.
29	Y							Phone Check May 2016
30	Y							Phone Check Apr 2017

Conservation of Solitary Bees (Sand)

The Year 1 monitoring requirements for this action were for an implementation check only. 30 sites were assessed by means of a phone call to the landholder. The results are summarised in the table below. All farmers surveyed said they had implemented the action.

Table 15: Conservation of Solitary Bees (Sand): Implementation Check Results

Criterion		Summary Results		
Implementation		Valid responses	30	
Action has been implemented		Sites meeting criterion	30	100%
Site	Implemented (date)	Not implemented		
1	✓ (no date)			
2	✓ Early 16			
3	✓ (no date)			
4	✓ (no date)			
5	✓ (no date)			
6	✓ July 16			
7	✓ (no date)			
8	✓ Jan 16			
9	✓ (no date)			
10	✓ (no date)			
11	✓ (no date)			
12	✓ Feb 16			
13	✓ (no date)			
14	✓ Feb 17			
15	✓ April 16			
16	✓ June 16			
17	✓ (no date)			
18	✓ (no date)			
19	✓ (no date)			
20	✓ (no date)			
21	✓ March 16			
22	✓ April 16			
23	✓ April 16			
24	✓ May 16			
25	✓ Oct 16			
26	✓ (no date)			
27	✓ May 16			
28	✓ (no date)			
29	✓ August 16			

Criterion		Summary Results		
Implementation		Valid responses	30	
Action has been implemented		Sites meeting criterion	30	100%
Site	Implemented (date)	Not implemented		
30	✓ (no date)			

Coppicing of Hedgerows

The Year 1 monitoring requirements for this action were for an implementation check only. 30 sites were assessed by means of a phone call to the landholder. The results are shown in the table below. All farmers said they had implemented the action.

Table 16: Coppicing of Hedgerows: Implementation Check Results

Criterion		Summary Results		
Implementation		Valid responses	30	
Implemented by the date specified		Sites meeting criterion	30	100%
Site	Implemented (date)	Not implemented		
1	✓ Nov 16			
2	✓ Oct 16			
3	✓ Nov 17			
4	✓ Feb 17			
5	✓ Feb 16			
6	✓ Nov 16			
7	✓ Sep/Oct 17			
8	✓ Oct 16			
9	✓ March 16			
10	✓ Feb 17			
11	✓ Feb 17			
12	✓ Aug 17			
13	✓ Dec 16			
14	✓ Feb 17			
15	✓ Oct 16			
16	✓ Feb 17			
17	✓ Oct 16			
18	✓ Feb 17			
19	✓ March 17			
20	✓ Feb 17			
21	✓ Jan 17			
22	✓ Feb 17			
23	✓ Sep 17			
24	✓ March 17			
25	✓ Oct 16			

Criterion		Summary Results		
Implementation		Valid responses	30	
Implemented by the date specified		Sites meeting criterion	30	100%
Site	Implemented (date)	Not implemented		
26	✓ Feb 17			
27	✓ March 16			
28	✓ Feb 17			
29	✓ (no date)			
30	✓ Mid-17			

Corncrake

30 sites for Corncrake were analysed with 10 quadrats/sampling points taken per site. Criteria have been interpreted and reported as follows:

Table 17: Corncrake Measures of Success: Overall Summary

Criterion		Summary Results		
Size and extent of ELC		Valid responses	6	
Should be as agreed on the GLAS plan		Sites meeting criterion	4	67%
Sward height			30	
Average sward height to be at least 30cm		Sites meeting criterion	6	20%
Sward Species		Valid responses	30	
Herb, nettle and rush cover at least 30%		Sites meeting criterion	4	13%
Grass cover no more than 80%		Sites meeting criterion	13	43%
Location		Valid responses	30	
Is the location of the ELC adjacent to other suitable habitat e.g. tall herb, meadow, etc.		Sites meeting criterion	5	17%
Field parcel		Valid responses	0	
Average sward height to be estimated (to nearest 5cm)		Sites meeting criterion	N/A	N/A
Presence of Corncrake		Valid responses	30	
No. of sites where Corncrake present			3	10%

The critical criterion for Corncrake is the presence of early and late cover (ELC). This needs to be both of a suitable height and, perhaps more importantly, of a sufficient extent. It is hard to obtain an overview of the second of these sub-criteria in that in only six cases was the extent of the ELC recorded. In four of these (#9, 20, 22, 23) the ELC was established as agreed on the GLAS plan. The second of these sub-criteria, the vegetation height, was clearly not met in the majority of cases (24 out of 30 sites failed to have a sufficient vegetation height).

Allied to the poor result for vegetation height, was a lack of 'correct' species composition, so only four out of 30 sites comprised at least 30% herb, nettle and rush cover (#8, 20, 22, 30). These criteria would be expected to complement each other, in that if sufficient herb, nettle and rushes were present, the height criteria would also be met (these being generally tall vegetation). Conversely, the result for grass cover indicates that many of these sites are too grassy at the expense of herbs, nettles and rushes. Whilst Corncrake are often strongly associated with good quality hay meadow vegetation, these sites would usually comprise a strong suite of herbs, as well as grasses. Clearly, many of the sites surveyed are more improved, and not hay meadow vegetation. However, if management prescriptions are followed and other conditions are conducive (e.g. a relatively high water table) then nettles and rushes (as well as iris-dominated vegetation) should start to appear at some of these sites and creating the 'right' type of conditions for breeding Corncrake should not be too difficult.

Three sites supported calling Corncrake (#6, 20, 22). At one site, there appeared to be two individuals calling (#6) even though the site was rather grassy and also failed to meet the height criteria. However, the surveyor commented that there was a frequency of hogweed and nettle there, indicating that conditions were perhaps more suitable than the quadrat data suggested. The other two sites met the criteria for grass cover and herb, nettle and rush cover. The ELC at these sites was also established in line with the GLAS plan. However, these sites also failed to meet the height criterion. Again, this fits with the assertion that it is extent of cover that is the most important criterion and not a particularly tall sward. Indeed, for these latter two sites, the surveyor commented on how well the measure had been executed. At a further 7 sites (#3, 7, 8, 21, 23, 24 and 28), Corncrake were either heard in adjacent parcels, in the general vicinity or were reported as being present (by the farmer) in the surveyed parcel earlier in the year.

The fact that Corncrake are either present on target or adjacent parcels at time of observation or are noted as having been present previously is encouraging given the rarity of the species in Ireland. Indeed this is quite surprising given the general lack of suitable conditions at the majority of sites. This may reflect appropriate geographic selection for the action. It is hoped that, with further management (largely non-intervention) of selected sites, that others will become suitable in time. Certainly, the experience in the west coast of Scotland indicates that it is possible to instigate a good recovery in this species over a relatively short timescale.

Table 18: Corncrake Measures of Success: Site Analysis

Site	Measures of success					Corncrake Present	Comments
	Size and extent ELC	Average sward height (cm)	Average herb, nettle and rush cover (%)	Average grass cover (%)	Location adjacent to suitable habitat		
1	?	4.1	0	99	N	N	
2	?	14	2.9	74	N	N	
3	?	10.9	0	98.6	N	N	Birds heard across road

Site	Measures of success					Corncrake Present	Comments
	Size and extent ELC	Average sward height (cm)	Average herb, nettle and rush cover (%)	Average grass cover (%)	Location adjacent to suitable habitat		
							(adjacent plot)
4	?	9.8	0	86.3	N	N	
5	?	18.5	4	97.5	Y	N	
6	?	21.2	2.7	77.1	Y	Y	Maybe 2 birds
7	N	20.6	14	86	N	N	Birds heard in vicinity
8	?	15.3	100	100	Y	N	Birds heard in vicinity
9	Y	30	18.1	81.9	N	N	
10	?	9.9	0.5	76.5	N	N	
11	?	13.4	0	72.5	N	N	
12	?	15.9	0	62.5	N	N	
13	?	7.4	2	58.5	Y	N	
14	?	4.2	0	84.5	N	N	
15	?	7.1	0	83.2	N	N	
16	?	56.5	4.9	63.5	N	N	
17	?	38.4	2.5	78	N	N	
18	?	33.4	0	65	N	N	
19	?	26.3	0	53.5	N	N	
20	Y	14.3	35.5	61	Y	Y	1 bird
21	N	5.1	3.5	96.5	N	N	Birds heard within 1km
22	Y	15.3	48	53	N	Y	1 bird, with possible second
23	Y	8.1	2.5	99	N	N	Heard earlier in year from parcel (landowner)
24	?	9.5	0	86.5	N	N	Present in previous years
25	?	1.7	0	100	N	N	
26	?	7	0	100	N	N	
27	?	5.5	0	100	N	N	
28	?	4	0	100	N	N	1 in distance (17 males calling on Inishbofin
29	?	7.1	0	100	N	N	
30	?	43.5	64	27	N	N	

Environmental Management of Fallow Land

The Year 1 monitoring requirements for this action were for an implementation check only. 28 sites were assessed by means of a phone call to the landholder. The results are shown in the table below. All farmers had implemented the action.

Table 19: Environmental Management of Fallow Land: Implementation Check Results

Criterion		Summary Results		
Implementation		Valid responses	28	
Implemented by the date specified		Sites meeting criterion	28	100%
Site	Implemented (date)	Not implemented		
1	✓ June 16			
2	✓ May 16			
3	✓ May 16			
4	✓ March 16			
5	✓ April 16			
6	✓ April 16			
7	✓ May 16			
8	✓ June 16			
9	✓ April 16			
10	✓ May 16			
11	✓ April 16			
12	✓ March 16			
13	✓ April 16			
14	✓ May 16			
15	✓ Aug/Sept 16			
16	✓ April 16			
17	✓ May 16			
18	✓ April 16			
19	✓ March 16			
20	✓ Sept 16			
21	✓ April 15			
22	✓ May 16			
23	✓ April 16			
24	✓ March 16			
25	✓ May 16			
26	✓ March 16			
27	✓ May 16			
28	✓ Autumn 16			

Farmland Habitat

There was the potential for the monitoring programme to encompass a range of Natura farmland habitats. In the event, only grassland and heathland habitats were captured by the sampling process. These are reported on separately.

Grassland

27 sites for Natura farmland habitats grassland were analysed and 10 quadrats were used at each site to gauge presence and absence of positive and negative variables. Criteria have been interpreted and reported as follows:

Table 20: Farmland Habitat (Grassland) Measures of Success: Overall Summary

Criterion	Summary Results		
Sward composition	Valid responses	27	
The combined cover of wildflowers and sedges should be > 20%	Sites meeting criterion	7	26%
Neutral & Calcareous grassland = A minimum of 3 positive indicator species should be Frequent and 3 Occasional. Acid grassland & Marshy grassland = A minimum of 2 positive indicator species should be Frequent and 2 Occasional.	Sites meeting criterion	4	15%
The combined cover of undesirable species should be < 5%	Sites meeting criterion	26	96%
The cover of <i>Lolium perenne</i> should be < 10%	Sites meeting criterion	15	56%
The combined cover of <i>Trifolium repens</i> , <i>Bellis perennis</i> & <i>Ranunculus repens</i> < 30%	Sites meeting criterion	16	59%
The combined cover of <i>Juncus effusus</i> , <i>J. inflexus</i> & <i>J. compactus</i> should be < 50%	Sites meeting criterion	27	100%
Vegetation Management (Whole of feature visible from sampling point)	Valid responses		
The combined cover of Bracken & scrub should be < 5%	Sites meeting criterion	22	81%
The combined cover of trees and scrub < 5%	Sites meeting criterion	16	59%
Sward structure	Valid responses		
The cover of bare ground should be < 5%	Sites meeting criterion	22	81%

In general, the results for the Natura farmland habitats grassland were disappointing. On a positive note, cover values for rushes were within acceptable parameters. Sites were also

generally acceptable in terms of bracken cover. Furthermore, undesirable species were at low levels (96% of sites met this criterion). A small number of sites (four) met the criteria for species diversity (Sites 2, 4, 5 and 14), in contrast to the traditional hay meadow sites.

However, sites performed badly in terms of scrub cover, with only just over half of the grasslands having acceptable levels of scrub. In addition, levels of improvement were generally high. Thus, only just over half the sites (56%) met the criterion for cover values of *Lolium perenne* and a similar figure (59%) was returned for the criterion for other indicators of improvement (*Trifolium repens*, *Bellis perennis* and *Ranunculus repens*). Several sites (#6, #8, #9 and #17) were highly improved.

The scrub cover issue is one that can be tackled relatively easily. Increasing the diversity of swards, particularly where starting from a highly improved baseline will be more difficult and the highly improved parcels are unlikely to become more diverse in the near-term. However, as with some of the hay meadows, some incremental and positive change should be expected at many of the other sites.

Table 21: Farmland Habitat (Grassland) Measures of Success: Site Analysis

Site	Measures of Success									Comments
	Wildflower and sedge cover (%)	Un-desirable species cover (%)	<i>Lolium perenne</i> cover (%)	<i>Trifolium repens</i> , <i>Bellis perennis</i> and <i>Ranunculus repens</i> cover (%)	Rush cover (%)	Bracken cover (%)	Tree and scrub cover (%)	Bare ground cover (%)	Indicator species	
1	5	0.2	70.5	0.3	0	0	0	0	1F, 2R	Marshy grassland, improved, but with frequent <i>Filipendula</i>
2	17.2	0	4.0	5.3	4	30	0	2.6	4F, 3O, 6R	Acid grassland/Marshy grassland; sheep-grazed mosaic. <i>Pinguicula vulgaris</i> present but not in quadrats
3	10	0	0	0.1	2.2	10	2	1.5	1F, 2O, 9R	Wet <i>Molinia</i> grass and, dry-humid acid grassland
4	31.38	0	0	3.1	21	0	0	0	2F, 4O	Marshy grassland, species rich
5	87	0	0	2.4	0	0	0	2.9	4F, 3O, 4R	Like machair, but difficult to assign
6	0.2	0.4	89.5	9.5	0.1	0	0	1.5	-	Highly improved, neutral. No indicators
7	6.7	0	67.5	17.5	0	0	0	0	1F	Neutral largely improved. <i>Trifolium pratense</i> and <i>Hypochaeris radicata</i> present though not in quadrats
8	0.6	0.2	82	5.5	0	0	0	0.5	-	Neutral grassland,

Measures of Success										
Site	Wildflower and sedge cover (%)	Un-desirable species cover (%)	<i>Lolium perenne</i> cover (%)	<i>Trifolium repens</i> , <i>Bellis perennis</i> and <i>Ranunculus repens</i> cover (%)	Rush cover (%)	Bracken cover (%)	Tree and scrub cover (%)	Bare ground cover (%)	Indicator species	Comments
										highly improved, though field boundaries support calcareous grassland species
9	0.7	0	98.4	1.4	0	0	0	0.5	-	Neutral grassland, field recently cut for silage, slurry spread. Very poor
10	13.5	4.6	61	4.3	0	0	0	0	1F, 1R	Neutral – pretty improved
11	0.5	0	58.3	14.2	0	0	20	1.5	1R	Marshy grassland, species-poor, quite improved.
12	29.7	4.3	0	2.4	14.1	0	25	1.1	1F, 1O	Wet grassland with rushes, landowner planted over 100 trees
13	5.8	0.3	19.2	9.5	1.2	0	0	1.8	1F, 1O, 1R	Wet grassland
14	36.5	0	0	11.5	28.5	0	7	1.5	4F, 2O, 1R	Good quality acid grassland, mosaic of GS2, GS4 and PF2
15	3.6	0	1.5	2.5	1.8	0	0	57.5	-	Application of herbicide apparently, with probable run-off to river. Poor
16	25	2.2	0	16	25	5	20	6.5	1F, 1O, 4R	Wet grassland; moderate quality. Large area of parcel is woodland of good quality
17	4.3	0	32	71.5	7.3	0	0	0.1	-	Generally improved – no positive indicators
18	39.2	0.1	1.6	23.8	14	0	5	1.2	5O, 3R	Semi-natural grassland of high quality
19	7.8	0	0	2.8	7.3	15	5	0	2F, 1O	Acid grassland/neutral grassland – grassy, few herbs
20	1.1	0	29.3	0.1	0.1	0	6	7	1R	Very grassy and quite improved
21	10.6	11.6	3.2	39.7	0	0	10	5	1F, 1R	Parcel dominated by <i>Cirsium palustre</i> and <i>Urtica dioica</i>
22	8.1	1.2	0	8.3	44.4	2	18	6.7	1F	GS4 wet grassland; rushy

Measures of Success										Comments
Site	Wildflower and sedge cover (%)	Un-desirable species cover (%)	<i>Lolium perenne</i> cover (%)	<i>Trifolium repens</i> , <i>Bellis perennis</i> and <i>Ranunculus repens</i> cover (%)	Rush cover (%)	Bracken cover (%)	Tree and scrub cover (%)	Bare ground cover (%)	Indicator species	
23	15.5	1.7	32.8	12.2	0	5	0	0	1F, 1O	<i>Conopodium majus</i> in parcel but not in quadrats
24	23.4	2	34.7	29	0	0	0	0	2O, 2R	A mix of unimproved and calcareous grassland
25	10.7	0.4	4.1	8.1	0	0	0	0	1F, 1O, 2R	Reserve site surveyed as W transect not feasible at priority site. GS4 wet grassland
26	0	7.5	0	12	9.5	0	5	4.2	-	Recent scrub clearance but brash remains. Heavily grazed and some poaching
27	8.9	5.0	2.5	16.9	0	0	8	0.9	1F, 2O	

Heathland

4 sites for Natura farmland habitats heathland were analysed and 10 quadrats were used at each site to gauge presence and absence of positive and negative variables. Criteria have been interpreted and reported as follows:

Table 22: Farmland Habitat (Heathland) Measures of Success: Overall Summary

Criterion	Summary Results		
Sward composition	Valid responses	4	
Heavily grazed features should be < Occasional throughout the parcel	Sites meeting criterion	2	50%
Pioneer phase (P): 10-40%; Building/mature phase (B): 20-80%; Degenerate phase (D): < 30%; and Dead (DD): < 10%, of total ericaceous cover.	Sites meeting criterion	2P, 2B	
Vegetation Management (Whole of feature visible from sampling point)	Valid responses		
Dry heath: > 50% Wet heath: 25% - 80%	Sites meeting criterion	2	50%
There should be ≥ 2 species of dwarf shrubs as Frequent	Sites meeting criterion	2	50%

Criterion	Summary Results		
The cover of <i>Sphagnum</i> should be maintained at or above its baseline level	Sites meeting criterion		
≥ 2 species Occasional throughout the parcel	Sites meeting criterion	4	100%
Cover of undesirable species should be < 1%	Sites meeting criterion	3	75%
Dense bracken cover should be: Dry heath < 10% Wet heath < 5%	Sites meeting criterion	3	75%
There should be no recently burnt areas and “Black burn” & “Grey burn” should decline from baseline.	Sites meeting criterion	4	100%
Vegetation Management (Whole feature)	Valid responses		
Cover of scrub/trees should be: Dry heath < 15% Wet heath < 10%	Sites meeting criterion	2	50%
Cover of non-native species should be < 1%	Sites meeting criterion	4	100%

Only four of the sample sites were classified as Natura farmland habitats heathland, and given the small number it is not possible to draw any firm conclusions. Nevertheless, all four sites scored well on the presence of non-native species, on a lack of burning and on the presence of at least two heath species being occasional throughout the sward. Results for the other criteria were more mixed. Two out of the four sites appeared to be heavily grazed and two out of four appeared to be suffering with encroachment of scrub and trees. The extent of the heath was also only within acceptable parameters at two out of the four sites. Site 3 was marked as poor quality heathland whereas site 4 was considered to be high quality heathland.

Table 23: Farmland Habitat (Heathland) Measures of Success: Site Analysis

Site	Measures of Success											Comments
	Heavily grazed features	Dwarf shrub growth form	Dwarf shrub cover (%)	Dwarf shrub species present	Sphagnum cover (%)	Positive indicators	Un-desirable species cover (%)	Bracken cover (%)	Burnt area cover (%)	Tree and shrub cover (%)	Non-native species cover (%)	
1	Y	B	68.75	2F	2.5	2F 1R	0	0	0	2	0	

Measures of Success												Comments
Site	Heavily grazed features	Dwarf shrub growth form	Dwarf shrub cover (%)	Dwarf shrub species present	Sphagnum cover (%)	Positive indicators	Un-desirable species cover (%)	Bracken cover (%)	Burnt area cover (%)	Tree and shrub cover (%)	Non-native species cover (%)	
2	Y	B	34	1F 2R	28.5	3F 2R	0	0	0	0	0	Sheep-grazed
3	N	P	4	1O 1R	0	1F 2O	1.3	6	0	20	0	Poor quality heathland
4	N	B	60.5	2F 1O	5.5	4F 2O 2R	0	0	0	15	0	Sounds good quality heathland

Geese and Swans

31 sites for Geese and Swans were analysed all of which were pasture, though one was rejected from the sample due to a land ownership dispute. 30 quadrats were used at each site unless Geese/Swans present (when bird numbers/species were recorded to avoid disturbance). Stock presence was part of the habitat survey criteria and has only been explicitly recorded where a bird survey also took place. Criteria have been interpreted and reported as follows:

Table 24: Geese and Swans Measures of Success: Overall Summary

Criterion	Summary Results		
Sward Height	Valid responses	29	
Average height of sward between 5cm to 12cm	Sites meeting criterion	20	69%
	Average of all samples (cm)	10.6	
Droppings	Valid responses	29	
Presence of Geese or Swans' droppings	Sites meeting criterion	4	14%
Stock Presence	Valid responses	13	
Absence of stock	Sites meeting criterion	11	85%
Presence of Geese/Swans	Valid responses	30	
No of sites where Geese/Swans present		4	13%

The mean of the average sward height was 10.6cm across the sites where data was recorded and a high proportion of sites (69%) met the average height criteria. Whilst only four sites (13% of the sample) had Geese/Swans actually on the site, one further site had droppings present and a further 9 sites had Swans and/or Geese in the vicinity and are therefore potentially used on occasion. Almost all sites (92%) met the absence of stock criterion, and the one site that failed, had a very low number of stock present.

In general, the action seemed well targeted both broadly and in the choice of specific parcels at farm scale. However, a small number of sites were too rank to support Geese/Swans (e.g. #10, #23) and one site was considered unsuitable in terms of its landscape characteristics (i.e. small fields, bounded by hedges). In one case (#13), the landowner seemed unaware of the prescriptions and had spread slurry on the field in late January. Although this was after the closed period, the use of machinery on Geese/Swans parcels from 15 October to 31 March is advised against in the action guidance due to the potential for disturbance of occupying birds.

Table 25: Geese and Swans Measures of Success: Site Analysis

Site	Measures of success			Geese/Swans Present	Comments
	Mean sward height (cm)	Droppings present	Stock present		
1	3.7	Y	N	Light-bellied Brent	
2	26.7	N	Y	N	
3	13.0	N	N	N	Brent close by
4	18.9	N	N	N	
5	7.1	Y	N	N	Brent close by
6	6.9	N	N	N	Farmer remembers Barnacle here
7	11.6	N	N	N	
8	7.8	N	N	N	
9	12.7	N	N	N	Geese/Swans in previous years (landowner)
10	24.2	N	N	N	
11	—	—	N	Whooper swan (84, 19 juveniles)	
12	15.1	N	N	N	Whooper swan close by
13	5.1	N	N	N	Farmer unaware of prescriptions (slurry)
14	8.4	N	N	N	Small fields, bounded by hedges; unlikely to support
15	9.0	N	N	N	Whooper swan close by
16	7.4	Y	N	Feral Geese only	Whooper swan close by
17	6.3	N	N	N	
18	6.8	Y	N	Brents, Greenland white-fronts, Barnacle	Excellent site; used for roosting
19	9.8	N	N	N	
20	6.8	N	N	N	Whooper swan close by
21	15.6	N	N	N	
22	8.1	N	N	N	
23	20.6	N	N	N	
24	7.7	N	N	N	
25	9.4	N	N	N	
26	8.4	N	N	N	Whooper swan close by
27	10.9	N	Y	N	
28	5.1	N	N	N	Whooper swan close by
29	7.6	N	N	N	
30	6.6	N	N	N	Swans (probably mute) close by

Grey Partridge

30 sites for Grey Partridge were analysed and 5 quadrats were used at each site to gauge presence and establishment of 'crop' species. Criteria have been interpreted and reported as follows:

Table 26: Grey Partridge Measures of Success: Overall Summary

Criterion	Summary Results		
Margin length and width	Valid responses	30	
Grass and arable margins full length of field unit and at least 12m in width	Sites meeting criterion	29	97%
Grass Margin	Valid responses	29	
Grass margin present and at least 3m in width	Sites meeting criterion	28	97%
Presence of sown species	Valid responses	30	
At least three of Triticale, Kale, Lucerne, Perennial chicory and Fodder radish to be present	Sites meeting criterion	26	87%
These species to cumulatively comprise at least 70% of mixture	Sites meeting criterion	15	50%
Presence of Grey Partridge	Valid responses	30	
No of sites where Grey Partridge present		2	7%

The overall implementation of the Grey Partridge action was very good. With a single exception (#14), grass and arable margins were established as stipulated. This was in terms of both length (i.e. full length of field unit) and width (i.e. 12m). The grass margin component of the margin was also established as stipulated (i.e. at least 3m of the 12m width).

Again, a high degree of compliance with the range of 'crop' species was met, with most sites (87%) having three species. This measure seeks to ensure both a food source and a degree of cover. Although this criterion was met in the majority of cases, it was noted that for a number of sites, one of these species was by far the most dominant. This is particularly the case with kale, which seemed to become well established, to the detriment of other species. Furthermore, in half the samples, the 'crop' did not meet the cover value criterion (i.e. 70% of mix to comprise these species).

Although measures had been well implemented and in a good number of cases, suitable conditions had been created, only two sites actually recorded Grey Partridge (#11, 12), with a further three (#2, 15, 28) reported by the farmer as having held the species either recently or at some stage in the past. Grey Partridge are slow to colonise or re-colonise new or former areas as they are a very sedentary species and will sometimes move no further than 1km from where they were hatched. Given time, numbers at the sites sampled may increase and this might be captured in subsequent surveys.

Table 27: Grey Partridge Measures of Success: Site Analysis

Site	Measures of success				Grey Partridge present	Comments
	12m width arable and grass margin present; full length of field	3m grass width present	3 sown species present	Average combined percentage cover		
1	Y	Y	Y	67	N	Never seen - farmer
2	Y	Y	Y	47	N	Farmer has seen previously
3	Y	Y	Y	41	N	
4	Y	Y	N	4.4	N	
5	Y	Y	Y	88	N	
6	Y	Y	Y	99	N	
7	Y	Y	N	0	N	
8	Y	Y	N	36	N	
9	Y	Y	Y	71	N	
10	Y	Y	Y	92	N	
11	Y	Y	Y	32	Y	Pair present, though target vegetation poor
12	Y	Y	Y	92	Y	Pair
13	Y	Y	Y	34	N	Gappy, weak growth
14	N	N	N	0	N	High rabbit numbers, grazing pressure
15	Y	Y	Y	24	N	Present last year
16	Y	Y	Y	97	N	Kale dominant
17	Y	Y	Y	82	N	Good arable strip
18	Y	Y	Y	70	N	Never seen – farmer
19	Y	Y	Y	80	N	Never seen – farmer
20	Y	Y	Y	92	N	Never seen – farmer
21	Y	Y	Y	88	N	Never seen – farmer
22	Y	Y	Y	88	N	Never seen – farmer
23	Y	Y	Y	80	N	Strip well established
24	Y	Y	Y	71	N	
25	Y	Y	Y	54	N	
26	Y	Y	Y	67	N	
27	Y	Y	Y	46	N	
28	Y	Y	Y	62	N	Partridge seen recently
29	Y	Y	Y	66	N	
30	Y	Y	Y	77	N	

Hen Harrier

30 sites for Hen Harrier were analysed with 30 quadrats sampled per site. Criteria have been interpreted and reported as follows:

Table 28: Hen Harrier Measures of Success: Overall Summary

Criterion	Summary Results		
Habitat Type	Valid responses	30	
No more than 5% samples to be classified as Improved Grassland	Sites meeting criterion	24	80%
Sward Height	Valid responses ¹	29	
At least 50% samples \geq 10cm	Sites meeting criterion	27	93%
At least 20% samples \geq 20cm	Sites meeting criterion	23	79%
At least 10% samples \geq 30cm	Sites meeting criterion	23	79%
At least 10% samples $<$ 10cm	Sites meeting criterion	9	31%
This measures the extent to which the vegetation is tussocky but not tall throughout.	Sites meeting ALL criteria	4	14%
	Sites meeting 3 of 4 criteria	19	66%
	Sites meeting 2 of 4 criteria	3	10%
	Sites meeting 1 of 4 criteria	3	10%
Sward Species	Valid responses	30	
No more than 10% of species should be Rye grass (<i>Lolium</i> sp) or White clover	Sites meeting criterion	23	77%
Sward Structural Diversity	Valid responses	30	
Between 40-70% of sample points to be rush or purple moor-grass dominant ² .	Sites meeting criterion	14	47%
<i>Note the proportions falling above and below the range.</i>	<i>Sites below 40%</i>	10	33%
	<i>Sites above 70%</i>	6	20%
Prey availability	Valid responses	28	
Total number of small birds (other than crows/pigeons) and small mammals present in field unit. Small mammal numbers to be estimated from burrows, droppings, etc. To pass criterion, site should have a minimum of 10 birds and/or small mammals recorded	Sites meeting criterion	12	43%
	<i>Mean prey availability / site</i>	10.6	
Presence of Hen Harrier	Valid Responses	30	
No of sites where Hen Harrier present		4	13%

¹ Sites #9, #10 and #11 are missing height data for quadrats 16-30. Interpretation has been based on 15 quadrats only for these sites.

² Protocol states "Where rush is the dominant species at $>$ 70% of samples, the ground / subordinate flora should be visible in at least 50% of these samples". However, this information was only captured at 6 sites. The protocol has been changed to a simple dominance criterion. Key thing here is that rushes do not become overly dominant in the sward, to the exclusion of other species i.e. too dense. 70% considered to be a good overall cover; over this and cover tends to be too dense i.e. not enough structural variation; well below this also leads to a uniformity of structure inimical to Hen Harrier foraging; purple moor-grass added as this is similarly structurally dense when dominant.

Hen Harrier were recorded either in or very close to four sites. A further 10 sites provided good foraging habitat and these are likely to form part of Hen Harriers' hunting ranges. Prey availability varied widely though sites were broadly similar in terms of area. However, this is still a good overall indicator of suitability and the criterion will be revisited in subsequent survey and analysis.

The action appeared to be well targeted at broad geographic scale in that all sites are close to or within SPAs for Hen Harrier (there would be little point in targeting other areas). Considering each measure of success individually, most sites (80%) are almost entirely unimproved habitat, most (77%) are almost entirely dominated by unimproved species criteria, and most (23 sites or 79%) meet either 3 or all 4 of the sward height criteria. Only four sites met all four criteria; of the remaining 19 that meet only three criteria the missing one is always the short (10% less than 10cm) criterion. However, some caution is advised in overly interpreting this finding: the data are very sensitive to the criteria boundary as many swards were recorded as having a height of 10cm exactly. As such, only nine sites were deemed to have sufficient short sward. If the criteria are changed to a less than or equal to for the short sward and a greater than for the others, then 17 sites have sufficient short vegetation and 23 have at least 50% greater than 10cm (the other two criteria scores being the same). In this scenario, 10 sites meet all four criteria.

Fourteen of the sites had a rush or purple moor-grass dominance of 40% to 70%, with 6 exceeding 70%. Almost all sites reported some prey availability, though only 12 sites met the threshold frequency in the protocol. Mean prey availability was over 14 animals per site but this is slightly skewed by one site which had 49 animals.

Nevertheless, the overall judgement of the surveyors was that some of the sites (almost half) had some unsuitability issue. A number of parcels either contained too much improved grassland (#6) or were overly dominated by gorse or woodland (#7), none of which are suitable for Hen Harrier foraging. Depending on the degree of improvement, some of these parcels may be amenable to management and gorse control could be implemented at some of the other sites. The woodland site (#28) would not be amenable to management because it would be unacceptable to fell woodland to encourage Hen Harrier.

Table 29: Hen Harrier Measures of Success: Site Analysis

		Measures of Success								
Site	Habitat Type (% un-improved)	Sward Height (% of samples in each category)				Sward Species (% of samples where un-improved species dominant)	Sward Structural Diversity (% of sample rush-dominated)	Total number of small birds and/or small mammals recorded	Hen Harrier Present	Comments
		≥ 10cm	≥ 20cm	≥ 30cm	< 10cm					

	Measures of Success									
Site	Habitat Type (% un-improved)	Sward Height (% of samples in each category)				Sward Species (% of samples where un-improved species dominant)	Sward Structural Diversity (% of sample rush-dominated)	Total number of small birds and/or small mammals recorded	Hen Harrier Present	Comments
		≥ 10cm	≥ 20cm	≥ 30cm	< 10cm					
1	100	100	70	40	0	100	40	12	Y	Good foraging habitat ; management ideal; some heather
2	100	100	97	90	0	100	97	5	N	Parcel too scrubby
3	100	63	13	7	37	100	6	10	N	HH recorded in area; needs more structural diversity (too uniformly low currently)
4	100	67	60	60	33	100	60	2	N	
5	100	97	73	37	3	100	37	15	N	Mix of heath and bog
6	100	100	93	70	0	100	60	8	N	
7	0	17	0	0	83	0	0	1	N	Highly improved, uniformly low vegetation heights
8	100	93	30	23	7	100	33	65	N	Habitat unsuitable, not enough structural diversity
9	100	60	53	20	40	100	83	100	N	
10	100	93	43	20	7	100	70	13	N	Unsuitable though adjacent habitat suitable
11	100	100	60	40	0%	100	67	6	Y	Suitable foraging
12	37	87	0	0	13	100	20	18	N	Landholder comments that HH in uplands just north of parcel. However, parcel appears too improved and lacks structural diversity
13	100	100	93	70	0	100	70	9	N	Unsuitable currently
14	100	100	100	100	0	77	73	2	N	Unsuitable currently
15	47	100	90	70	0	47	17	11	N	Unsuitable; improved
16	100	100	77	70	0	100	50	6	Y	Good foraging habitat
17	100	93	57	37	7	60	87	1	N	Unsuitable

	Measures of Success									
Site	Habitat Type (% un-improved)	Sward Height (% of samples in each category)				Sward Species (% of samples where un-improved species dominant)	Sward Structural Diversity (% of sample rush-dominated)	Total number of small birds and/or small mammals recorded	Hen Harrier Present	Comments
		≥ 10cm	≥ 20cm	≥ 30cm	< 10cm					
										currently; rushes too dense
18	0	7	0	0	87	10	30	0	N	Unsuitable; improved
19	100	100	90	70	0	80	73	9	N	Good potential
20	100	100	87	70	0	97	63	11	N	
21	100	87	63	57	13	100	50	9	N	Suitable foraging
22	100	93	73	43	7	100	30	9	N	Unsuitable currently
23	100	97	80	60	3	100	43	8	Y	Potential but rather scrubby
24	100	100	90	77	0	100	70	12	N	HH have been present in previous years
25	43	100	47	40	0	93	50	49	N	Surrounded by good habitat; high prey availability
26	100	100	90	73	0	100	50	18	N	Good - HH reported by farmer; very heather dominated and some bog
27	100	97	13	0	3	100	97	n/a	N	Very low prey availability (but sample level data n/a)
28	100	n/a	n/a	n/a	n/a	100	3	1	N	Mature woodland; completely unsuitable
29	40	50	40	37	50	70	0	5	N	Wholly unsuitable; mix of gorse and improved grassland; farmer unsure of scheme requirements
30	100	70	3	0	30	100	45	n/a	N	Sample level prey data n/a

Laying Hedgerows

The monitoring requirements for this action were for an implementation check only. 30 sites were assessed by means of a phone call to the landholder but one farmer has subsequently dropped out of GLAS due to illness. The action has been implemented on 27 of the remaining 29 sites with two farms having apparently missed the completion deadline.

Table 30: Laying Hedgerows: Implementation Check Results

Criterion		Summary Results		
Implementation		Valid responses	29	
Implemented by the date specified		Sites meeting criterion	27	93%
Site	Implemented (date)	Not implemented		
1	✓ Partial Jan/Feb 17; completed Nov 17			
2	✓ Sept 15			
3	✓ Winter 16/17			
4	✓ Partial Sept 16; completed Feb 17			
5	✓ Dec 16			
6	✓ Nov 16			
7	✓ Feb 16			
8	✓ March 16			
9	✓ Sept/Oct 17			
10		✓ Dropped out of GLAS due to illness		
11	✓ March 16			
12	✓ Feb 17			
13	✓ Jan 17			
14	✓ Feb/March 16			
15		✓ Followed up Dec 17 - not complete		
16	✓ Feb 17			
17	✓ Feb 17			
18	✓ Dec 16			
19	✓ Nov 16			
20	✓ Feb 16			
21	✓ Feb 11			
22	✓ Feb 17			
23	✓ Jan 17			
24		✓ Followed up Dec 17 - not complete		
25	✓ Feb 17			
26	✓ Feb 16			
27	✓ Feb/Mar 16			
28	✓ Feb 17			
29	✓ Jan/Feb 16			
30	✓ March 16			

Low Input Permanent Pasture

30 sites for low input permanent pasture were analysed and 10 quadrats were used at each site to gauge presence and absence of positive and negative variables. Criteria have been interpreted and reported as follows:

Table 23 Low Input Permanent Pasture Measures of Success: Overall Summary

Criterion	Summary Results		
Sward composition	Valid responses	30	
There should be \geq four grasses and three forbs throughout the sward.	Sites meeting criterion	30	100%
Cover of <i>Lolium perenne</i> should be < 30%	Sites meeting criterion	25	83%
Cover of <i>Trifolium repens</i> should be < 25%	Sites meeting criterion	29	97%
Cover of wildflowers and sedges should be > 20%	Sites meeting criterion	9	30%
Cover of rank grasses should be < 10%	Sites meeting criterion	18	60%
Cover of bare ground should be < 10%.	Sites meeting criterion	27	90%
Cover of undesirable species should be < 5%.	Sites meeting criterion	27	90%
Vegetation Management (Whole of feature visible from sampling point)	Valid responses	30	
The whole parcel should be stock-proof	Sites meeting criterion	28	93%
The parcel must be grazed	Sites meeting criterion	27	90%
The parcel should not be topped between 15 th March & 1 st July.	Sites meeting criterion (28 valid responses)	22	79%
Cover of scrub/bracken etc should be < 5%.	Sites meeting criterion	19	63%

In general, low input permanent pasture scored well against the majority of evaluation criteria. Levels of improvement appeared to be low, with the majority of sites meeting the criteria for cover of *Lolium perenne* and *Trifolium repens* (83% and 97% respectively). Landowners had also complied well with the vegetation management criteria: grazed, stock-proof parcels and no topping visible on the majority of sites. However, a material number of sites were suffering from scrub and/or bracken encroachment (11 out of the 30).

Grass diversity appeared to be high, with all sites supporting four or more grass species. However, forty per cent of sites had unacceptable levels of rank grasses. Where present, rank grasses are likely to suppress the growth of a diversity of forbs. Floral diversity was not measured as an indicator but from an overall cover perspective only nine sites met the

criterion for greater than 20% cover value of wildflowers and sedges. This may be related in part to the high rank grass presence.

The management regime for low input permanent pasture is such that levels of wild flower cover are unlikely to improve during the course of the scheme. However, two management issues that could be addressed are scrub encroachment and cutting of rank grasses on a number of sites.

Table 31: Low Input Permanent Pasture Measures of Success: Site Analysis

Site	Measures of Success											Comments
	No. of grasses and forbs	<i>Lolium perenne</i> cover (%)	<i>Trifolium repens</i> cover (%)	Wildflowers and sedge cover (%)	Rank grass cover (%)	Bare ground cover (%)	Un-desirable species cover (%)	Stock-proof	Grazing stock present	Topped	Scrub and tree cover (%)	
1	16	1.6	9.7	2.7	0	0	0.2	Y	Y	N	3	Standard wettish pasture, two Irish hare
2	7	59	11	1.1	0.1	0.8	0	Y	Y	Y	5	
3	20	0	7	2.7	0	0	0.2	Y	Y	Y	0	Relatively species-rich wet grassland with some flushing
4	20	0	4.7	29.5	0	7	0	Y	Y	N	0	Reserve parcel surveyed
5	12	10.5	5.8	1.4	0	0	0.7	Y	Y	N	0	Reserve parcel surveyed
6	12	6.1	4.2	0.5	0	0	4.5	Y	Y	N	0	
7	16	59	15.5	0.6	0.2	0	0	Y	Y	N	1	
8	20	61.1	12.3	8.8	0.1	0.9	1.8	Y	Y	N	7	
9	20	0.1	0.1	26	9.5	0	13	Y	N	N	0	Reserve 2 plot surveyed
10	14	47	11.4	8.7	0	0	0.1	Y	Y	Y	0	Recently topped; cover of grasses difficult to estimate
11	22	0	5.5	30.5	3.5	0	0	Y	N	N	5	GS4 + PF2, HH3, PB
12	17	0	9.7	27	8	0.9	3.7	Y	Y	N	2	<i>Juncus effusus</i> dominant
13	15	25.5	12	20	0	0	0.7	Y	Y	N	0	
14	18	0	37.4	14.9	36	6.7	2.5	Y	Y	N	8	GS4 wet grassland
15	9	46	17	24.5	0.1	2.5	0	Y	Y	N	0	Improved, dominated by <i>Lolium perenne</i>
16	13	8.5	5.1	2.9	0	0	8.4	Y	Y	N	0	Abundance of dock species and <i>Ranunculus repens</i> throughout

Measures of Success												Comments
Site	No. of grasses and forbs	<i>Lolium perenne</i> cover (%)	<i>Trifolium repens</i> cover (%)	Wildflower s and sedge cover (%)	Rank grass cover (%)	Bare ground cover (%)	Un- desirable species cover (%)	Stock- proof	Grazing stock present	Topped	Scrub and tree cover (%)	
17	16	35.5	20	8.3	0	0	1.9	Y	Y	N	0	
18	14	10.5	1.3	9.1	0	0	3.3	Y	Y	N	0	Small herd of cattle
19	19	12	11.5	22	3.8	0	2	Y	Y	N	5	Small discrete area of scrub
20	9	7.2	7.6	0.8	91.7	0.6	3.2	Y	Y	Y	0	
21	13	0.7	1	14	17.6	14.7	4.4	Y	N	N	0	
22	12	3.5	3.4	5.3	74.9	12.4	0.1	Y	Y	N	10	Wet grassland, significantly poached in places
23	16	5.3	8.4	35.6	31.3	8.8	0.3	Y	Y	N	30	Reserve parcel
24	12	8.1	3.5	12.5	66.1	7.3	3.5	Y	Y	N	10	
25	19	0	5.7	17.1	47	6.4	0.2	Y	Y	N	30	
26	16	0	1.5	8	57	17.7	1.6	N	Y	N/A	5	
27	10	4.7	9	24.9	44.5	0.4	2.1	Y	Y	N	0	
28	10	4.6	1.6	34.2	60	0.6	0.1	Y	Y	N/A	10	
29	8	3.5	5.5	6.7	72.9	2.5	10.3	N	Y	N/A	0	
30	7	5.3	0.4	2.1	86	9.2	1.9	Y	Y	Y	0	

Planting a Grove of Native Trees

The Year 1 monitoring requirements for this action were for an implementation check only. 29 sites were assessed by means of a phone call to the landholder but one site has subsequently dropped out of GLAS. The action has been implemented on 27 of the remaining 28 sites with one farm partially complete and due to finish planting by end 2017.

Table 32: Planting a Grove or Native Trees: Implementation Check Results

Criterion		Summary Results		
Implementation		Valid responses	28	
Implemented by the date specified		Sites meeting criterion	27	96%
Site	Implemented (date)	Not implemented		
1		✓ Removed from scheme		
2	✓ Feb 17			
3	✓ Jan / Feb 16			
4	✓ Feb 17			
5	✓ Nov 16			
6	✓ Jan / Feb 16			
7	✓ March/April 16			
8	✓ March 16			
9	✓ March 16			
10	✓ Oct 16			
11	✓ March 16			
12	✓ Jan 16			
13	✓ Feb 17			
14	✓ Oct 16			
15	✓ March 17			
16	✓ March 16			
17	✓ Nov 16			
18	✓ March 17			
19	✓ June 16			
20	✓ Jan 17			
21	✓ March 16			
22	✓ March 16			
23	✓ (no date)			
24	✓ (no date)			
25	✓ Mar/Apr 16			
26	✓ Partial. Early 17	Remaining trees being planted Dec 17		
27	✓ Jan / Feb 16			
28	✓ Feb 16			
29	✓ Feb 16			

Planting New Hedgerows

The Year 1 monitoring requirements for this action were for an implementation check only. 30 sites were assessed by means of a phone call to the landholder. The action has been implemented on all sites though the completion date on 3 sites (April 2017) was slightly after the specified date in the protocol (31 Mar 2017).

Table 33: Planting New Hedgerows: Implementation Check Results

Criterion		Summary Results		
Implementation		Valid responses	30	
Implemented by the date specified		Sites meeting criterion	27	90%
Site	Implemented (date)	Not implemented		
1	✓ Sept 17			
2	✓ Partial Sept 16 and completed Jan 2017			
3	✓ March 17			
4	✓ (no date)			
5	✓ Partial Mar 16 and completed Mar 17			
6	✓ March/April 17			
7	✓ April 17			
8	✓ March 16			
9	✓ March 16			
10	✓ Jan 17			
11	✓ Feb 16			
12	✓ Feb 16			
13	✓ March 17			
14	✓ Dec 16			
15	✓ March 17			
16	✓ Dec 16			
17	✓ Jan 17			
18	✓ March 17			
19	✓ April 17			
20	✓ March 17			
21	✓ Dec 16			
22	✓ Dec 16			
23	✓ (no date)			
24	✓ Jan 17			
25	✓ Feb 17			
26	✓ March 17			
27	✓ March 17			
28	✓ Feb 16			
29	✓ Oct/Nov 16			
30	✓ March 17			

Protection of Watercourses from Bovines

30 sites for this action were analysed and 5 quadrats were used at each site to gauge presence and absence of positive and negative variables. Criteria have been interpreted and reported as follows:

Table 34: Protection of Watercourse from Bovines Measures of Success: Overall Summary

Criterion	Summary Results		
Stock management	Valid responses	30	
The fence should be stock-proof and constructed with permanent post and wire.	Sites meeting criterion	27	90%
Fence should be $\geq 1.5\text{m}$ from water's edge	Sites meeting criterion	26	87%
Stock should not be able to gain access	Sites meeting criterion	23	77%
Vegetation composition	Valid responses	30	
There should be no invasive alien species	Sites meeting criterion	29	97%
Cover of wildflowers and sedges should be $> 10\%$	Sites meeting criterion	25	83%
Cover of undesirable species should be $< 5\%$.	Sites meeting criterion	18	60%

The measure appears to be well implemented on the majority of sites: 27 out of 30 sites were deemed to have stock-proof fences, and where a fence was not stock-proof, this was usually only a small sub-section of its length. Again, most fences were correctly positioned, being at least 1.5m from the water's edge. Only a single site supported invasive alien species (Himalayan balsam at Site 17).

Results for the amount of wild flowers and sedges were also encouraging, with 21 out of 30 sites having at least 10% cover. Two of the sites (#21 and #27) were noticeably species-rich. However, only 18 sites met the criterion for less than 5% undesirable species, suggesting that the high wildflower/sedge cover may be attributed to undesirables such as *Ranunculus repens* that are likely to be widespread on these sites. This is not a surprising finding as sites under this action are generally more likely to be improved than those under the riparian margin action. Indeed, almost all riparian margin sites were found to have under 5% undesirable species cover (see below). Given that the principal aim of this action is the protection of watercourses from pollution from cattle, the preponderance of undesirable species is not considered a major issue.

Table 35: Protection of Watercourses from Bovines Measures of Success: Site Analysis

Site	Measures of Success						Comments
	Stock-proof fence	Fence >= 1.5m from watercourse	Stock access to water	Presence of invasives	Wildflower and sedge cover (%)	Undesirable species cover (%)	
1	Y	Y	N	N	15.6	4	Elec. fence broken but large hedge preventing stock
2	N	Y	Y	N	1	0	Bovine- but not sheep-proof
3	Y	Y	N	N	1.6	12	Cattle and sheep in parcel
4	N	Y	Y	N	10.6	4.6	Fence broken down
5	Y	Y	Y	N	19.8	5	Stock proof but adjoining fence not so stock gain access anyway
6	N	N	N	N	8.2	1.2	
7	Y	Y	N	N	19	10	
8	Y	N	N	N	41.6	2.2	Bovine present in one field; fence collapsed for some length but no stock access.
9	Y	N	Y	N	21.2	0	
10	Y	Y	N	N	28.2	4.2	
11	Y	Y	N	N	13	0.4	
12	Y	Y	N	N	37	0	
13	Y	Y	N	N	24.6	1.6	Drainage ditch rather than stream
14	Y	Y	N	N	9	19.6	
15	Y	Y	N	N	25.8	2.6	
16	Y	Y	N	N	48	4.6	Bracken/Bramble
17	Y	Y	N	Y	19	7	Himalayan balsam noted.
18	Y	Y	N	N	14	7	
19	Y	N	Y	N	27	0	
20	Y	Y	Y	N	10.4	0.4	
21	Y	Y	N	N	50	2.6	Well-implemented; good flora within
22	Y	Y	N	N	9.4	6	
23	Y	Y	N	N	35	3.2	
24	Y	Y	N	N	13	1	
25	Y	Y	Y	N	34	6.4	Fence passes over dip and cattle can get in at this point
26	Y	Y	N	N	25	15	
27	Y	Y	N	N	61	25	Species-rich within
28	Y	Y	N	N	85	0	
29	Y	Y	Y	N	50	7.2	Elec. fence not switched on; appears to be stock access; poaching of lands adjacent to stream
30	Y	Y	Y	N	15.8	20.4	

Riparian Margins

27 sites for riparian margins were analysed and 10 quadrats were used at each site to gauge presence and absence of positive and negative variables. Of the original 30 sites in the sample, two were not assessable as the action had not been implemented and the other was rejected as the margin present consisted of an unsuitable cover. Criteria have been interpreted and reported as follows:

Table 36: Riparian Margins Measures of Success: Overall Summary

Criterion	Summary Results		
Sward composition	Valid responses	27	
Cover of wildflowers and sedges should be > 10%	Sites meeting criterion	19	70%
Cover of <i>Lolium perenne</i> should be < 25%	Sites meeting criterion	24	89%
Cover of <i>Trifolium repens</i> should be < 25%	Sites meeting criterion	27	100%
Cover of rank grasses should be < 50%	Sites meeting criterion	25	93%
Cover of undesirable species should be ≤ 10%	Sites meeting criterion	26	96%
Vegetation and livestock Management (Whole of feature visible from sampling point)	Valid responses	27	
Cover of scrub/bracken etc should be ≤ 10%.	Sites meeting criterion	24	89%
The fence should be stock-proof and constructed with permanent post and wire.	Sites meeting criterion	23	85%
Stock should not be able to gain access	Sites meeting criterion	26	96%

Scores for almost all criteria for the riparian margins action were high. The action appears to be generally well-implemented: the large majority of sites are well fenced with post and wire. An even higher percentage of sites are stock-proof (some that have not been fenced have a stock-proof hedge preventing ingress of animals). The survey has also noted a good floral diversity at most sites (19 of the 27) and the indicators of improvement (*Lolium perenne* and *Trifolium repens*), rank grasses and undesirables have been kept at low levels on the large majority of sites. A number of these fenced margins appear to be botanically species-rich (Sites 13, 14, 17, 24 and 25).

Table 37: Riparian Margins Measures of Success: Site Analysis

Measures of Success

Site	Wildflower and sedge cover (%)	<i>Lolium perenne</i> cover (%)	<i>Trifolium repens</i> cover (%)	Rank grass cover (%)	Un-desirable species cover (%)	Scrub and bramble cover (%)	Stock-proof	Signs of stock presence	Stock access to water	Comments
1	21.1	0	0	11.95	0.1	15	Y	N	N	
2	3.15	66.3	0.15	0	0.05	0	N	Y	N	Posts up but not wire
3	26.55	4.3	0.6	4	2.9	0	Y	N	N	Good implementation
4	11.8	0	1.2	18.4	1.4	4	Y	N	N	Nicely fenced, but flooded
5	3.8	28	10.4	7.2	0.8	0	N	N	N	No post and wire fence, but hedgerow
6	17.4	0	0	33.4	0	0	Y	Y	N	
7	0	43	19	0	5	0	Y	N	?	
8	0.65	0	0	0	0	10	Y	N	N	Dominated by <i>Molinia caerulea</i> ; occ. <i>Erica tetralix</i> . Adjacent to salmon spawning beds
9	7.1	0	0	0	0	15	Y	N	N	
10										No quadrats taken as unsuitable (mature woodland)
11	4	0	0	5.8	2	0.05	Y	N	N	Well-executed; rank grassland with a few herbs
12	74	0	0	10.8	1	20	N	N	N	Rank grassland, but species rich in places. Not fenced
13	11	0	0	0.5	0.1	1.03	Y	N	N	Wet grassland; quite species rich
14	56.5	0	0	3.5	4	0.05	Y	N	N	Fenced; wet heath with <i>Molinia caerulea</i> and <i>Erica tetralix</i>
15	16.5	0.5	0	12	0.3	0.25	N	N	N	Fence present but open at either end; reserve surveyed
16	14	0	0	3.1	0	0.1	Y	N	N	<i>Holcus lanatus</i> dominated grassland
17	22.5	0	0	7.5	9.1	0	Y	N	N	Wet grassland mosaic, with relatively rich species mix
18	4.3	6.3	1.7	6.5	1.5	0	Y	Y	N	Evidence of cattle grazing, though non present. Significant slope to watercourse
19	25	2	1.3	17.5	0.5	0	Y	N	N	Wet margin with <i>Typha</i> , <i>Juncus</i> , <i>Mentha</i> , <i>Angelica</i> , <i>Lychnis</i>
20	21	0	0	7	0	0.3	Y	N	N	Grassy verge; <i>Angelica</i> , <i>Scrophularia</i>
21										Not implemented

Measures of Success										Comments
Site	Wildflower and sedge cover (%)	<i>Lolium perenne</i> cover (%)	<i>Trifolium repens</i> cover (%)	Rank grass cover (%)	Un-desirable species cover (%)	Scrub and bramble cover (%)	Stock-proof	Signs of stock presence	Stock access to water	
22	28.5	0	0	0	1.5	0.1	Y	N	N	GS4 wet grassland; wet woodland, some planted
23	31.5	0	0	9.5	4	0.15	Y	N	N	Abt. Giant hogweed along banks of river
24	30.5	0	1.2	77	3.1	3	Y	N	N	Well-executed; botanically rich
25	63.5	0	2.1	9.5	0.7	2	Y	N	N	Well-executed; ground very wet
26	51.5	0	1.4	54.5	1	10	Y	N	N	
27	36	2.1	15.6	0.5	0	0	Y	N	N	Well-implemented
28	55.5	0	2	16.5	29.5	10	Y	N	N	Stock access to stream at end of margin fence
29	5	1	0	43	0	0	Y	N	N	
30										Not implemented

Traditional Hay Meadows

28 sites for traditional hay meadow were analysed and 10 quadrats were used at each site to gauge presence and absence of positive and negative variables. Criteria have been interpreted and reported as follows:

Table 38: Traditional Hay Meadows Measures of Success: Overall Summary

Criterion	Summary Results		
Sward composition	Valid responses	28	
There should be \geq three grasses throughout the sward.	Sites meeting criterion	17	61%
Cover of <i>Lolium perenne</i> should be < 50%	Sites meeting criterion	27	96%
Cover of <i>Trifolium repens</i> should be < 30%	Sites meeting criterion	28	100%
A minimum of 3 Indicator Species should be Frequent and 3 Occasional	Sites meeting criterion	0	0%
Cover of bare ground should be < 10%.	Sites meeting criterion	26	93%
Cover of undesirable species should be < 5%.	Sites meeting criterion	27	96%
Vegetation Management (Whole of feature visible from sampling point)	Valid responses	28	
Cover of scrub/bracken etc should be < 5%.	Sites meeting criterion	26	93%
Cover of rushes should be \leq 5%.		21	75%
Vegetation Management (Whole feature)	Valid responses	28	
The parcel must not be grazed from April 15th after 1 st of July and until the hay has been cut	Sites meeting criterion	24	86%
There should be no poaching	Sites meeting criterion	24	86%

Sites scored well on many of the assessment criteria for hay meadows. Few sites supported undesirable species and few supported *Lolium perenne* and/or *Trifolium repens* at levels higher than 50% and 30% respectively. Three quarters of the sites supported rushes within acceptable parameters. Furthermore, grazing animals were generally not present (86% of sites). Scrub and bracken were also at low levels.

The results for the species diversity criteria were less positive. Only 61% of the sites held three or more grass species (other than *Lolium*) and no site was able to demonstrate presence of at least three indicator species at 'frequent' and three at 'occasional' levels³.

³ For the purposes of evaluation, 'Occasional' was interpreted as species present in at least two quadrats and 'Frequent' as species present in at least four quadrats

However, this result must be noted with the context that these criteria are not particularly stringent requirements, as a medium quality hay meadow is likely to support the level of species diversity observed.

There is also evidence to suggest that the limited species diversity observed will ameliorate at subsequent reporting cycles if the appropriate management regime is followed. A small number of sites (e.g. #20, #21 and #25) narrowly missed the criterion for indicator species diversity. A few sites (e.g. #6) were described as having good grass diversity, but poor for herbs. In a number of cases, herbs were mentioned as being present though not captured by the quadrats. This is probably a function of them being at low levels within the sward (e.g. sites 2, 3, 26 and 27). This last two in particular supported a small suite of species within the parcel generally considered excellent indicators of good quality habitat (e.g. *Dactylorhiza fuchsii*). In general, diversity was higher on wetter parcels. However, some sites were obviously improved (e.g. #7, #15 and #28) and the effect of management may be more limited during the lifetime of the scheme.

Table 39: Traditional Hay Meadow Measures of Success: Site Analysis

Site	Measures of Success											Comments
	No. grasses (mean)	<i>Lolium perenne</i> cover (%)	<i>Trifolium repens</i> Cover (%)	Wild-flower and sedge cover (%)	Bare ground cover (%)	Un-desirable species cover (%)	Bracken and scrub cover (%)	Rush cover (%)	Parcel grazed	Parcel poached	Indicator species	
1	1.8	25	5	24	2.5	7.5	0	0	N	N	1 R	
2	3.1	0	1	12	0	4.0	5	0	N	N	1 R	<i>Trifolium pratense</i> present though not in quadrats
3	2.5	0	0	13	0.5	0.0	2	8	N	N	2O	<i>Conopodium majus</i> present, though not in quadrats
4	3.2	0	0	0	0	0.0	3	0	N	N	-	
5	3.8	5.9	4	22	1.9	0.0	10	0	N	N	1F	
6	4.7	0.8	16	22	0	0.7	0	2	N	N	2F	Spp-poor meadow, good grass diversity. Good ecological value overall
7	2.2	47.5	3	8	0	2.8	0	1	N	N	2R	Agriculturally improved
8	3.9	5.5	5	9	0	0.4	0	0	N	N	1R, 1F	
9	3.1	28.5	3	2	1.2	2.6	0	70	N	N	2R	Very rushy
10	3.6	0	6	8	0.2	0.1	2	8	N	N	2F, 1R	
11	3.2	1.2	0	9	0.4	0.0	0	75	N	N	1R, 1O	
12	2.2	0	1	10	1	0.4	2	15	N	Y	1F, 1O, 1R	Poaching caused by machinery

Measures of Success												
Site	No. grasses (mean)	<i>Lolium perenne</i> cover (%)	<i>Trifolium repens</i> Cover (%)	Wild-flower and sedge cover (%)	Bare ground cover (%)	Un-desirable species cover (%)	Bracken and scrub cover (%)	Rush cover (%)	Parcel grazed	Parcel poached	Indicator species	Comments
13	2.8	22.5	8	25	7.5	2.0	2	5	Y	Y	2O, 4R	Poaching not recent
14	2.7	0	21	31	11.8	0.0	0	<1	N	Y	1F, 1O	Poaching not recent
15	2.2	36.5	1	1	0	0.0	0	0	N	N	-	Very poor, improved
16	3.8	0.25	19	10	0	0.9	0	0	N	N	-	Rel. improved, only a few herbs present
17	1.4	31	6	4	10.5	5.5	0	2	Y	Y	-	Sheep poaching, badly targeted
18	3	0	0	3	0	0.0	N/A	0	Y	N	1R	Low lying, grazed by sheep
19	4	6	1	21	0	0.8	0	10	N	N	1F, 2O	
20	2.8	24.5	4	18	0	1.5	0	5	Y	N	2F, 4O, 1R	Rel. herb-rich
21	3.2	1.5	0	3	0	3.9	0	0	N	N	1F, 2O, 4R	Rel. herb-rich; grass-rich
22	3	2.5	0	1	0	0.0	0	0	N	N	-	Dom. by tall grasses
23	3.9	15	0	2	0.3	0.4	0	0	N	N	1O, 1R	Dom. by grasses, few dicots
24	4.1	6	1	16	0	2.5	0	3	N	N	1F, 2O, 1R	Good grasses, but poor for herbs
25	4.6	5.7	2	16	0	0.0	2	<1	N	N	2F, 2O	
26	3.7	0	1	27	0	0.0	0	25	N	N	2F	<i>F. ulmaria</i> and <i>D. fuschii</i> present but not at sample points. Other species e.g. <i>Silene flos-cuculi</i> frequent. Good wet meadow
27	2.7	48.5	2	12	0	0.0	0	1	N	N	2F	<i>Lathyrus pratensis</i> and <i>Silene flos-cuculi</i> present though not at sampling points. Not particularly wet.
28	0.6	74	19.5	9.3	0	1.0	0	0	N	N	-	Assessed after cutting though high frequency of <i>L. perenne</i> indicates highly improved

Traditional Orchards

The Year 1 monitoring requirements for this action were for an implementation check only. 30 sites were assessed by means of a phone call to the landholder. The action has been implemented on 28 of the sites checked. One farmer has dropped out of GLAS and the other has not been contactable. Two farms were slightly late to implement, after March 2017.

Table 40: Traditional Orchard: Implementation Check Results

Criterion		Summary Results		
Implementation		Valid responses	26	
Implemented by the date specified		Sites meeting criterion	23	88%
Site	Implemented (date)	Not implemented		
1	✓ (no date)			
2	✓ Nov 15			
3	✓ Feb/Mar 16			
4	✓ Mar/Apr 16			
5	✓ Feb 16			
6	✓ Feb 17			
7	✓ Dec 16			
8	✓ Jan 17			
9	✓ Mar 16			
10	✓ Mar 16			
11	✓ Feb 16			
12	✓ March 16			
13	✓ March 16			
14	✓ Feb 16			
15	✓ Feb 17			
16	✓ Dec 16			
17		✓ Dropped out of GLAS		
18	✓ March 17			
19	✓ Mar 16			
20	✓ April 17			
21	✓ Feb 16			
22		✓ Pending response		
23	✓ Mar 16			
24	✓ Mar 17			
25	✓ (no date)			
26	✓ March 17			
27	✓ June 17			
28	✓ Nov 16			
29	✓ Jan/Feb 16			
30	✓ Feb/Mar 16			

Traditional Stone Wall Maintenance

30 sites for Traditional Dry Stone Walls were analysed and a range of criteria used to assess them. Criteria have been interpreted and reported as follows

Table 41: Traditional Stone Wall Maintenance Measures of Success: Overall Summary

Criterion	Summary Results		
Sward composition	Valid responses	30	
There should be a full height wall with missing top stones \leq 5% of assessed wall length	Sites meeting criterion	25	83%
There should be no gaps in the wall	Sites meeting criterion	28	93%
Rebuilt walls must be built in the local style	Sites meeting criterion	30	100%
There may be minor imperfections such as minor slumping, but the wall should not be in danger of collapse at any point	Sites meeting criterion	28	93%

The criteria used to assess traditional dry stone walls are concerned with the integrity of the wall. Sites all scored highly with only a small number of walls (6) having missing top stones and an even smaller number (3) having gaps in them. Slumping or major imperfections were found to be very rare with only two out of the 28 walls assessed showing these signs. Where necessary, walls had all been rebuilt in the local style. In two cases (Sites 22 and 27) walls appeared to be suffering from encroaching vegetation.

Table 42: Traditional Stone Wall Maintenance Measures of Success: Site Analysis

Site	Measures of Success				Comments
	% of wall not full height	Gaps?	Construction in local style	Structurally sound	
1	0	N	Y	Y	
2	0	N	Y	Y	
3	0	N	Y	Y	Excellent condition, intact, etc
4	0	N	Y	Y	
5	8	N	Y	Y	
6	12	N	Y	Y	
7	20	Y	Y	N	Decrepit in places
8	5	Y	Y	Y	Good
9	2	N	Y	Y	Very good. Local stone used.
10	2	N	Y	Y	Because wall has been stripped of vegetation, famer thinks that

Site	Measures of Success				Comments
	% of wall not full height	Gaps?	Construction in local style	Structurally sound	
					biodiversity has been compromised
11	0	N	Y	Y	
12	5	N	Y	Y	
13	0	N	Y	Y	
14	0	N	Y	Y	
15	2	N	Y	N	Mainly very good
16	0	N	Y	Y	Local flags with gorse on top
17	1	N	Y	Y	Posts incorporated into wall – local style
18	0	N	Y	Y	Posts incorporated into wall – local style
19	0	N	Y	Y	Posts incorporated into wall – local style
20	0	N	Y	Y	Posts incorporated into wall – local style
21	0	Y	Y	Y	
22	0	N	Y	Y	Heavy tree growth both sides
23	0	N	Y	Y	
24	0	N	Y	Y	
25	25	N	Y	Y	Fully stockproof
26	1	N	Y	Y	
27	0	N	Y	Y	Generally good, bramble in a few places
28	2	N	Y	Y	Minor dip due to recently fallen capstones
29	1	N	Y	Y	Some vegetation cover
30	2	N	Y	Y	Reserve parcel

Twite

30 sites for Twite were analysed with 10 quadrats sampled at each site for habitat criteria.

Table 43: Twite Measures of Success: Overall Summary

Criterion	Summary Results		
Sward Height	Valid responses	29	
Average sward height of 5cm or over	Sites meeting criterion	29	100%
Sward species	Valid responses	30	
Recognised Twite breeding season forage species presence: minimum 3 frequent and 3 occasional.	Sites meeting criterion	10	33%
Presence of Twite	Valid responses	30	
No of sites where Twite present		1	3%
Presence of other bird species	Valid Responses	30	
No of sites where other bird species present		29	97%

The height criterion was designed to capture whether swards were tall enough, such that seed would be produced. The sward species criterion was designed to gauge whether a diversity of target forage species was present and thus a sufficient range of seed sources during the breeding season. All sites with valid responses met the criteria for sward height, but only a third met the requirement for forage species availability. For the remaining 20 sites, some may have been too improved (#8, #13-#15), overgrazed (#1, #7, #12), or rank (#10, #19) to support an adequate range of target forage species. Others were atypical breeding habitat comprising saltmarsh-type vegetation (e.g. #2, #5) though these might have been appropriate winter habitat.

Twite were only observed on one of the sites (#18); at one further site (#3), Twite were recorded just after survey finished on an adjacent land parcel. Neither of these sites met the forage species presence criterion.

Other than simply bad luck in terms of the timing of a single 'snapshot' survey, a reason for non-observance at the 10 sites which did meet height and forage criteria could relate to the location of the site. A number of these were good quality habitat (e.g. #21 - #24, #26 - #27) but are outside the recognised current breeding range in Ireland so are unlikely to support Twite at the time being or in the near future.

Table 44: Twite Measures of Success: Site Analysis

Measures of Success

Site	Sward height average (cm)	Forage species freq. (Frequent, Occasional, Rare)	Twite present	Other birds present	Comments
1	22.2	1F 1O 2R	N	Y	Land heavily flooded and grazed
2	41.3	2F 1O 0R	N	Y	Wet grassland
3	78.5	0F 0O 3R	N	Y	Twite (1) seen after survey near parcel
4	15.8	2F 0O 4R	N	Y	Wet grassland
5	46	1F 1O 4R	N	Y	Very wet grassland
6	85.5	1F 2O 1R	N	Y	Shrubs, heather
7	11.4	1F 0O 1R	N	Y	Wet grassland, heavily grazed
8	41.5	4F 0O 2R	N	N	Improved wet grassland
9	24.2	1F 2O 2R	N	Y	Wet grassland with thistles
10	20.9	2F 1O 2R	N	Y	Not suitable, rank species
11	36.4	1F 1O 3R	N	Y	Rush-dominated
12	46.5	2F 0O 2R	N	Y	Reserve site surveyed. Wet grassland, poached
13	14.6	2F 1O 2R	N	Y	Wet, improved
14	13.8	2F 0O 4R	N	Y	Improved
15	34.4	2F 2O 1R	N	Y	Improved, wet
16	46.8	1F 2O 2R	N	Y	Very wet, large area gorse/bracken
17	15.1	2F 0O 2R	N	Y	Very wet, rock outcrops
18	51	2F 0O 1R	Y	Y	35 Twite present in flock; small flock of 3 birds also seen
19	76.2	3F 1O 0R	N	Y	High value wetland, though not suitable for Twite
20		4F 0O 0R	N	Y	Field suitable, though farmer didn't really grasp rationale behind measures
21	9.2	6F 3O 2R	N	Y	Well executed, on outer limit of Twite breeding range
22	15.6	8F 0O 0R	N	Y	Outside breeding range, but good habitat and well executed
23	8.7	9F 0O 0R	N	Y	Outside breeding range, but good habitat and well executed
24	6.3	5F 2O 0R	N	Y	Correctly implemented, but outside breeding range
25	7.8	6F 0O 2R	N	Y	Cereal plot also located within parcel
26	16.5	8F 1O 1R	N	Y	Botanically rich including <i>Spiranthe spiralis</i> . Outside breeding range
27	33	5F 1O 2R	N	Y	Unaware of requirements of scheme (i.e. splitting parcel). Outside breeding range
28	5.6	7F 1O 1R	N	Y	Generally ok, within breeding range
29	15.5	7F 0O 2R	N	Y	Good site, many seeding plants and within breeding range
30	16.7	5F 1O 0R	N	Y	Generally improved grassland

Wild Bird Cover

30 sites for wild bird cover were analysed with 5 quadrats assessed at each site. Criteria have been interpreted and reported as follows:

Table 45: Wild Bird Cover Measures of Success: Overall Summary

Criterion	Summary Results		
Vegetation Height	Valid responses	30	
To be at least 15cm tall on average	Sites meeting criterion	29	97%
Crop Species Composition	Valid responses	29	
Wheat, Barley, Oats, Triticale, Oilseed rape, Linseed, Mustard and Kale, to comprise cumulatively at least 50% of the sward and at least two of the above species to be present.	Sites meeting criterion	10	33%
	<i>Sites meeting cum. sward criterion</i>	15	50%
	<i>Sites meeting 2 species criterion</i>	14	47%
Presence of target birds	Valid Responses	30	
Average number of birds present across sites		57.2 (mean)	36 (median)

The height criterion was met on almost all sites. However, on two sites no wild bird cover had been planted and the height criteria were met through the existing vegetation. One of these was a site dominated by rushes (#40), which was deemed to be unsuitable cover. A further site (#2) appeared to be inappropriately selected and actually comprised species-rich wet grassland with fen/flush characteristics, which should not be replaced with wild bird cover. Despite this, the majority of sites appeared to be well suited to the action at a parcel level.

The percentage of 'crop' recorded as being the correct species varied considerably, from zero to as high as 92%, but half the sample were at least 50% correct. A number of the planted species were rather sparse and on a small number of sites, only single species had properly established. Linseed and oats were the most commonly planted species, along with kale on a number of sites. A third of sites met both the requirements for crop species composition.

Based on the number of birds recorded using many of these sites, the management appears to be working well (sites are broadly similar in terms of area) with a median of 36 recorded across the sample. Two sites supported at least 200 birds (#5, #6) though surprisingly both of these had relatively low score on the percentage of correct crop species criterion. A slightly greater number (five sites) supported 100 to 199 birds. The majority of the birds recorded were target species with finches appearing to be the main beneficiary. Yellowhammers were present on five sites in good numbers and a single site (#24) had 190 birds including 39 reed buntings and 4 yellowhammers.

Table 46: Wild Bird Cover Measures of Success: Site Analysis

Site	Measures of success				Comments
	Vegetation height (cm)	% of crop that is correct species	Number of correct species present in crop	Birds Present (total numbers)	
1	38	9	2	7	
2	58	0	0	0	Badly targeted - good quality alkaline fen
3	95	29	0	100	
4	112	34	5	12	
5	78	25	5	200	
6	67	21	3	223	
7	37	56	5	30	
8	28	21	1	37	
9	78	85	1	36	
10	14	10	2	10	
11	65	56	5	32	Includes 11 yellowhammer
12	86	68	5	12	
13	36	60	5	106	Includes 9 yellowhammer
14	48	62	5	20	
15	37	19	1	35	
16	26	14	0	17	
17	56	68	2	138	
18	52	51	5	52	Includes 8 yellowhammer
19	40	38	4	121	
20	30	13	1	47	
21	36	0	0	1	Nothing planted
22	74	58	4	81	
23	27	57	4	6	
24	60	64	0	190	Includes 39 reed bunting and 4 yellowhammer
25	54	36	0	36	
26	35	59	2	41	
27	40	0	0	2	Rushes; not planted
28	77	92	5	12	
29	68	89	5	42	
30	52	51	1	70	