Revised Moorland Management Plan for College Valley / The Cheviot SSSI.
The original 1 November 2006 plan has now been replaced and superseded by this Revised Moorland Vegetation Management Plan (Revised MVMP) dated August 2018.

This revised MVMP is only valid until 31/03/2021 applies to the following HLS agreements AG00423221 (College Valley Estates Ltd); AG00625354 (College Valley Estates Ltd) AG00425277; (Cheviot Farming Ltd) and AG00353125 (W & F Elliot).

Parties have signed a declaration confirming that this Revised MVMP will take effect and is binding on all parties to the HLS Agreements listed above, and that the HLS Agreements are varied to formally incorporate this Revised MVMP.

MOORLAND VEGETATION MANAGEMENT PLAN

College Valley Estate

13 August 2018 2018 – 31st March 2021

AUGUST, 2018
GEORGE DODDS & CO
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	Who	Dates
Surveyor	**George Dodds /** [redacted]	**17/7/2017**
Report author	**George Dodds /** [redacted]	**24/11/2017**
Q/A	**George Dodds /** [redacted] **/** [redacted] **/** [redacted] **/** [redacted] **/ Northumberland National Park Authority/NE Upland QA panel**	**25/6/2018** **6/8/2018**

Professional Indemnity Insurance number: PIP12001058

George Dodds & Co aims to:

- **To provide professional high quality environmental advice and practical guidance to farmers and landowners in Northumberland, North East England and the Scottish Borders.**

- **All work adheres to the Charted Institute of Ecology and Environmental Management standards and guidance See http://www.cieem.net/ for full details**

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1 INTRODUCTION

Management of the upland landscape can create a mosaic of habitats important for nature conservation and provide nesting and feeding ground for a range of native bird species whilst also providing grazing for livestock; this is often achieved through selective heather burning, bracken management, cutting for hay and low intensity grazing. A diverse range of archaeology is found in the uplands and can be protected through suitable stock management, bracken control and appropriate access routes.

This Moorland Vegetation Management Plan (MVMP) encompasses all areas of dry and wet heath, blanket bog, montane heath and associated acid grassland and scrub habitats that are grazed by livestock within College Valley Estates. The majority of these habitats (but not exclusively) lie above the Moorland line.

The College Valley Estate is located in the far north of England on the border with Scotland and lies within the Northumberland National Park. This tranquil valley has been managed by grazing animals for over two thousand years. Evidence is provided by the wide range of archaeological and historical features including defended settlements, Roman-British homesteads, strip terracing and medieval ridge and furrow. The mid twentieth century saw a decline in cattle numbers and an increase in the numbers of 'hefted' sheep. In the 1970's and 1980's, an increase in sheep numbers had a detrimental effect on the upland vegetation. Too many over-wintered sheep saw the reduction in quality and quantity of upland heathland vegetation despite parts of the Estate being Sites of Special Scientific Interest (SSSI). The introduction of agri-environment schemes (e.g. Countryside Stewardship and Higher Level Schemes) and a change in the agricultural tenancies has seen upland vegetation flourish. Today, the landscape is farmed using traditional breeds of cattle (Galloways and Luings) and sheep (Scottish black-faced and North Country Cheviots).

1.1 OUTCOMES APPROACH

This upland vegetation plan represents the development and three-year trial of a new approach for the management of moorland in the College Valley. The plan is a joint vision of shared outcomes between College Valley Estates, Natural England and the Northumberland National Park. This three-year trial reflects the remaining terms of the Higher Level Scheme (HLS) agreements in place across the Estate (See section 7.2). At the end of this period, the success and delivery of the shared outcomes approach will be reviewed along with management prescriptions of the HLS agreement. This will allow both parties to incorporate lessons learned and conclusions of the trial work from both College Valley Estates and Natural England's on-going work.

2 COLLEGE VALLEY ESTATE'S OBJECTIVES AND INTERESTS

It is important to recognise that **C**ollege **V**alley **E**states stands for: **C**onservation, **V**isitors and **E**ducation.

The Owners and Directors of College Valley Estates strive '*to manage the Estate in a way that will enhance and maintain its value as a cultural, environmental, economic and scenic place of excellence*'

- Environment – enhancing habitats and biodiversity (including woodland).
- Farming – sheep, cattle and happy tenants.
- Timber – commercial conifer and amenity plantations.
- Shooting – grouse, pheasants and deer.
- Recreation – walking, cycling, horse riding, wedding receptions.
- Accommodation – long-term lets, self-catering holiday cottages and the bunkhouse.

2.1 THE VISION

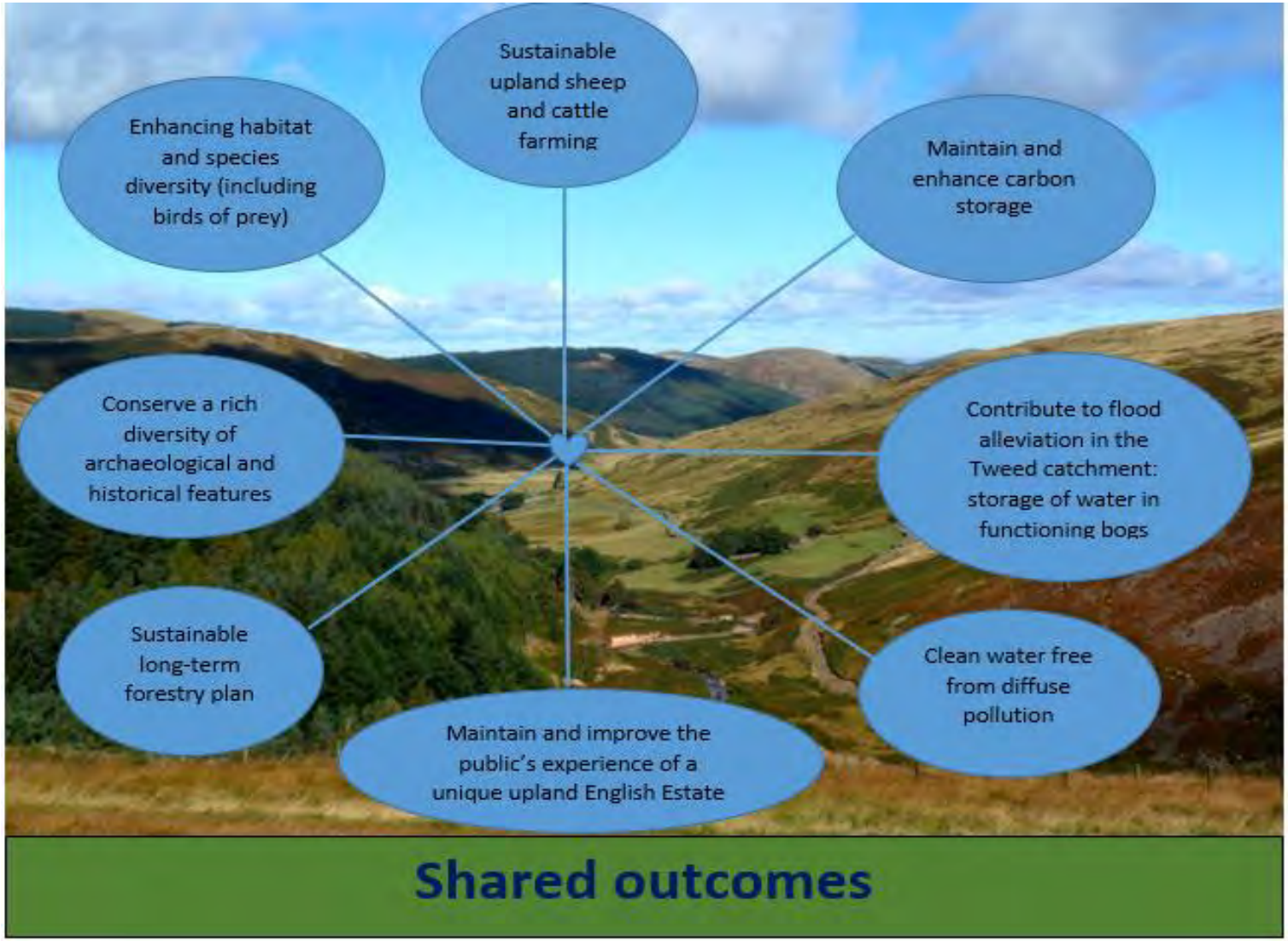
Our shared vision for College Valley Estates is…

"College Valley Estates Limited, Natural England and Northumberland National Park agree to work together to enhance existing positive management. This will ensure the continued successful integration of the upland farming, forestry and sporting business with important ecological, archaeological and landscape features, whilst continuing to provide opportunities for the public in-terms of recreation, learning, and well-being.

The long-term goal is to maintain and enhance moorland habitats and their soils as well as improving carbon storage and water quality. These measures will help to support a rich diversity of flora and fauna. Resilient functioning ecosystems will long-term benefit farming, forestry, archaeology, sporting and socio-economic aspects of the College Valley enterprise."

The shared outcomes are:

Work in partnership to manage upland habitats so that they are functioning in a way which positively supports, provides and enables the following:


Sustainable upland sheep and cattle farming
Enhancing habitat and species diversity (including birds of prey)
Maintain and enhance carbon storage
Conserve a rich diversity of archaeological and historical features
Contribute to flood alleviation in the Tweed catchment: storage of water in functioning bogs
Sustainable long-term forestry plan
Clean water free from diffuse pollution
Maintain and improve the public's experience of a unique upland English Estate
Shared outcomes

The delivery of these shared multiple outcomes in the uplands involve a mutual understanding of, and joint working on, a number of key positive management principles. College Valley Estates and Natural England have designed these principles in partnership to guide and facilitate management across the site; their application on the ground will require professional judgement by the land managers, who know and understand the site, on a case by case basis.

This management agreement has been designed to take account of the special qualities in College Valley and should not be taken as a template for other estates.

3 NATURAL ENVIRONMENT

3.1 LANDSCAPE

College Valley estate is located within the Cheviots National Character Area. The landscape is noted for its volcanic hills that have been rounded by glacial processes and incised by steep sided valleys. The character area is dominated by moorland that is comprised of a mosaic of dry heath, blanket bog, and grassland as well as specialised habitats such as montane heath. Land use is predominately sheep farming with managed grouse moors and blocks of conifer plantation. Eastern Cheviots have a generally lower rainfall compared to the rest of the character area (per. comm. Natural England). Rainfall, impervious rocks, peaty soils, and extensive semi-natural habitats, play an important role in the regulation of water quality and flow, and carbon storage. This is a remote, undisturbed landscape, highly valued for its tranquillity and wild open spaces, and provides an important setting for outdoor recreation.

3.2 COLLEGE VALLEY ESTATES

The estate encompasses a wide range of habitats including montane heath, open moorland, enclosed pastures, ancient semi-natural woodland and broadleaf & conifer plantations. In addition to the wide range of biodiversity there are extensive areas of archaeology that require protection, these will be considered in Section 4. There are three Sites of Special Scientific Interest (SSSIs) within the Estate, The Cheviot SSSI, College Valley Woodlands SSSI and the Tweed Catchment Rivers – England: Till Catchment SSSI (See Appendix 7.1). The College Burn, up to the confluence with the Lambden Burn, is designated a Special Area of Conservation (SAC).

The Phase 1 survey map of (Appendix 7.2) is included as a historical reference. Many of the habitats and their boundaries have changed since the survey was carried out in 2002 and a minimal update in 2012.

3.3 THE CHEVIOT

This management block is dominated by Cheviot massif and lies within The Cheviot SSSI; the Wilderness, an open native woodland planted in 1995, runs south from Fawcett Shank with an offshoot to the west of College Burn.

Hen Hole to Braydon Craggs the vegetation is dominated by Bilberry *Vaccinium myrtillus* and acid grassland with blanket bog on suitable upper slopes. Large patches of Greater wood-rush *Luzula sylvatica* can be found in the mid-slopes and continue around to the Bizzle. The area between Braydon & Bizzle Crags also contains a number of species-rich flushes. Heather *Calluna vulgaris* becomes increasingly dominant from Dunsdale heading eastwards; Mid Hill, Bellyside, Scald Hill and Broadhope. There is a high proportion of dry heath interspersed with areas of wet heath and blanket bog. A number of the scree slopes contain Fir club-moss *Huperzia selago* and a diversity of lichens. The majority of the blanket bog is found at higher altitudes (600m and above) is classed as montane heath. Smaller pockets of blanket bog can be found at lower levels, for example on the side of Scald Hill. The Bizzle and Hen Hole are outcrops of base-rich rock within cliffs of acidic rocks and support rare alpine plant species e.g. Roseroot *Sedum rosea*, Mossy *Saxifraga hypnoides* and Starry saxifrage *Saxifraga stellaris*. Several sub-arctic plants (e.g. Starry saxifrage) are now found at lower levels and along watercourse away from the traditional sites (e.g. Goldscleugh gully and Broadhope). Scrub and woodland are colonising the upper reaches of the Goldscleugh Burn and Lambden Burn. Tree species are dominated by Rowan *Sorbus aucuparia*, Grey *Salix cinerea* and Goat Willow *Salix caprea*.

In 2016 and 2017, one pair of Golden plover *Pluvialis apricaria* bred at the eastern end of Cheviot in the area of short wind-clipped heather. Dunlin are also recorded on the summit of Cheviot. The lower slopes support breeding Whinchat *Saxicola rubertra* and Ring Ouzel *Turdus torquatus*. Breeding Merlin *Falco columbarius* are found in remote areas where there is suitable long heather. Since 2012, increasing numbers of Snipe *Gallinago gallinago* have bred in suitable wet habitats especially west of Dunsdale (4+ males drumming), the lower slopes of Woolhope Crag (1 drumming male) and Mount Hooley (1 drumming male). Snipe have been recorded on other parts of Cheviot both during the breeding season and the winter period. Cliff nesting birds such as Peregrine *Falco peregrinus* and Raven *Corvus corax* also breed.

Up until a lengthy period of snow in 2011, Black grouse *Lyrurus tetrix* lekked on the estate close to Mount Hooley. Red grouse *Lagopus lagopus*, Meadow pipit *Anthus pratensis* and Lesser redpoll *Carduelis cabaret* are relatively common in their preferred habitats.

3.4 Preston Hill, Coldburn and Hare Law

Preston Hill is predominately dry heath with an intergrade of wet heath and Blanket bog in an area neighbouring the estate boundary. Between Coldburn Hill and Hare Law lies a large area of blanket bog (Coldburn Flats), either side of which, dry heath and patches of wet heath can be found. The southern face of Coldburn Hill is dominated by a large scree slope that changes colour dramatically when the Bell heather *Erica cinerea* comes into flower in July / August. The western slope of Coldburn Hill is characterised by a dense grassy sward; between Harrowbog and Hare Law there is a mixture of bracken beds, dry heath, rocky outcrops and acid grassland that, in places, supports waxcaps.

Breeding birds include Red grouse, Curlew *Numenius arquata* (1 pair occasionally) and Snipe. Whinchat (7+ males in 2018) and Ring ouzel breed on the lower slopes.

3.5 Roughside / Fleehope

This block has a dry and wet heath mosaic at higher levels with areas of blanket bog around Black Hag; interspersed within the heathland. Rough grassland dominating lower levels, with bracken beds prolific on the side of the valleys. Gorse and acid grassland has created an interesting mosaic on the haughs.

Breeding birds include Red grouse, Curlew (1 pairs in 2017) and Snipe.

3.6 Elsdonburn

This management block is largely made up of rough grassland and bracken beds with some fragmented heath found adjacent to the western boundary as well as the boundary along Black Hag where small areas of blanket bog are also located.

This area has responded favourably to the change to a more sympathetic grazing regime. *Calluna* and *Erica* are starting to appear in areas where it has not been seen for years.

3.7 HETHPOOL

Land above the moorland line in this management block includes Great Hetha, White Hill and part of Wester Tor. Great Hetha has some extremely degraded dry heath around its summit, the remainder is rough acid grassland and bracken beds. White Hill, as the name suggests, is also dominated by acid grassland, as well as bracken. The area of Wester Tor included in this tenancy is made up of large bracken beds, rough grassland, rocky outcrops and small areas of fragmented dry heath.

The greatest densities of Dark-green fritillary *Argynnis aglaja* are found on White Hill. This area also contains the occasional breeding pair of Curlew. Snipe are found in wetter areas.

3.8 WILDLIFE

3.8.1 Birds of Prey

3.8.1.1 Hen harrier Circus cyaneus

Hen harriers show a clear preference for nesting in heather. Within heather moorland, harriers nest in taller heather (average height 46cm) and within proximity to streams. Analysis of nest sites, in the UK, have found that more nests are on northwest-facing slopes than were expected. This type of habitat can be found around Mid Hill, Bellyside and Hare Law.

This species is recorded annually in the spring and autumn. Birds have lingered in the past but have not bred. There are opportunities for Hen harriers to nest in the future. The Estate will encourage this by continuing to maintain suitable habitat and breeding conditions in the same way that they have done for Short-eared owl *Asio flammeus,* Merlin *Falco columbarius* and Peregrine *Falco peregrinus*, all of which have bred successfully on the estate in recent years.

3.8.1.2 Merlin

There are 1-2 pairs of Merlin that nest on the Estate each year (pers. comm. [redacted]). Both pairs are found on the Cheviot massif, with one pair on the eastern side (Broadhope /Scald Hill area) and the other on the western side (above Hen Hole and possibly nesting on the Scottish side of the boundary). Increasing heathery/grassland mosaic habitat on the western side of the Estate should provide more suitable nesting habitat in the future.

3.8.1.3 Other birds of prey and owls

Two pairs of Peregrine breed within the Cheviot massif SSSI. Both pairs are found on the rocky crags of the Bizzle and Hen Hole.

Short-eared owls are seen throughout the year and are known to breed locally. A pair has been present in 2018. There are at least five pairs of Barn owls on the estate that have been successful for a number of years. Pairs hunt extensively on the lower slopes of the moorland.

3.8.2 Waders

Breeding waders are not an avian feature of the College Valley Estate due its topography and vegetation composition. A map of the bird survey sites from 2017 and the wader territories can be found in appendix 7.3. Snipe were recorded on two of the monitored sites. No Snipe, Curlew, Lapwing or redshank were found in the third monitored site at Mount Hooley.

Small numbers of Curlew breed on the Estate in moorland areas. In 2017, there was at least one pair breeding in the Fleehope/Roughside parcel with further pairs in the Trowupburn area. Pairs also occasionally breed on the blanket bog on Coldburn Flats.

Snipe breed where there are suitable wet areas including wet heath and blanket bog across the whole estate. A change in grazing regime since 2012, has seen numbers of breeding Snipe increase on the Estate.

The summit of Cheviot holds a small number of breeding Golden plover. 1-2 pairs have been seen with chicks, in the last 2 years, during vegetation monitoring. Vegetation length may be becoming too long to support this species on the western end of the Cheviot plateau. Dotterel *Charadrius morinellus* are occasionally found on the plateau during May on their northward migration.

Dunlin *Calidris alpina* have been recorded trilling (singing) and on passage in May, in recent years, but there are no records of breeding recently. The Northumbria Bird Atlas (2015) indicates that there was '*probable'* breeding between 2007 and 2011. Accessibility, weather and difficult terrain hampers surveying during the nesting season.

The legal control of predators is carried out and help with the breeding success of waders.

3.8.3 Other Notable Bird Species

Other red listed species that are found on the moorland areas include Woodcock *Scolopax rusticola* (breeds in small numbers in open woodlands but feeds on moorland), Cuckoo *Cuculus canorus* (good numbers recorded between late April and early July), Skylark *Alauda arvensis* (grass dominated areas), Ring ouzel, Song thrush *Turdus philomelos* (moorland edge where there is scrub), Mistle thrush *Turdus viscivorus*, Whinchat, Tree pipit *Anthus trivialis*, Linnet *Linaria cannabina*, Twite *Linaria flavirostris* (small numbers recorded each year and during the breeding season) and Lesser redpoll *Acanthis cabaret*.

3.8.4 Other taxa

3.8.4.1 Feral goats

A population of Feral goats *Capra hircus* are found in the north-eastern part of the Estate around Hare Law and Harrowbog. The Northumberland goat group sits twice a year. The 'group' and their management plan encompasses neighbouring estates and is chaired by the Northumberland National Park.

To date there has been no inference that the goats are to the detriment of the moorland mosaic on Hare Law and Coldburn area.

3.8.4.2 Water voles

Large entrance holes were found on the western side of the Cheviot summit in 2016. Further investigations were carried by a Newcastle University student in the summer 2017. The results have yet to be made available.

3.8.4.3 Adder and common lizard

Adder *Vipera berus* is a relatively common species on moorland and blanket bog within College Valley. No formal survey has been carried out on this species.

Common lizard *Zootoca vivipara* is also relatively common when walking around the drier heaths of the Estate. No formal survey has been carried out on this species.

3.8.4.4 Dark-green fritillary butterfly

Dark-green fritillary *Argynnis aglaja* is found in the northern third of the Estate. To date most of the sightings have been where there is bracken on grassland e.g. White Hill. There is a chance that this species may be found in other areas where there is a combination of bracken and violets.

3.8.4.5 Other insects

Large heath butterfly is not widely known from the north Cheviots and is probably under-recorded or not present in the College Valley. Mountain bumblebee is relatively common on the slopes of Cheviot and other sites where Bilberry and preferred flowering plants are present.

4 HISTORIC ENVIRONMENT

There are a range of historical features found within CVE, from Iron-Age hillforts and Romano settlements to cairns, cultivation terraces and World War II aircraft crash sites. A Scheduled Monument Assessment was carried out by Tom Gledhill for Historic England in 2016 and can be provided on request; a map showing Scheduled Ancient Monuments can be found in Appendix 7.4.

Non-statutory historical features have been highlighted in past Farm Environmental Plans (produced as part of HLS applications), details were submitted to Natural England and can be provided on request. Historical features can be adversely affected by unsympathetic burning and grazing regimes, as well as inappropriate access routes and the spread of bracken.

5 LAND MANAGEMENT

This management plan is to be read in conjunction with any agri-environment, Section 39 agreements and woodland schemes in place within College Valley Estate. See Appendix 7.5 for information on existing environmental schemes.

Throughout this plan, management for restoration purposes is referred to many times. This is defined as:

'*Management which facilitates functioning upland heath systems (including blanket bog), whilst maintaining structural and vegetative diversity implicit for a wide range of upland/moorland species (see section 3.6).*'

This management plan represents an outcomes focused approach to delivering the shared vision (see section 2.1), through managing moorland vegetation across the College Valley Estate. This approach builds on the 'traffic light system' developed elsewhere in England.

Any burning will comply with the Heather and Grass Burning Regulations (2007) (Regulations 5(2) and 6(1) – GAEC 6.

5.1 GRAZING

Livestock numbers and grazing management can be referenced through the current Higher Level agreements (Appendix 7.2) and their associated stocking calendars.

5.2 DRY HEATH

Favourable conditions (visual format shown in Appendix 7.5.1), vegetation management and restoration principles for dry heath habitat are:

Vegetation management & restoration principle: A functioning dry heath system will maintain structural and vegetative diversity suitable for Hen harrier, Red grouse, Ring ouzel, Whinchat, Stonechat and Merlin. These features include healthy heather and a diversity of age structures, other dwarf shrubs (e.g. Bilberry, Crowberry), lichens and feather mosses.

Favourable condition (i.e. what 'good' looks like) for this habitat type, when assessed against SSSI protocol, includes the following criteria:

1. **Sensitive features should show no signs of disturbance, burning, cutting etc.:** Wind-clipped heath, thin soils (<5cm), steep slopes (less than 1 in 3), gullies, Sphagnum carpets, wet hollows, pools, sides of watercourses (within 10m), peat haggs and erosion gullies, scree slopes, bracken beds, Lichen dominated area and old heather with uneven structure. Vegetation management will generally not take place above 600m subject to individual areas, which are not classified as 'Sensitive Areas' and which are agreed with Natural England in advance.
2. **Structural diversity:**
    - All growth phases of heather (pioneer, building, mature, late mature / degenerate) should be present in the area.
    - At least 10% *Calluna vulgaris* should be at least in the mature phase / degenerate.
    - Less than 33% of the last growing season's shoots should show signs of browsing by livestock.
    - No measurable decline in the overall area/extent of favourable dry heath.
3. **Vegetation diversity:**
    - At least 50% of cover should be dwarf shrub (excluding gorse).
    - At least 2 dwarf shrub species should be present and not located within sensitive areas.
    - At least 1 species of feather-moss, liverwort or non-crustose lichen should be present.
    - Negative species – thistles, nettles, docks and non-natives species should be less than 1% of cover.
    - Bracken and / or Soft rush should be less than 10% cover.
    - Scattered trees and scrub should be less than 20%.
    - Less than 10% is disturbed bare ground (exclude recently burnt areas).

5.3 WET HEATH

Favourable conditions (visual format shown in Appendix 7.5.2), vegetation management and restoration principles for wet heath habitat are:

Vegetation management & restoration principle: Depth of peat less than 40cm. Management which facilitates a functioning wet heath / blanket bog system, whilst maintaining structural and vegetative diversity suitable for Red grouse, Snipe, Large heath butterfly and Golden-ringed dragonfly.

Favourable condition (i.e. what 'good' looks like) for this habitat type, when assessed against SSSI protocol, includes the following criteria:

1. **Sensitive features should show no signs of disturbance, burning, cutting etc.:**
   Sphagnum carpets, flushes with rushes or sedges, wet hollows, pools, sides of watercourses, haggs and erosion gullies, uneven ground resulting from Sphagnum hummocks and cotton-grass or dwarf shrub tussocks.
2. **Structural diversity:**
   - Less than 10% of Sphagnum cover is crushed, broken or pulled up
   - There should be no signs of burning into the Sphagnum, liverwort or lichen layer or exposed peat surface (although bleaching of Sphagnum layer does not fail condition assessment).
   - Less than 33% of the last growing season's shoots should show signs of browsing by livestock
   - Less than 10% of wet heath should show signs of active drainage (resulting from ditches, heavy trampling or tracks).
   - Extent of eroding peat is less than the area of re-deposited peat and / or new growth in bog vegetation (e.g. in gullies, haggs and bare peat areas etc.)
   - No measurable decline in wet heath vegetation across the site.
3. **Vegetation diversity**
   - Cross-leaved heath present within 20m radius of quadrat.
   - At least 3 indicator species present: Sphagnums, Hare's tail cotton-grass, Common cotton-grass, Cross-leaved heath, Heather, Crowberry, Bilberry & Common sedge.
   - At least ½ of quadrat area (10m x 10m) made up of wet heath indicators.
   - At least 20% cover should be dwarf shrubs.
   - Dwarf shrub (**Heather**), grasses, rushes should not exceed 75%.
   - Bare ground less than 10% cover.
   - Negative species e.g. Creeping thistle, Creeping buttercup or non-natives should be less than 1%

- Bracken or soft rush less than 20% cover.
- Trees and shrubs less than 20% cover.

5.4 BLANKET BOG

Favourable conditions (visual format shown in Appendix 7.5.3), vegetation management and restoration principles for blanket bog habitat are:

Vegetation management & restoration principle: Management which facilitates a functioning blanket bog system, whilst maintaining structural and vegetative diversity suitable for Red grouse, Large heath butterfly, Snipe, Golden-ringed dragonfly and possibly Water vole.

Favourable condition (i.e. what 'good' looks like) for this habitat type, when assessed against SSSI protocol, includes the following criteria:

1. **Sensitive features should show no signs of disturbance, burning, cutting etc.:**

Sphagnum carpets, flushes with rushes or sedges, wet hollows, pools, sides of watercourses, haggs and erosion gullies, uneven ground resulting from Sphagnum hummocks, cotton-grass or dwarf shrub tussocks.

2. **Structural diversity:**
   - Less than 10% of Sphagnum cover is crushed, broken or pulled up
   - There should be no signs of burning into the Sphagnum, liverwort or lichen layer or exposed peat surface (although bleaching of Sphagnum layer does not fail condition assessment).
   - Less than 33% of the last growing season's shoots should show signs of browsing by livestock.
   - Less than 10% of bog should show signs of active drainage (resulting from ditches, heavy trampling or tracks).
   - Extent of eroding peat is less than the area of re-deposited peat and / or new growth in bog vegetation (e.g. in gullies, haggs and bare peat areas etc.)
   - No measurable decline in bog vegetation across the site.

- Less than 75% of site should be dominated by Heather.

3. Vegetation diversity

- At least 6 indicator species present: Sphagnums, Hare's tail cotton-grass, Common cotton-grass, Cranberry, Cross-leaved heath, Heather, Bilberry & Common sedge.
- At least ½ of quadrat area (10m x 10m) made up of 3 or more indicators.
- Any one of Hare's tail cotton-grass, Deer-grass or Dwarf shrub not to exceed 75% cover
- Bare ground or scattered trees or shrubs less than 10% cover.
- Negative species e.g. Creeping buttercup, Bracken, Sitka spruce or non-natives should be less than 1%.

5.4.1 Montane heath

Montane heaths comprise of a diverse range of dwarf-shrub, cotton-grass, sedge, moss and lichen dominated plant communities occurring above the potential tree-line (above 600m). These communities generally have a prostrate structure and are affected by climate, especially wind and temperature. These habitats are also affected by nitrogen deposition, which is approximately 20 - 25 kg / ha / year on the top of Cheviot (Air pollution Information System).

Any areas considered as montane heath above 600m will be considered as a 'sensitive feature' and will not be managed other than suitably grazed by livestock (as per livestock calendars set by Natural England for HLS prescriptions).

Habitats that are deemed not to be montane heath above 600m will be reviewed at the annual review if management is considered necessary.

A project is being developed by the Northumberland National Park to look at the management of peat haggs and area of bare peat on the top of Cheviot. See appendix 7.11 for further details on the Northumberland National Park project.

5.5 MOORLAND MANAGEMENT ASSESSMENT

This management plan represents an outcomes focused approach to managing moorland vegetation across the College Valley Estate, building on the 'traffic light system' developed elsewhere.

5.5.1 Traffic light system

The traffic light system provides a decision-making toolkit to determine whether management of moorland vegetation is required for habitat restoration purposes. The traffic light graphics in Appendices 7.7.6 – 7.7.9 provide pictorial guides to 'decision-making' with regard to moorland restoration works

- Red – This management zone represents habitats where intervention is not required or appropriate.
- Amber - This management zone represents habitats where intervention may be appropriate.
- Green – This management zone represents habitats where intervention is required for restoration.

5.5.2 Management interventions

Intervention could be in the following form:

- Grip blocking – there are a small number of grips on Coldburn / Hare Law, between Broadhope and Scald Hill and in an area north of Red Cribs. There are a relatively small number of grips and most need to be assessed to see if they are running.
- **Dry heath: a rotational burning approach is still applicable where there is a dominance of Calluna over 75% and away from sensitive areas** (Sections 5.2, 5.5.6 & 7.7.6)**.**
- **Blanket bog / wet heath: restoration burning may be appropriate as a one-off intervention to reduce the dominance of *Calluna vulgaris*** (Appendix 7.7.7 for wet heath and 7.7.8 for the blanket bog management decision-making schematic)**.** Restoration burning is not to be conducted on a routine, regular or rotational basis. Appendix 7.8 provides a methodology of non-rotational blanket bog restoration to be followed in this plan.

On blanket bog after restoration burning, follow up with introduction of peat-building species e.g. Sphagnum / Cotton-grasses. Trial plots will be established to compare introduction of Sphagnum / Cotton-grass with natural colonisation.

All restoration burning will comply with the Heather and Grass Burning Regulations (2007) (Regulations 5(2) and 6(1) – GAEC 6.

- Generally cutting is the preferred restoration technique but will not be possible in a large number of locations in the College Valley:
    - Too rocky to cut plots with the machinery.
    - Too wet to cut the plot with machinery. Rutting or disturbance to the peat is likely in the plot, or access to the plot would cause ground disturbance.
    - Structural diversity of the vegetation (e.g. Sphagnum hummocks or cotton-grass tussocks) would be diminished.

Cutting of heather can be applied to dry and wet heath and blanket bog. On blanket bog, after restoration cutting, follow up with the introduction of peat building species if required. This requirement is based on a consideration of whether natural colonisation from adjoining habitats is realistic, and/or whether sufficient time has elapsed to allow this to happen i.e. establish trial plots to compare the introduction of Sphagnum / cotton-grasses with natural colonisation.

Cutting is not to be conducted on a routine, regular or rotational basis (Appendix 7.8.2 for details).

5.5.3 Heather management for ground nesting Birds of Prey

Hen harrier, Merlin and Short-eared owl will nest in long heather. Currently, Hen harrier and Short-eared owl do not nest on the estate. All areas where Merlin have nested in the last five years lie outside the proposed burning area. If Hen harrier, Merlin or Short-eared owl begin use other suitable breeding areas on the Estate, the 'traffic light' system will be used to determine management 3 years after breeding activity has ceased.

5.5.4 Wildfire Plan

With increasing numbers of people using the hills, there is potential hazard of wildfire on the Estate especially during prolonged periods of dry weather. A wildfire plan is already in operation with cooperation from neighbouring Estates, Northumberland National Park and Northumberland Fire Service

(Wildfire Fire Plan – College Valley, nr. Wooler, R Stacey, 15th March 2015 – reviewed June 2018 with minimal change).

5.5.5 Heather beetle management

Heather beetle is currently not a significant management issue on College Valley Estate. Where there are concerns regarding an outbreak of Heather beetle within 'heather habitats', the solution of intervention will be discussed and agreed between College Valley Estates and Natural England prior to work taking place. This approach will allow for bespoke monitoring to be considered to ensure efficacy of management and take advantage of any new evidence or best practice.

5.5.6 Sensitive areas / habitats

There will be no burning in sensitive areas. These are listed within 'Favourable conditions for dry and wet heath and blanket bog' within the management sheets in Appendix 7.7.1, 7.7.2 & 7.7.3. Sensitive features occur across the College Valley Estate. These sensitive features are recognised as being inappropriate for management intervention due to their biodiversity value and potential risk of damage. All of the features below fall within the RED zones for management assessment.

Figure 1: Wind-clipped heath on upper slopes on Cheviot

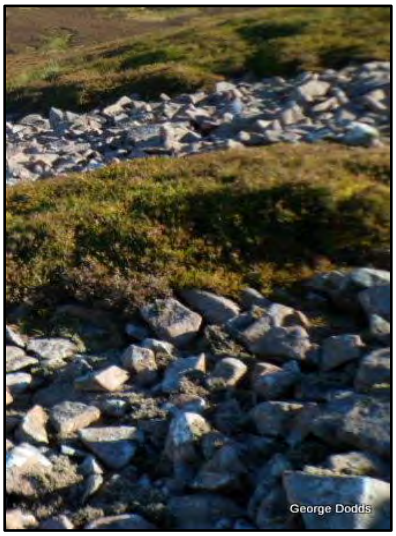


Figure 2: Scree slopes on Cheviot but can be found on the lower slopes of Hare Law, Coldburn, Preston Hill, and Fleehope.

Figure 3: Gullies are found on a small number of moorland parcels

Figure 4: Peat haggs and erosion features in peat are predominately found on the upper altitudes of Cheviot.

Figure 5: Thin soils (<5cm) are found especially on steep slopes and closely associated with screes (example not on CVE).

Figure 6: Steep slopes (greater than 1:2 on dry heath and 1:3 on wet heath/ blanket bog) are found on the sides of the 'U' shaped valleys and gullies.

Figure 7: Sphagnum carpets are predominately found on blanket bog and are rare due to the drier climate of the north-east Cheviots.

Figure 8: Sphagnum hummocks are a rare habitat on the Estate occurring occasionally on Coldburn Flats.

Figure 9: Flushes with rushes and sedges. Generally rare habitat but associated with spring lines and issues.

Figure 10: Wet flushes and pools. Mainly associated with montane blanket bog on Cheviot. Small pools occur occasionally elsewhere. A man-made pool system occurs in the upper Lambden Burn catchment.

Figure 11: Watercourses: College Burn and its tributaries are part of the River Till SSSI and part of the system lies in the SAC.

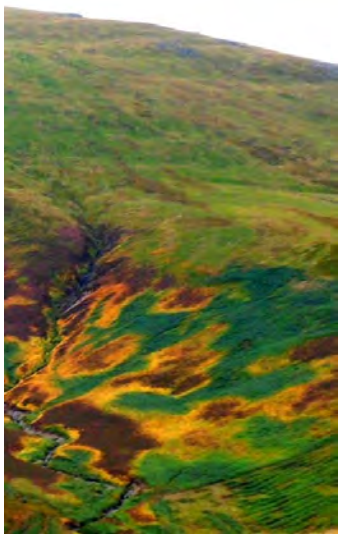


Figure 12: Bracken beds (dark green and yellow) are generally found on lower slopes of the valleys.

Figure 13: Lichen areas within swards are associated with dry steep slopes.

Figure 14: Old & uneven aged structure of heather is found across the Estate especially in the Scald Hill and Goldscleugh gullies.

Figure 15: Land over 600m is found on the Cheviot massif.

Figure 16: Areas for breeding birds of prey are associated with long heather and secluded areas.

Figure 17: Montane heath (above 600m).

5.6 BRACKEN

There are extensive beds of Bracken across the whole Estate. Many of these beds are associated with extensively grazed upland acid grasslands, dry heath, scree slopes and felled forestry. Many of the larger Bracken beds hold breeding Stonechat, Whinchat and Meadow pipit. Birds such as Quail *Coturnix coturnix* (recorded in 2016 close to Sutherland Hall), Cuckoo and Ring ouzel have all be seen in bracken beds on the estate.

Dark-green fritillary butterfly is known to breed in the northern half of the estate and a Small pearl-bordered fritillary was found in 2014. Both species' larval food plants are Common dog-violet and Marsh violet which can be relatively common in Bracken beds on the Estate.

A number of the bracken beds have also been encountered whilst surveying plots across the Estate. Approximately 36% of the plots have bracken components (NVC: U20, U20a, U20b and U20c). Generally, the species composition is relatively poor. There are a few places where there are very thin soils on / near to scree slopes where the species composition is relatively rich. In steep valleys, Bracken can be complemented with Male fern *Dryopteris filix-mas*, Broad-buckler fern *Dryopteris dilatata*, Hard shield fern *Polystichum aculeatum*, Common polypody *Polypodium vulgare*, Hart's tongue *Asplenium scolopendrium* and Hard fern *Blechnum spicant*.

Several archaeological / historical sites suffer from the spread of Bracken. A Scheduled Monument assessment was carried out by Tom Gledhill for Heritage England in 2016. A summary of this report can be provided. This report highlights Scheduled Monuments that are effected by Bracken.

5.6.1 Bracken management

Vegetation management & restoration principle: management that facilitates a reduction of bracken and the potential enhancement of underlying or neighbouring habitats for the benefit of upland species.

The assessment for bracken control can be found at Appendix 7.7.5 and 7.7.9.

5.7 SCRUB

Across the estate, especially in areas where sheep have been removed, increasing amounts of Rowan *Sorbus aucuparia*, Willow species (Salix cinerea and caprea), Downy birch *Betula pubescens* and Sitka spruce *Picea sitchensis* seedlings are becoming established. It is likely that in the past, winter grazing by sheep would have suppressed many of the deciduous seedlings. A number of these seedlings show multi-stemmed or enlarged areas of the stem where they have been grazed.

Scrub is currently expanding up gullies such as Goldscleugh, and in the Scald Hill gully. These areas will be allowed to develop as management would be extremely arduous.

5.7.1 Scrub management

Sitka spruce, Scot's pine and European larch will be hand pulled when discovered. In areas where regeneration is prolific, a concerted effort may be needed.

Areas of Gorse *Ulex europaeus* are prominent in the valley bottoms of the estate. The current practice is to cut areas outside the bird nesting season. The main moorland areas affected is the Fleehope Haugh land adjacent to the College Burn.

5.8 RUSH MANAGEMENT

Soft rush *Juncus effusus* is not a major problem on heathland. There may be sites adjacent to turn out areas that may need cutting or spraying with a suitable product to allow improved gathering of livestock and access to the hill. None of these potential areas are suitable for breeding waders as they are close to boundaries, woodlands, scrub, roads etc.

5.9 DRAINAGE

Hydrological integrity of moorland habitats is an important part of sustainable moorland management. It is therefore agreed that there will be no new drainage works or gripping carried out on the land.

There will be consideration made to the small number of grips especially on Coldburn and Hare Law, between Broadhope and Scald Hill and an area to the north of Red Cribs. No intervention with grips have been carried out since the 1980's. Many of the existing grips have been blocked by natural means e.g. Sphagnum plugs. A Natural England management implementation plan (PA1) will be considered within the remaining years of the current environmental stewardship schemes to determine whether works are required for blocking grips and drains.

Drains alongside existing access tracks can be maintained but not deepened, widened or improved.

5.10 VEHICULAR ACCESS

The use of vehicles must not result in rutting or damage to the surface vegetation and special care should be taken to avoid wet and boggy areas. Maps of existing tracks can be found in Appendix 7.6.

During the bird breeding season, 1 April to 31 July, vehicles used off established routes will be kept to a minimum to avoid bird disturbance and damage to nest sites. Where it is current practice not to use vehicles during the bird breeding season this will continue.

Tracks are necessary to facilitate good heather moorland management; existing tracks (see Appendix 7.4) are the main access routes. Care is taken to avoid sensitive areas. Where necessary, access routes may be cut/swiped to contribute to achieving shared outcomes, as long as doing so does not cause rutting or damage to the surface vegetation.

Any consideration to the creation of new tracks would require separate consultation and written agreement from the relevant statutory bodies e.g. Natural England and Northumberland National Park.

5.11 OTHER INFRASTRUCTURE

A map showing lines of grouse butts and other existing infra-structure can be found in the Appendix 7.6.3. Currently, no additional moorland infrastructure is planned. Any additional structures planned for the moorland areas will be determined separately in consultation with the relevant statutory bodies (e.g. Natural England, Environment Agency and Northumberland National Park).

5.11.1 Grit stations

- Grit is laid on the ground, in a box or tray. Trays can be supported on a couple of turned over turfs dug by hand and \ or raised on small piles of stones.
- The footprint of each station will not be more than 50% bigger than the size of the tray.
- Grit stations will be set out according to GWCT guidelines of 1kg of grit every 100m within a grid format.
- Grit stations will be sited to avoid the discharge of materials into the wider environment, particularly watercourses, water bodies and ground water.
- Grit stations will not be sited on sensitive habitat features identified on the Estate, wherever possible.
- Grit stations will not be placed on or near to historic sites.
- All machinery to be used in the topping up of grit stations will be low ground pressure vehicles to reduce any impacts to the ground and vegetation.

- All placing of grit trays (but excluding topping up with grit) will be conducted from 1st July to 1st April and providing that there are no nesting birds in the locations of the works.

6 MONITORING

6.1 SURVEYS

The surveys below will help to provide a baseline for both parties to monitor progress towards achieving our joint outcomes.

6.1.1 Natural England condition assessments

Natural England carried out vegetation surveys on the Cheviot SSSI units in 2014 (unit 7), 2016 (unit 8) and 2017 (units 9, 10 & 11).

6.1.2 College Valley Estate independent long-term vegetation monitoring

A long-term independent vegetation monitoring programme began in 2012. The programme is designed scientifically monitor changes in vegetation composition across the Estate. It has been set up in conjunction with the Centre for Ecology and Hydrology (Professor Simon Smart and Professor Robert Bunce) and has ratification from the Heather Trust and Professor Robert Marr (Liverpool University) – both leading specialists on the subject of moorland management.

There are 268 randomly generated 10m x 10m plots across the Estate which are to be monitored every 5 years (Appendix 7.9 for map of plots). The monitoring is looking at species, sward composition, length and use by livestock. 134 plots fall within areas of moorland and 63 plots fall in areas that are currently subject to moorland vegetation management. All plots are photographed each time the plot is surveyed. Fixed point photography is used at each compass radial at ground level.

6.1.3 Monitoring of annual vegetation management

It is proposed that a selection of restoration burn/cutting plots are monitored using standard vegetation monitoring techniques. This monitoring will be linked to the work being carried out in section 6.1.2. The monitoring approach will be reviewed alongside vegetation recovery data, and revised to take account of suitable best practice during the term of the management plan.

1. All plots will be photographed and a GPS point taken of the selected burn/cut sites once the area has been swiped.
2. All burn/cut sites where there are thought to be wet heath or bog communities will be surveyed for vegetation change in year 2 and 4 after the management year.
3. The area will be surveyed using standard vegetation monitoring techniques. All plant species will be recorded including mosses and Sphagnums. Sward lengths will be measured and photographs taken at each compass point.

6.1.4 Fixed point photographic monitoring

Locations have been identified across the estate (Appendix 7.10 – sites of fixed point monitoring) where annual site visits and photographic monitoring will take place to enable both parties to see what effects the Agreement is having towards achieving our joint outcomes. This will complement the fixed point photography which is carried out for the long-term monitoring programme (section 6.1.2).

Fixed Point Photography is a tool which enables us to record and monitor visual change within the landscape. It involves taking photographs, from the same point, at intervals over a period of time. The photographs are then compared to identify if changes occur (e.g. before and after restoration cutting \ burning or before) and if such changes have a positive or negative impact upon the character and condition of the landscape or habitats, with reference to our joint outcomes.

In mid-July of each year fixed point photography will be carried out at two different levels at agreed locations:

- **Landscape - scale photographs** will be taken to investigate potential large –scale changes in the landscape across the estate.
- **Smaller - scale photographs** will be taken to investigate potential changes in plant species composition and cover over time. These will be particularly useful in assessing the impacts of restoration management techniques such as vegetation cutting or burning. The photographs will cover an area of 20 x 20m approximately (see section 6.1.2).

The methodology for each of these is summarised in the annotated pictures Figure 17 and 18.

The results of these fixed point photographs will be considered at each annual review meeting and be used to inform future management on the estate.
Monitoring approaches may be reviewed during the term of the management plan to take account and advantage of emerging best practice and suitable approaches identified elsewhere.

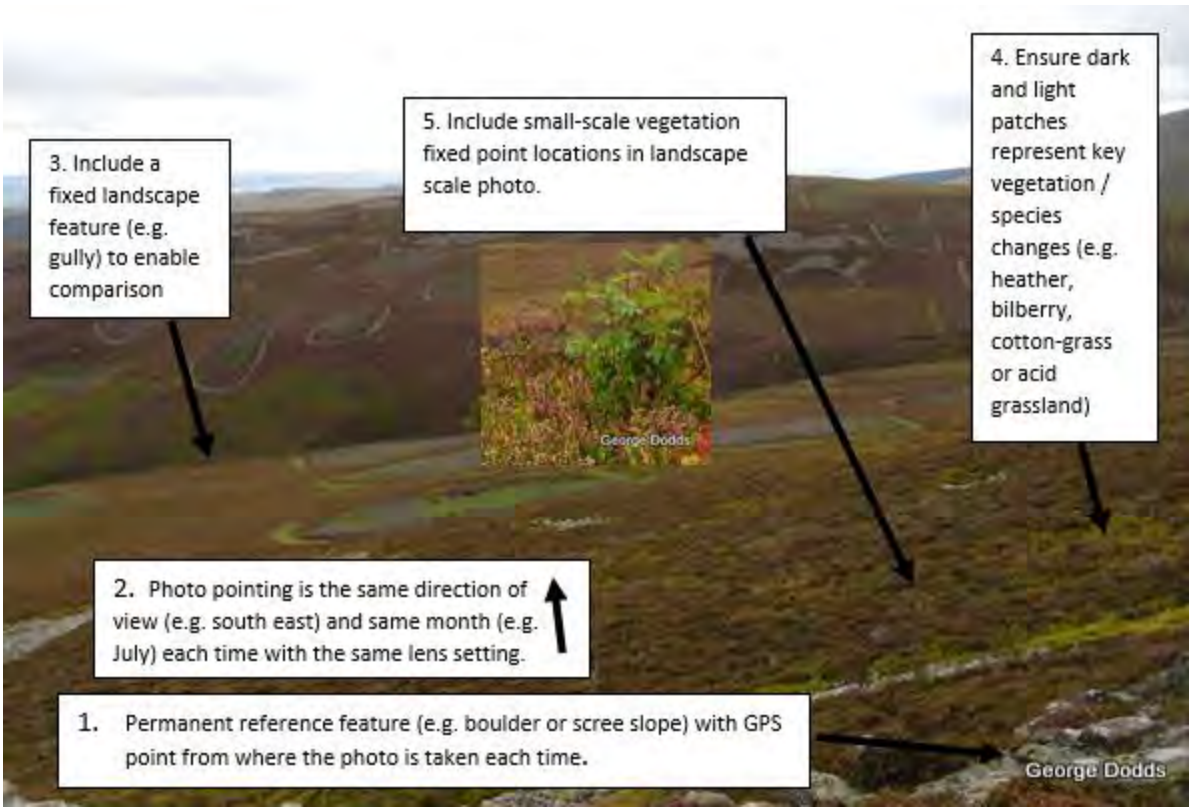


Figure 18: Landscape- scale fixed point photography

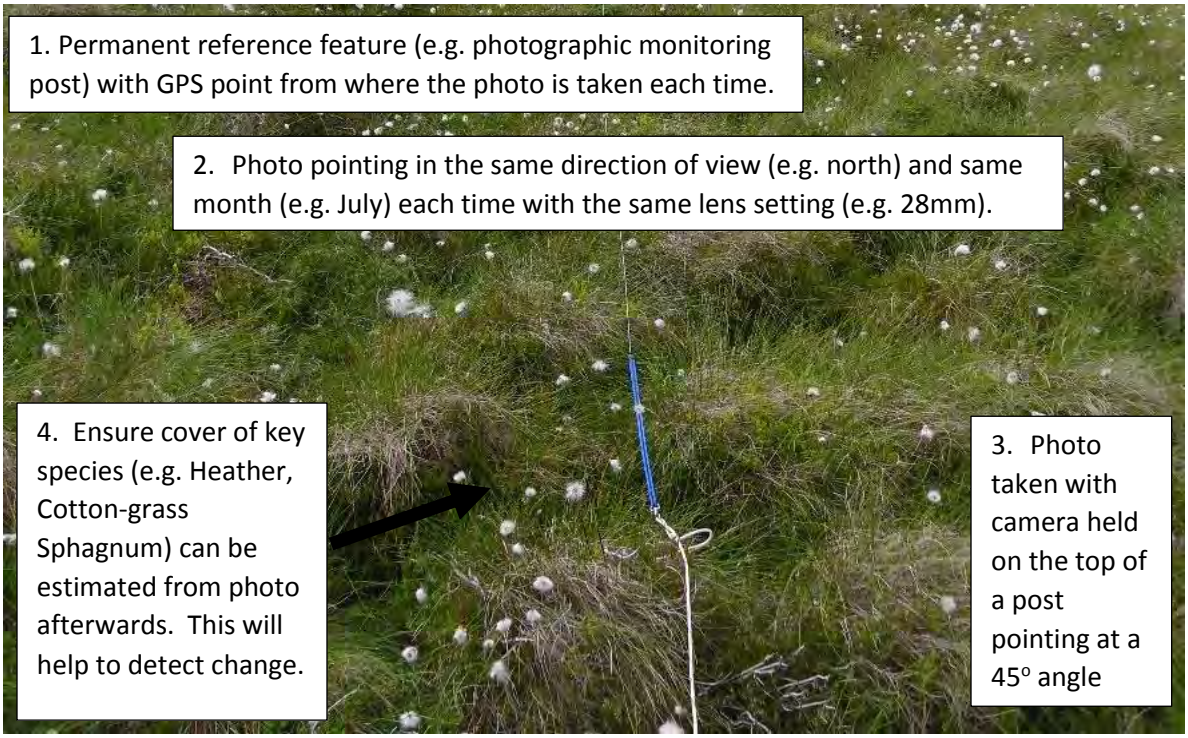


Figure 19: Small- scale vegetation fixed point photography

6.1.5 Montane vegetation restoration

Northumberland National Park will monitor the results of the re-profiling of peat hags and areas of bare peat. Northumberland National Park will provide College Valley Estates with updates when necessary (e.g. annual meeting).

6.1.6 Remote satellite sensing and aerial photographs

To complement the above on-site photographic monitoring, the potential longer-term use of new remote sensing techniques to study vegetation changes in response to land management practices will be explored during years 1 – 3 of this management plan. If successful, such techniques will be used alongside the photographic monitoring to inform future discussions regarding the delivery of the agreed joint outcomes.

Discussions have already begun with both Lancaster University and Newcastle University, prior to this plan being put together.

Northumberland National Park have provided College Valley Estates with a copy of the aerial photographs for 2016.

6.1.7 Bird surveys

Since 2014 bird surveys have been carried out at three sites on the Cheviot SSSI. Each survey area is 1km^2 and the British Trust for Ornithology breeding bird methodology is used. The sites for the surveys are centred on the following grid points: NT880 210, NT893 227 and NT925 227. A follow up survey is carried out every three years.

Breeding birds such as Peregrine, Merlin, Barn owl and Raven nests are monitored annually by John Steele.

6.2 ANNUAL REVIEW

A liaison meeting will act as an annual point of formal review. This liaison meeting will confirm that the management intervention decisions will be reviewed against the assessment criteria. Field visits will be made to intervention sites for the purposes of monitoring and evaluation by all parties.

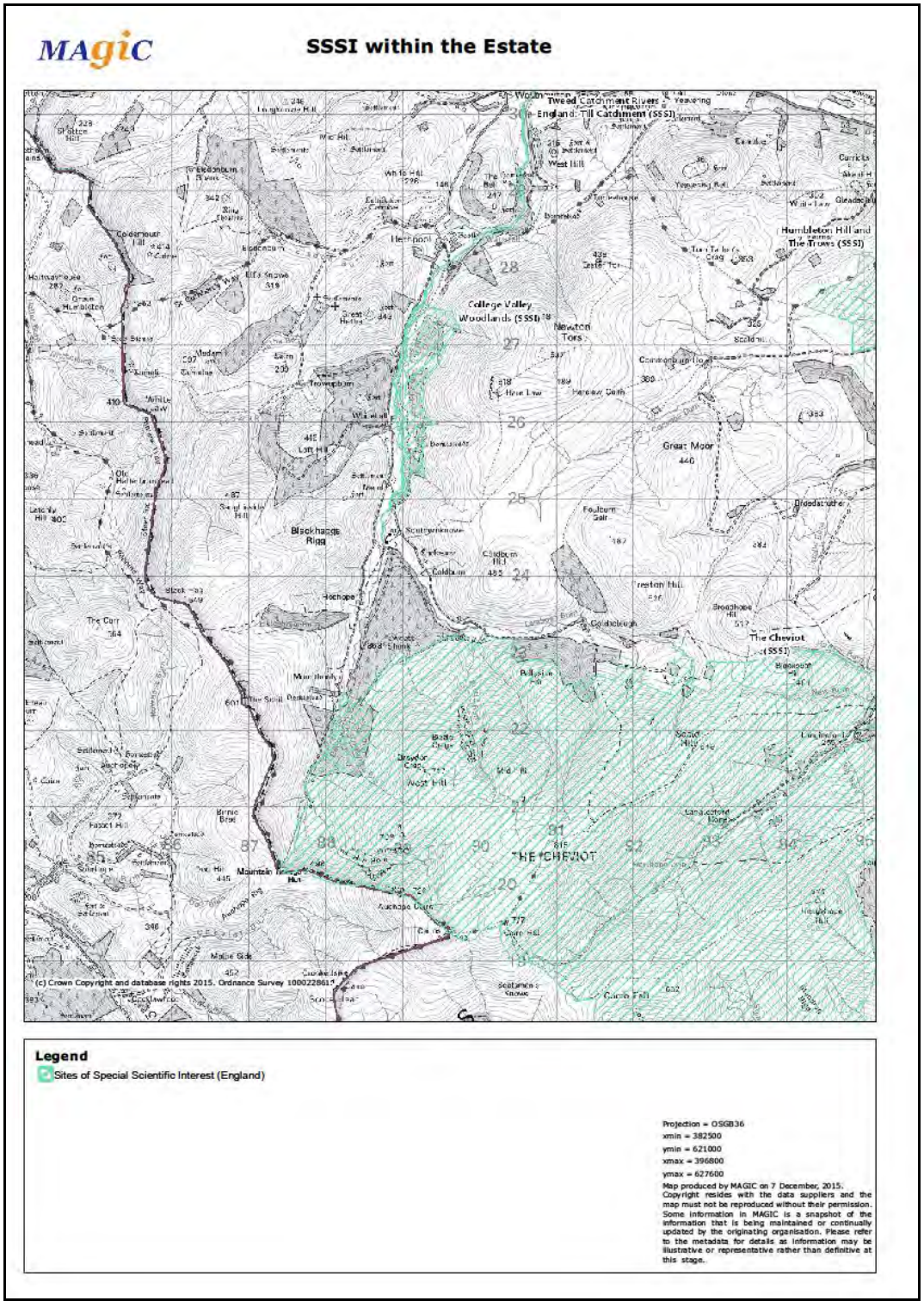
The annual review is intended to consider whether the shared vision and joint outcomes are being delivered by the management principles within the plan, and that monitoring approaches are proving effective at providing data to inform this.

Those at the meeting will include representatives from College Valleys Estates, Natural England and the Northumberland National Park.

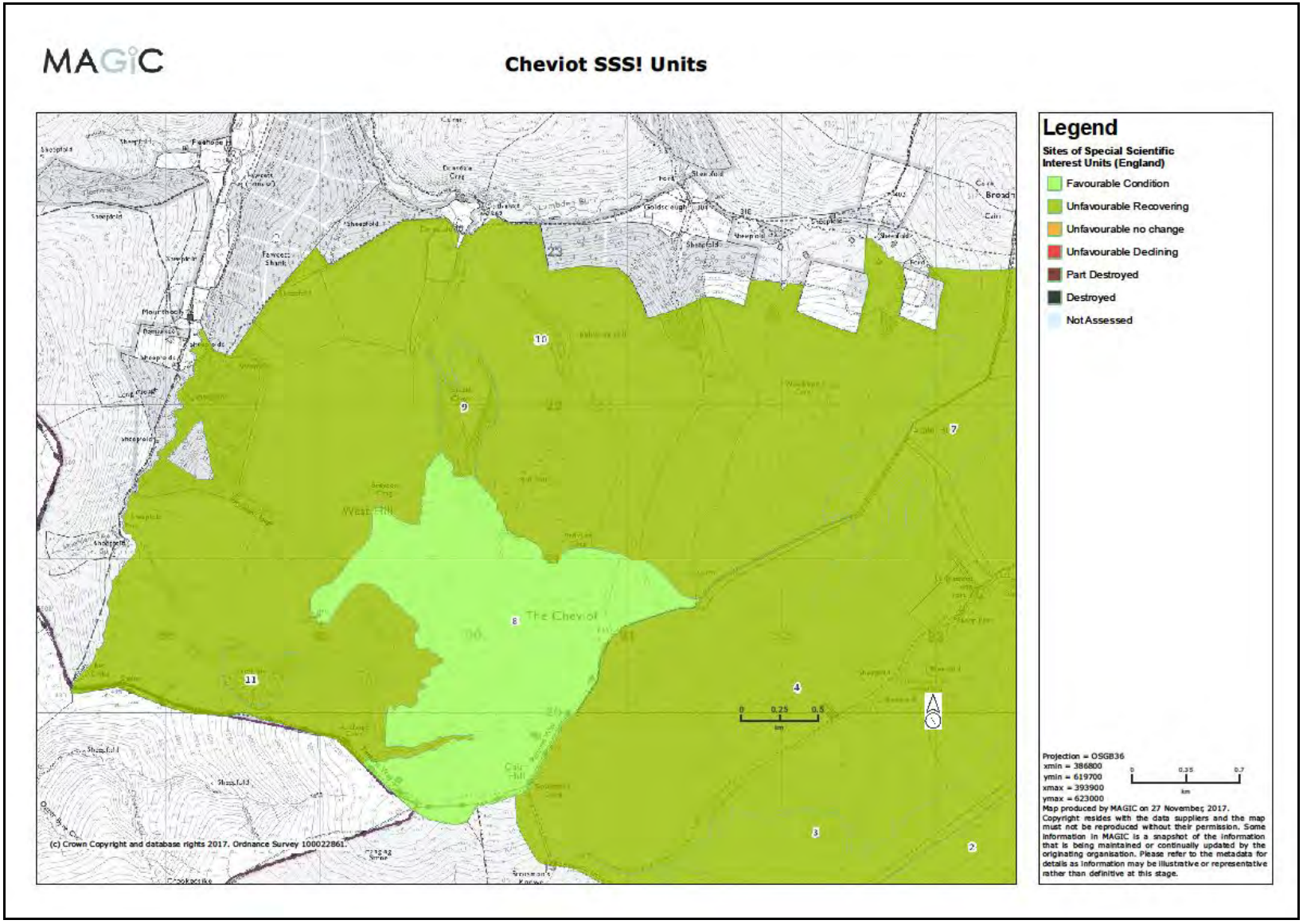
Figure 20: On-going vegetation monitoring – plot 104

7 APPENDIX

7.1 SSSIs WITHIN THE ESTATE



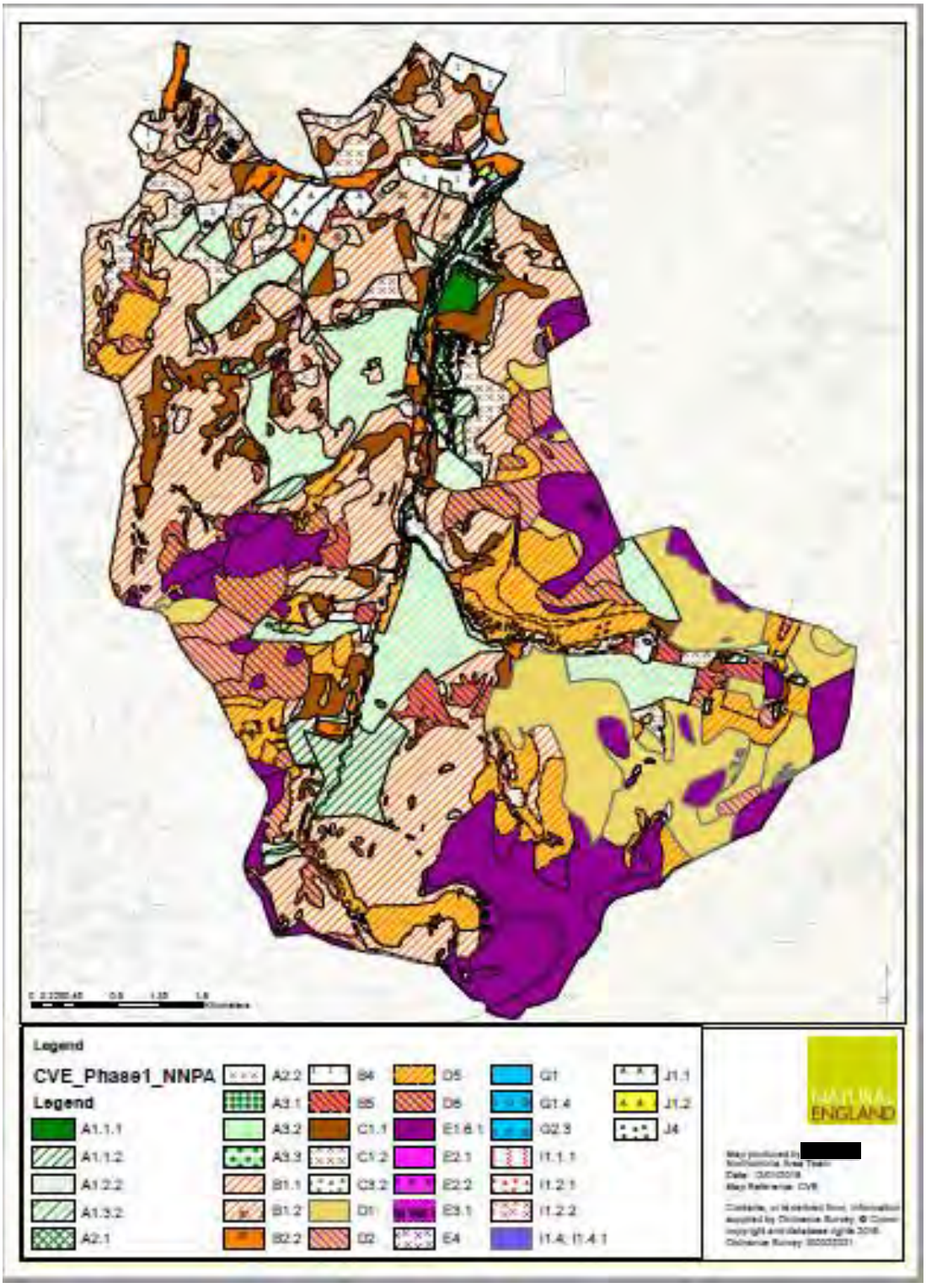
7.1.1 Cheviot SSSI units



7.1.2 Cheviot SSSI Condition Assessments (2017)

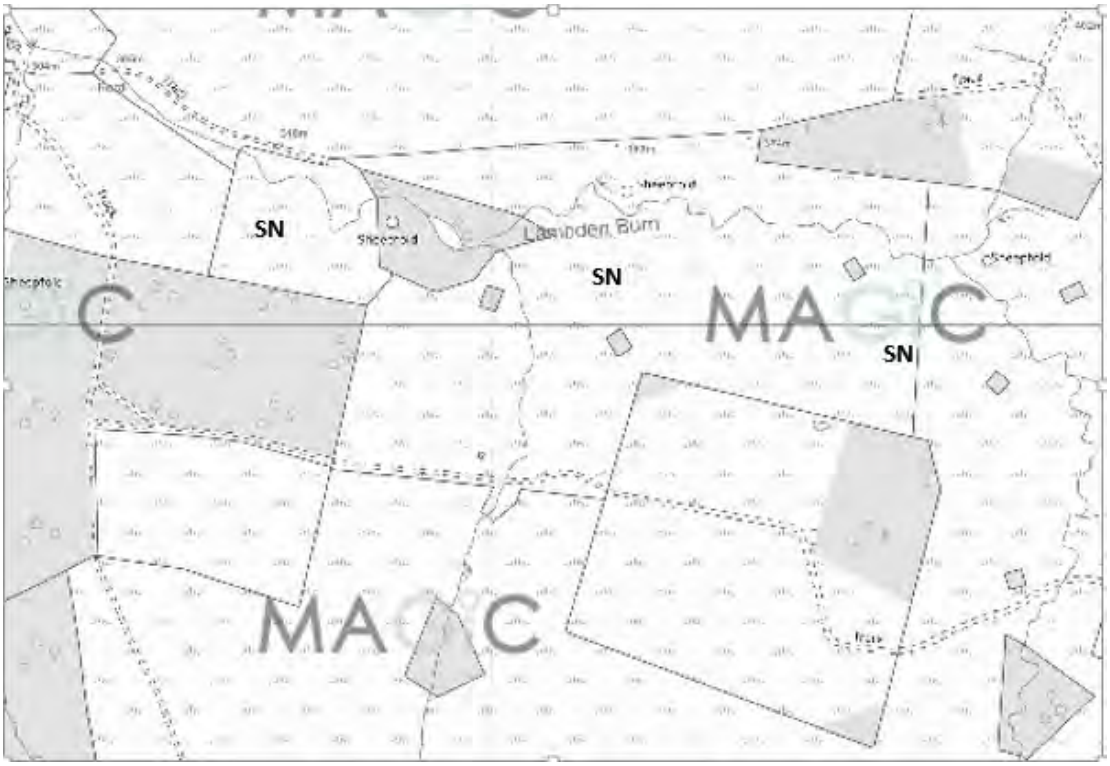
- Unit 7 incorporates some land along the eastern boundary on Scald Hill and Broadhope Hill, most of the unit is outside of CVE. It was last assessed in 2014 and is currently classed as Unfavourable Recovering due to the impacts of recreational activity (walkers accessing the Cheviot Summit).
- Unit 8 includes an area of blanket bog to the west of the Cheviot Summit. This unit is favourable: was last assessed in 2016.
- Unit 9 is the Bizzle, which was classed as Unfavourable-Recovering in 2010 due to overgrazing.
- Unit 10 covers the majority of Cheviot, the upland heath is classed as Unfavourable-Recovering due to overgrazing, and it was last assessed in 2009.
- Unit 11 is the Hen Hole; this area was classed as Unfavourable-Recovering in 2009 due to overgrazing.

7.2 Phase 1 Survey (2002 and some 2012 data)

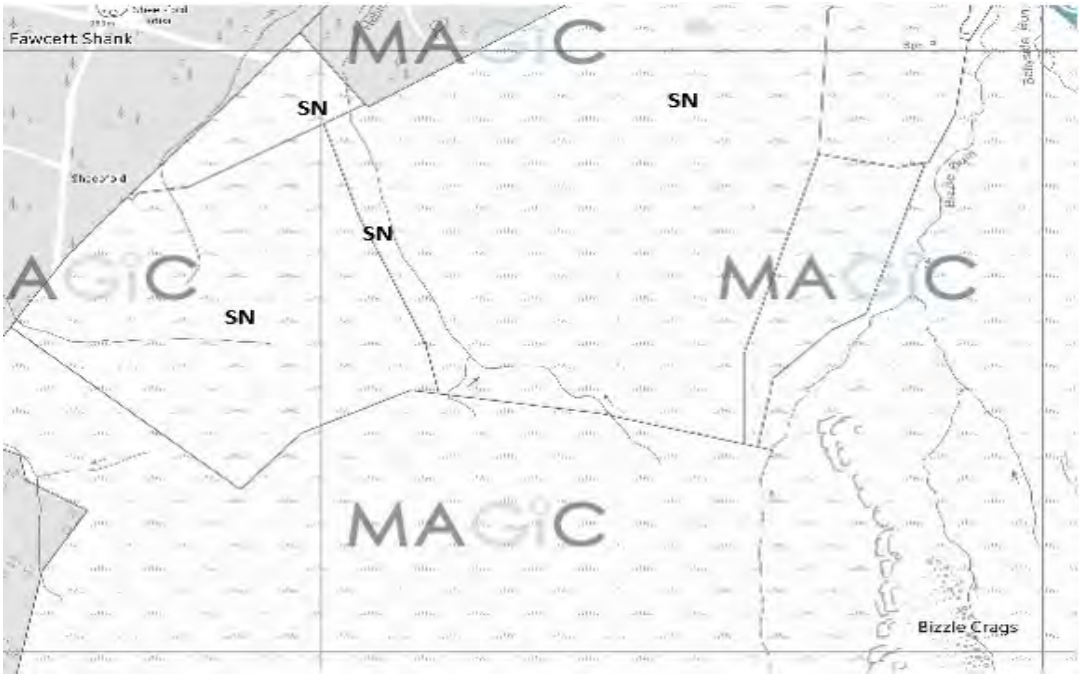


7.3 WADER TERRITORIES WITHIN BIRD MONITORED SITES IN COLLEGE VALLEY

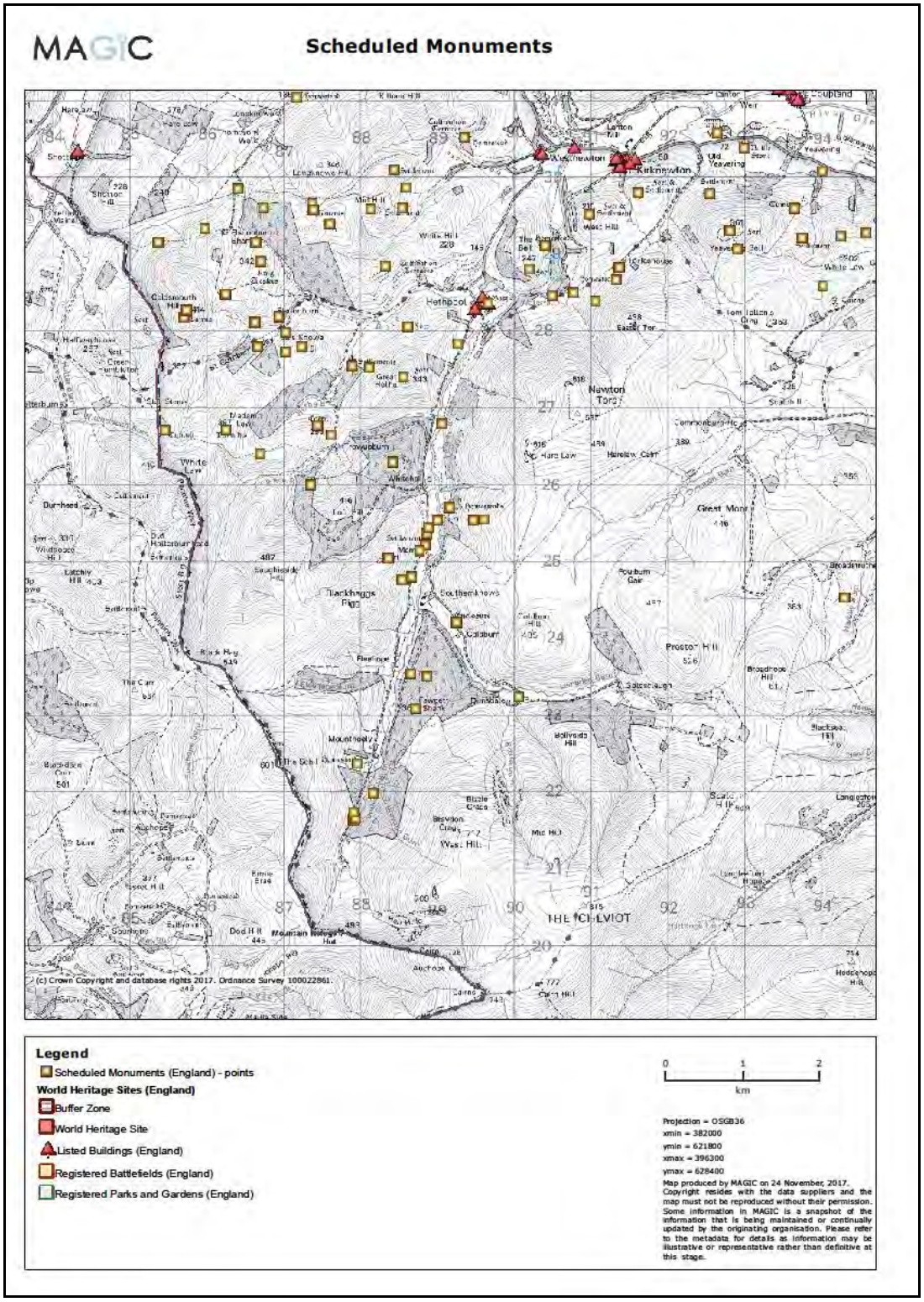
7.3.1 Goldscleugh



7.3.2 Dunsdale

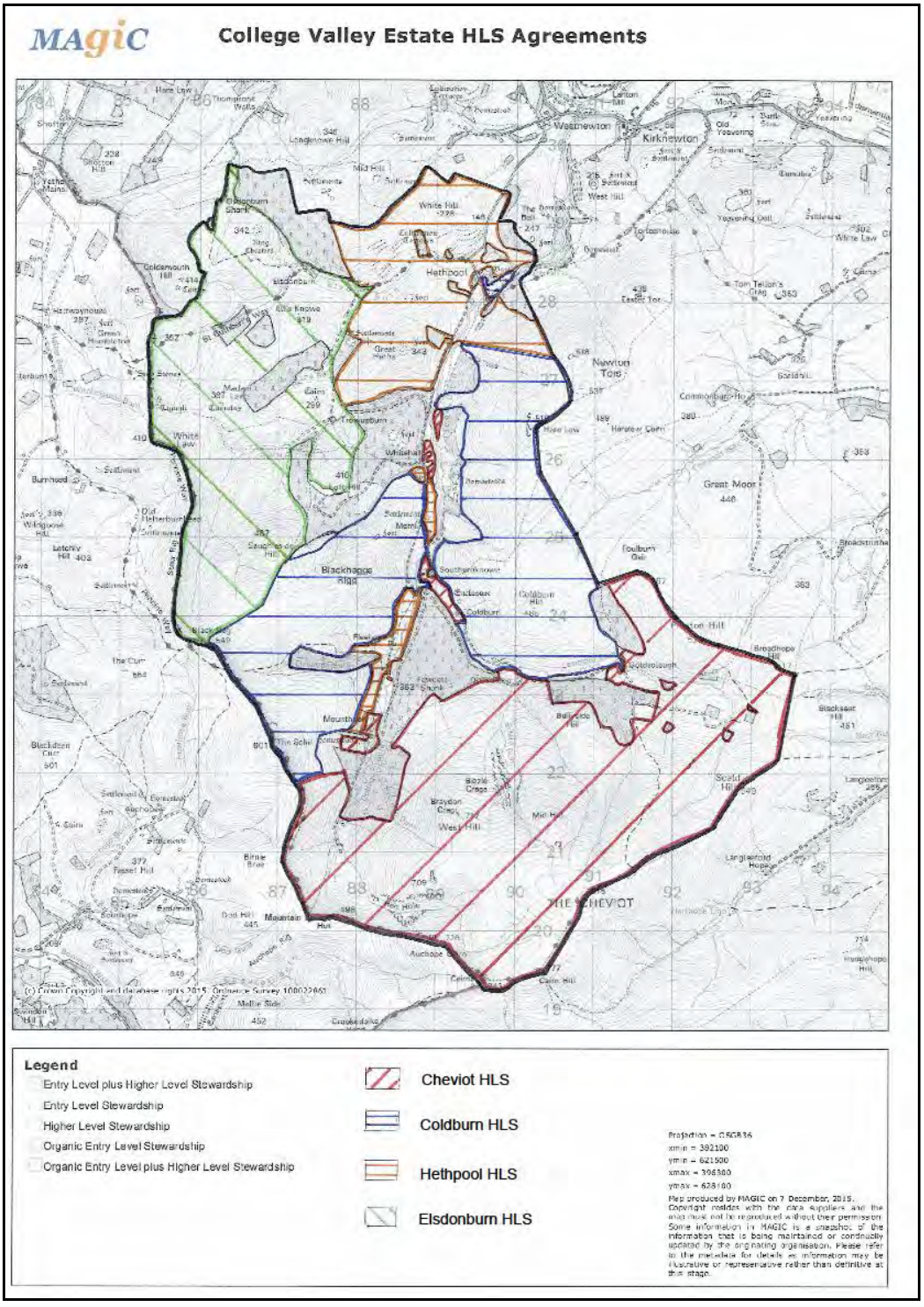


7.4 SCHEDULED MONUMENTS



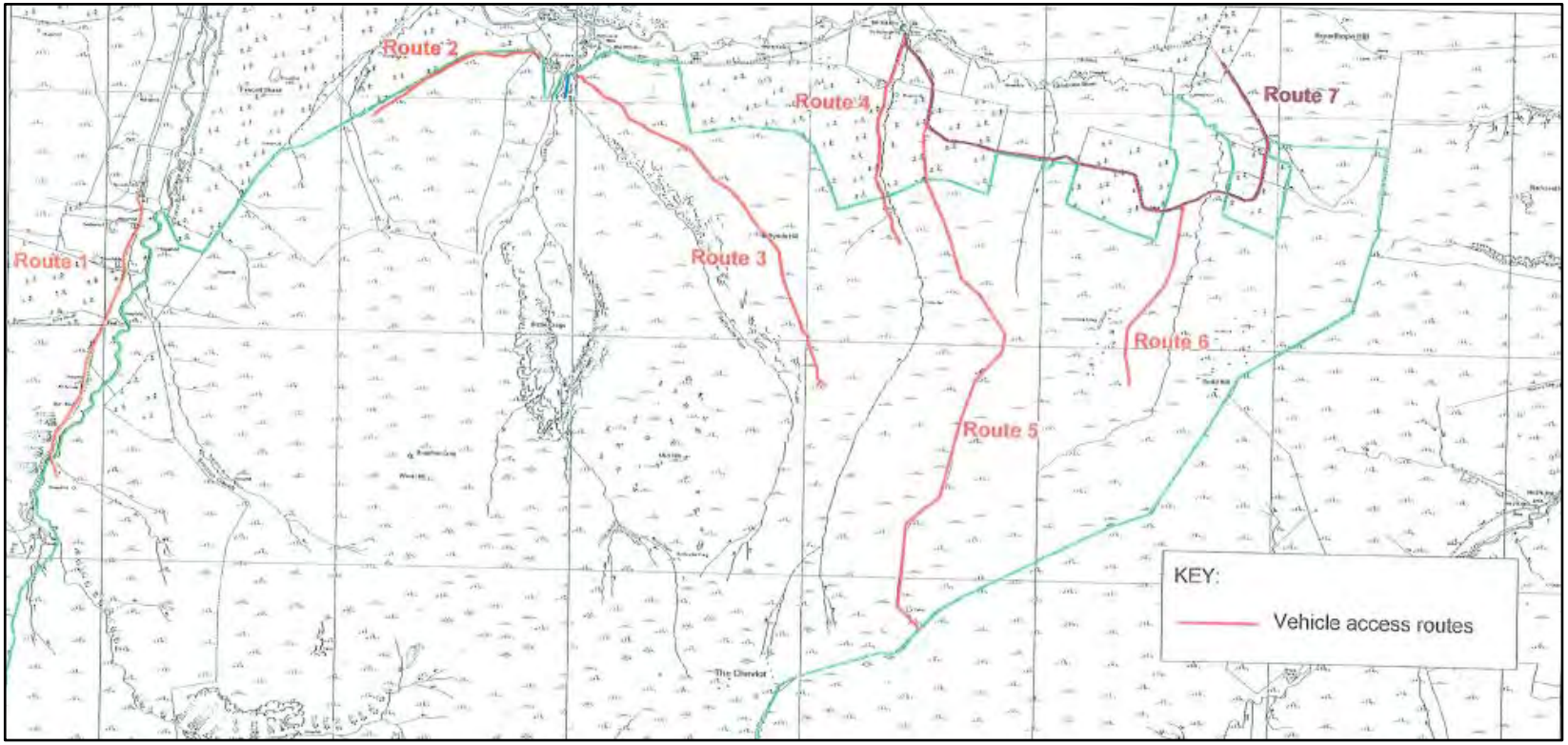
7.5 HLS AGREEMENTS ACROSS THE ESTATE

- AG00625354 (Coldburn) – managed by CVE, expires 2020.
- AG00353125 (Hethpool) – managed by Mr Elliot, expires 2020.
- AG00423221 (Cheviot) – managed by CVE, expires 2021.
- AG00425277 (Elsdonburn) – managed by Mr Waugh, expires 2021.

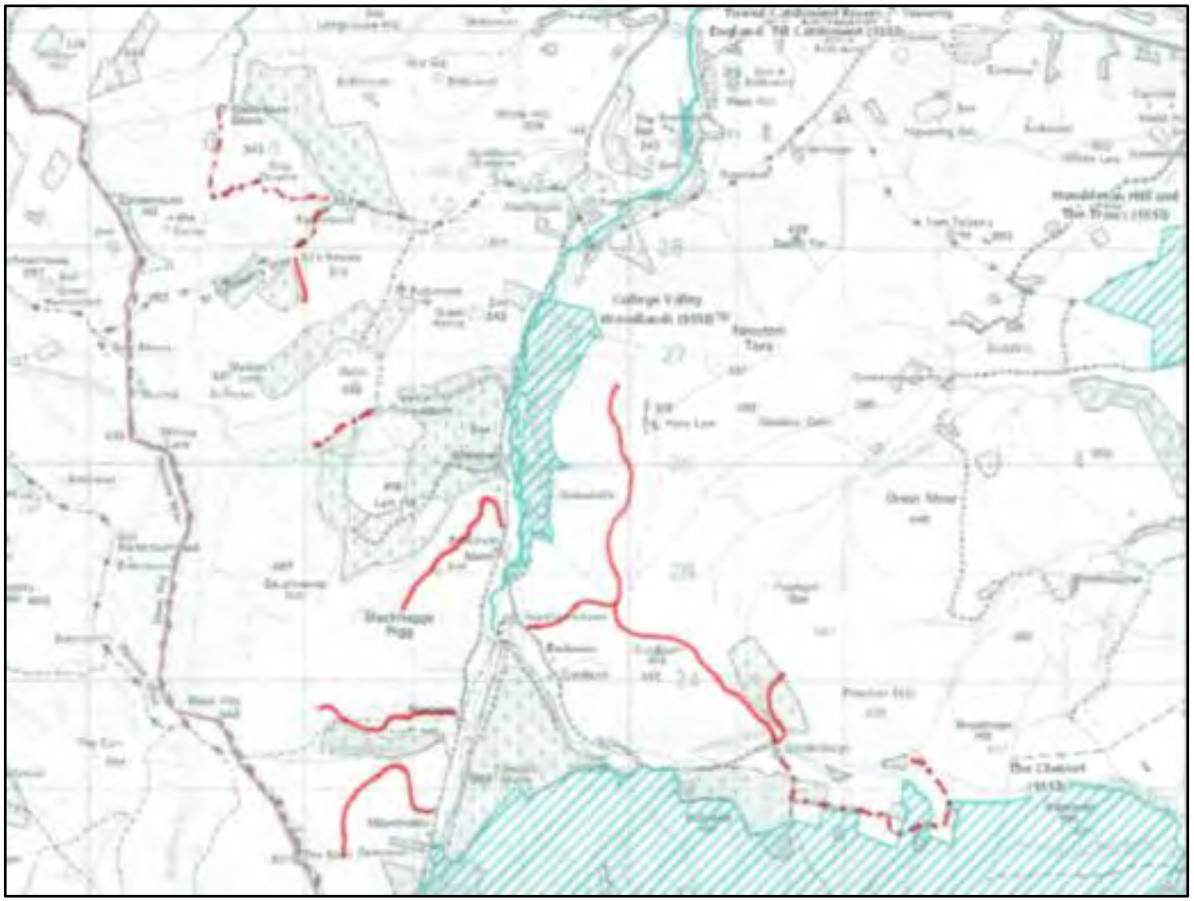


7.6 Access Routes

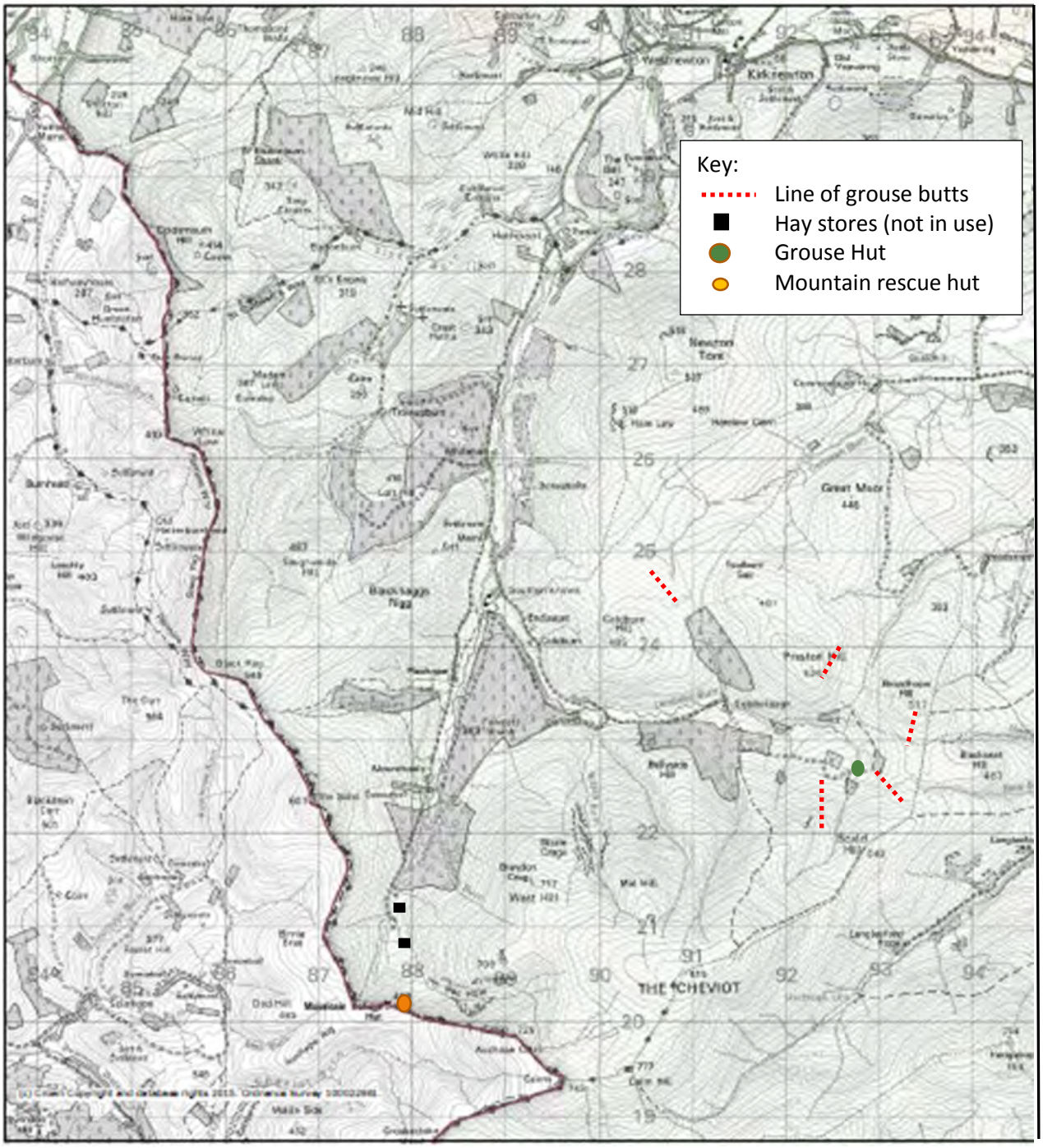
7.6.1 Cheviot SSSI



7.6.2 Access routes outside of Cheviot SSSI



7.6.3 Other infrastructure



7.7 Vegetation Restoration Management Assessments

7.7.1 Dry heath – favourable condition

Dry heath - favourable condition.

Vegetation management & restoration principle: A functioning dry heath system will maintain structural and vegetative diversity suitable for Red grouse, Ring ouzel, Whinchat, Stonechat and Merlin. These features include healthy heather and a diversity of age structures, other dwarf shrubs (e.g. bilberry, crowberry) and feather mosses.

1. Sensitive features should show no signs of disturbance, burning, cutting etc.:

Wind-clipped heath
Thin soils
Steep slopes
Gullies
Sphagnum carpets
Wet hollows
Pools
Sides of watercourses within 10m
Haggs and erosion gullies
Scree slopes
Bracken beds
Lichen dominated area
Old heather with uneven structure

3. Vegetation diversity – favourable condition:

- At least 50% of cover should be dwarf shrub (excluding gorse)
- At least 2 dwarf shrub species should be present and not located within sensitive areas (box 1)
- At least 1 species of moss, liverwort or non-crustose lichen should be present.
- **Negative species** – thistles, nettles, docks and non-natives and should be less than 1% of cover.
- Bracken and / or Soft rush should be less than 10% cover.
- Scattered trees and scrub should be less than 20%.
- Less than 10% area is disturbed bare ground (exclude recently burnt areas that have not disturbed ground).

2. Structural diversity for favourable condition:

- All growth phases of heather (pioneer, building, mature, late mature / degenerate) should be present in the area.
- At least 10% heather should be at least in the mature phase / degenerate.
- Less than 33% of the last growing season's shoots should show signs of browsing by livestock.
- No measurable decline in the overall area/extent of favourable dry heath.

Wet heath - favourable Condition

Vegetation management & restoration principle: Depth of peat less than 40cm. Management which facilitates a functioning blanket bog system, whilst maintaining structural and vegetative diversity suitable for Red grouse, Large heath butterfly, Snipe, and Golden -ringed dragonfly.

1. Sensitive features should show no signs of disturbance, burning, cutting etc.:

Sphagnum carpets
Flushes with rushes or sedges
Wet hollows
Pools
Sides of watercourses – within 10m
Haggs and erosion gullies
Uneven ground resulting from Sphagnum hummocks, cotton-grass or dwarf shrub tussocks.

2. Lower plants:

- Less than 10% of Sphagnum cover is crushed, broken or pulled up
- There should be no signs of burning into the Sphagnum, liverwort or lichen layer or exposed peat surface (although bleaching of Sphagnum layer does not fail condition assessment).

3. Dwarf shrub species – less than 33% of the last growing season's shoots should show signs of browsing by livestock.

5. Vegetation diversity

- Cross-leaved heath present within 20m radius of quadrat.
- At least 3 indicator species present: Sphagnums, Hare's tail cotton-grass, Common cotton-grass, Cross-leaved heath, Heather, Crowberry, Bilberry & Common sedge.
- At least ½ of quadrat area (10m x 10m) made up of wet heath indicators.
- At least 20% cover should be dwarf shrubs.
- Dwarf shrub (**Heather**), grasses, rushes should not exceed 75%
- Bare ground less than 10% cover.
- Negative species e.g. buttercup or non-natives should be less than 1%
- Bracken or soft rush less than 20% cover.
- Trees and shrubs less than 20% cover.

4. Negative structural features

- Less than 10% of wet heath should show signs of active drainage (resulting from ditches, heavy trampling or tracks).
- Extent of eroding peat is less than the area of re-deposited peat and / or new growth in bog vegetation (e.g. in gullies, haggs and bare peat areas etc.).
- No measurable decline in wet heath vegetation across the site.
- Less than 75% of site should be dominated by Heather.

Blanket bog - favourable condition

Vegetation management & restoration principle: Management which facilitates a functioning blanket bog system, whilst maintaining structural and vegetative diversity suitable for Red grouse, Large heath butterfly, Snipe, Golden -ringed dragonfly and possibly Water vole.

1. **Sensitive features should show no signs of disturbance, burning, cutting etc.:**

Sphagnum carpets
Flushes with rushes or sedges
Wet hollows
Pools
Sides of watercourses within 10m
Haggs and erosion gullies
Uneven ground resulting from Sphagnum hummocks, cotton-grass or dwarf shrub tussocks.

2. **Lower plants**:

- Less than 10% of Sphagnum cover is crushed, broken or pulled up
- There should be no signs of burning into the Sphagnum, liverwort or lichen layer or exposed peat surface (although bleaching of Sphagnum layer does not fail condition assessment).

3. **Dwarf shrub species** – less than 33% of the last growing season's shoots should show signs of browsing by livestock.

5. **Vegetation diversity**

- At least 6 indicator species present: Sphagnums, Hare's tail cotton-grass, Common cotton-grass, Cranberry, Cross-leaved heath, Heather, Bilberry & Common sedge.
- At least ½ of quadrat area (10m x 10m) made up of 3 or more indicators.
- Any one of Hare's tail cotton-grass, Deer-grass or Dwarf shrub not to exceed 75% cover
- Bare ground or scattered trees or shrubs less than 10% cover.
- Negative species e.g. buttercup, Bracken, Sitka spruce or non-natives should be less than 1%

4. **Negative structural features**

- Less than 10% of bog should show signs of active drainage (resulting from ditches, heavy trampling or tracks).
- Extent of eroding peat is less than the area of re-deposited peat and / or new growth in bog vegetation (e.g. in gullies, haggs and bare peat areas etc.)
- No measurable decline in bog vegetation across the site.
- Less than 75% of site should be dominated by Heather

7.7.4 Is vegetation management required on blanket bog?

Is vegetation management required on blanket bog?

Traffic light

NO

Possibly

YES

What state is the bog?

- Very active (Active Sphagnum hummock & hollow).
- Active & potentially active (State 5: High dwarf shrub cover & State 4: Grass or sedge dominated. Both with some Sphagnum and other bog species).
- Largely inactive (State 3: Dwarf shrub dominated. Sphagnum rare.

Hydrological measures are in place (e.g. grips blocked) and these are sufficient to enable blanket bog restoration without vegetation management?

NO

What is the likely direction of change?

- No change
- Becoming less active (heather increasing, Sphagnum decreasing)
- Becoming more active (heather decreasing, Sphagnum increasing)

NO

Blanket bog restoration:

'Restoration' in this context means intervention through which a blanket bog positively changes over time towards or achieving the goal of becoming a well-functioning blanket bog. This is where, subject to climatic and topographical conditions, a high water table and extensive peat forming vegetation with a diverse structure and a diversity of component species can occur in balance rather than an over-dominance of any one species.

Will vegetation management help to

a) Create, maintain or enhance a diverse hummock and hollow structure of the vegetation and peat surface?
b) Provide shelter, cover, viewing points, drying areas and over-wintering survival opportunities for red grouse and other birds.

Vegetation management in this context means non-rotational management (e.g. cutting or burning) on largely inactive (State 3), potentially active (State 4) or modified active blanket bog (State 5) on deep peat in excess of 40cm where this is a necessary for restoration purposes, but excluding areas of very active blanket bog (State 6 – very uncommon in College Valley). See Blanket Bog Outcomes Approach Land Management Guidance pack (Uplands Management Group and Moors for the Future Partnership, 2017) for full details and definitions.

Diversity of component species

Will vegetation management help to reduce the shading effect of a dominant heather canopy (or sometimes cotton-grass canopy) on understorey species to:

a) Promote an equal balance of heather, cotton-grass and hummock building Sphagnum mosses
b) Promote a diversity of dwarf shrubs (e.g. cross-leaved heath, crow berry, cranberry, cowberry & bilberry), feather mosses, reindeer lichens and other bog plants (e.g. sundews, bog asphodel, cloudberry, deergrass)
c) Provide more varied food and nesting opportunities for grouse and other birds.

Well –functioning blanket bog

Will vegetation management help to:

a) promote the main peat forming species (hummock forming red-olive Sphagnum mosses, cotton-grasses?
b) Increase rainwater reaching lower vegetation layers and bog surfaces?
c) Reduce drying effect of heather litter layers and bog surfaces?
d) Raise the water table by reduction of the heather root system?
e) Maintain or enhance the damp, thin living surface layer of peat forming vegetation ('the acrotelm')?
f) Reduce water loss from the bog (e.g. by reducing occurrence of peat pipes, slumping and gullies)?

Bracken - favourable condition for management

Vegetation management & restoration principle: Management which facilitates a reduction of bracken and potential enhancement of underlying or neighbouring habitats for the benefit of upland species e.g. Red grouse, Curlew, Snipe.

2. Sensitive features should show no signs of spraying

Very steep slopes where soil erosion could occur.
Sphagnum carpets.
Flushes with rushes or sedges.
Wet hollows.
Pools.
Sides of watercourses.
Haggs and erosion gullies.
Scree slopes.
Sensitive archaeology.
Plant diversity (including Waxcaps).
Bracken beds with breeding Whinchat, Stonechat, and Dark-green fritillary butterfly.

2. Lower plants:

- Less than 10% of Sphagnum cover
- There should be no signs of killing off Sphagnums, liverwort or lichen layer.

3. Bracken.
Canopy of between 50% - 100% cover can be sprayed.

5. Vegetation diversity

Violets, Climbing corydalis, Chickweed wintergreen, bluebells and / or other fern species within 100m of the quadrat.

Waxcaps present?

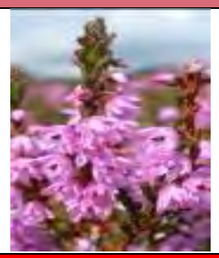
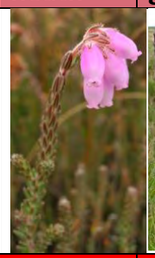
4. Negative structural features

- Areas (0.2 ha) of deep litter layer should be avoided unless there is a plan to revegetate the area post spraying.
- No measurable decline in under-lying vegetation across the sprayed site.

7.7.6 Dry heath – traffic light system

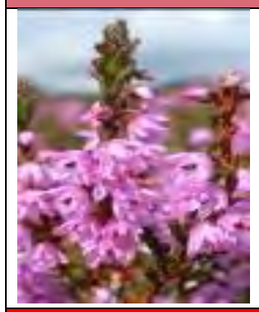
Dry heath – vegetation management (on areas of peat less than 40 cm deep or mineral soils and rocky areas). Altitude up to 600m*							
Heather	**Other dwarf shrubs**	**Bell heather**	**Feather mosses**	**Purple moor-grass**	**Other plants**	**Habitat type**	**Is habitat management required?**
						Sensitive dry heath Dry heath	
Heather less than 50% cover. Not forming a canopy and less than 30 cm in height.	Bilberry, Crowberry, Cowberry usually present	May be present	Usually present	May be present	Usually present: Heath bedstraw, Tormentil, Milkwort, heath-wood-rush, Greater wood-rush, Hard fern, Male fern	Sensitive areas: Wind-clipped heath, thin soils (less than 5cm), Steep slopes ((less than 3º), gullies, wet hollows, pools, sides of watercourses and springs (within 10m), haggs and erosion gullies, areas of established scrub, scree slopes, Bracken beds, Lichen dominated area and old heather with uneven structure	No management Supporting nesting Merlin
Between 50% and 75% cover, usually with open Heather canopy and sometimes more than 30 cm in height	May be present (see above for species).	May be present	Usually present	Present. May be abundant.	Often present (but not always).	Sensitive areas see above Dwarf shrubs or grasses less than 75% cover	No management
Greater than 75% where there are degenerate growth phase	May be present	May be present	Usually present	Generally not present	May be present	Sensitive areas – see above Known nesting areas of Merlin	No management
Between 50% and 75% cover, usually with open Heather canopy and greater than 30 cm in height	May be present	May be present	Usually present	May be present	May be present	Dwarf shrubs or grasses more than 75%	Cutting or burning once the Heather reaches at least 30cm, on a 12 year minimum rotation. * Vegetation management above 600m in areas that are not deemed to be 'sensitive areas' will be agreed with Natural England prior to management being carried out.
Greater than 75% cover. Usually with dense closed canopy and at a height of greater than 30cm.	May be present	May be present	May be present less than 10%.	May be present	May be present	Dry heath areas in mature or degenerate growth phase Areas that do not support ground-nesting species such as Merlin.	Burning / cutting on a minimum of a 12 year rotation.

7.7.7 Wet heath – traffic light system

Wet heath – vegetation management (on areas of peat less than 40 cm deep or mineral soils and rocky areas). Altitude up to 600m*.							
Heather	**Other dwarf shrubs**	**Cross-leaved heath**	**Purple moor-grass**	**Sphagnum mosses**	**Cotton-grasses**	**Habitat type**	**Is management required for habitat restoration?**
						Sensitive wet heath Wet heath	**Methodology for peat depth:** Walk 'W' through proposed management area. Take between 5 and 10 depth measurements.
Heather less than 50% cover. Not forming a canopy and less than 30 cm in height.	Bilberry, Crowberry, Cowberry, usually present Cranberry can be present on wettest areas.	May be present	May be present	May be present	Hare's – tail cotton-grass may be present	**Sensitive features:** Sphagnum carpets, flushes with rushes or sedges, wet hollows, pools, sides of watercourses and spring (within 10m), haggs and erosion gullies, uneven ground resulting from Sphagnum hummocks, cotton-grass or dwarf shrub tussocks.	Small scale grip blocking may be required where applicable. Restoration burning not required.
Between 50% and 75% cover, usually with open Heather canopy and sometimes more than 30 cm in height	May be present (see above for species).	May be present	Present. Can be common.	Often present (but not always).	Hare's-tail cotton-grass may be present	Sensitive wet heath – dwarf shrubs or grasses less than 75% cover	Management not required
75% cover, usually with open Heather canopy and more than 30 cm in height	Bilberry, Crowberry, Cowberry May be present	May be present	May be present. Often less than 20%	Present in small amount. Less than 10%	Hare's-tail cotton-grass may be present. Less than 20%	Dwarf shrubs, cotton-grasses or grasses more than 75%	Grip blocking may be required e.g. area to the north of Red Cribs. Restoration cutting or burning and Sphagnum inoculation / seeding where required. * Vegetation management above 600m in areas that are not deemed to be 'sensitive areas' will be agreed with Natural England prior to management being carried out.
Greater than 75% cover. Usually with dense closed canopy and at a height of greater than 30cm.	May be present	May be present less than 10%.	May be present less than 10%.	Usually absent	May be present less than 10%.	Wet heath components being lost to Heather colonisation	Restoration burning / cutting and introduction of Sphagnum or Cotton-grass. Grip blocking may be required e.g. west face of Colburn and Hare Law.

7.7.8 Blanket bog – traffic light system

Blanket bog – vegetation management (on areas of peat greater than 40 cm deep). Bogs at an altitude up to 600m.

Heather	Other dwarf shrubs	Cotton-grasses	Feather mosses	Sphagnum mosses	How active is the bog	Direction of change as shown by monitoring	Is management required for habitat restoration?
					Very active Less active Modified (inactive)	• No change (Sphagnum & Heather cover is stable). • Becoming less active (Heather increasing. Sphagnum decreasing. • Becoming more active (Heather decreasing. Sphagnum increasing).	**Methodology for peat depth:** Walk 'W' through proposed management area. Take between 5 and 10 depth measurements.
Heather up to 50% cover.	Cross-leaved heath, Crowberry, Cowberry Bog bilberry Cranberry may be present	Hare's tail cotton-grass and Common cotton-grass present.	Generally low percentage cover	Often seen in small carpets or hummocks.	Active	**Sensitive features**: Sphagnum carpets, flushes with rushes and/or sedges, wet hollows, pools, sides of watercourses and springs (within 10m), haggs and erosion gullies and areas of Sphagnum hummocks, cotton-grass and dwarf shrub tussocks.	Not required
More than 50% cover, usually with open Heather canopy and sometimes more than 30 cm in height	May be present (see above for species).	May be frequent but often less than cover of Heather	May equal cover of Sphagnum.	More than 20% cover with few carpets or hummocks.	Becoming more active	Satisfactory measures are usually in place to support a more active bog system. Bogs on the eastern side of Cheviot are generally drier than similar habitats in the North Pennines and western Cheviots	Not required. Be careful to check if mature hummock and hollow structure is present. In certain situations 75% cover of mature heather greater than 30cm may be acceptable on hummocks if most other blanket bog species are present in hollows.
75% heather cover usually with open heather canopy. Heather height more than 30cm.	May be present (see above for species).	May be frequent but often less than the cover of Heather	Feather moss cover usually exceeds Sphagnums	Less than 10% cover of Sphagnums. In places may be absent.	No change or becoming less active	Satisfactory hydrological measures may not be in place to support a more active bog. Improvements could be made.	Be careful to check if mature hummock and hollow structure is present. In certain situations 75% cover of mature heather greater than 30cm may be acceptable on hummocks if most other blanket bog species are present in hollows. Block grips if present e.g. area to the north of Red Cribs / east of Smeddum sike (further investigation required). Monitor any potential change in vegetation before restoration burning or cutting are considered. If cutting is appropriate consider potential for natural colonisation of peat-building species. Where this is unlikely, or where burning is considered follow-up of Sphagnum / cotton-grass introduction.
Greater than 75% cover. Usually with dense closed canopy and at a height of greater than 30cm. Can look like dry heather e.g. between Scald Hill and Broadhope	May be present normally less than 10%. Species include Bilberry, Crowberry and Cowberry	Usually present with just a few strands in the Heather canopy. Can be absent.	Often much more extensive cover than Sphagnums	Rare or absent	Inactive.	Satisfactory hydrological measures often not in place to support a more active bog. Improvements could be made. This appears to be the final transition phase of bogs on slopes in the College Valley where there are no grips etc.	Block grips where present and active e.g. Coldburn area, between Broadhope and Scald Hill Restoration cutting where appropriate, with introduction of Sphagnum or Cotton-grasses where colonisation is unlikely. Restoration burning with follow-up introduction of Sphagnum / cotton-grasses where these species are absent.

7.7.9 Bracken – vegetation traffic light system for management

Bracken – vegetation management.

Bracken	Flowering plants & sedges, Sphagnums	Ferns	Bare ground / deep litter layer	Archaeology	Water e.g. watercourses, springs, flushes, pools	Direction of change as shown by monitoring	Is management required?
						No change in bracken cover Bracken spreading slowly Bracken spreading quickly	
Bracken less than 40% cover. Not forming a canopy. Very steep slopes Dark-green fritillary butterfly present.	Violets, bluebells, Chickweed wintergreen, Wood anemone, Climbing corydalis, sedges, Waxcaps may be present	Male ferns, Broad-buckler, Hard – shield, Hard, Polypody may be present	More than 0.1 ha in any one block	Schedule monument – Sensitive archaeological feature – contact Heritage England.	No spraying within 6m of feature	No change	Not required Sensitive archaeological features e.g. under-ground sites may be sprayed if discussion have taken place with Heritage England.
40% - 60% cover.	Can be frequent (see above for species). Violets are especially important in areas where dark-green fritillary butterflies occur (northern part of estate)	Can be frequent but often less than cover of bracken	Present in areas less than 0.1ha	See above	Spraying 6m away from feature unless using aerial spraying or are close to a spring used for drink water (50m away)	Bracken beds slowly increasing	Proximity to watercourse will be dependent on what method spraying is used e.g. helicopter, weed wiper or using a lance from the back of a quad or other similar machine. Areas can be important for breeding Whinchat, Stonechat, Tree pipit and Nightjar.
Greater than 60% cover. Usually with dense closed canopy and at a height of greater than 60cm	May be present normally less than 10% (see above).	May be present with just a few plants such Male fern and Hard fern	See above	See above	See above	Bracken beds increasing rapidly often as a result of reduction in livestock especially in winter.	See above.

7.8 MANAGEMENT GUIDELINES

7.8.1 'One-off' restoration burning on blanket bog

- Restoration burning is a 'one-off' operation and will be followed by the application of Sphagnum and other species where required to achieve favourable blanket bog.

- Records of GPS locations and dates of all restoration burns will be maintained and made available to Natural England.

- Burning vegetation will take place between 1st October and 15th April, providing that there are no nesting birds in the location of works. College Valley Estates stop burning in the first week of April.

- All burning will follow the Heather and Grass etc. Burning (England) Regulations 2007 (and any subsequent amendments or future revisions thereof and should be in accordance with Defra 'Heather and Grass Burning Code' (2007 version and any future revisions thereof)

- Individual burns will usually be less than 30m wide and will not exceed a maximum width of 55m.

- Burning will not expose bare soil along any natural or artificial channel through which water flows and, where possible, will avoid areas within 5m of such features likely to be significant hydrological function taking water off site.

- Burning will not be undertaken on steep hillsides and gullies where slopes are steeper than 1 in 3 or in areas above 600m above sea level.

- Burning will be carried out only with cool and quick burns which remove the dwarf-shrub canopy and leaves behind a proportion of 'stick' and when conditions allow for this. When conditions do not allow for this, fires will not be started.

- Following the burn, the moss and lichen layer will remain intact and the peat surface will not be exposed or scorched.

- When required, follow up treatments (the spreading or inoculation on each burnt area of blanket bog with Sphagnum mosses and cotton-grasses seed or pellets) will occur within one year of the initial burn.

- The Land Manager will ensure that burning is conducted with sufficient personnel and equipment to control and regulate the burn and take all reasonable precautions to prevent damage to neighbouring land.

- The Land Manager will inform Natural England as soon as possible and within a week of any accidental burns that do not follow the practices listed above.

7.8.2 One-off cutting of vegetation to reduce dominance of Heather/ other species

- One-off cutting of Heather or other over-dominant species will take place between 1st July and 1st April, providing that there are no nesting birds in the location of the works. The majority of the cutting, in the College Valley will take place after the 15th July to avoid ground nesting bird. Drought conditions will also be avoided in accordance with the wild fire plan.

- All cutting will be carried out by low ground pressure vehicles, preferably during the autumn months when ground conditions are likely to be firmer.

- Cutting will not scalp or damage the moss or peat surface. Cuts will be a maximum of 30m wide by 100m in length.

- If cutting is being used to create an extensive firebreak, the location, size and management of these will be subject to separate consent from Natural England.

- Cut material will be flailed/chopped/brashed to create a mulch on the surface of the peat. This will be evenly distributed across the cutting plot and there will be no signs of piles that can shade out any potential regeneration of bog building species.

- Where required, follow up treatments (e.g. the spreading or inoculation of each cut area of blanket bog with Sphagnum mosses and cotton-grass seed or pellets) will occur within one year of the initial cut.

- Patches of degenerate heather will be left uncut in traditional Merlin (or other ground nesting birds of prey) sites and at least 10% of heather in the late mature / degenerative stage will be retained across the site to achieve a mosaic of heather structure.

- Use of cutting machinery must not result in rutting or exposure of the peat or damage to Historic Environment features.

Cutting will not be undertaken where;

- It is too wet to cut the plot with machinery and rutting or disturbance to the peat is likely in the plot, or access to the site would cause rutting elsewhere.

- Structural diversity of the vegetation (e.g. Sphagnum hummocks, cotton-grass tussocks) would be reduced.

7.8.3 Sphagnum collection from donor sites

- Collection of Sphagnum species suitable for peat formation will be conducted sustainably from suitable receptor sites (e.g. Coldburn Flats) for the restoration of blanket bog elsewhere on the site.

- Where possible this will be done by hand collection of material rather than mechanical collection.

- No damage to the hummocks/hollow nature of the bog surface will take place.

7.8.4 Sphagnum introduction at receptor sites

Introduction of Sphagnum species suitable for peat formation will be carried out if restoration objectives are not met through natural colonisation. This is considered likely to be the case in areas of restoration burning intervention and where Sphagnum is absent from managed sites. This will be carried out by one or several of the techniques suggested in the Blankets Bog Outcomes Approach Land Management Guidance pack (Upland Management Group & Moor of the Future Partnership, 2017):

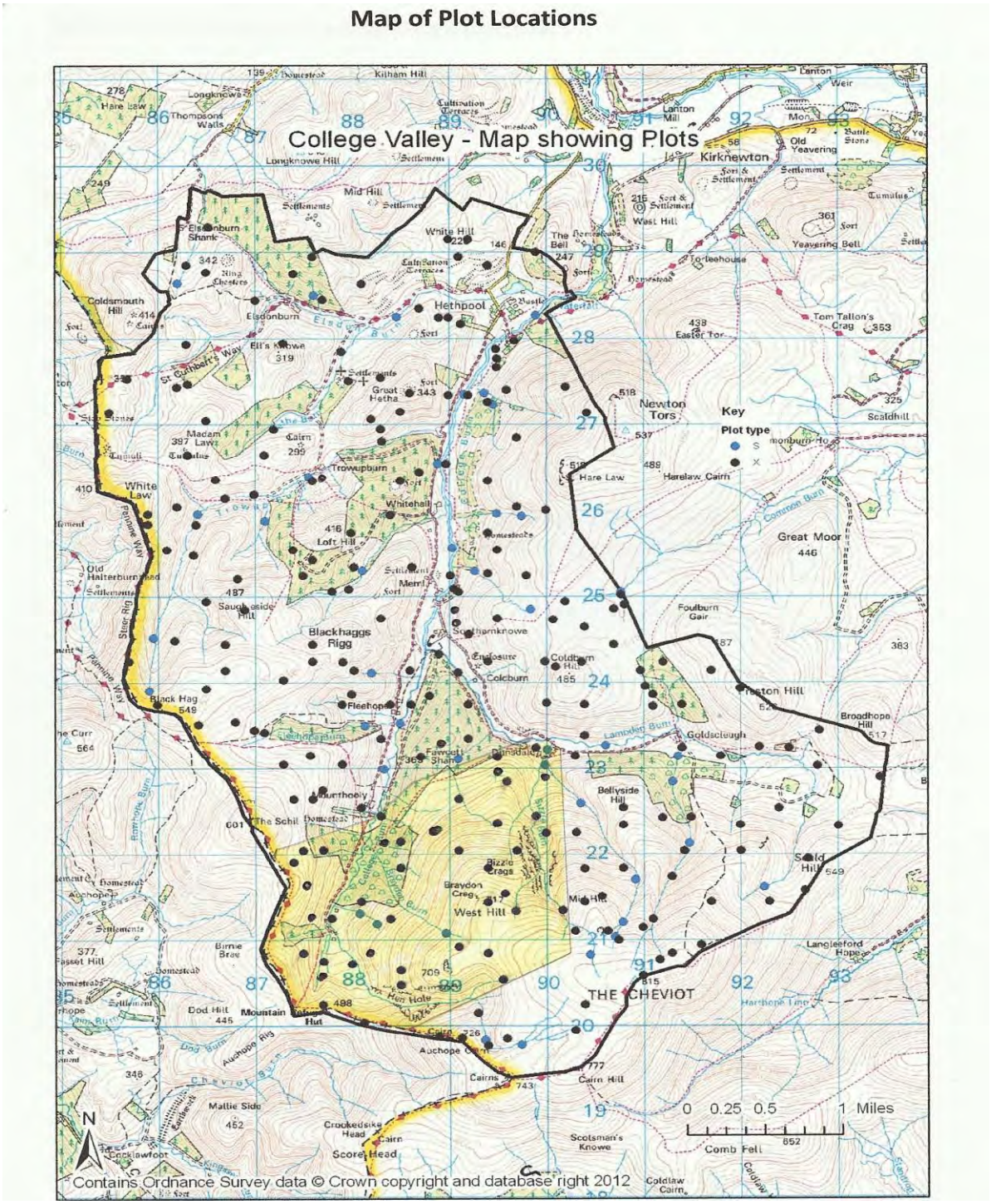
1. Direct transplanting of Sphagnum harvested on site and moved to an area where it is needed, usually by hand methods.
2. Cutting of brash containing Sphagnum material and spreading on required areas.

Other techniques including spreading of pellets with Sphagnum spores and micro-propagation will be considered. These techniques are considered to be less applicable to the College Valley – upland blanket bogs in the north eastern Cheviots are some of the driest in UK due to the reduced rainfall. Average rainfall at Berwick-upon- Tweed Meteorological station is 589.2mm (1981 – 2010).

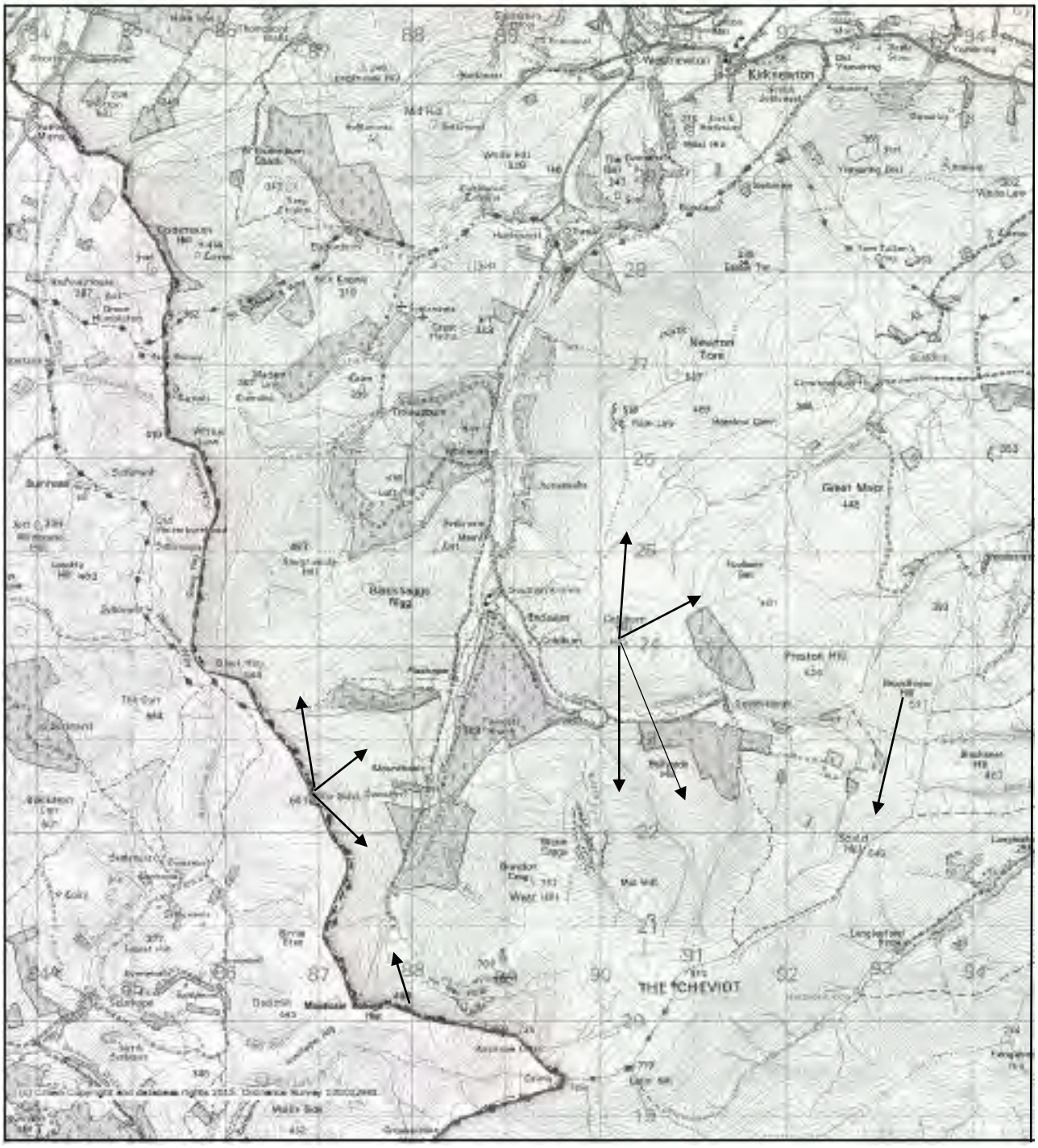
Sphagnum spores and micro-propagation techniques will be attempted if transplantation of Sphagnums is deemed not successful i.e. restoration objectives are not met.

7.9 INDEPENDENT VEGETATION MONITORED PLOTS

Map of Plot Locations



7.10 LANDSCAPE SCALE PHOTOGRAPH SITES



7.11 NORTHUMBERLAND NATIONAL PARK PEATLAND PROJECT

The majority of the summit of The Cheviot is in the ownership of CVE. Three other land owners own areas of Cheviot. The summit plateau, which is at an altitude of over 800m (>2400ft) is an area of blanket peat with bog and montane heath vegetation designated as SSSI. Extreme weather (frost heave, snow and wind), historic grazing patterns and recreation, have probably all contributed to hagging and bare peat areas. Apart from the weather, these issues have been addressed on the CVE area – currently there are no sheep on the summit area and a flagged path has been created on the Pennine Way. No burning occurs on the summit of Cheviot.

Hagging of the blanket peat on the flatter areas has occurred and at the edges of the peat cap, where the ground becomes steeper, there is some gully formation. There are no artificial drains on the site. In places some of the gullies have revegetated naturally. Natural re-colonisation with common cottongrass (*E. angustifolium*) has occurred on many more of the flatter areas of peat since the sheep have been removed. However some areas (both steep hags and flatter areas) show no signs of re-vegetating, probably due to frost heave and wind on this very high altitude and exposed site. Low pH may also be an issue (tests carried out about 18 years ago when the flagging work was carried out showed a pH of 3). The peat depths measured at a range of locations around the site go up to ~2.7m but in places the peat is only 40cm deep. Some gullies have eroded down to the mineral base with visible stones at the base of the gully. There may also be peat pipes in some places, with water leaving the peat cap into gully bases in unexpected ways. Outside of the gully walls and bare peat areas, the vegetation cover is improving, with recent SSSI condition assessments suggesting the vegetation is moving to 'favourable condition'.

DEFRA have awarded funding to four peat restoration projects in England, based on carbon capture and the value to wildlife, which in total will work on 21 peatland sites. With the backing of the CVE Board, NNPA were successful in being awarded funding for Cheviot summit to be one of these sites. The intention is to carry out peat reprofiling and revegetation work using low ground pressure machinery in late summer / early autumn 2018 and 2019 on up to 57,100m of bare gully walls and haggs. Other work to on cover bare peat with sphagnum-rich heather brash, lime-seed-fertiliser application and sphagnum clump relocation is also planned. CVE are working closely with NNPA and Natural England to develop and implement this project which is probably one of the most challenging peat restoration projects in the country because of the location.

8 REFERENCES

Below are a list of management plans that have relevance to this plan:

- Long-term Sustainable Development plan 2001 – 2021. Natural Capital Jan. 2001.
- Elsdonburn / Cheviot Farm Environmental Plan. Farming & Wildlife Advisory Group 2005.
- Coldburn / Fleehope Farm Environmental Plan. Farming & Wildlife Advisory Group 2006.
- Hethpool. Farm Environmental Plan. Farming & Wildlife Advisory Group 2006.
- Integrated Land Management Plan. Alison Grant 2006.
- Forest Management Plan 2016 – 2036. Felix Karthaus Oct. 2015.
- Woodland Management Plan 2017 – 2027. For the Forestry Commission. George Dodds & Co 2017.
- Goat management Plan. D. Bullock & J. Smith (Annually reviewed).
- Scheduled Monument Review – Tom Gledhill – Historic England 2017.
- Wildfire plan – College Valley, R Stacey, 15th March 2015 (Reviewed - June 2018 with minimal change).