HABITAT SURVEY OF GREENMOUNT HILL FARM GLENWHERRY

RESURVEY 2016

Report to GHRP
January 2017

1. INTRODUCTION

The Glenwherry Hill Regeneration Partnership (GHRP) was established to promote good upland management to sustain grouse moor, farming and nature conservation interests at Greenmount Hill Farm, Glenwherry, Co Antrim. One of the primary aims is the conservation and enhancement of habitats, in particular heather moorland. A baseline survey was carried out in 2008 to produce vegetation maps of the Creeve Hill and Back Point areas of the farm (Flexen *et al*., 2008). The remaining area of the farm was surveyed in 2009 (Flexen et al, 2009). In conjunction with the habitat survey, vegetation was assessed in order to determine condition in terms of nature conservation value. Subsequent monitoring has been undertaken to determine any effects of management practices on habitat condition over an 8 year period, specifically controlled burning and/or grazing. The following report details the results of a resurvey of all vegetation plots carried out in 2016.

2. METHODS

For the baseline survey in 2008, a series of 2m x 2m plots were located in representative areas of vegetation within each management unit (Figure 1). Plant species cover and appropriate attributes were recorded for these plots in order to assess condition, using the methods detailed below. Peat depth and mean heather height was also recorded for each plot, together with details of management, specifically burning and grazing. The centre of each plot was marked with a metal pole and recorded onto a handheld GPS. These vegetation plots were located and surveyed during August and September 2016 using the same method. New areas of burning were mapped each year from 2008 and entered onto a GIS database.

Methods for condition assessment were adapted from English Nature's assessment of upland vegetation condition and NIEA methods for upland monitoring of ASSIs in Northern Ireland. The condition of blanket bog and wet heath was assessed using targets for certain attributes (Table 1 & 2). Blanket bog classification was used where peat depth was >50cm. If the habitat was degraded (i.e.< 25% dwarf-shrub cover) then the vegetation was assessed using the appropriate targets, depending on peat depth. Dwarf-shrub species include heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), bell heather (*Erica cinerea*), bilberry (*Vaccinium myrtillus*), cranberry (*Vaccinium oxycoccus*) and crowberry (*Empetrum nigrum*). Graminoid species refers to all grasses, sedges and rushes, e.g. cotton-grasses (*Eriophorum* spp.), purple moor grass (*Molinia caerulea*) and deer-grass (*Trichophorum cespitosa*). The term bryophyte refers to all moss and liverwort species, including *Sphagnum* species.

A scoring system based on English Nature methodology was devised to determine vegetation condition (Tables 1 & 2). Vegetation was classed as being in 'favourable condition' if the plot met all the primary attribute targets. Points were totalled for each attribute for all plots and graded as follows: 0 points = favourable, 1-5 points = unfavourable, >5 points = severely unfavourable. Scores for vegetation types based on mean values per plot were calculated and also the overall condition score for each management unit. (N.B. Condition assessment would not generally be carried out for vegetation burned within two years). For the Creeve and Back Point, mean attributes values and condition scores are shown for each survey year to give an indication of vegetation changes following burning

overall and on different vegetation types. A lower score indicates a better vegetation condition in terms of conservation value.

Table 1. Attributes and targets for wet heath

Attribute	Favourable (0 points)	Unfavourable (1 point)	Unfavourable (2 points)	Unfavourable (4 points)
Dwarf-shrub cover	51-75%	>75% or 26-50%	5-25%	<5%
Range of dwarf-shrubs	2 or more spp. widespread and frequent	1 spp. widespread and frequent		
Bryophyte abundance	abundant (>25%)		occasional	rare
Graminoid cover	<50%	50-75%	>75%	
Extent of bare ground	none (<2%)	present	frequent	
Trees and shrubs	none/rare	frequent/ occasional		
Grazing impact	light	moderate	heavy	

Table 2. Attributes and targets for blanket bog

Attribute	Favourable (0 points)	Unfavourable (1 point)	Unfavourable (2 points)	Unfavourable (4 points)
Dwarf-shrub cover	>33%	<33%, except in wetter areas	<5%	
Range of dwarf-shrubs	2 or more spp. widespread and frequent	1 spp. widespread and frequent		
Bryophyte abundance	abundant, *Sphagnum* widespread (>25%)	frequent, *Sphagnum* occasional/rare	occasional, *Sphagnum* absent	rare
Graminoid cover	<50%	50-75%	>75%	
Extent of bare ground	none (<2%)	present	frequent	
Trees and shrubs	none/rare	frequent/ occasional		
Grazing impact	light	moderate	heavy	

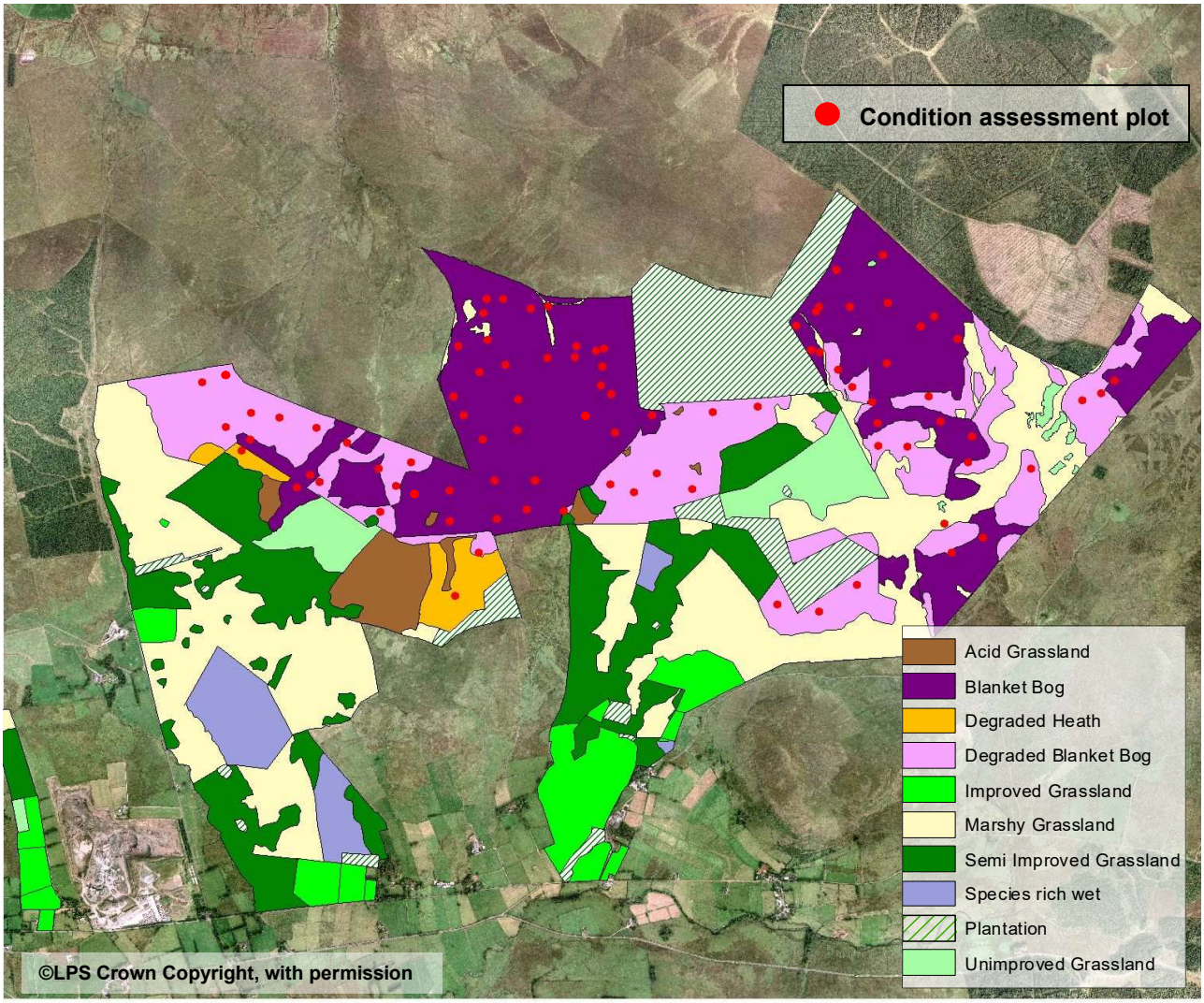

Figure 1. Baseline habitat map of Greenmount Hill Farm showing location of vegetation condition assessment plots

3. RESULTS

3.1. Area of heather burning

The areas of vegetation burnt each year on the Hill Farm were mapped (Figure 2). The total area of burns between 2008 and 2015 was 42.3ha, which includes 217 individual patches.

The total area of mature heather burnt on Creeve Hill (and McKays) as part of the burning plan between 2008 and 2015 was 7.5 ha (Table 3). This was 28% of the total area of mature dense heather estimated in the habitat survey in 2008. There was also an uncontrolled burn area of 8.2ha on McKays in 2010, which was mostly grass-dominated vegetation.

The total area of heather burnt on the Back Point since 2008 was 20.9ha (Table 3). This included 16.6ha of previously unburnt mature heather. This was 60% of the area of this vegetation type as mapped in 2008. The remaining 4.4ha had been burnt before in 2001 and equated to 19% of this vegetation type.

A total of 3.7ha of mature heather was burnt on the Front Point between 2011 and 2012. In addition an area of 2ha dominated by *Molinia* was burnt on Glenhill in 2015.

Table 3. Area of heather burnt under burning plan between 2008 and 2015

Year	***Area burnt (ha)***			
	Creeve	**Back Point**	**Front Point**	**Glenhill**
2008	-	8.9	-	
2010	1.1	2.7	-	-
2011	2.5	5.9	2.5	-
2012	2.1	2.9	1.2	-
2014	1.1	-	-	-
2015	0.7	0.5	-	2.0
Total	**7.5**	**20.9**	**3.7**	**2.0**

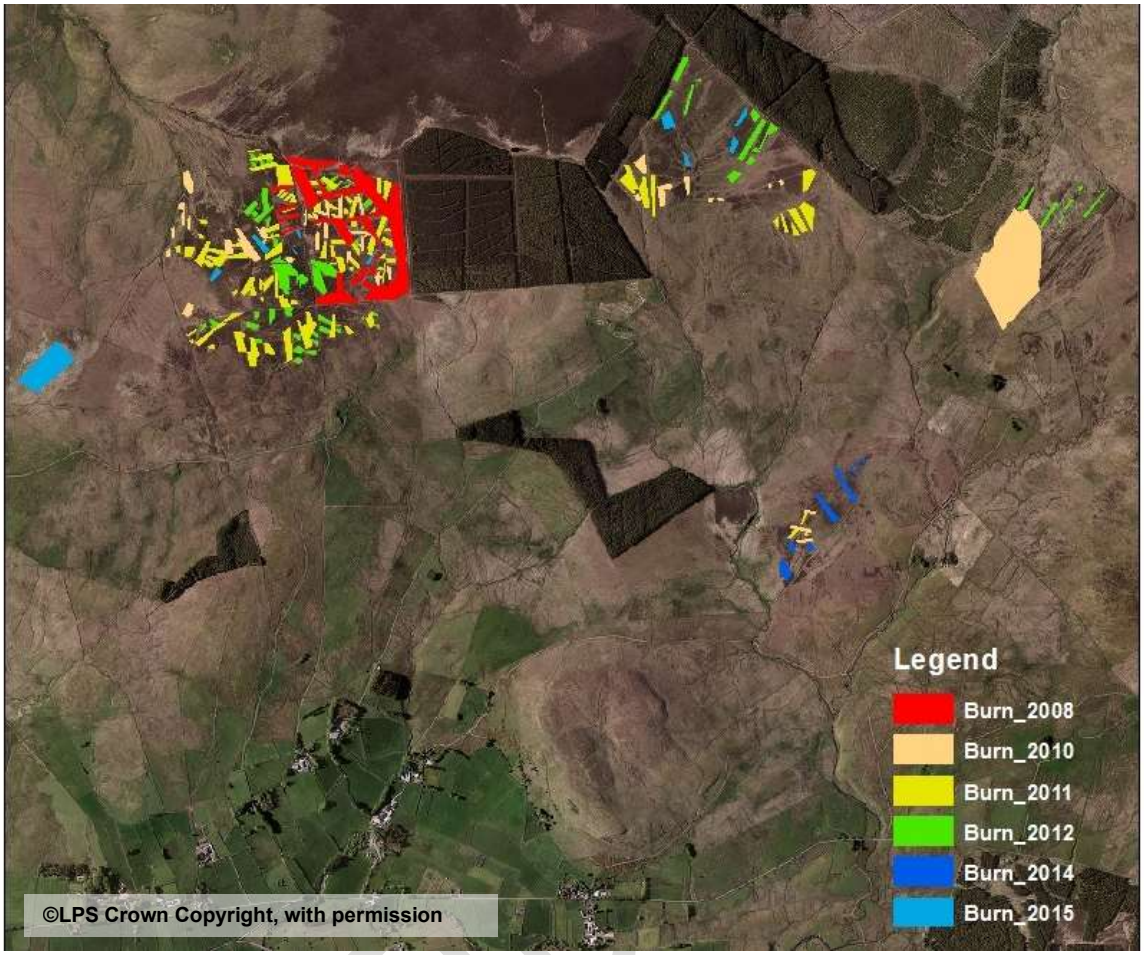

Figure 2. Map of the Greenmount Hill Farm showing areas burned each year between 2010 and 2015.

3.2 The Creeve

The Creeve Hill has a complex mosaic of vegetation types as a result of past management, topography and hydrology (Figure 1). The majority of the 180ha area is blanket bog, but much of this is degraded with low dwarf-shrub cover. There are also large wet areas dominated by soft rush (*Juncus effusus*), with sedges and/or grasses. Some managed burning and flailing activity had occurred on the upper part of the Creeve between 1996 and 2005. Within the current project, areas of dense mature heather had been burnt as part of the management plan since 2010.

Grazing impacts were low overall on the Creeve in 2016. Grazing was light although some localised sheep trampling and dung were evident. There was a significant increase in graminoids (mainly *Eriophorum vaginatum*) due to decreased stocking levels since 2008. Indications in 2013 were that the heather over much of hill was unhealthy and overall there was a significant loss of *Calluna*, possibly due to damage from heather beetle and/or the heavy snow in spring 2013. However results in 2016 showed that heather had recovered, with mean % cover at the same level as baseline survey.

Overall condition of the vegetation was fairly good and had remained the same since 2008 (i.e. score of 1). However there were fewer individual plots in favourable condition in 2016, i.e. 5 plots as compared to 8 in 2008. For two plots this was due to graminoid cover having increased to >50%, and one plot burned in 2011 had low *Sphagnum* cover.

Main changes determined by the monitoring for the different vegetation types on the Creeve have been summarised below (Table 4).

Unburnt mature heather (n=9)

- No difference in mean dwarf-shrub cover between 2008 and 2016. Heather cover had increased since declining in 2011 and 2013, but was still lower than at baseline survey, with mean cover in 2016 of 31%, compared to 39% in 2008.
- Decrease in mean heather height (47cm to 34cm). This was due to degeneration and/or death of mature heather bushes in previous years. Heather height was 40cm or more on 4 of the plots in 2016.
- Mean graminoid cover had significantly increased, with all plots showing some increase since 2008 (mainly *Eriophorum vaginatum*).
- No change in mean *Sphagnum* cover, very variable between plots (10-90%)
- Two plots were recorded as in favourable condition in 2016

Burnt 2001 (n=3)

- Increase in dwarf-shrub and heather cover since 2008. Mean heather cover had increased from 42% to 82%. Mean heather height had increased to 48cm. Patches adjacent to these plots (in north part of Creeve) have been burnt in 2014/15.
- Condition assessment showed plots were in good condition, with the exception of *Sphagnum* cover being fairly low. There was also a decrease in other bryophytes, possibly due to shading by mature heather.
- Two plots were recorded as favourable condition in 2016

Burnt 2005 (n=4)

- Although there was no loss in total dwarf-shrub cover, there was a decrease in heather cover on three plots due to previous beetle damage.
- Mean cover of *Sphagnum* had increased.
- Condition assessment showed an improvement in vegetation condition for these plots since 2008.

Burnt 2010/2011 (n=4)

- Mean dwarf-shrub cover had increased since 2011 survey and was slightly higher than in 2008. Crowberry and bilberry were more abundant than prior to burning. Heather cover was also fairly high (44%) following good regeneration, with mean height over 30cm.
- Mean graminoid cover was higher than baseline survey, but showed a decline since 2013.
- Cover of *Sphagnum* was variable, with little change in mean cover since 2008.
- Condition of vegetation had improved since previous assessments. One plot was recorded as in favourable condition in 2016.

Table 4. Mean values for vegetation attributes and condition scores for the Creeve Hill in 2008, 2011, 2013 and 2016

Attribute	***Vegetation type – Creeve***																							
	All plots (*n*=30)				**Unburnt (*n*=9)**				**Burnt 2001 (n=3)**				**Burnt 2005 (n=4)**				**Burnt 2010/11 (*n*=4)**				**Degraded bog/heath (*n*=10)**			
	08	**11**	**13**	**16**	**08**	**11**	**13**	**16**	**08**	**11**	**13**	**16**	**08**	**11**	**13**	**16**	**08**	**11**	**13**	**16**	**08**	**11**	**13**	**16**
Dwarf-shrub cover (%)	43	30	35	46	60	48	51	62	67	77	77	86	39	29	38	45	70	21	39	78	11	5	5	7
Calluna cover (%)	29	16	17	27	39	26	22	31	42	65	70	82	20	5	9	10	64	6	14	44	4	1	1	3
Calluna height (cm)	37*	31*	25*	33*	47	44	32	34	35	43	40	48	24	24	22*	30	51	10	16	33	27*	24*	16*	25*
Graminoid cover (%)	59	67	71	67	50	64	68	63	45	43	47	30	70	75	76	69	36	44	69	59	75	82	80	84
Sphagnum cover (%)	28	30	38	30	39	42	47	39	23	22	20	17	25	38	54	30	19	13	19	15	24	27	37	32
Total bryophytes (%)	58	63	67	52	59	63	68	51	76	83	82	62	61	78	79	60	59	64	58	38	49	51	59	54
Bare ground (%)	0.1	0.8	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0	0	0	0.1	0	0	0	0.2	3.0	0	0.5	0.1	1.0	0.2	0.2
Mean condition score **per plot**	2.1	2.6	2.7	2.4	0.5	1.2	1.2	1.2	0.3	0.3	0.3	0.3	2.3	2.3	1.8	1.3	2.8	4.0	2.2	1.8	4.5	4.7	5.2	4.7
Condition score for veg type	**1**	**1**	**1**	**1**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**3**	**2**	**2**	**3**	**3**	**3**	**3**

(* Mean height excl. plots with no *Calluna* present)

Degraded blanket bog/wet heath (n=10)

- Degraded habitat generally dominated by *E.vaginatum* remained poor, with all plots having <25% dwarf-shrub cover. Where heather cover was very low in 2008, there had been no increase by 2016. Only 1 plot showed a small increase in heather. Three of the plots had no heather present. There had been no burning of this vegetation type (except for the accidental burn on McKays).
- Graminoid cover had remained very high, at >75% on all plots.
- Cover of *Sphagnum* was very variable but there had been an increase on most sites.
- Degraded plots had not improved in terms of heather/dwarf-shrub cover despite reduced stocking rates. There was an apparent improvement in visual condition since 2008, with less trampling and poaching evident. Localised minor poaching on some plots due to proximity to sheep pathways leading to grassy areas.
- Condition of the plots remained poor

3.3 The Back Point

The majority of the Back Point area (63ha) is blanket bog, on peat >1m deep (Figure 1). There is evidence of past drainage, particularly towards the forestry. Grazing rates had been very low over many years, with evidence of few sheep except in certain areas, i.e. near gate and towards fence near the Front Point. However, since 2013 the numbers of sheep on this area have been increased in certain periods during the grazing season (>100).

A large part of the Back Point area (approximately 40%) was burnt in 2001. Smaller patches had been burnt since 2008 as part of the rotational burning plan.

Dwarf-shrub cover was mainly dominated by *Calluna*, with other shrubs generally at low cover. Overall there had been very little change in heather cover since 2008, despite the burning. Condition assessment indicated that 8 plots were in favourable condition as in 2008, although not all the same individual plots.

Main changes determined by the monitoring for the different vegetation categories on the Back Point have been summarised below (Table 5).

Unburnt mature heather (n=6)

- Mean heather cover was 56%, a decrease since 2008. Heather was becoming degenerate and there was heather beetle damage on some plots. These factors had also led to a large decrease in mean height (from 61cm to 36cm).
- Increase in mean *Sphagnum* cover, although cover of other bryophyte species had decreased.
- Increase in mean graminoid cover from 32% to 44%
- Vegetation was in favourable condition overall. Only one plot was poor due to loss of heather.

Burnt 2001 (n=5)

- Dwarf-shrub cover had decreased due to loss of heather on some plots from damage by heather beetle in previous years.
- No change in heather height, varied between 20cm and 50cm.

- Some increase in *Sphagnum* on all plots (between 5 and 30%)
- No change in mean graminoid cover
- One plot was recorded as favourable condition in 2016.

Burnt 2008 (n=4)

- Good regeneration of heather with mean cover of 49%, and heather height of 25-30cm in all plots.
- Increase in graminoids since 2008, but no change was recorded since 2013 survey.
- A small increase in bare ground was recorded, due to sheep trampling in some patches.
- Mean *Sphagnum* cover was 30%, slightly lower than the abundance estimated prior to burning. Dead/damaged *Sphagnum* was no longer evident. Other bryophyte species had not recovered fully.
- One plot was recorded as favourable condition in 2016.

Burnt 2010/2011 (n=4)

- Heather regeneration was good with mean cover of 50% and height of 15-30cm (Figure 3).
- Mean *Sphagnum* cover was generally same as abundance recorded prior to burning. Other bryophytes had decreased.
- An increase in mean graminoid cover since 2008 was recorded (from 34% to 55%), but no change since 2011 or 2013 surveys.
- Small increase in bare ground was recorded, due to localised sheep trampling in some patches.
- One plot was recorded as favourable condition in 2016.

Burnt 2014/15 (n=1)

- Dwarf-shrub cover was 5% and heather height of 10cm recorded.
- Some damaged *Sphagnum* hummocks present.

Figure 3. Photo of condition plot on Back Point

Table 5. Mean values for vegetation attributes and condition scores for the Back Point in 2008, 2011, 2013 and 2016

Attribute	***Vegetation type - Back Point***																			
	All plots (*n*=20)				**Unburnt (*n*=6)**				**Burnt 2001 (*n*=5)**				**Burnt 2008 (*n*=4)**				**Burnt 2010/11 (*n*=4)**			
	08	**11**	**13**	**16**	**08**	**11**	**13**	**16**	**08**	**11**	**13**	**16**	**08**	**11**	**13**	**16**	**08**	**11**	**13**	**16**
Dwarf-shrub cover (%)	54	50	54	52	75	74	69	56	57	35	37	38	0.5	58	63	69	66	20	40	55
Calluna cover (%)	51	42	48	45	74	72	69	53	46	30	36	37	0.3	31	46	49	66	17	33	50
Calluna height (cm)	40	33	27	30	61	54	39	36	36	38	29	35	3	11	20	26	48	9	13	23
Graminoid cover (%)	35	52	52	54	29	36	41	44	61	66	62	63	11	61	59	58	34	54	55	55
Sphagnum cover (%)	42	46	48	48	44	50	51	50	40	52	58	58	38*	24	23	30	46	50	54	49
Total bryophytes (%)	78	74	74	67	80	77	75	62	62	76	81	80	88*	58	56	56	85	84	79	64
Bare ground (%)	0	0.6	0.8	0.7	0	0	0.3	0.2	0	0.6	0	0	0	1.5	1.8	0.8	0	0.8	1.8	1.3
Mean condition score per plot	1.0	1.4	1.4	1.3	0.3	0.3	0.3	0.7	0.8	2.6	2.2	1.8	3.0	1.3	1.8	1.3	0.5	1.8	2.0	1.3
Condition score per vegetation type	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**3**	**2**	**2**	**1**	**0**	**2**	**1**	**1**

(* Estimate of living *Sphagnum*/bryophyte cover prior to burning)

3.3 Front Point (*n*=11)

The Front Point (approx. 100ha) is mainly blanket bog, although a large area in south east is degraded with very little heather cover. Grazing impacts were variable across the area, with heavier grazing occurring on lower parts of the site near the track. The upper part with mature heather had been subject to some controlled burning since 2011. Main vegetation changes can be summarised as follows:

- Little change in mean dwarf-shrub cover or heather cover (Table 6). Decrease in heather height, due to sheep grazing on lower plots.
- Three plots in degraded area had virtually no heather present, as at baseline.
- Significant increase in mean graminoid cover since baseline.
- Vegetation assessment showed that blanket bog condition was relatively good (mean score of 1.5), if plots on degraded area were not included in the analysis. Three plots were in favourable condition in 2016

3.4 Vogie Hill (*n*=11)

The Vogie Hill was previously mainly classified as degraded blanket bog, but now has >25% dwarf-shrub cover over much of this area. Grazing was generally light. Main vegetation changes can be summarised as follows:

- Increase in mean dwarf-shrub cover on the Vogie Hill. Heather cover had significantly increased from 6% to 22%, although variable across the area. Recovery following past heather beetle damage which was apparent at baseline.
- Slight increase in *Sphagnum* cover.
- Improvement in condition of the management unit. One individual plot recorded as favourable condition in 2016.

3.5 Glenhill North (*n*=8)

Vegetation was mainly blanket bog with some degraded areas. Grazing was light to moderate across the site to the north of the lane, with fairly high numbers of sheep congregating on drier, grassy areas. Main vegetation changes can be summarised as follows:

- Little change in vegetation since baseline survey.
- Some increase in graminoid cover and *Sphagnum*, possibly due to less grazing pressure.
- Slight improvement in condition, indicated by lower score.

3.6 Glenhill South (*n*=2)

Two plots in field to south of lane were on degraded wet heath. Although showing impacts of heavy grazing there had been a reduction in stocking evident since baseline survey. Main vegetation changes can be summarised as follows:

- Increase in mean graminoid cover and less bare ground recorded.

- Very little heather present on this area and therefore it was considered suitable area for a heather reseeding trial.
- Condition severely unfavourable.

3.5 Creeve Side (*n*=5)

Plots were recorded on an area of mainly degraded blanket bog. Grazing impacts were variable across the area. Main vegetation changes can be summarised as follows:

- No change in mean dwarf-shrub cover, with heather remaining at low cover and height.
- *Sphagnum* cover remained fairly low, possibly due to past drainage.

3.6 Skerry (*n*=3)

There had been no livestock grazing on two of these plots for a number of years and hence heather was very tall, up to 60cm (Figure 4). Main vegetation changes can be summarised as follows:

- Increase in mean dwarf-shrub cover and abundance of *Sphagnum*

Figure 4. Photograph of ungrazed condition plot

Table 6. Mean values for vegetation attributes and mean condition scores for plots in other areas of the Greenmount Hill Farm in 2009 and 2016

Attribute	***Management Unit***											
	Front Point (n=11)		**Vogie Hill (n=11)**		**Glen Hill North (*n*=8)**		**Glen Hill South (n=2)**		**Creeve Side (*n*=5)**		**Skerry (n=3)**	
	2009	**2016**	**2009**	**2016**	**2009**	**2016**	**2009**	**2016**	**2009**	**2016**	**2009**	**2016**
Dwarf-shrub cover (%)	49	38	19	35	24	25	1	1	14	17	22	37
Calluna cover (%)	43	36	6	22	20	20	0.1	1	3	7	13	25
Calluna height* (cm)	31	21	22	22	30	23	5	15	10	15	40	43
Graminoid cover (%)	46	63	72	72	62	70	75	90	74	79	68	68
Sphagnum cover (%)	42	40	24	32	20	26	3	1	16	12	38	50
Total bryophytes (%)	69	57	52	54	48	42	58	51	32	30	83	82
Bare ground (%)	1	2	0.1	0	1	1	6	1.5	2	1	0	0
Mean condition score per plot	2.1	3.0	3.7	2.3	3.9	3.3	9.5	8.5	4.4	4.0	3.3	1.7
Condition score per management unit	**1**	**2**	**3**	**1**	**4**	**3**	**9**	**7**	**4**	**4**	**2**	**1**

(* Mean height excl. plots with no *Calluna* present)

4. CONCLUSIONS

The target within the current GHRP management plan (2015-2019) is to improve the condition of blanket bog habitat by 10% from the baseline in 2008/09, as indicated by the plot assessment method. At baseline assessment, the mean condition score for all 90 plots was 2.54, with 24% of plots assessed as favourable (i.e. score of 0), 64% unfavourable and 12% severely unfavourable. The mean condition score in 2016 was 2.48, with 20% of plots assessed as favourable, 69% unfavourable and 11% severely unfavourable. (Note that a decrease in score indicates an improvement in condition). These results suggest that there had been very little overall change in vegetation, although there were some positive indications.

Of the 90 plots assessed, 55 plots were on blanket bog habitat. The mean score had increased from 1.1 at baseline to 1.4 in 2016, indicating that overall condition had not improved. However the low score indicates that the blanket bog on the Hill Farm is in relatively good condition, although not favourable overall. Unburnt bog on the Back Point was the only vegetation type to be assessed as in favourable condition in terms of meeting all the attribute targets. It should be noted that targets were based on those used for condition monitoring of designated sites in Northern Ireland.

A further 35 plots were located on areas classified as degraded blanket bog in the baseline habitat survey. Comparison of the mean condition score of these plots at baseline (4.8) with resurvey in 2016 (4.3), indicated an improvement in condition. If particular, vegetation on the Vogie Hill had improved in condition with increased dwarf-shrub cover on previously degraded habitat. This was probably due to low stocking levels together with recovery following past heather beetle damage.

Livestock grazing was generally light on blanket bog areas and as such there was very little trampling or bare ground present. Grazing impacts in 2016 were generally lower than had been the case at baseline survey. Appropriate stocking rates over the whole grazing season in subsequent years had resulted in improvement, particularly on the Front Point. The increase in graminoid cover on the Creeve Hill was due to the reduced stocking rates since 2008 and reduced competition from heather where it had died back or been burnt. Graminoid cover had also increased on the Back Point, generally due to increases following burning. High graminoid cover (over 50%) appeared to be the main reason for unfavourable condition as shown by the plot assessment. This could be addressed by livestock grazing, including light cattle grazing, at appropriate times of year to ensure reduction of *Eriophorum vaginatum* and *Molinia,* without damage to heather or *Sphagnum*.

Controlled burning of patches within the Creeve and Point had led to areas previously dominated by dense mature heather becoming more diverse. This apparent increase in plant species diversity and improvement in vegetation structure was not taken into account by the plot assessment method. For example, heather height is not included as a condition attribute, although for blanket bog in favourable condition this should mainly be between 15cm and 30cm. Prior to burning the height of mature heather on these areas was 50-70cm.

There was good regeneration of heather on plots burnt within the last 15 years, except where these had been affected by die-back. A decrease in heather cover on Creeve plots was still evident due to die-back or death of bushes, likely to have been caused by periodic damage from heather beetle. However there was very little evidence of recent heather beetle damage in 2016, and heather was recovering.

The survey results indicated that in general for this site there had been no apparent adverse impact of burning of blanket bog vegetation on the abundance of *Sphagnum* moss. Of the 90 plots assessed, 26 had been burnt since 2001. Blanket bog burnt between 2001 and 2005 had similar abundance of *Sphagnum* to unburnt vegetation. There were 14 plots that had been subject to burning as part of the GHRP management plan between 2008 and 2015. These showed no significant change in mean cover of *Sphagnum* since baseline. Some plots had greater abundance of *Sphagnum* than recorded at baseline. However there were five plots where there had not been full recovery of *Sphagnum* following controlled burning, with some damaged moss evident.

The data from the monitoring gives an indication of the impacts of managed burning and grazing on blanket bog vegetation. However, as has been found in previous years, and elsewhere in the UK, results were variable and site-specific. All vegetation plots will be surveyed before the end of the current GHRP Management Plan in 2019, to assess any changes in plant species abundance and vegetation condition due to habitat management or other factors.