Natural England Commissioned Report NECR343

NVC and Condition Assessment Surveys of West Penwith Moor Cornwall (2012)

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Foreword

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Background - Since 2012, Natural England has been gathering evidence to ascertain whether land in the Penwith Moors in west Cornwall meets the published guidelines for the selection of Sites of Special Scientific Interest (SSSIs). This report is one of many commissioned by Natural England to provide the evidence required to identify those areas which should be included in an SSSI designation, to identify the features to be designated and to inform definition of the SSSI boundary. This report will also help to inform future site monitoring and to provide land management advice.

This report should be cited as: *Adams, S. et al., (2012). NVC and Condition Assessment Surveys of West Penwith Moors, Cornwall 2012 Cornwall Environmental Consultants Ltd.*

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Further information
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NVC and Condition Assessment Surveys
West Penwith Moors
Cornwall

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Final Version

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1. Introduction

1.1. Background

Cornwall Environmental Consultants Ltd was commissioned by Natural England in September 2012 to undertake a National Vegetation Classification (NVC) survey and condition assessment (CA) of a number of moorland sites within the West Penwith Moors Area of west Cornwall. Natural England is gathering evidence to support the potential notification of key areas of semi-natural habitat in the West Penwith Moors as a site of special scientific interest (SSSI). It is envisaged that this work will be carried out in two phases: phase one in 2012; the subject of this report and phase two in 2013.

To provide substantive habitat information to underpin Natural England's biodiversity evidence base for the area, the moorland known locally as roughland, was surveyed to National Vegetation Classification (NVC) standards.

1.2. Outputs

The output from the field survey assessment (NVC and Condition Assessment) will be a report comprising:

- Description of field survey methods and dates, site coverage and any limitations;
- Analysis of the survey results citing the NVC documents used and how decisions to assign particular NVC types were made; justification of choosing one vegetation code over another;
- CSM compliant assessment of all habitats surveyed that are likely to meet the guidelines for selection of biological SSSIs (BAP habitats);
- Hard copy and digital maps showing the cover of NVC types and BAP habitats for the survey area, and
- Quadrat data in Excel format recording the floristic composition of the main stand types.

1.3. Methodology

1.3.1. Field surveys

All habitats within the defined area (Map 1) have been surveyed to determine the extent and classification of habitats in accordance with NVC http://jncc.defra.gov.uk/page4259, where relevant following guidance regarding degraded habitats (notably mires, heaths and acid grasslands).

All habitats within the defined area were mapped using BAP habitat survey methodologies consistent with UK Biodiversity Action Plan; Priority Habitat Descriptions (BRIG), http://www.ukbap.org.uk.library/UKBAPPriorityHabitatDescriptionsRevised 20100730.

In addition, all habitats likely to meet the guidelines for selection of biological SSSIs (likely to be lowland heath, lowland grassland and lowland wetland) were assessed in line with the relevant JNCC Common Standards Monitoring Guidance http://jncc.defra.gov.uk/page-2201.

1.3.2. Quality Assurance

From our initial meeting with Andrew McDouall (Natural England), the importance of collecting field data within the optimum period recommended for heathland habitats (CSM methodology) was emphasised. In recognition of the need for robust, defendable data to support any proposed designation of areas of West Penwith Moors as a SSSI, with only one small exception, all field survey work was completed by the end of October 2012.

The NVC and CA surveys were carried out by a team of four surveyors, who generally worked alone. All the surveyors carrying out the work were competent and experienced in the methodologies required. However, to minimise any possible variation between individual surveyors in the assignment of NVC communities and assessment of the condition of BAP habitats, surveyors were encouraged to work together at the start of the project, or where this was not possible, sites mapped and assessed by one surveyor were later checked by another surveyor from the team.

All site reports have been proof read by at least one other member of the team to ensure consistency of approach.

1.3.3. Departures from Standard Methodology

For reasons of practicality, where the total extent of a BAP habitat within a site was very small, e.g., acid grassland (U4) at Carn Galver and Noon Digery, purple moor-grass and rush pasture (M23a) at Bosporthennis, condition assessment was not carried out. In addition, based on the surveyors' previous experiences of the difficulties/inappropriateness in using the draft woodland condition assessment form (2010), as recommended as part of CSM methodology, stands of wet woodland even where significant were not assessed.

Conversely, based on the surveyors' previous experience of mapping areas of bracken habitat within the West Penwith Moors, a decision was

made a priori, to assess the condition of stands of **U20b** on the basis that such stands may represent degraded heath. Assessment of these **U20b** stands was carried out using the Dry Lowland Heath forms. Finally, to avoid loss of possibly important data on the ecological development of heath in response to burning, areas of recently burnt, but regenerating heath were sampled and assessed as part of the condition assessment of both dry and humid heaths.

1.3.4. Digital Mapping

The distribution of NVC sub-communities was mapped onto 1:2500 scale OS Landline maps supplied by Natural England in accordance with the NE guidance on field work and digital mapping as detailed in Annex 2 of the project brief.

In the absence of a standard colour coding system for NVC vegetation communities, several years ago, CEC developed a colour coding system based on the standard colour coding for Phase 1 Habitat Survey (JNCC, 1993). Thus green forms the basis for all woodland and scrub communities, purple for mires, yellow for heaths, etc. Within woodland and scrub, each community has been allocated a distinct shade of green, with hatching or other forms of patterning used to discriminate between the sub-communities within each community. A key showing colour codes for each community/sub-community is provided on each of the NVC maps.

Vegetation mosaics are indicated by a grey scale, with a label giving details of the cover percentages of each of the component vegetation communities/sub-communities.

2. Results

For detailed accounts on the findings from the NVC and Condition Assessment surveys at all fifteen sites in this phase of the West Penwith Moors study please refer to individually named and numbered sub-folders on the project CD. A copy of each of the site accounts, together with associated maps, is appended to this report in the hard copy form.

Site 2 - Chapel Carn Brea

Site 14 - Bosvenning Common

Site 23 - Chun Downs

Site 31 - Watchcroft

Site 32 - Carn Galver (south of the B3306) combined report with Site 33

Site 33 – Carn Galver (north of the B3306)

Site 34 - Bosporthennis

Site 38 - Chykembro 1

Site 39 - Chykembro 3

Site 43 - Logan Stone

Site 44 - Zennor Quoit

Site 47 - Trewey Common

Site 51 - Noon Digery

Site 52 - Trevalgan Hill (included with Site 52 - Rosewall Hill)

Site 53 - Rosewall Hill

3. Discussion

3.1. Unassigned NVC Communities

As far as possible, all stands of vegetation within each of the 15 sites (Carn Galver and Rosewall Hill are split into two parts) have been assigned to an NVC type and in most cases to a sub-community of that vegetation type. Occasionally, stands have been mapped as mosaics; where it has been possible to recognise distinct NVC types but their intimate distribution does not allow mapping at the standard scale used for the rest of the survey. In these situations, the different NVC types within the mosaic are listed along with an estimate of their percentage cover. In just two cases: Mol/Ug (*Molinia caerulea*/*Ulex gallii* – purple moor-grass/western gorse) and Mol/Pta (*Molinia caerulea*/*Pteridium aquilinum* – purple moor-grass/bracken), the recognition and mapping of distinct vegetation stands proved impossible to assign to known communities within the NVC. Rather than mask these anomalies by accommodating them within a known NVC type, a decision was taken to retain the data by recording them as a distinct vegetation types, in this case Mol/Ug and Mol/Pta.

3.1.1. Mol/Ug

Stands of Mol/Ug were mapped at Carn Galver in both 2009 and 2012. At Watchcroft, areas mapped in 2009 have since been assigned to **H8a** on the basis of the appearance, often at low cover, of ericoids, notably bell heather (*Erica cinerea*) and heather (*Calluna vulgaris*). The transition and, at Watchcroft at least, the change from Mol/Ug to **H8a** and, more generally, the close association of **H8a** within areas assigned to Mol/Ug is strong circumstantial evidence for the latter being one of the precursors for **H8a**. Certainly at Carn Galver large areas mapped as Mol/Ug occur within close proximity to stands of **H8a** and just as at Watchcroft there has been a significant change in the balance of Mol/Ug to **H8a** between the two survey dates; with an increase in the cover of **H8a**. Despite the strong circumstantial evidence of the transitional relationship between Mol/Ug and **H8a**, the likely progression from one to the other can be slow, with some areas of Mol/Ug at Carn Galver showing little change between the two survey dates. This suggests that Mol/Ug can persist at least over the medium term and may possibly be stable for many years. If the relationship of Mol/Ug and **H8a** is correct, one possible genesis for the development of Mol/Ug is likely to be from the burning of heath; either dry heath or possibly humid heath (**H4c**).

3.1.2. Mol/Pta

Vegetation stands assigned to the non-NVC type Mol/Pta comprise little more than tall dense tussocks of purple moor-grass, through and above which is growing bracken. In contrast to Mol/Ug, sub-shrubs are generally absent, with the only other occasional species being common sorrel and the straggling shoots of bramble. Mol/Pta occurs at Carn Galver where it is found in association with heath (**H4c**/**H8a**) and bracken dominated (**U20b**) vegetation and within a similar context at Zennor Quoit, where it

covers a large proportion of the southwest facing slopes. Although almost certain to be linked in some way to a burning event; purple moor grass and bracken both respond positively to burning, the precise factors controlling development of Mol/Pta rather than another vegetation type, such as dry heath or humid heath, or indeed Mol/Ug are unclear. If Mol/Pta has developed after burning of a heath, the factors preventing regeneration/colonisation of dwarf shrubs are unknown, but may include the nature of the fire (too hot), depth of soil and or the wetness of the ground. Whatever else, the absence of grazing or other disturbance following a fire event is likely to be important in development of Mol/Pta.

3.2. Relationship of Humid Heath to Dry Heath

From changes in the mapping of humid heath stands at several sites in West Penwith and from accounts on succession in the relevant sections of the NVC, it is reasonable to conclude that **H4a** represents a transitional stage in the development of **H4c** following a burn. Certainly there is circumstantial evidence for this from Carn Galver and Watchcroft, where stands sampled and mapped as **H4a** in 2008/9 were assigned to **H4c** in 2012. Less certain is the relationship between **H8a** and **H4c**. There are two aspects to this uncertainty, the first is the frequent close floristic and structural similarity between the two NVC types, where often discrimination of **H4c** from **H8a** is predicated solely on the occasional occurrence of cross-leaved heath (*Erica tetralix*) and a significant reduction in the cover of purple moor-grass; in several places and certainly when viewed from a distance it can be difficult to separate **H4c** from **H8a**. Secondly, there are several places where resurvey of a site (2008 and 2012) shows **H8a** to have developed directly following the burning of humid heath (**H4c**) and where it appears to be stable. The occurrence within several sites of stands of **H4c** that show close similarity with **H8a** could be interpreted as **H8a** being under certain circumstances the natural successor to **H4c**. Furthermore, given the apparent stability of **H8a**, there are questions regarding its long term management. However, under circumstances where some degree of management has been carried out, for example at Carn Brea and Bosporthennis, the burning of **H8a** appears to result in **H4a**, which may result eventually in a return to **H8a**, or the anticipated succession may be arrested with the development of **H4c**.

The findings from this NVC survey and that carried out in 2008 raise questions about both the need and desirability of management of **H8a** and the drier forms of **H4c**. Also, is it, in any case, meaningful within a southwest context, where western gorse and purple moor grass1 are known to be overrepresented, to distinguish between **H4c** (humid) and **H8a** (dry) heath. Ordinarily, you would expect **H8a** to open up as the dwarf shrubs age and enter a degenerate stage, but in West Penwith, with

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[1] Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D., & Yeo, M., (2004) *An Illustrated Guide to British Upland Vegetation* & Rodwell, J.S., Dring, J.C., Averis, A.B.G., Proctor, M.C.F., Malloch, A.J.C., Schaminée, J.N.J., & Dargie T.C.D., (2000) Review of coverage of the National Vegetation Classification

the notable exception of some **H1** type heath at Watchcroft, where the vegetation is characterised by heather, bryophytes and little else, this innate senescence and with it succession, appears not to happen. Although rarely forming large stands, where they do occur, areas of humid heath assigned to **H4d** are structurally and floristically distinct and under conditions where they do develop (waterlogged, nutrient poor soils) they appear stable.

3.3. Relationship of U20a to W25b

A consistent pattern seen at a number of the sites surveyed in 2008 and 2012 was the apparent replacement of **U20a** grassland with **W25b** scrub vegetation. A clear example of this was seen on land to the north of Coronation Farm (Watchcroft) where bramble had colonised and now was co-dominant with bracken in vegetation previously assigned to **U4a**. This replacement of **U20a** grassland with **W25b** scrub is likely to be repeated wherever there is abandonment of enclosed acid grassland pastures, with bramble colonising progressively from the edges of fields.

3.4. Condition Assessment

Looking at the results for condition assessments throughout all 15 sites, the overwhelming impression is that for heath habitat, the general position is one of unfavourable status, predicated on an over-representation of dwarf shrubs, particularly western gorse, which limits the opportunity for ericoid regeneration and the appearance/persistence of other vascular and non-vascular species. This superabundance of western gorse is well documented in the NVC and mentioned specifically in the guidance notes that accompany the CSM methodology for lowland heathland (Natural England, 2009) where, in effect, it states that high covers of western gorse (greater than 50%) can be a natural characteristic of heaths within the South West (including Cornwall) and are not necessarily an indication of poor management. Whilst, therefore, recognising the need to modify some of the criteria for assessment of condition based on the cover of dwarf shrubs, this is rarely if ever, the only criterion on which a decision of unfavourable condition is made and although mandatory criteria such as age structure, cover of bare ground and floristics (forbs and graminoids) are linked to overall shrub cover assessed as a whole, heaths consistently failing on several of these attributes are correctly identified as requiring management. Indeed, it is worth noting that the minority of stands assessed as being of favourable condition are associated with more extreme edaphic conditions (**H4d**), **H8a** around rocks, or are the result of recent disturbance through burning or more occasionally grazing, e.g., favourable areas of **M25a** that are grazed at Bosporthennis, and areas **H8a** and **H4c** which whilst not yet favourable were assessed as unfavourable recovering.

Whilst the results from this CSM exercise at West Penwith indicate there is a need to refine further the assessment forms and methodology for use on heaths in Cornwall, this point does not invalidate or in any way obscure the main conclusion from the

findings of the survey work that indicate a strong positive correlation between levels of vegetation disturbance, e.g., grazing, swaling, cutting, etc. and an assessment of favourable condition.

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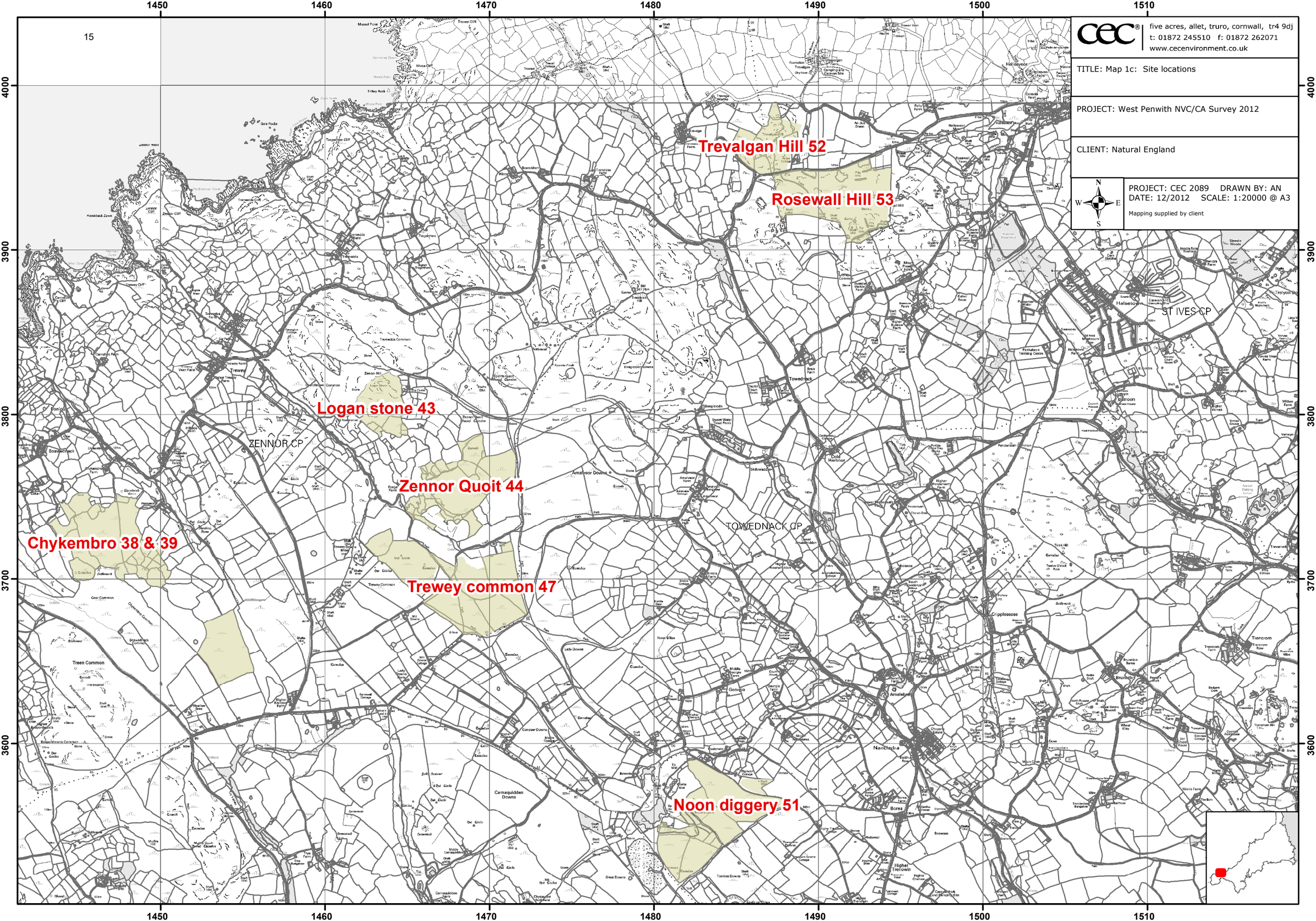

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CLIENT: Natural England

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PROJECT: CEC 2089 DRAWN BY: AN
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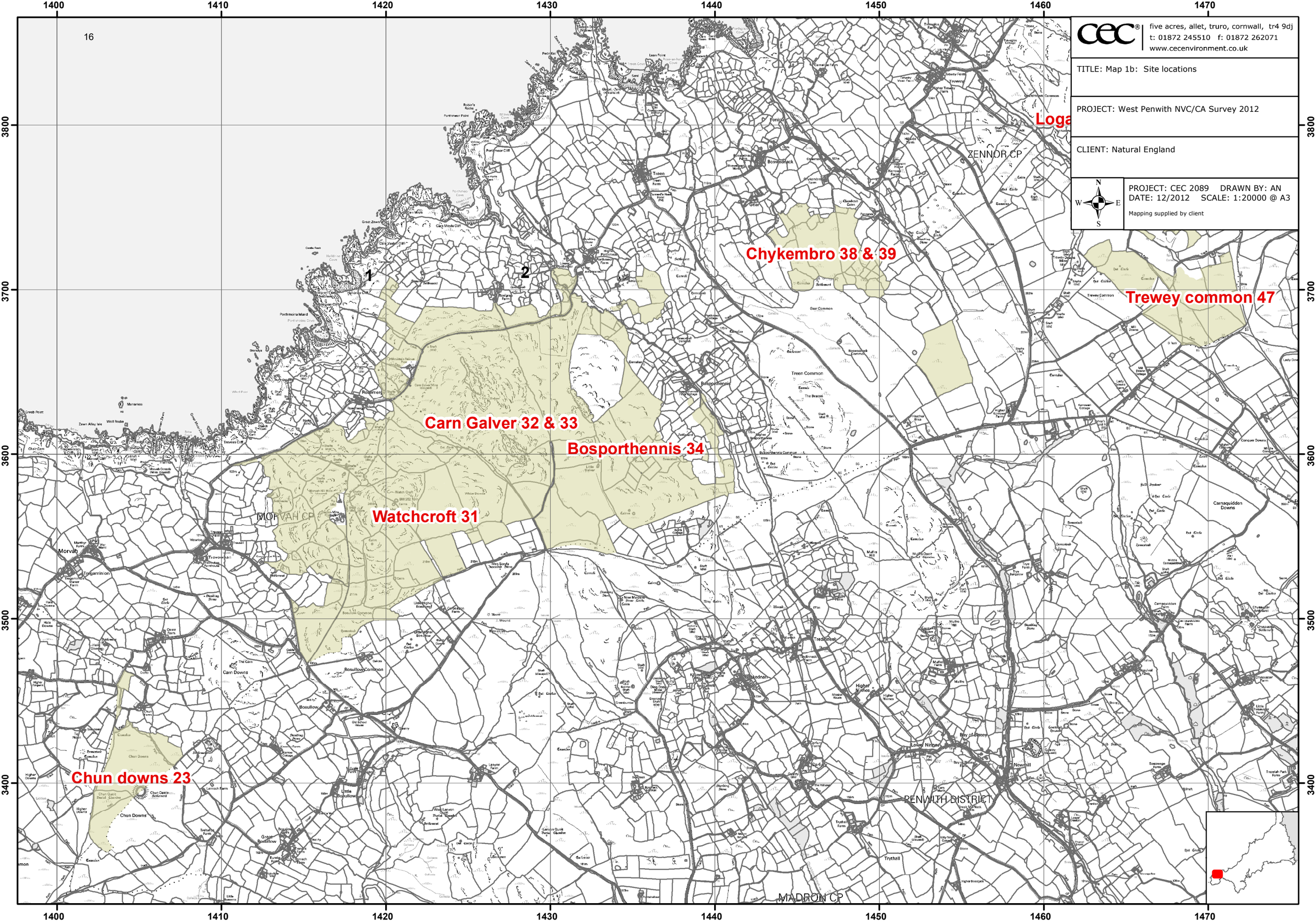

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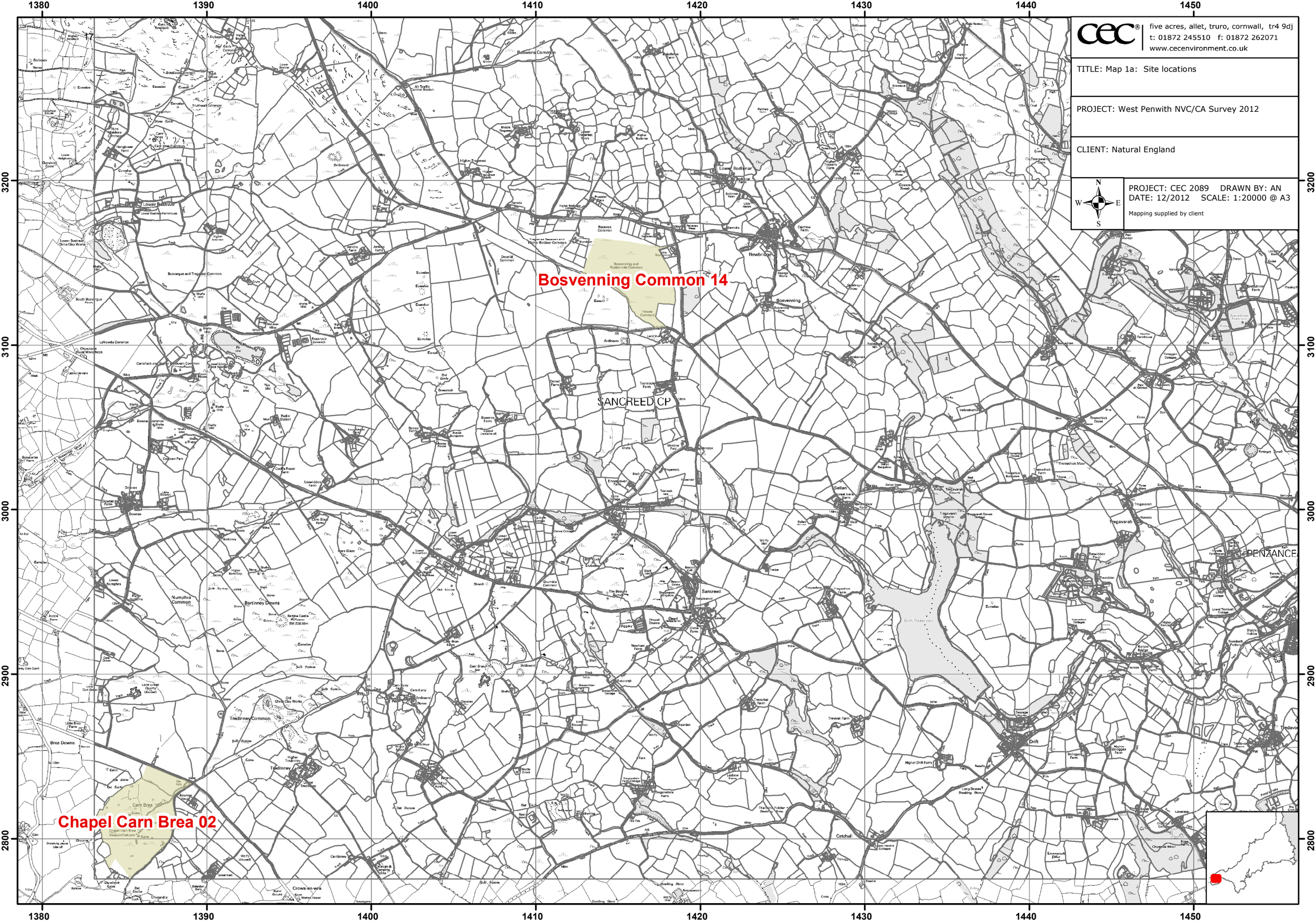

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CARN BREA (Survey Area 2 – 2012)

Surveyor	John Sproull	Date surveyed	22nd & 25th October 2012
Report compiled by	John Sproull		

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name/ No	Chapel Carn Brea
County	Cornwall
District	Penwith
Parishes	St. Just & St. Buryan
Map Reference	Access at SW382382,(car-park)
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

This site is roughly centred around Carn Brea hill situated between St.Buryan and St.Just in West Cornwall. It is the most south westerly hill on the British mainland. With an elevation of 198m there is a Bronze Age cairn at its summit with smaller burial monuments around it. The site is surrounded by small agricultural fields of permanent pasture, stocked with grazing cattle, with arable fields nearby. Carn Brea was previously surveyed in 2008. The location of the site is shown on *Map 1*.

1.2 Summary description

Area	23ha
Altitude	133m – 198m AOD
Aspect	Chapel Carn Brea is a low rounded hill with moderate to gentle north, east, south and west facing slopes. The northwest side is slightly steeper than the eastern side.
Drainage	There are no water courses within the site. Rainfall appears to drain naturally down the slopes onto adjacent fields.

1.3 Access

The site is easily accessed by a network of footpaths and tracks. The northern boundary of the site abuts a minor road joining the A30 at Crows-an-wra and the B3306 at Brea Downs. There is a small car-park at SW382382 which is regularly used, particularly by dog-walkers and sight seers who tend to walk up to the trig point and viewpoint indicator at the summit of the hill. The site was grazed by about six ponies, apparently with free access to the whole hill at the time of the survey (barring limitations imposed by terrain and dense vegetation).

1.4 Tenure

The site is owned by the National Trust and managed by a tenant farmer in partnership with the National Trust.

2 Biological Description

2.1 Habitats

The main habitat present within the site is heath (both dry and humid); there are lesser amounts of scrub and acid grassland. Boundaries are marked by extant and relict Cornish hedges of a style typical to the area. Habitats are described in more detail below and their distribution within the site is shown on *Map 2* in *Appendix 1*. A list of plant species recorded within each habitat is provided in *Appendix 2*.

Field notes made during the vegetation survey visits are annotated onto *Map2 and* included as Target Notes in *Appendix 1.* Photographs taken during the field visits are included in the text where they are considered useful in illustrating particular points of discussion. Photographs relating to each quadrat and CSM sampling point (as annotated onto *Map 2*) are appended (with quadrat data) to this report as a named subfolder on CD (*Appendix 3*).

2.1.1 Scrub

In general scrub appears as a fringe around the base of the hill. The majority, dominated by bramble (*Rubus fruticosus*) has been mapped

as **W25 *Pteridium aquilinum - Rubus fruticosus* underscrub**. A smaller area dominated by European gorse (*Ulex europaeus*) is assigned to **W23 *Ulex europaeus – Rubus fruticosus* scrub.** In places, as along much of the south-western site boundary, patches of coalesced gorse clumps frequently punctuate an otherwise more or less continuous cover of bracken-bramble scrub (Q18 & 21), such that, at times, it is hard to separate the two distinct communities as **W23** and **W25**. European gorse can play a frequent role within **W25** (up to *c.*30% within a sample according to the published description). To account for the relative abundance yet patchy distribution of European gorse here rather than map **W23** and **W25** in mosaic, the approach has been to map **W23** only where the cover of gorse is judged to exceed about 50% within the stand overall. It is also noted that (as reflected within the sampling – see Q17 & 18) heathy elements (Ericoids, but also Western gorse (*Ulex gallii*)) also occur within mapped areas of **W25** with local frequency. In this respect some areas show a localised shift towards **U20b,** the heathy sub-community of ***Pteridium aquilinum-Galium saxatile* calcifugous grassland.** However, the extent of bramble (generally rare within **U20**) has precluded the mapping of this community.

W25b *Pteridium aquilinum - Rubus fruticosus* underscrub, *Teucrium scorodonia* sub-community

Within areas mapped as W25 the two dominants, bracken and bramble, generally form a more or less continuous cover. Woodsage (*Teucrium scorodonia*) and broad buckler fern (*Dryopteris dilatata*) are constant at low levels of abundance. Common sorrel (*Rumex acetosa*) is frequent and other acidic grassland species such as sweet vernal grass (*Anthoxanthum odoratum*), common bent (*Agrostis capillaris*) and to a lesser extent Yorkshire fog (*Holcus lanatus*) make a localised contribution. This is especially the case to the north west (Q22) where the cover is rather more open and the assemblage takes on a more grassy feel. Occasionally, further south with localised disturbance, more ruderal elements such as rosebay willowherb (*Chamerion angustifolium*) come to the fore.

W23c *Ulex europaeus – Rubus fruticosus* scrub, *Teucrium* sub-community European gorse dominates a small area in the extreme north western corner of the site. The gorse tends to form a tall, more-

or-less continuous canopy up to 2.5m high, the height and density of the canopy limits the number of associate species, with bramble and bracken the main constants. Atlantic ivy and wood sage are frequent; other species, such as red campion (*Silene dioica*) and common sorrel (*Rumex acetosa*) can be locally frequent.

Plate 1 2-2012-Q21 W25b

Plate 2 2-2012-Q23 W23c

2.1.2 Acid grassland

Grassland is generally of restricted occurrence within the site occurring as small fragments often too small to map within more open W25b vegetation and around rock outcrops and along paths. Larger areas of grassland, kept short from compaction from walkers and grazed by ponies and rabbits, were sampled to a limited extent on the summit of the hill (Q16) and towards a drinking trough in the northern corner of the site where the ponies congregate (Q7).
Common bent is overwhelmingly dominant with some of Yorkshire fog, red fescue (*Festuca rubra*), perennial rye-grass (*Lolium perenne*), annual meadow-grass (*Poa annua*) and crested dog's-tail (*Cynosurus cristatus*). Associates are few but include milfoil (*Achillea millefolium*), common sorrel and common cat's-ear (*Hypochaeris radicata*).

The community is best placed within **U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland.** U4 is the typical sward type derived from the grazing of H8 heath and is characteristic of acid soils peripheral to moorland in the South West. Stands at Carn Brea are probably referable to **U4a the typical sub-community.** Improvement of this type of grassland by the addition of fertilisers or top-seeding, can facilitate a transition towards more mesophytic conditions associated with **MG6** grassland. Accurate assessment of grassland at this time of year however is difficult; in particular crested dog's-tail (*Cynosurus cristatus*) a species key to separating some forms of **U4** from **MG6** is hard to spot, even more so where swards are tightly grazed and/ or trampled as here. A fuller assessment of the grassland would be better undertaken at a more favourable time of year.

Plate 3 2-202-Q16, U4 near the summit.

2.1.3 Dry heath

Dry heath tends to occupy steeper, freer-draining, rocky slopes and localised patches around exposed cairns across southern parts of the site. Assemblages overwhelmingly dominated by a moderately tall (about 75cm) canopy of heather and western gorse are referable to **H8a *Calluna vulgaris – Ulex gallii* heath, species poor sub-community** and it is this which accounts for the bulk of the dry heath at Carn Brea. Elsewhere recently burnt stands of a somewhat more open character with grasses playing a more prominent role alongside regenerating sub-shrubs have been assigned to **H4b *Ulex gallii - Agrostis curtisii* heath, *Festuca ovina* sub-community.**

H8a, species poor sub-community

Western gorse, heather and bell heather tend to form a more or less continuous, dense cover with, generally, very little else. Cross-leaved heath, purple moor-grass (*Molinia caerulea*) and bristle bent (*Agrostis curtisii*) in contradistinction to **H4c** are typically here more or less absent (though they can, at times, be present). Other associates are few, tormentil is typical, woodsage and bramble are occasional. For the most part this community appears in a dense, species poor and homogeneous form across the site.

Plate 4 2-2012-Q21 view of homogeneous, species poor H8a

H8b *Danthonia decumbens* sub-community

There is a small area of grazed out H8b to the west of the car park (mapped but not sampled). Here the shrubs (predominantly Western gorse with occasional heather and bell heather) are reduced to a series of 'islands' surrounded by areas of pony grazed, species poor U4 grassland.

H4b *Ulex gallii - Agrostis curtisii* heath, *Festuca ovina* sub-community

There are two distinct areas of burnt heath, one to the south of the cairn at the summit, burnt during 2012, the other less recently treated and to the north east. These areas are marked out by a more open canopy (or the skeletal blackened remains of one) and a marked increase in the contribution of grasses to the overall cover. Western gorse accounts for the bulk of the canopy but regenerating Ericoids are also constant. In contrast to **H4a** (the community which tends to supervene immediately after fire, where bristle bent dominates) it is **U4** grasses such as common bent, sweet vernal grass and Yorkshire fog which make up the bulk of the grass cover. There is also an attendant increase in the contribution of cross-leaved heath. The opening up of the canopy also allows more diminutive species such as common

milkwort (*Polygala vulgaris*), pill sedge (*Carex pilulifera*) and common dog violet (*Viola riviniana*) to become established.

Plate 5 2-2012-C16 Recently burnt heath (2012). Mapped as H4b.

Plate 6 2-2012-Q9. Less recently burnt area mapped as H4b

2.1.4 Humid heath

Humid heath referable to **H4c (*Ulex gallii - Agrostis curtisii* heath, *Erica tetralix* sub-community)** dominates over north facing gently sloping ground across the site. Western gorse tends to dominate with abundant heather and frequent cross-leaved heath and bell heather.

Separation from **H8a** and **H4b** is predicated primarily upon the greater presence here of cross-leaved and a general reduction in the extent of the **U4** grasses. Where grasses are found it is generally in the shape of bristle bent; purple moor-grass atypically is noticeably more or less absent from this community over much of the site, only coming to anything like prominence towards the bottom of the slope (as at Q6).

The gross appearance of the vegetation can vary markedly from a 1m tall, species poor, shrub-dominated canopy to a much reduced (5cm tall), tightly grazed and rather more species rich cover. This variation may reflect localised edaphic variation as well as past treatment such as burning and grazing or the lack thereof.

Plate 7 2-2012-Q3 overgrown H4c

Plate 8 2-2012-C5 expanse of short H4c towards summit of hill.

2.1.5 Hedges

The northern part of the site is partially sub-divided by Cornish hedges; these are mostly overgrown and have consequently been mapped as part of the surrounding vegetation. The line of existing boundaries is shown on the Ordnance Survey maps and they have not, in consequence been mapped as part of the NVC survey. On the north-east facing slope linear strips of bracken mark out overgrown hedges. These are generally quite species-poor, though those less heavily shaded can be expected to retain more floristic richness and respond more quickly to restoration. With the exception of those that are fenced and those surrounding semi-improved grassland fields, additional fencing would be likely to be required to ensure stock-proofing in most areas.

2.2 Species

2.2.1 Vascular plants

Patches of the Vulnerable, BAP species chamomile (*Chamaemelum nobile*) were recorded around SW38592854. Chamomile is a species of well-grazed damp grassland especially along tracks and road verges in Cornwall.

3 Condition Assessment

3.1 Humid Heath (H4c/H4b)

12 samples were taken distributed across the site; 7 of the sampling points relate to H4c, 5 relate to H4b.

Overall, although samples meet the majority of attribute criteria there is insufficient variation within the growth phases of ericoid sub-shrubs. The mandatory attribute for vegetation structure is therefore not met and the community must be assessed as in **unfavourable** condition.

Despite this a combination of extensive grazing and controlled burns has created a degree of physiognomic as well as floristic diversity within the sward. This is reflected in the samples, those taken within burnt areas (of H4b) tend to be slightly more species-rich with a greater emphasis on (pseudo) pioneer heathers and areas of bare ground. By contrast, unburnt areas (of H4c) tend to support a taller, more or less closed canopy and with associated shading less diversity in the ground flora. On this basis of such management the humid heath is considered to be **recovering.**

3.2 Dry Heath (H8a)

10 sample points distributed throughout areas of dry heath within the site.

Overall, dry heath is assessed as **unfavourable/ no change**. The community fails on mandatory attributes for vegetation structure and composition. There is an even age structure (almost all of the heather being in the building/mature growth phase) and a general floristic paucity, with respect to graminoids and desirable forbs. These failures would seem to suggest too low a level of disturbance and to make the case for further management. It is interesting to note however that (at least) the southern stand of H4b seems likely to have been H8a prior to having been burnt. Opening up of the canopy here has allowed typical post-burn H8b species such as sweet vernal grass, pill sedge and bell heather to come to the fore but the presence of H4 species such as bristle bent and cross-leaved heath tips the balance in favour of H4b.

This begs the question as to how H8 is best maintained in the extreme south west, where these species are relatively ubiquitous and more apt to supervene following disturbance.

Table 1 Summary of habitats and vegetation communities

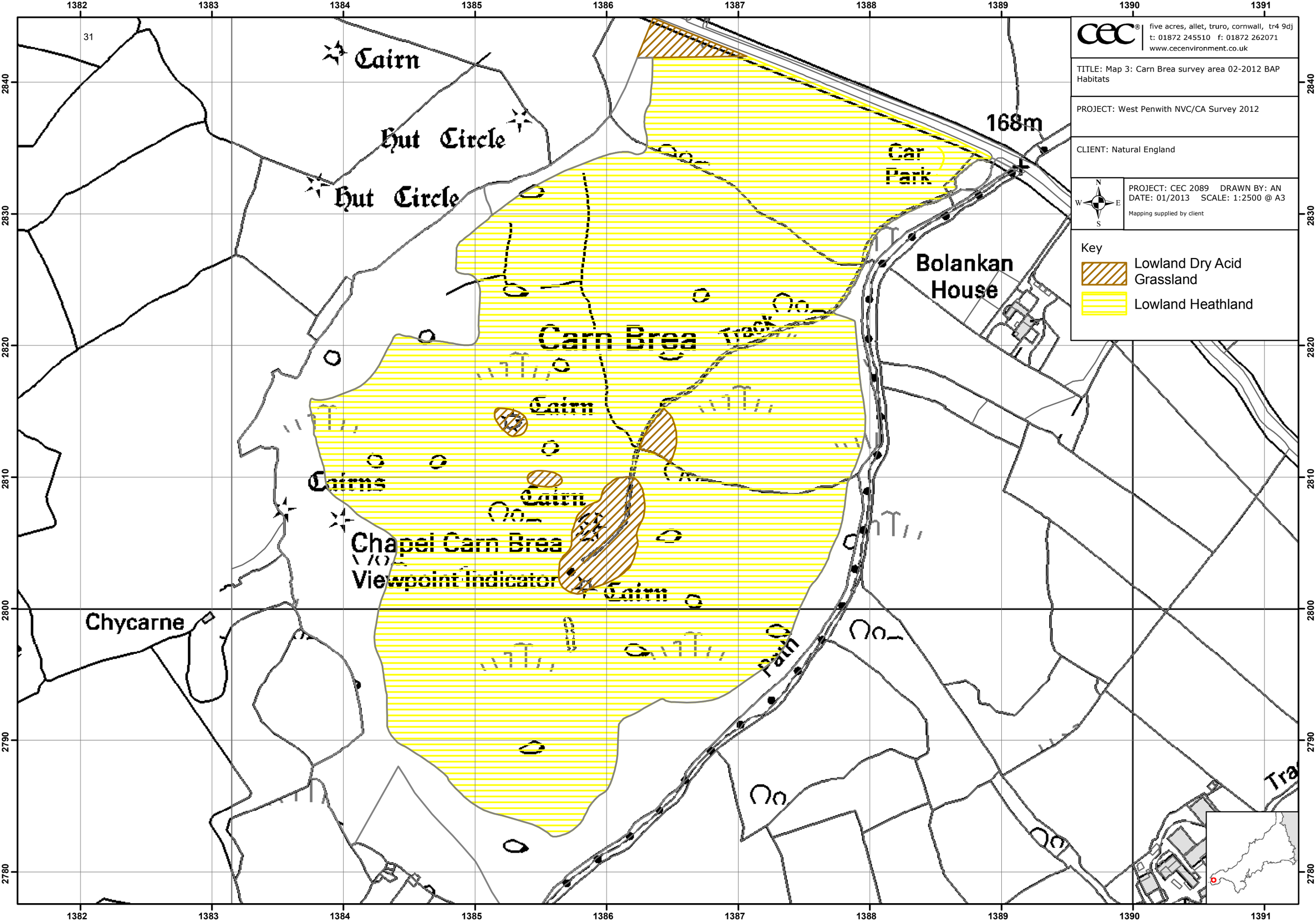
Carn Brea 2-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W23c	4.72	0.31	N/A	N/A
	W25b	2.03	4.55		
Acid grassland	U4a		0.63	N/A	Lowland dry acid grassland 0.63
SI/Acid Grassland	Probably MG6/ U4	0.17		N/A	N/A
Dry heath	H8a	5.06	6.25	UFNC	Lowland heathland 15.96
	H8b		0.09		
Humid heath	H4a	3.14		N/A	
	H4b		2.35	UFR	
	H4c	7.18	7.27		
Unassigned	Unassigned	0.81	0.05	N/A	N/A
Total Area Mapped		23.12	21.5		

Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD)

Appendix 1

Maps (1: Location, 2: NVC, 3:BAP habitat)

See separate folder on CD


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3: Carn Brea survey area 02-2012 BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
N
W
E
S
Key
Lowland Dry Acid Grassland
Lowland Heathland
Cairn
Hut Circle
Hut Circle
168m
Car Park
Bolankan House
Carn Brea
Cairn
Cairns
Cairn
Chapel Carn Brea
Viewpoint Indicator
Cairn
Chycarne
Path
1382
1383
1384
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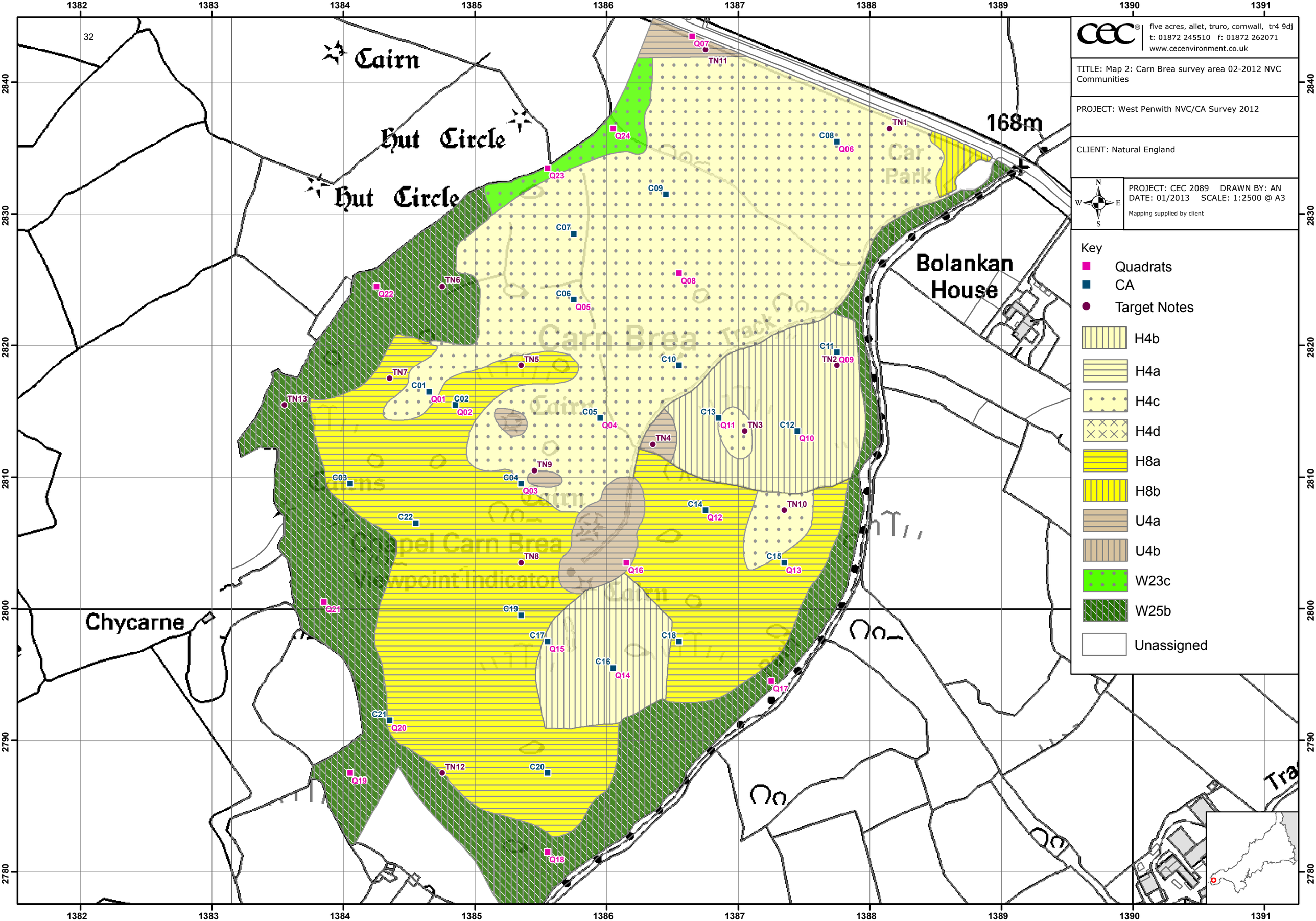
2820
2810
2800
2790
2780


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2: Carn Brea survey area 02-2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
H4b
H4a
H4c
H4d
H8a
H8b
U4a
U4b
W23c
W25b
Unassigned
Cairn
Hut Circle
Hut Circle
168m
Car Park
Bolankan House
Carn Brea
Chapel Carn Brea
Viewpoint Indicator
Chycarne
Q07
TN11
Q24
Q23
TN1
C08
Q06
C09
C07
Q08
TN6
Q22
C06
Q05
C11
TN2
Q09
C10
TN5
TN7
C01
Q01
C02
Q02
TN13
C05
Q04
C13
Q11
TN3
C12
Q10
TN4
TN9
C03
C04
Q03
C14
Q12
TN10
C22
TN8
Q16
C15
Q13
Q21
C19
C17
Q15
C18
C16
Q14
Q17
C21
Q20
TN12
C20
Q19
Q18
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Map 2 Target Notes Carn Brea (Survey Area 2 – 2012)

TN. No.	Grid Ref.	Text
1	SW38812836	*Molinia caerulea* present only as sparse sprigs through sub-shrub canopy *Agrostis curtisii* also more or less absent
2	SW38772818	Burnt heath - possibly formerly H8a, now referable to H4b
3	SW38702813	Short sward with LA *Erica tetralix* - H4c
4	SW38632812	Short grassy sward, surrounded by rather scrubby heath with Rf, *Salix cinerea, Digitalis purpurea* and *Ulex dioica. Chamaemelum nobile* recorded within similar U4 assemblage at SW38592854
5	SW38532818	Very localised H8 around cairns with taller *Ulex gallii* canopy and LF/A *Pteridium aquilinum.*
6	SW38472824	*Cotoneaster* sp - possible patches of U20b where *Rubus fruticosus* drops out a bit but not mapped
7	SW38432817	H8 locally around cairns, *Ulex europaeus* and *Pteridium aquilinum* LF/A
8	SW38532803	Poor H8a *Ulex europaeus* LA
9	SW38542810	Small burnt area now supporting U4 grassland
10	SW38732807	Area of H4c nominally mapped where *Erica tetralix* becomes frequent. Surrounding H8a area more or less lack *Agrostis curtisii* and *Molinia caerulea*. *Erica tetralix* is O/R coming to local prominence where gradient levels off and canopy becomes more open. Possible patches of H4c (not mapped) elsewhere on this contour.
11	SW38672842	U4 fragments around pony trough surrounded by grazed out H8b (not mapped) and then H4c. Scrubby area alongside hedge with *Rubus fruticosus* A.
12	SW38472787	*Ulex europaeus* F within W25
13	SW38352815	*Holcus lanatus* LA v. grassy and quite open *Pteridium aqulinum* and *Rubus fruticosus* still >25%

Appendix 2 Plant species recorded during survey

Species Name	Common Name	Scrub	Acid grassland	Dry Heath	Humid heath	Hedge
Achillea millefolium	Yarrow		R			
Agrostis capillaris	Common bent-grass	O-F	A	O	O	F
Agrostis curtisii	Bristle bent	O-F		O-A	F	O-F
Aira sp.	Hair-grass (unidentified)					R
Anthoxanthum odoratum	Sweet vernal-grass	O-F	F	LA	LF	O-F
Blechnum spicant	Hard-fern	R		R	R	
Calluna vulgaris	Heather	O-F		LA	O	O-F
Carex binervis	Green-ribbed sedge			LF	O	
Carex pilulifera	Pill sedge	R		LF		
Cerastium fontanum subsp. *vulgare*	Common mouse-ear chickweed	R		R		
Chamaemelum nobile	Chamomile		R			
Chamerion angustifolium	Rosebay willowherb	LF				
Cirsium arvense	Creeping thistle		R			
Cotoneaster sp.	Cotoneaster (unidentified)	R				
Crataegus monogyna	Hawthorn					R
Cynosurus cristatus	Crested dog's-tail		O			
Dactylis glomerata	Cock's-foot	R	O-F			
Digitalis purpurea	Foxglove	O			R	O
Dryopteris dilatata	Broad buckler-fern	O-F		R		O-F
Erica cinerea	Bell heather	O		F/LA	F/LA	O
Erica tetralix	Cross-leaved heath			O	F/LA	

Species Name	Common Name	Scrub	Acid grassland	Dry Heath	Humid heath	Hedge
Festuca rubra agg.	Red fescue	O	LA			
Galium saxatile	Heath bedstraw	O-F		O/LF	R	O
Geranium robertianum	Herb-robert	R				R
Hedera helix subsp. *hibernica*	Atlantic ivy	O-F		O/F	O/F	O
Holcus lanatus	Yorkshire-fog	O-F	LA	LF		O
Hyacinthoides non-scripta	Bluebell	O				
Hypericum pulchrum	Slender St John's-wort			R	R	
Hypochaeris radicata	Cat's-ear		O		R	
Ilex aquifolium	Holly	R				
Jasione montana	Sheep's-bit	R	R			R
Kinbergia praelongum	A moss	F				
Lolium perenne	Perennial rye-grass		O			
Lonicera periclymenum	Honeysuckle	R				
Lotus corniculatus	Common bird's-foot-trefoil					O
Molinia caerulea	Purple moor-grass	R		O	LF	
Oxalis acetosella	Wood-sorrel	O				
Pedicularis sylvatica	Lousewort			R		
Plantago lanceolata	Ribwort plantain		O			
Poa annua	Annual meadow-grass		O			
Polygala serpyllifolia	Heath milkwort	R		O/LF		
Polypodium vulgare	Polypody					O
Potentilla erecta	Common tormentil	R		F	F	R
Prunus spinosa	Blackthorn					R
Pteridium aquilinum	Bracken	A		O	O	LF
Ranunculus repens	Creeping		O			

Species Name	**Common Name**	**Scrub**	**Acid grassland**	**Dry Heath**	**Humid heath**	**Hedge**
	buttercup					
Rubus fruticosus agg.	Blackberry	A/D	R	O	O	O
Rumex acetosa	Common sorrel	F	F	R	R	R
Rumex acetosella	Sheep's sorrel		O			O
Salix cinerea subsp. *oleifolia*	Grey willow	R		R		
Sambucus nigra	Elder	O				
Sedum anglicum	English stonecrop					O
Silene dioica	Red campion	O				O
Sonchus oleraceus	Smooth sow thistle			R		
Stellaria holostea	Greater stitchwort	F				
Teucrium scorodonia	Wood sage	F		F	O	O
Trifolium repens	White clover		O/LF			
Ulex europaeus	Gorse	LF/LD		R	R	O
Ulex gallii	Western gorse	R		A/LD	A	O-F
Umbilicus rupestris	Navelwort					O
Viola riviniana	Common violet	O		LF	O	O

DAFOR is a nominative scale for measuring plant frequency: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally, E = Edge

Appendix 3 NVC Quadrat data and photos

See separate folder on CD

Survey	Carn Brea					Recorder	JS		Date	22/10/2012	
Vegetation type	H4b										
Species	Q9	Q10	Q11	Q14	Q15	Species	1	2	3	4	5
Ulex gallii	6	8	6	4	5						
Calluna vulgaris	3	4	5		2						
Erica tetralix	3	3	6								
Erica cinerea	5	5	5	3	4						
Anthoxathum odoratum	7	6	5	5	5						
Agrostis curtisii	3	4	4	5	5						
Polygala vulgaris	3	1		3	2						
Potentilla erecta	3	3	3	3							
Carex binervis	3		3								
Galium saxatile	3		3								
Holcus lanatus	3	4	2	3	3						
Carex pilulifera	3			2	3						
Viola riviniana	1		2	3	3						
Rubus fruticosus		1	2	2	2						
Hypochaeris radicata		2	3		1						
Pedicularis sylvatica			1								
Ranunculus repens				1							
Digitalis purpurea				3							
Teucrium scorodonia				1							
Sonchus oleraceus				1							
Cirsium vulgare				1							
				5	5						

	Quadrats				
	Q9	Q10	Q11	Q14	Q15
Grid. ref.	SW38772819	SW38742813	SW38682814	SW38602795	SW38552797
Photo. No.					
NVC method					
Slope	Moderate	Gentle	Gentle	Moderate	Gentle
Aspect	N	NE	E	S	SE
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	4 m Sq
Vegetation height (mm)	60cm	50cm	40cm	5-50cm	5-50cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Burnt, pony access, grassy	Burnt, pony access	Becoming increasingly scrubby upslope with Rf and less E. tet (more like H8)	V. Few Ericoids - possibly was H8 and will go back to this. No grazing signs visible	Pony grazed

Survey	Carn Brea					Recorder	JS		Date	22/10/2012	
Vegetation type	H4c										
Species	Q1	Q4	Q5	Q6	Q8	Species	1	2	3	4	5
Ulex gallii	9	3	8	7	6						
Calluna vulgaris	6	6	5	7	7						
Erica tetralix	3	6	5	7	8						
Erica cinerea	4	1	4	4	4						
Agrostis curtisii	3	4	2	3	4						
Potentilla erecta	1	1		1							
Carex pillulifera	1										
Carex binervis		5		3	5						
Polygala vulgaris		1			1						
Pteridium aquilinum			2								
Molinia caerulea				4							
Bare ground		3									

Quadrats

	Q1	Q4	Q5	Q6	Q8
Grid. ref.	SW38462816	SW38592814	SW38572823	SW38772835	SW38652825
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Moderate	Gentle	Moderate
Aspect	W	NW	N	N	N
Soil type					
Quadrat area	4mx4m	2mx2m	2mx2m	4mx4m	2mx2m
Vegetaation Height	50cm	5cm	1m	40cm	30cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	V poor, shrubs more or less continuous very few grasses previously mapped as H4a	V. Short, pony grazed	Morphologically like H8 but E tet constant Pta in linear strips marks boundaries	Pony tracks and wind pruned	Quite steep for H4 E tet A Ponies have access (occ tracks visible)

Survey	Carn Brea					Recorder	JS		Date	22/10/2012	
Vegetation type	H4b										
Species	Q2	Q3	Q12	Q13	Q20	Species	1	2	3	4	5
Ulex gallii	7	7	7	6	8						
Calluna vulgaris	6	6	6	8	4						
Erica cinerea	6	6	6	6	6						
Potentilla erecta	1	1									
Agrostis curtisii		1			1						
Teucrium scorodonia		1			1						
Erica tetralix			1		5						
Ulex europaeus					1						
Rubus fruticosus					3						
Bare ground	2	1									

	Quadrats				
	Q2	Q3	Q12	Q13	Q20
Grid. ref.	SW38482815	SW38532809	SW38672807	SW38732803	SW38432791
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle	Gentle	Gentle
Aspect	N	N	SE	SE	W
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	4 m Sq
Vegetation height (mm)	75cm	60cm	75cm	75cm	1.2m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)			Unmanged though open to ponies (would possibly need to cut paths as very overgrown). E tet is R but would poss be H4 if managed	Unmanged. E.tet rare in vicinity but not constant	Ue LA Unmanaged

Survey	Carn Brea					Recorder	JS		Date	22/10/2012	
Vegetation type	W23										
Species	Q23	Q24				Species	1	2	3	4	5
Ulex europaeus	8	8									
Rubus fruticosus	9	7									
Pteridium aquilinum	4	3									
Silene dioica	3	3									
Hedera hibernica	7										
Dryopteris dilatata	1	3									
Anthoxanthum odoratum	2										
Teucrium scorodonia	4	2									
Holcus lanatus	3	2									
Viola rivininiana	1										
Rumex acetosa		2									

Quadrats

	Q23	Q24			
Grid. ref.	SW38552833	SW38602836			
Photo. No.					
NVC method					
Slope	Gentle	Gentle			
Aspect	N	N			
Soil type					
Quadrat area	4 m sq	4 m sq			
Vegetation height (mm)	2m	2.5m			
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Pony access	Pony access			

Survey	Carn Brea					Recorder	JS		Date 22/10/2012		
Vegetation type	W25b										
Species	Q17	Q18	Q19	Q21	Q22	Species	1	2	3	4	5
Pteridium aquilinum	5	6	6	6	6						
Rubus fruticosus	8	9	7	8	6						
Ulex europaeus	5										
Dryopteris dilatata	2	1	2	1	4						
Ulex gallii	2										
Kinbergia praelongum	6		4								
Erica cinerea	2										
Teucrium scorodonia	2	3	3	3	3						
Hedera hibernica	4				4						
Agrostis capillaris		2		3							
Rumex acetosa		2	2		2						
Hyacinthoides non-scripta		1									
Chamerion angustifolium			4								
Digitalis purpurea			2		2						
Stellaria holostea			3	4	3						
Silene dioica			3	3							
Holcus lanatus			1		5						
Viola rivininiana			1								
Oxalis acetosella				4	5						
Anthoxanthum odoratum				2	6						
Galium saxatile					5						
Agrostis canina					4						

	Quadrats				
	Q17	Q18	Q19	Q21	Q22
Grid. ref.	SW38722794	SW38552781	SW38402787	SW38382800	SW38422324
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle	Gentle	Gentle
Aspect	S	SW	SW	W	N
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	75cm	1m	1m	1m	75cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Some heathy elements	Ue can be LA + some heathy elements LF. Pony tracks	Pony access	Ue LF but always less than 50% perhaps 5-10% overall	Pony access. Grassy, quite open

Survey	Carn Brea					Recorder	JSp		Date	22/10/2012	
Vegetation type		**U4**									
Species	**Q7**	**Q16**				**Species**	**1**	**2**	**3**	**4**	**5**
Agrostis capillaris	10	9									
Holcus lanatus	4										
Rumex acetosa	3										
Rubus fruticosus	2										
Hypochaeris radicata	1										
Cerastium fontanum	1										
Poa annua		4									
Achillea millefolium		4									
Trifolium sp		3									
Lollium perenne		3									
Festuca rubra		5									
Cynosurus cristatus		4									
Bare ground		3									

Quadrats

	Q7	**Q16**			
Grid. ref.	SW38702842	SW38612803			
Photo. No.					
NVC method					
Slope	Gentle	Gentle			
Aspect	NW	NW			
Soil type					
Quadrat area	2x2m	2x2m			
Vegetation height (mm)	5cm	5cm			
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Tightly grazed, poor	Rabbit grazed/ trampled by walkers			

BOSVENNING COMMON (Survey Area 14 - 2012)

NVC surveyor	Michael Davies	Date surveyed	22nd and 24th October 2012
Report compiled by	Michael Davies	20th December 2012	

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Bosvenning Common
County	Cornwall
District	Penwith
Parish	Sancreed
Map Reference	Access at SW417311, with centre of site at SW416314
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith 156

The location of the site is shown on *Map 1*.

1.2 Summary description

Area	16ha
Altitude	160 – 200m AOD
Aspect	Bosvenning Common comprises gentle to moderate north-facing slopes, veering north-east over eastern parts of the site. The highest parts of the site (198m) are toward the southern boundary, where slopes are very gentle. Gradients are steepest around mid-slope, but ease again along the western and northern boundaries. Hedges mark the eastern, western and southern boundaries, with the northern boundary marked by a series of wooden posts.
Drainage	Although the ground is noticeably wetter over gentle, north-facing slopes, the site in general is free draining

with no areas of open or running water.

1.3 Access

As a Cornwall Wildlife Trust Reserve, there is public access to all parts of the Bosvenning Common site. In addition, a public footpath forms the southern boundary of the site. A wide firebreak across the site from southwest to northeast creates a second path that links the public footpath along the southern boundary to an access point onto the road at Little Bosvenning along the northeast boundary.

1.4 Tenure

The survey area is owned and managed by Cornwall Wildlife Trust

2 Biological Description

2.1 Habitats

There are three main habitats present within the site: humid heath, dry heath and continuous scrub. Cornish earth and stone hedgebanks mark most of the boundaries of the site. A list of plant species recorded within each habitat is provided in *Appendix 2*.

The National Vegetation Classification (NVC) communities identified during the survey are described below under the habitat in which they occur, and their distribution is shown on *Map 2* in *Appendix 1.*

The location and reference number of target notes made during the field visits are annotated onto *Map 2*. A comprehensive list of target notes is appended to this report. Photographs taken during the field visits are inserted into the text where these are thought useful to illustrate particular points of discussion. A full set of photographs covering both NVC quadrat points and condition assessment sampling points is appended to this report as a named subfolder on CD (*Appendix 3*).

2.1.1 Continuous scrub

Scrub is subordinate to heath vegetation at Bosvenning Common, but a large stand has developed along the northern and eastern boundary of the site, with two smaller stands along the footpath close to the southern boundary. Typically these stands are 1-2m tall and dominated by bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticusus* agg), with other constants limited to broad-buckler fern (*Dryopteris dilatata*), heath bedstraw (*Galium saxatile*), bristle bent (*Agrostis curtisii*) and the common acrocarpous mosses; common feathermoss (*Kindbergia praelongum*) and cypress-leaved plait-moss (*Hypnum cupressiforme*). Other occasional species include common sorrel (*Rumex acetosa*), tormentil (*Potentilla erecta*), foxglove (*Digitalis purpurea*), common bent (*Agrostis capillaris*) and sweet vernal grass (*Anthoxanthum odoratum*).

Plate 1 14-2012-Q7**,** W25b scrub vegetation showing co-dominance of bracken and bramble

The appearance at low cover of western gorse (*Ulex gallii*) and heather (*Calluna vulgaris*) mark transitions to heath habitat or indicate stands of former heath that have been invaded by bracken and bramble. Based primarily on the relative cover of the main species this vegetation is characteristic of **W25b Teucrium scorodonia sub-community** of ***Pteridium aquilinum – Rubus fruticosus*** **underscrub**.

2.1.2 Humid heath

Humid heath dominates the plateau and gentle slopes over the southern and north western parts of Bosvenning Common, where it forms large, uniform stands. Typically, the cover of dwarf heath shrubs is very high and as a result these are species-poor, closed canopy stands that often comprise little more than a coarse mix of western gorse and the ericoids: heather, bell heather (*Erica cinerea*) and cross-leaved heath (*Erica tetralix*). There is no evidence that these stands are grazed. Although the uniformity of vegetation height and the presence of several large firebreaks indicate earlier management by burning, discussion with the Reserves Manager for CWT (Callum Deveney, pers.comm) confirms that the site is neither grazed nor burnt at present, though a fire break is regularly maintained to reduce the impact of accidental fires. Across the site there is a discernible

difference in the structure and floristics of the humid heath, with stands over the lower slopes being taller, with a higher frequency and cover of purple moor-grass (*Molinia caerulea*), bristle bent (*Agrostis curtisii*) and cross-leaved heath. Stands of humid heath over the flatter ground of the plateau are shorter, presumably the result of more recent burning and often lack both purple moor-grass and bristle bent. Cross-leaved heath is frequent to locally abundant throughout, though it is more prominent over the lower slopes toward the west.

Plate 2 14-2012-Q3**,** extensive stand of H4c; note increase in *Molinia* within humid heath downslope

Though purple moor-grass and bristle bent are infrequent within large parts of humid heath toward the centre of Bosvenning Common, the constancy and cover within the dwarf shrub species, and in particular the abundance of cross-leaved heath, is sufficient to support its assignment to ***Erica tetralix* sub-community of *Ulex gallii – Agrostis curtisii* heath (H4c)**.

2.1.3 Dry heath

Dry heath dominates the moderate, slightly steeper north and east facing slopes over the eastern half of Bosvenning Common. Invariably, these dry heath stands are over 1m tall, dense and species-poor, typically comprising little more than a closed canopy of western gorse

and the ericoids; heather and bell heather. Sparse shoots of tormentil, broad-buckler fern and heath plait-moss (*Hypnum jutlandicum*) are the only other constants, with bristle bent, sweet vernal grass and bramble occasional, the latter often locally abundant.

Plate 3 14-2012-Q11**,** tall dense stand of dry heath assigned to H8a

With both humid heath and dry heath stands at Bosvenning Common being species-poor, differentiation in the field can be difficult and other than the presence/absence of cross-leaved heath, purple moor-grass and bristle bent is oftentimes predicated as much on physiognomic differences as any floristic indicators. Notwithstanding these difficulties dry heath at Bosvenning Common has been confidently assigned to **H8a, species-poor sub-community of *Calluna vulgaris - Ulex gallii* heath**.

2.1.4 Earth and stone banks

A 1m wide, stone and earth bank forms the boundary in the southeast corner of the site. Similar stone and earth banks form most of the eastern boundary and a short section of the western boundary. More open sections of bank support sparse vegetation, with English stonecrop (*Sedum anglicum*) the only frequent species, with wood sage (*Teucrium scorodonia*) and red campion (*Silene dioica*) occasional. More typically, these banks are dominated by bracken and

bramble or heath vegetation. None of these boundaries were assessed as part of the NVC survey, with communities in most cases likely to reflect those of adjacent habitats, e.g., W25b, H8a or H4c. Certainly this is the case where boundaries are low and overgrown.

2.2 Species

2.2.1 Vascular plants

The NVC and condition assessment survey visits carried out over two days in October 2012 recorded a total of c.65 plants, including a limited number of non-vascular species. Two notable plant species were recorded; dodder (*Cuscuta epithymum*) which is listed as vulnerable in Cheffings and Farrell (Ed.) (2005) and is occasional to locally abundant within heath vegetation, particularly within areas of humid heath, and Japanese knotweed (*Fallopia japonica*), a plant listed on Schedule 9 of the WCA 1981 (2010 amended), that occurs as a large stand within the eastern field of Little Receven to the north of the sites northern boundary.

3 Condition Assessment

3.1 Humid Heath (H4c)

18 sample points distributed throughout humid heath stands within Bosvenning Common (site 14).

Overall, the humid heath is assessed as unfavourable/no change based on the recent field visit and visits carried out in 2008/2009. The humid heath fails on percentage cover of bare ground, percentage cover of dwarf shrubs and the age structure of the heath, with most being in building/mature phase.

The heath passes on all other attributes with positive indicator being the presence of dodder in more than half the samples. Japanese knotweed occurs in a stand close to the northern boundary of the site. Heath fails overall through to low a level of disturbance.

3.2 Dry Heath (H8a)

10 sample points distributed throughout dry heath stands within Bosvenning Common (site 14).

Overall, the dry heath is assessed as unfavourable/no change based on the recent field visit and visits carried out in 2008/2009. The dry heath fails on percentage cover of bare ground (less than 1%) and too high a cover for Western gorse. The height and density of these tall heath stands is such that most only just meet the minimum standards for species-richness with respect to both graminoids and forbs.
The heath passes on all other attributes with positive indicator being the presence of dodder in some of the samples.

Table 1 Summary of habitats and vegetation communities

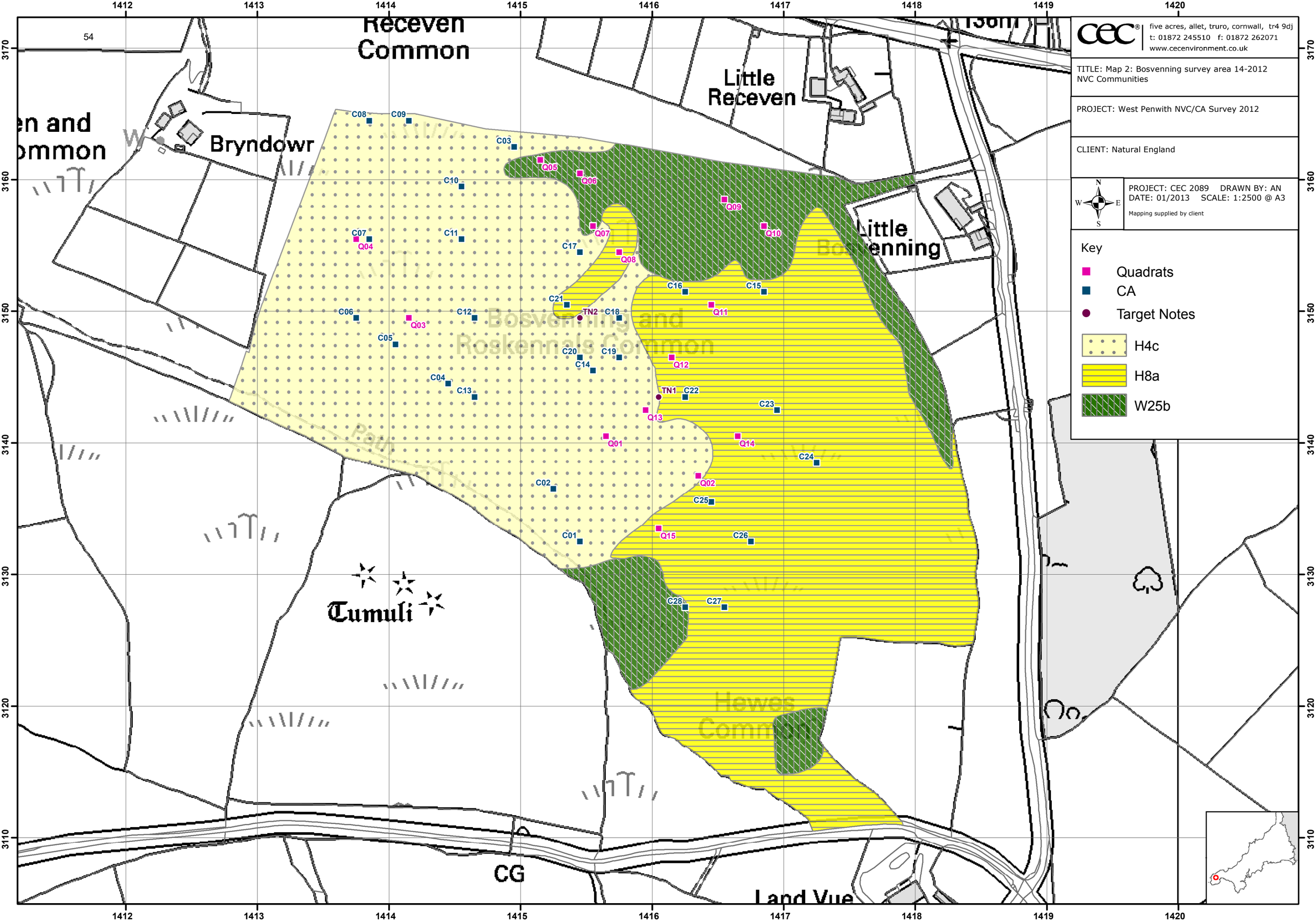
Bosvenning Common 14-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W25b	4.38	2.64	N/A	N/A
Acid grassland	U3	0.40	-	N/A	-
Dry heath	H8a	4.7	7.57	UFNC	Lowland heathland 15.25
Humid heath	H4c	7.02	7.68	UFNC	
Total Area Mapped		16.5	17.89		

Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD)

Appendix 1

Maps (1: Location, 2: NVC, 3: BAP habitat) See separate Maps Folder on CD

Target Notes



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TITLE: Map 2: Bosvenning survey area 14-2012
NVC Communities

PROJECT: West Penwith NVC/CA Survey 2012

CLIENT: Natural England

PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3

Mapping supplied by client

Key

- Quadrats
- CA
- Target Notes
- H4c
- H8a
- W25b

Map 2 Target Notes Bosvenning Common (Survey Area 14 - 2012)

TN. No.	Grid Ref.	Text
1	SW4160 3143	Heath vegetation is spp-poor with only *Ulex gallii* and ericoids present. *Molinia* and *Agrostis curtisii* only present along firebreaks with *Potentilla erecta*. Heath mapped as H4c with uniform height from burning and density eliminating grasses and forbs.
2	SW4154 3149	5-6m wide firebreak cut recently allowing a richer vegetation to develop more characteristic of H4c/a. Sub-shrubs are frequent but grasses and *Carices* account for 50% of cover. Sub-shrubs include *Erica tetralix*, *Calluna* and *Erica cinerea* and *Ulex gallii*. *Molinia A curtisii* and *Carex binervis* are frequent to locally abundant with frequent *Potentilla erecta* and occasional *Polygala*.

Appendix 2 Species list – Vascular and non-vascular plants

Latin	Common Name	Scrub	Wet Heath	Dry Heath	Hedges
Agrostis canina	Velvet bent	O			
Agrostis capillaris	Common bent-grass	O (e)		O	F/LA
Agrostis curtisii	Bristle bent-grass		LF	LF	O
Agrostis stolonifera	Creeping bent	O		R	O
Angelica sylvestris	Wild angelica	O			
Anthoxanthum odoratum	Sweet vernal grass				F
Athyrium filix-femina	Lady fern	O			O
Blechnum spicant	Hard fern	R			O
Calluna vulgaris	Heather/ ling		A	A	LF
Carex binervis	Green ribbed sedge		O (fb)		
Carex panicea	Carnation sedge		R (fb)		
Carex pilulifera	Pill sedge		R (fb)		
Centaurea nigra	Common knapweed	O			O
Crataegus monogyna	Hawthorn				O
Cynosurus cristatus	Crested dog's-tail	O			O
Dactylis glomerata	Cock's-foot	O			O
Digitalis purpurea	Foxglove	O		O	O/LF
Dryopteris dilatata	Broad buckler fern	O	O	O	O
Dryopteris filix mas	Male fern	R			O
Erica cinerea	Bell-heather		O	F/LA	O
Erica tetralix	Cross-leaved heath		F/LA	R	O
Festuca rubra	Red fescue				O
Galium aparine	Cleavers				O
Galium mollugo	Hedge bedstraw				O
Cuscuta epithymum	Dodder		F	O	
Galium saxatile	Heath bedstraw				O/LF
Geranium robertianum	Herb-Robert	R			O
Glechoma hederacea	Ground ivy	O			
Hedera helix ssp Hibernica	Atlantic ivy	O			
Heracleum sphondylium	Hogweed	O			
Holcus lanatus	Yorkshire fog	O/LF			O
Holcus mollis	Creeping soft-grass	O			O
Hyacinthoides non-scripta	Bluebell				O
Hypochaeris radicata	Common cat's ear				O
Lonicera periclymenum	Honeysuckle	O		O	O
Molinia caerulea	Purple moor-grass		F/LA	O	O
Phyllitis scolopendrium	Hart's tongue	O		O	LF
Plantago lanceolata	Ribwort plantain	O			O
Polypodium vulgare	Polypody				O
Potentilla erecta	Common tormentil		R	O	LF
Prunus spinosa	Blackthorn	O		R	O
Pteridium aquilinum	Bracken	A	R	O/LF	O/LF
Ranunculus repens	Creeping buttercup	O			
Rubus fruticosus agg.	Blackberry/bramble	A/LD	R	O/LF	LF
Rumex acetosa	Common sorrel	O			LF

Latin	Common Name	Scrub	Wet Heath	Dry Heath	Hedges
Rumex acetosella	Sheep's sorrel			O	O
Salix cinerea ssp oleifolia	Grey willow	O/LD	R	O	O/LF
Sambucus nigra	Elder	O			R
Sedum anglicum	English stonecrop				LF
Senecio jacobaea	Ragwort	LF			
Silene dioica	Red campion	O			LF
Stachys officinale	Betony				O
Stachys sylvatica	Hedge woundwort				O
Stellaria holostea	Greater stitchwort				O
Teucrium scorodonia	Wood sage	O		O	LF
Ulex europaeus	European gorse	R/LF		O	O/LF
Ulex gallii	Western gorse	R/LF	A/LD	A/LD	LF
Umbilicus rupestris	Navelwort				O/LF
Veronica chamaedrys	Germander speedwell	O			O
Viola riviniana	Common dog-violet	O		R	O/LF

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally, E = Edge, fb = Firebreak

Appendix 3 NVC quadrat data and photos

See Bosvenning Common subfolder on West Penwith CD for quadrat data, quadrat photos and other site photos.

Survey	Bosvenning Common					Recorder	MD		Date	221012	
Vegetation type	H4c										
Species	Q1	Q2	Q3	Q4	Q13	Species					
Calluna vulgaris	6	7	7	8	7						
Erica cinerea	4	4	4	3	4						
Erica tetralix	4	6	5	4	4						
Molinia caerulea	1	0	4	5	0						
Ulex gallii	7	7	7	6	7						
Agrostis curtisii	0	0	3	2	0						
Cuscuta epithymum	0	3	0	2	2						
Bare ground											

	Quadrats				
	Q1	Q2	Q3	Q4	Q13
Grid. ref.	SW4156 3140	SW4163 3137	SW4141 3149	SW4137 3155	SW4159 3142
Photo. No.					
Survey method					
Slope	Moderate	Slight	Moderate	Moderate	Slight
Aspect	N	N	N	N	N
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	450	450	450	450	450
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cpovering slopes is an even stand of dwarf heath vegetation comprising Cv, Ecin, E tet. Mc and Acurt are infrequent as is P erecta. No grazing but fire breaks.	Again very even and spp poor.	Abrupt increase downslope in Molinia as part of H4c.	Noticeable increase in cover of Mc. No evidenec of grazing.Sward needs opening upto allow herbs to colonise.	Intimate mix of Ug and ericoids, but Mc and A curt rare. Very dense cover and littel evidence of grazing or recent burning.

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

Survey	**Bosvenning Common**					**Recorder**	**MD**		**Date**	**221012**	
Vegetation type	**H8a**										
Species	**Q8**	**Q11**	**Q12**	**Q14**	**Q15**	**Species**					
Ulex gallii	9	9	9	8	9						
Erica cinerea	3	4	4	3	4						
Calluna vulgaris	3	3	4	4	4						
Potentilla erecta	3	3	3	3	3						
Dryopteris dilatata	2	1	1	2	2						
Athyrium filix femina	1	0	0	0	0						
Agrostis curtisii	2	0	1	2	0						
Hypnum jutlandicum	4	3	3	4	3						
Anthoxanthum odoratum	3	1	2	0	3						
Pteridium aquilinum	2	2	3	4	0						
Erica tetralix	0	1	0	0	0						
Rubus fruticosus	0	0	1	4	4						
Bare ground											

	Quadrats				
	Q8	**Q11**	**Q12**	**Q14**	**Q15**
Grid. ref.	SW4157 3154	SW4164 3150	SW4161 3146	Sw4166 3140	SW4160 3133
Photo. No.					
Survey method					
Slope	Moderate	Moderate	Moderate	Slight	
Aspect	N	N	NE	NE	
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	1200	1400	1200	1200	1200
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	No evidence of grazing but fire breaks close by. Very tall spp poor heath; E tet occasional but infrequent.	Adjacent to firebreak and fringed by H4c and H8a. G tall and leggy and statring to open up.	Taller heath from which E tet is generally absent. This is domiannt over NE and E slopes of site. No grazing orvrecent burning.	Taller heath showing normal transition through H4c to H4c/H8a.	As for Q14 with Rf encroaching.

Survey	Bosvenning Common					Recorder	MD		Date		221012
Vegetation type	**W25b scrub**										
Species	**Q5**	**Q6**	**Q7**	**Q9**	**Q10**	**Species**					
Pteridium aquilinum	9	9	9	8	9						
Rubus fruticosus	6	6	7	7	7						
Ulex gallii	1	0	4	1	5						
Agrostis curtisii	4	4	3	3	3						
Dryopteris dilitata	3	3	3	2	2						
Galium saxatile	2	2	2	3	2						
Hypnum cupressiforme	3	4	3	3	3						
Kindbergia praelonga	3	3	3	3	3						
Calluna vulgaris	0	4	3	0	0						
Molinia caerulea	1	2	0	4	0						
Sclerpodiuym parum	2	0	0	3	5						
Agrostis capillaris	0	0	0	3	3						
Anthoxanthum odoratum	0	0	0	2	3						
Potentilla erecta	0	0	2	2	4						
Rumex acetosa	0	0	0	0	3						
Digitalis purpurea	0	0	0	0	2						
Bare ground											

Quadrats

	Q5	Q6	Q7	Q9	Q10
Grid. ref.	SW4151 3161	SW4154 3160	SW4155 3156	SW4165 3158	SW4168 3156
Photo. No.					
Survey method					
Slope	Slight	slight	Moderare	Moderare	Moderare
Aspect	N	N	N	N	N
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	1000	1000	1000	1000	1000
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Small disturbed stand of Pta/Rf within H4c over north facing slopes.	As for Q5	As for Q5 and Q6	Ug overtopped by Rf and Pta	

Chun Downs (Survey Area 23 – 2012)

NVC surveyor	Steve Adams	Date surveyed	22/10/12
CSM surveyor	Steve Adams	Date surveyed	23/10/12
Report compiled by	Steve Adams		

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Chun Downs
County	Cornwall
District	Penwith
Parish	Morvah
Map Reference	Access at SW 404 347 & from Trehyllys Farm at SW 408 337
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

Chun Downs is a Cornwall Wildlife Trust (CWT) Reserve site.

1.2 Summary description

Area	20.9 ha
Altitude	140-200 m AOD
Aspect	The site includes the summit of the hill at Chun Castle sloping moderately to the north, north-east, north-west and south-west.
Drainage	There are no watercourses at Chun Downs.

1.3 Access

A bridleway follows the north-western edge of Chun Downs leading to Chun Quoit which then cuts across the heathland at right angles to Chun Castle. There is access to Chun Castle by other unofficial pathways through the heathland. The site is used by walkers and the view at the top of Chun Castle provides a stunning panorama of the west Penwith landscape to the sea. The

parish boundary runs right through the centre of Chun Castle and the site lies north-west of this centre line.

1.4 Land Tenure

The Chun Downs site is owned by the Cornwall Wildlife Trust and is managed by a tenant farmer. Most of the site boundary is not marked by any physical boundary on the ground.

2 Biological Description

2.1 Habitats

The site is predominantly humid heath with bramble and bracken scrub on the lower north facing slopes and around Chun Castle at the summit. Within the scrub there are scattered European gorse bushes but they are never dense enough to form an actual gorse scrub community.

The National Vegetation Classification (NVC) communities identified during the survey are described below, and their distribution with target notes shown on *Map 2* in *Appendix 1.* A list of plant species recorded within each habitat is provided in *Appendix 2*.

Photographs taken during field visits are included in the text to illustrate particular points of discussion as appropriate. Photographs relating to each quadrat sampled during the NVC survey are included (with quadrat data) as a named subfolder on the accompanying CD.

2.1.1 W25b *Pteridium aquilinum - Rubus fruticosus* underscrub, *Teucrium scorodonia* sub-community

The lower slopes of the hill along the north-east boundary are dominated by a bracken/bramble (*Pteridium aquilinum*/*Rubus fruticosus*) scrub. The small fields in the finger of land pointing north are also dominated by this community. The ramparts of Chun Castle also support this community which spreads out a short distance from the castle.

This is a relatively species poor community with only broad buckler fern (*Dryopteris dilatata*) being a constant other than the two dominant species. Wood sorrel (*Oxalis acetosella*) and the grass false brome (*Brachypodium sylvaticum*) are both frequent along with the bryophyte, cypress-leaved plait-moss (*Hypnum cupressiforme*). Other species only occur as occasionals.

A small area of scrub has recently been cleared from immediately outside Chun Castle. This may grow back as scrub, although the area

within the castle that was cleared of scrub just before the last survey in the winter of 2008/09 is more of an acid grassland/heathland with bramble only occurring as scattered plants.

The 2009 survey mapped some areas of **W23** ***Ulex Europaeus*** European gorse scrub. While this species is still present within the scrub, it is as scattered bushes and is never dense enough to be defined as a separate community.

There is no distinct boundary between the **W25** scrub and heathland higher up the slope. Instead there is a slow grading with the heathland sub-shrubs species slowly coming in while bracken and bramble slowly decrease. This means that there is a significant area of heathland that appears degraded due to the amount of bracken and bramble present.

Plate 1 23-2012 W25b scrub between the ramparts of Chun Castle

Plate 2 23-2012-TN1 Recently cleared scrub immediately outside Chun Castle

2.1.2 Humid dwarf shrub heath

Humid dwarf shrub heath is the dominant habitat type over the majority of the site. There are four constants: heather (*Calluna vulgaris*), bell heather (*Erica cinerea*), cross leaved-heath (*Erica tetralix*) and purple moor grass (*Molinia caerulea*). This suite of species is strongly associated with **H4c *Ulex gallii-Agrostis curtisii* heath *Erica tetralix* sub-community**; although bristle bent (*Agrostis curtisii*) should also be a constant.

Most of the heath species are in the mature growth phase, so that there is a tall and often closed canopy of sub-shrubs. This has presumably reduced the frequency of bristle bent, which was a constant in the 2008 survey.

There are areas where there is more diversity in the age structure of the heath species so that there are plants still in the pioneer phase. These are mainly to the immediate south-west of the castle and on the eastern side of the path on the lower northern slopes. Here the

vegetation is shorter (10-15cm) with much higher frequencies of both purple-moor grass and bristle bent.

Plate 3 23-2012-C1 Shorter heath with pioneer phase heathers and greater frequency of grasses.

On the northern slopes bracken and bramble are also present within the heath. The frequency of these two species slowly increases moving north and east down the slope, giving the heath a degraded quality.

Plate 4 23-2012-C10 Heath on the lower northern slopes with both bracken and bramble present.

It was possible to find areas where cross-leaved heath was absent with the other three constants remaining, suggesting an **H8a *Calluna vulgaris-Ulex gallii* heath**. However these were too small to map but it does suggest that as the heathland matures it is not only bristle bent that is pushed out.

The largest difference since 2008 is the change in the constancy and frequency of bristle bent. In 2008 it was recorded in 7 of 7 heathland quadrats with a frequency of 3-9. In 2012 it was only recorded in 3 of 9 heathland quadrats with a frequency of 4-5.

It is understood that there had been a large part of the site burnt in 2003[1]. Bristle bent recovers faster than the sub-shrubs after a fire so that a **H4a *Agrostis curtisii – Erica cinerea* sub-community** develops often as a temporary post-burn recovery phase to be

[1] Arkley, c. (2000) Managing and Monitoring Plan Chun Downs 2001-2006 A Report to Cornwall Wildlife Trust, Environmental Consultants (CTNC)

superseded by another sub-community (in this case **H4c**) once surviving shrubs re-establish themselves. In 2008 areas of **H4a** were mapped but the reduction in bristle bent means that by 2012 no **H4a** heath remained.

2.1.3 Enclosed field

There is an enclosed field in the north-east corner of the site (SW40653424 Map 2 Target Note 6). The surveyor was not aware that this was part of the 2012 survey area, so did not go into this field. This field was also not included in the 2008 survey. It was last surveyed in September 1999, when it was recorded as a mosaic of **U4b *Festuca ovina* - *Agrostis capillaris* - *Galium saxatile* grassland, *Holcus lanatus* - *Trifolium repens* sub-community** and **W25** scrub. Photo-monitoring that the Cornwall Wildlife Trust (CWT) has undertaken, suggests that this field had not changed between 1999 and 2009 with a mix of grassland and scrub.

Plate 5 23-1999 Enclosed field (TN6) April 1999 (CWT Photo-monitoring Pt 2 – 9°)

Plate 6 Enclosed field (TN6) January 2009 (CWT Photo-monitoring Pt 2 – 9°)

2.2 Species

2.2.1 Vascular plants

33 species of vascular plants were recorded during the survey in October 2012 which is similar to the 31 species recorded during the December 2008 survey. In addition 8 common mosses and a lichen were recorded in October 2012. None of the species recorded is of conservation importance.

The nationally scarce species Cornish moneywort (*Sibthorpia europaea*) and coral necklace (*Illecebrum verticillatum*), have previously been recorded here (Arkley, 2001). Whilst Cornish moneywort is considered of least concern in Cheffings *et al*, (2005), coral necklace is listed as vulnerable.

3 Condition Assessment

There is only one community present on this site that requires condition assessment. The **H4c** heathland counts as Cornish Humid Lowland Heathland and was assessed using Natural England's CSM forms for this habitat.

3.1 The Cornish humid lowland heath (H4c) is assessed as being unfavourable declining. This is because it has uniform age structure and the dense sub-shrub canopy has presumably shaded out most grasses and herbs, so that it is species-poor. In 2008 there was still evidence of a fire from 2003, with the burnt area supporting the grassy form of heath, H4a, thus a greater structural diversity of sub-shrubs and higher frequency of herbs and grasses existed only four years ago. There is currently no active management taking place that will prevent the decline in the condition of this site.

In 2012 the heathland was very uniform with the effects of the reported fire in 2003 no longer easily identifiable. Approximately 95% of the heath is in the building/mature growth stage with less than 5% being at the pioneer stage and no noticeable degenerate or dead heath. This structural uniformity is likely to be due to an absence of active management/disturbance; the only current management is the annual cutting back of a narrow band of scrub around the castle (N. Marriott, Cornwall Wildlife Trust, pers.comm.).

To improve the diversity of the heathland structure there needs to be some active management. Ideally grazing should be introduced to the site. If this is not possible, other management options such as cutting or burning might to be considered.

This site is only part of a larger area of heathland at Chun Downs. Ideally management proposals should consider the whole of Chun Downs heathland. It is also possible that if the whole of the Chun Downs site was surveyed and included within the condition assessment there would be a higher diversity of heathland types and structure.

Table 1 Summary of habitats and vegetation communities

Chun Downs 23-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W23c	1.28	0		N/A
	W25b	3.08	4.50		
Humid heath	H4a	1.89	0		
	H4c	12.52	14.54	UFD	Lowland heathland 16.40
Enclosed field TN6			1.86		
Total Area Mapped		**18.77**	**20.9**		

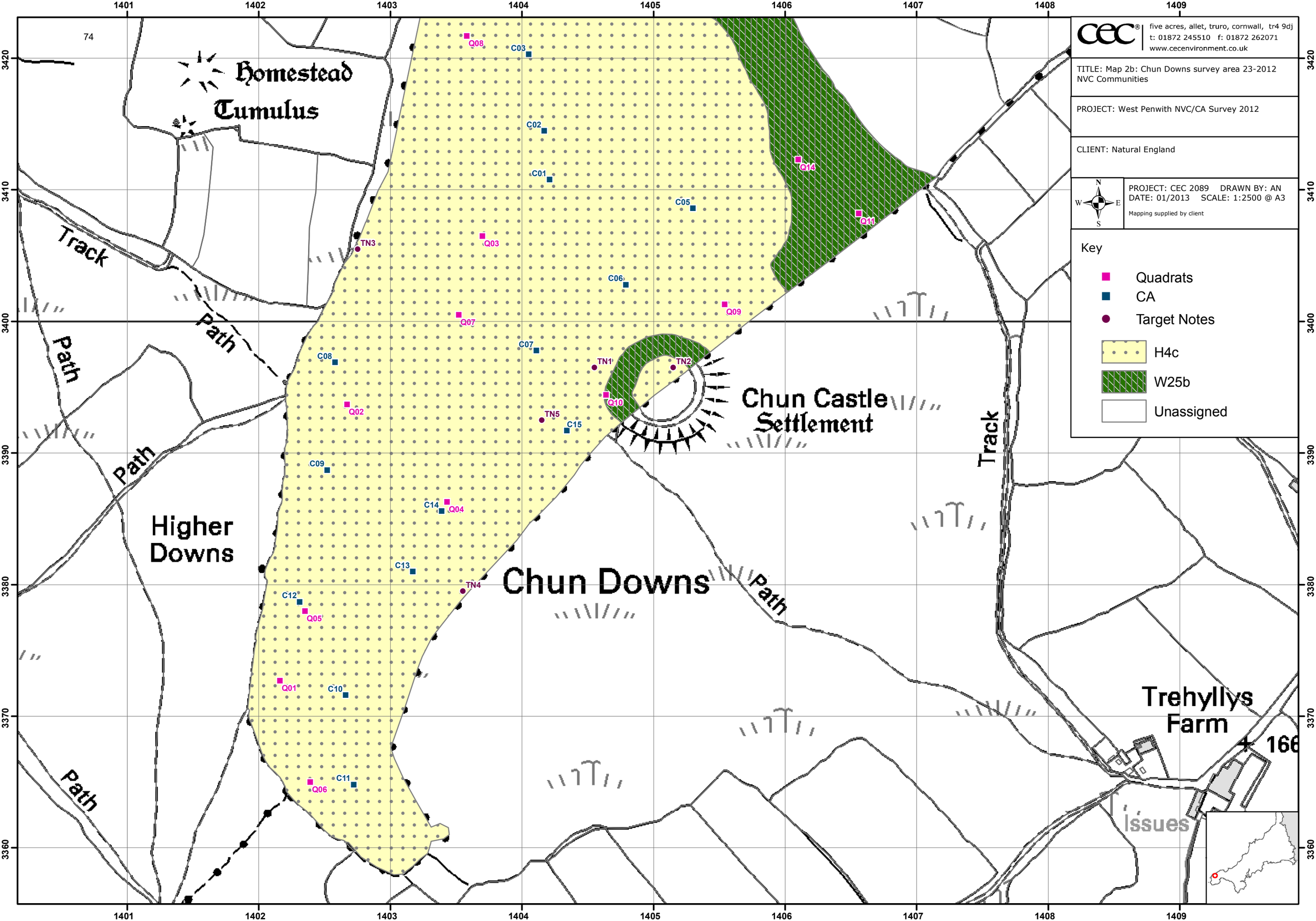
Condition Assessment reporting categories:
Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC)**,** Unfavourable declining (UFD)

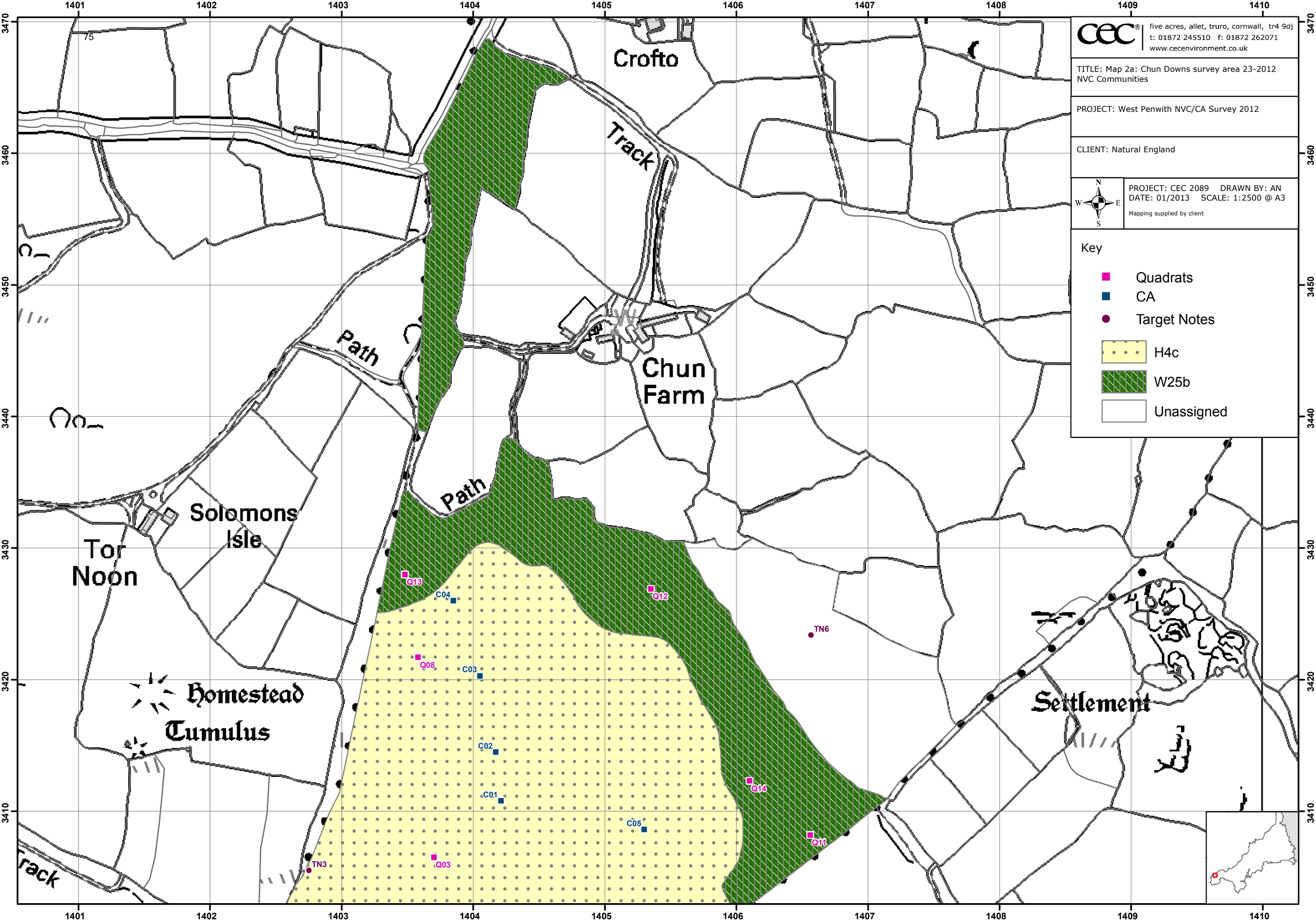
The site areas differ between the two surveys. The 2008 survey did not include the finger of land that points north from the north-west corner of the site, nor the enclosed field on the north-east corner of the site.

Appendix 1

Maps (1: Location, 2: NVC, 3: BAP habitat) See separate Maps Folder on CD

Target Notes


five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2b: Chun Downs survey area 23-2012
NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
H4c
W25b
Unassigned
Homestead Tumulus
Track
Path
Higher Downs
Chun Castle Settlement
Chun Downs
Trehyllys Farm
Issues
Q08
C03
C02
C01
C05
Q14
Q11
TN3
Q03
C06
Q09
Q07
C07
C08
TN1
TN2
Q10
Q02
TN5
C15
C09
C14
Q04
C13
TN4
C12
Q05
Q01
C10
C11
Q06


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2a: Chun Downs survey area 23-2012
NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
N
W
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PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
H4c
W25b
Unassigned
Crofto
Track
Path
Path
Chun
Farm
Solomons
Isle
Tor
Noon
Homestead
Tumulus
Settlement
Track
Q13
C04
Q12
TN6
Q08
C03
C02
C01
Q14
C05
Q11
Q03
TN3
1401
1402
1403
1404
1405
1406
1407
1408
1409
1410
3470
3460
3450
3440
3430
3420
3410

Target Notes for Chun Downs (Survey Area 23 – 2012)

TN. No.	Grid Ref.	Text
1	SW40453396	Area cleared recently of scrub. Cornwall Wildlife Trust carry out annual scrub cutting of a narrow strip around the castle.
2	SW40513396	The central area of the castle was scrub in 2003. It has been cleared and is now a grassland with heath (*Calluna vulgaris*) and scrub (bramble) species.
3	SW40273405	There is no physical boundary from this target point northwards for the western site boundary.
4	SW40353379	There is no physical boundary along the eastern site boundary.
5	SW40413392	This is the only area that has heath in pioneer stage.
6	SW40653424	This field was not surveyed in 2012, as the surveyor did not realise that it was within the site. This field was last surveyed in September 1999, when it was recorded as a mix of W25 scrub and U4b acid grassland. It is mapped as unassigned as part of this report.

Appendix 2 Plants recorded during the 2012 NVC/CSM survey

Scientific name	Common name	Scrub	Humid dwarf heath
Vascular plants			
Agrostis curtisii	Bristle bent	R	F
Blechnum spicant	Hard fern	R	
Brachypodium sylvaticum	False brome	O	
Calluna vulgaris	Heather	O	A
Carex binervis	Green-ribbed sedge	R	R
Carex panicea	Carnation sedge		R
Cynosurus cristatus	Crested dog's-tail	R	
Digitalis purpurea	Foxglove	O	
Dryopteris affinis	Scaly male fern		R
Dryopteris dilatata	Broad buckler fern	R	F
Erica cinerea	Bell heather	R	A
Erica tetralix	Cross leaved heath	R	A
Festuca rubra	Red fescue	R	R
Gallium saxatile	Heath bedstraw	O	O
Hedera hibernica	Atlantic ivy	O	
Holcus lanatus	Yorkshire fog	O	
Hypochaeris radicata	Cat's ear	R	
Juncus effusus	Soft rush	R	
Lonicera periclymenum	Honeysuckle	R	
Molinia caerulea	Purple moor grass		A
Oxalis acetosella	Wood sorrel	O	
Polygalla serpyllifolia	Heath milkwort	R	R
Potentilla erecta	Tormentil	R	O
Pteridium aquilinum	Bracken	A	O
Rubus frutisocosus	Bramble	A	O
Rumex acetosa	Common sorrel	O	
Sedum anglicum	English stonecrop	R	
Silene dioica	Red campion	R	
Solidago virgaurea	Goldenrod	R	
Stellaria graminea	Lesser stitchwort	R	
Ulex europaeus	European gorse	O	
Ulex gallii	Western gorse	O	A
Viola riviniana	Common dog-violet	O	
Non-vascular plants			
Dicranum scoparium	Broom Fork-moss	R	
Kindbergia praelonga	Common feather-moss	R	R
Polytrichum juniperinum	Juniper Haircap	R	
Pseudoscleropodium purum	Neat Feather-moss	O	R
Rhytidiadelphus loreus	Little Shaggy-moss	R	
Hypnum cupressiforme	Cypress-leaved Plait-moss	O	R
Hypnum jutlandicum	Heath Plait-moss	O	R
Dicranum majus	Greater Fork-moss	R	
Cladonia portentosa	A cladonia lichen		R

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally, E = Edge

Appendix 3 NVC quadrat data and photos

See relevant sub-folder on West Penwith CD for quadrat data, quadrat photos and other site photos

Survey	Chun Downs					Recorder		SA		Date	22/10/2012
Vegetation type			**H8a**								
Species	**Q1**	**Q2**	**Q3**	**Q4**		**Species**					
Ulex gallii	10	8	9	9							
Erica cinerea	6	5	6	7							
Calluna vulgaris	5	8	7	7							
Agrostis curtisii	4	5	0	0							
Galium saxatile	3	0	0	0							
Dryopteris dilatata	0	2	0	0							
Rubus fruticosus agg.	0	2	0	5							
Potentilla erecta	0	3	0	0							
Pteridium aquilinum	0	0	3	0							
Bare ground											

Quadrats

	Q1	**Q2**	**Q3**	**Q4**
Grid. ref.	SW 40216 33727	SW 40267 33937	SW 40370 34065	SW 40343 33863
Slope	Very gentle	Very gentle	Gentle	Very gentle
Aspect	na	32	0	352
Soil type				
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation Height	60-100cm	40-60cm	70cm	70cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	No grazing	No grazing	No grazing	No grazing

Survey	Chun Downs					Recorder	SA		Date	22/10/2012	
Vegetation type	H4c										
Species	Q5	Q6	Q7	Q8	Q9	Species	1	2	3	4	5
Ulex gallii	9	9	8	8	9						
Erica cinerea	7	2	3	7	4						
Erica tetralix	4	4	5	4	6						
Molinia caerulea	4	6	0	8	3						
Calluna vulgaris	8	5	8	8	8						
Potentill erecta	0	3	0	3	3						
Agrostis curtisii	0	0	4	0	0						
Pteridium aquilinum	0	0	0	0	3						
Bare ground	1		2								

	Quadrats				
	Q5	Q6	Q7	Q8	Q9
Grid. ref.	SW 40235 33780	SW 40239 33650	SW 40352 34005	SW 40358 34217	SW 40554 34013
Slope	Gentle	Flat	Very gentle	Very gentle	Very gentle
Aspect		na			
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	60cm	60cm	30-40cm	70cm	50cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	No grazing	No grazing	No grazing	No grazing	No grazing

Survey	Chun Downs					Recorder	SA		Date	22/10/2012	
Vegetation type	W25b										
Species	Q10	Q11	Q12	Q13	Q14	Species	1	2	3	4	5
Pteridium aquilinum	7	9	9	7	8						
Rubus fruticosus	7	8	8	7	7						
Dryopteris dilatata	0	4	5	7	4						
Hedera atlantica	3	0	0	0	6						
Brachypodium sylvaticum	2	4	0	5	0						
Galium saxatile	3	0	0	0	0						
Pseudoscleropodium purum	3	0	3	0	0						
Oxalis acetosella	3	0	3	3	0						
Hypnum cupressiforme	4	5	0	0	4						
Rumex acetosa	5	0	0	3	0						
Ulex europaeus	0	0	4	0	0						
Holcus lanatus	0	0	3	0	0						
Rhytidiadelphus squarrosus	0	0	3	0	0						
Silene dioica	0	0	0	1	0						
Agrostis capillaris	0	0	0	3	0						
Kindbergia praelonga	0	0	0	5	0						
Agrostis curtisii	0	0	0	0	4						
Ulex gallii	0	0	0	0	4						
Calluna vulgaris	0	0	0	0	4						
Bare ground											

	Quadrats				
	Q10	Q11	Q12	Q13	Q14
Grid. ref.	SW 40464 33944	SW 40656 34082	SW 40535 34269	SW 40348 34280	SW 40610 34123
Photo. Bearing	342	24	315		
Slope	Flat	Gentle	Gentle	Gentle	Gentle
Aspect			0		
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m		
Vegetation height (mm)	40cm	60cm	60-100cm	40-50cm	50-60cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

WATCH CROFT (Survey Area 31 - 2012)

NVC and condition assessment surveyor	John Sproull	Date surveyed	21.09.12 27.09.12 28.09.12 29.09.12
Report compiled by	John Sproull		

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name/ No	Watch Croft
County	Cornwall
District	Penwith
Parishes	Morvah
Map Reference	Access at SW42463603
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

This site is roughly centred around Watch Croft hill, the heathy summit of which is marked by a granite outcrop surrounded by a gently sloping hill top plateau. White Downs to the east forms a saddle of slightly lower lying ground dominated by wet heath before giving way to the slopes of Carn Galver which mark the eastern extent of the site. To the west, the moderate north-facing slopes of Morvah Hill support a mixture of bracken dominated vegetation and scrub in mosaic with heath over extensive areas of mine spoil leading down to the road. South of Watch Croft hill, gentle south-facing and steeper west-facing slopes, supporting primarily wet heath and derivatives of it, are bounded by an access track running to the north of Little Higher Bosullow and south of Bosullow Common. Watch Croft was previously surveyed in 2008 the area surveyed during 2012 is larger including additional areas to the north of Watch Croft hill within the Carn Galver valley and on the western flanks of Morvah Hill

1.2 Summary description

Area	135ha
Altitude	145 -252 m AOD
Aspect	The hill top plateau is primarily south facing though surrounding hill-sides display aspects through 360^0 of the compass. Gradients are mostly gentle becoming moderate to the north and west.
Drainage	There are ponds at SW42703559 and SW41473477. Water was noted to drain to the north after rain during the survey running down the Carn Galver valley along the route of the footpath. No other open water features were recorded within the site.

1.3 Access

The site is easily accessed by a network of footpaths and tracks. A number of paths and firebreaks have recently been cut and some fencing work has recently been undertaken to facilitate the reintroduction of cattle grazing. A surfaced track gives access from Bosullow Common toward the western boundary of the site to the property of Garden Mine Cottage at the summit of Morvah Hill. A number of walkers, dog walkers, horse-riders and on one occasion off-road motorbikers were seen across the site during the surveys. The location of the site is shown on *Map 1.*

1.4 Tenure

The site is owned by the National Trust and managed by tenant farmers in partnership with the National Trust. The western part of this survey area is managed in hand by a farm manager as part of Trevean Farm.

2 Biological Description

2.1 Habitats

The main habitat types present within the site include: scrub, unimproved acid grassland, bracken and heath (both dry and wet/humid). Boundaries are marked by extant and relict Cornish hedges of a style typical to the area. Habitats are described in more detail below and their distribution within the site is shown on *Map 2* in *Appendix 1*. A list of plant species recorded within each habitat is provided in *Appendix 2*.

Field notes made during the vegetation survey visits are annotated onto *Map 2* and included as Target Notes in *Appendix 1.* Photographs taken during the field visits are included in the text where they are considered useful in illustrating particular points of discussion. Photographs relating to each quadrat and CSM sampling point (as annotated onto *Map 2*) are appended (with quadrat data) to this report as a named subfolder on CD (*Appendix 3*).

2.1.1 Scrub

Areas of vegetation dominated by European gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus*) have been mapped as scrub and assigned within the NVC to **W23 *Ulex europaeus – Rubus fruticosus* scrub** and **W25 *Pteridium aquilinum - Rubus fruticosus* underscrub**, respectively.

Along the western site boundary in particular these two scrub communities sometimes occur in intimate association with one another such that European gorse forms a broken canopy where the shrubs coalesce over a backdrop of bracken. It can be difficult to map the two communities separately where this occurs and within one field the two were mapped in mosaic. Where bracken (*Pteridium aquilinum*) dominates with a general absence of bramble (with or without western gorse (*Ulex gallii*)) stands are better placed within the **U20** NVC community.

W23c *Ulex europaeus – Rubus fruticosus* scrub, *Teucrium scorodonia* sub-community European gorse dominates the extreme north western corner of the site and occurs in patches along the western site boundary. Although generally scarce across the rest of the site, European gorse can also occur as a minor component (with local frequency) within disturbed areas of heath and bracken. Within the areas assigned to **W23** the gorse tends to form a tall, more-or-less continuous canopy up to about 2m high, the height and density of the canopy limits the number of associate species, with bramble the only other constant; bracken can be locally abundant, Atlantic ivy and wood sage are frequent, the last of which is preferential for this sub-community. Other species, such as red campion (*Silene dioica*), foxglove (*Digitalis purpurea*) and common sorrel (*Rumex acetosa*) can be locally frequent.

Plate 1 31-2012-Q20 W23c,

W25b *Pteridium aquilinum - Rubus fruticosus* underscrub, *Teucrium scorodonia* sub-community

As indicated above, this community is also found along the western boundary of the site; the transition between it and **W23**, in places, blurred by the influence of grazing cattle. Noticeably the extent of bramble and consequent distribution the **W25** community appears to have increased across the site since the 2008 survey. This can be seen in particular to the north west of Bosullow Common and in areas to the north of Coronation Farm, both previously ascribed to U20a (the

amount of which now seems reduced within the site). Patches of W25 have also been mapped over disturbed ground to the north towards Rosemergy Farm. Also distinctive is the occurrence of this community within depressions associated with over-grown surface works, the remains of old shafts and tipped spoil over extensive areas to the north west of the site. Here several vegetation types occur in close association with one another in a repeating pattern; these areas have been mapped as mosaics (see below).

Plate 2 31-2012-Q31, W25b note H8 in distance.

Within areas mapped as **W25** the two dominants, bracken and bramble, form a more or less continuous cover. Woodsage, typical of this sub-community is frequent; common sorrel is constant and other acidic grassland species such as sweet vernal grass (*Anthoxanthum odoratum*), common bent (*Agrostis capillaris*) and to a lesser extent Yorkshire fog (*Holcus lanatus*) tend to remain frequent. Occasionally more ruderal elements such as rosebay willowherb (*Chamerion angustifolium*) come to the fore. Although not captured in the samples sometimes scattered shrubs such as grey willow (*Salix cinerea* ssp. *oleifolia*) and blackthorn (*Prunus spinosa*) are suggestive of **W25a**, the bluebell (*Hyacinthoides non-scripta*) sub-community, but bluebell is generally scarce across the site and this sub-community has not been mapped (although it should be noted that bluebell would have been easily missed during the survey period).

2.1.2 Acid grassland

Semi-improved, acid grassland occupies three small fields adjacent to derelict farm buildings immediately south of White Downs and a small field on the northern site boundary near to Rosemergy Farm. The sward is generally species-poor, mostly unmanaged and rather rank. Common bent dominates with sweet vernal grass and Yorkshire fog both abundant. Frequent associates are few but include tormentil (*Potentilla erecta*) and common sorrel. The community is best placed within **U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland**. Overall the absence of sheep's fescue (*Festuca ovina*) and abundance of Yorkshire fog along with the occurrence of cock's-foot (*Dactylis glomerata*) and more mesic dicot herbs, such as white clover (*Trifolium repens*) is suggestive of a degree of agricultural improvement and **U4b,** the ***Holcus lanatus – Trifolium repens* sub-community.** However the samples also reflect the local occurrence of more acidic stands perhaps better placed within **U4a** (the **typical sub-community**) where heather and carices are present at low levels of abundance. Within the field to the east of the farm ruins soft rush (*Juncus effusus*) is locally abundant.

U4 is the typical sward type derived from the grazing of **H8** heath and is characteristic of poorer quality grazing land over acid soils peripheral to upland areas supporting heath in the South West. Improvement, by the addition of fertilisers or top-seeding, can further facilitate a transition towards more mesophytic conditions associated with **MG6** grassland. (Grassland apparently approaching this is visible in fields adjacent to those described around Coronation Farm but these are outside of the study area).

Plate 3 31-2012-Q32, U4. Derelict farm buildings visible in background

In an adjacent field further east an open form of **H8** dry heath (**H8b** or "grass heath") shows clear floristic continuity with the acid grassland found here (see below).

2.1.3 Bracken

Vegetation in which bracken is dominant (generally without abundant bramble) has been assigned within the NVC as **U20 *Pteridium aquilinum- Galium saxatile* calcifugous grassland.** Along with the heath habitats described below, bracken is one of the major habitats within the site, at times occurring in coarse mosaic, particularly with drier forms of heath as over White Downs. The most extensive stands of bracken are found on lower, northern slopes where they again tend to give way to dry heath on higher, steeper ground or its wet counterpart heath over more level ground. The abundance of bracken at Watch Croft and its tendency to obscure other components of the vegetation (particularly sub-shrubs) - even during winter - makes large areas of habitat within the site appear morphologically similar. Although the mapping of localised transitions can be problematic, closer inspection reveals that the habitat takes various forms. Where dwarf heath shrubs (including western gorse) are at least locally frequent– sometimes with the shrubby element more or less restricted to freer draining boulders among quite dense covers of bracken, stands are assigned to the heathy sub-community **U20b.** Less commonly acid

grasses become pre-eminent amidst a more scattered covering of bracken; these stands have been placed within **U20a.** Where bramble has gained a foothold as over perhaps richer, disturbed soils, to the extent that it impedes easy access, stands are better placed as **W25** scrub (see above)**.**

Purple moor-grass (*Molinia caerulea*) and bristle bent (*Agrostis curtisii*) can be occasional to locally frequent in all of these communities; indeed, these species appear generally over-represented across the site relative to their importance in published community descriptions and can make assignment problematic. (This factor is seemingly an accepted south-western anomaly within the NVC, attributable to the mild climate of the region[1]). A limited suite of broadleaved herbs (forbs) common to both sub-communities in varying degrees of abundance can include tormentil, common sorrel, wood sorrel (*Oxalis acetosella*) and common dog violet (*Viola riviniana*).

U20a *Pteridium aquilinum- Galium saxatile* calcifugous grassland *Anthoxanthum odoratum* sub-community.

Here the bracken layer is more diffuse over a grassy field layer particularly of common bent, sweet vernal-grass and Yorkshire fog occasionally with red fescue and creeping soft-grass (*Holcus mollis*). Ericoid sub-shrubs and bryophytes are very sparse or absent and associated forbs are few. These areas are of restricted occurrence at Watch Croft and tend to be found in association with **H8** heath, transitions being mediated by the effects of grazing cattle such that the **U20a** forms scattered patches within an otherwise continuous cover of sub-shrubs, examples are found over White Downs. Areas previously mapped as **U20a** during the 2008 survey to the north of Coronation Farm appear to have become increasingly bramble dominated and are now assigned to **W25**.

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[1] Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D., & Yeo, M., (2004) *An Illustrated Guide to British Upland Vegetation* & Rodwell, J.S., Dring, J.C., Averis, A.B.G., Proctor, M.C.F., Malloch, A.J.C., Schaminée, J.N.J., & Dargie T.C.D., (2000) Review of coverage of the National Vegetation Classification

Plate 4 31-2012-C27 open area of U20a in association with H8a heath

U20b *Pteridium aquilinum- Galium saxatile* calcifugous grassland, *Vaccinium myrtillus – Dicranum scoparium* sub-community.

Stands with an increased cover of sub-shrubs, in particular western gorse but also, on close inspection, scattered sprigs of any of heather (*Calluna vulgaris*), bell heather (*Erica cinerea*) or bilberry (*Vaccinium myrtillus*) have been mapped as **U20b**.

Plate 5 31-2012-C31 showing typical U20b within Carn Galver valley

The abundance of western gorse in some stands sits uneasily with published descriptions of this community, but this species would appear to be at its climatic optimum within the British Isles in the extreme south west and in consequence can appear over-represented in certain communities. Notwithstanding this, the presence of an, albeit difficult to spot, heathy sub-shrub element suggests a heathland origin for this type of vegetation and the approach in surveying has been to favour heath where it is present when interpreting bracken dominated stands on this basis. **U20b** is a community which commonly intervenes in the absence of further management following the burning of heathland. This seems to be what has happened where the community finds maximum expression to the northern side of the site.

2.1.4 Dry heath

Dry heath is sub-ordinate in cover to its wetter counterpart within the site and tends to occupy steeper, freer-draining, rocky slopes and localised patches around exposed cairns. In general heather and western gorse are overwhelmingly dominant: in contrast to wet heath, cross-leaved heath is noticeably more or less absent and purple moor-grass is typically scarce. The most extensive stands are found around the periphery of White Downs giving way to bracken dominance down-slope and wet/humid heath over more level ground. Similarly dense, species poor and homogeneous stands dominate steeper slopes to the west of Garden Mine Cottage. Elsewhere, such as around Morvah Hill Mine stands are of a somewhat more open character with grasses playing a more prominent role alongside a mostly lower canopy of sub-shrubs.

In general, species poor assemblages overwhelmingly dominated by heather and western gorse are referable to **H8a *Calluna vulgaris – Ulex gallii* heath, species poor sub-community** and it is this which accounts for the bulk of the dry heath mapped at Watch Croft. One rather different area where there is a reduced heath element represented by shrubby islands surrounded by runnels of acid grassland has been mapped as **H8b *Danthonia decumbens* sub-community.** Finally, more or less distinct is a third form where bristle bent becomes prominent. This is shown as **H4a *Ulex gallii - Agrostis curtisii* heath, *Agrostis curtisii – Erica cinerea* sub-community.**

H8a, species poor sub-community

Here western gorse tends to form a more or less continuous, dense cover with only scattered bushes of heather and bell heather (though these two species can come to prominence in some stands). Other associates are few: trailing species such as tormentil and heath bedstraw are occasional, while beneath, common mosses including *Pseudoscleropodium purum* and *Hypnum cupressiforme* can be locally frequent. Grasses including common bent and (atypically for this community) purple moor-grass and bristle bent are generally of minor importance but can appear as scattered tussocks occasionally protruding through the shrubby canopy. For the most part this community appears in a dense, species poor and homogeneous form within the site. Stands occupying a ridge mid-slope to the north of Watch Croft hill (see Q17) are less typical in being dominated by mature/ degenerate heather bushes forming a collapsing canopy to about 1.5m high with no western gorse and a slight increase in the richness of the associated flora.

Also anomalous is a form occupying a single field to the north of Bosullow Common (Q7) derived from previous burning. This comprises little more than western gorse with grossly over-represented purple-moor grass and scant regenerating bell heather (*Erica cinerea*). It is interesting to note that when last surveyed (in 2008) this area was left unassigned within the NVC.

Plate 6 31-2012-C19, view of homogeneous, species poor H8a

H8b *Danthonia decumbens* sub-community

In a field to the south of White Downs the cover of sub-shrubs is more diffuse such that western gorse dominated **H8**-type heath appears to occur as a series of islands of varying sizes within a sea of **U4** acid grassland. This sub-community was mapped previously to the north of Morvah Hill Mine but was not seen here during the present survey. It can occur as an intermediary stage following burning and in the absence of grazing or arrest from natural factors would normally be succeeded by **H8a** in time as the canopy of sub-shrubs becomes increasingly closed.

At the time of the survey the intention was to show this area as **U4b/H8a** mosaic. One quadrat and one CSM sample only were taken from within an area of grass (Q34 and C23 respectively). The grass sward, dominated by common bent and sweet vernal-grass appeared rank and unmanaged at the time of the survey and was treated as **U4b.** The decision to re-assign this area to **H8b** was taken retrospectively in the interest of consistency following subsequent mapping of similar stands as **H8b** by the surveyor elsewhere within the 2012 West Penwith survey area. This approach is considered more informative and the mapping of mosaics has been avoided where possible.

Plate 7 View S from SW42593555 H8b within field south of White Downs

H4a *Ulex gallii - Agrostis curtisii* heath, *Agrostis curtisii – Erica cinerea* sub-community

Stands with a generally more scattered, lower level canopy of sub-shrubs with an accompanying more noticeable contribution from bristle bent (a species usually absent from **H8**) are placed within **H4a.** When surveyed in 2008 these stands bore the hallmarks of recent burning but appear to have been left to regenerate since this time. Bristle bent is a species known to monopolise the ground in the early years of recovery following fires. Not only does it set abundant seed and so is readily able to colonise bare ground but the bases of established tussocks are fire resistant and are quickly able to re-sprout following a burn; enabling the grass to attain ascendency over slower-growing shrubby elements. In the absence of other factors (such as grazing) this state of affairs is temporary, such that **H4a** frequently marks a post-burn recovery phase to be superseded by another sub-community (here **H4c** or perhaps **H8a** over drier soils) once surviving shrubs re-establish themselves. This appears to be what is happening at Watch Croft; within sampled stands around Morvah Hill Mine (Q23) there has been a definite shift in the floristics away from bristle bent dominance toward an increase in sub-shrubs (and less H4a was mapped in 2012 compared to 2008). To the south (Q5 and Q8) less controlled, ‘accidental’ burning appears to have tipped the balance in favour of continued grass dominance. Although still sub-ordinate within the samples, purple–moor grass appears over-represented here for this community.

A fourth, very species poor, form of dry heath occurring in a fragmented sequence with bramble and bracken scrub in disturbed areas of mine-spoil (not map-able at the scale of the present survey) is described under the mosaics heading below.

Plate 8 H4a heath to the north of Morvah Hill Mine in 2008

Plate 9 31-2012-Q22 similar viewpoint to plate 8 above; H4a, note shift away from bristle bent dominance

2.1.5 Humid heath

Humid heath referable to **H4c (*Ulex gallii - Agrostis curtisii* heath, *Erica tetralix* sub-community)** is the dominant habitat over much of the higher and gently sloping ground within the site. As described

above, separation from **H8a** and **H4a** is predicated primarily upon the presence here of cross-leaved heath (*Erica tetralix*). Cover of purple-moor grass and/or bristle bent (neither typically abundant within **H8**, the latter abundant in **H4a**) is not a reliable guide. Both species are over-represented generally within the SW and it seems within the site as a result of past management.

The gross appearance of the vegetation varies markedly from one stand to another from open and grassy to closed and shrub-dominated. This variation appears in part to be an artefact of past treatments such as burning and grazing or the lack thereof. In more extensive stands, as around the summit of Watch Croft and over Bosullow Common, different forms of **H4c** grade into one another, possibly also reflecting localised edaphic variation.

H4c *Erica tetralix* sub-community

Wetter than **H4a** this sub-community generally occurs over flatter ground, presumably with impeded drainage, cross-leaved heath is more or less constant. Typically (though it may still retain frequency) an accompanying reduction in the amount of bristle bent gives these stands a subtly different appearance to those assigned to **H4a**. The sward can be closed and up to *c.*50cm high in which case it tends to be rather species-poor and dominated by either western gorse, or more locally, heather, with frequent tussocks of purple-moor grass punctuating the canopy. In other stands, particularly where burning has been more recent, it attains little more than 10cm and there may be frequent patches of bare ground. These stands tend to be somewhat richer with frequent bryophytes, lichens and locally abundant sedges, green-ribbed sedge and carnation sedge (*Carex binervis* and *C. panacea*) being recorded during the survey.

Plate 10 31-2012-Q2 overgrown H4c

Plate 11 31-2012-C1 expanse of short H4c over Bosullow Downs

2.1.6 Hedges

Enclosed land within the site is divided by an intricate network of Cornish hedges; these are mostly overgrown and have consequently been mapped as part of the surrounding vegetation. The line of existing boundaries is shown on the Ordnance Survey maps and they have not, in consequence been mapped as part of the NVC survey. Overgrown hedges are generally quite species-poor, though those less heavily shaded can be expected to retain more floristic richness and

respond more quickly to restoration. With the exception of those that are fenced and those surrounding semi-improved grassland fields, additional fencing would be likely to be required to ensure stock-proofing in most areas.

2.1.7 Mosaics

In some areas the mapping of mosaics proved unavoidable due to the occurrence of more than one NVC community occurring in intimate association in repeated patterns across a stand. Two different forms have been mapped as follows:

Plate 1 Hummock and hollow area supporting mosaics of heath and bracken with locally abundant lichens (Photo taken during 2010/11 surveys)

Hummock and hollows over areas of gross disturbance associated with former mining around Morvah Hill Mine and Garden Mine Cottage support intricate **heath/ scrub/ bracken mosaics**. The intricacies of these areas proved unmappable at the scale of the present survey, furthermore dense scrub and occasional open shafts hinder access. However, the vegetation tends to show regular repetitions: **H8**-type heath tends to occupy drier hummocks (presumably spoil) – often with locally abundant bryophytes and lichens and areas of bare rock/ coarse spoil, **W25** occurs within excavated hollows/depressions and the surrounding areas tend to be best placed within **U20b**. Within this, in

some areas, there may be intermittent patches of **H4** occupying flatter areas with impeded drainage.

Plate 13 Grossly disturbed area of hummock and hollow (Photo taken during 2010/11 surveys)

As already mentioned above the scrub communities W25 and W23 occur in intimate association with one another along parts of the western site boundary. Where the have been mapped in mosaic broken patches of the gorse scrub effectively form a fragmented canopy over a backdrop of bracken and bramble to the extent that precluded the mapping of two separate communities.

2.2 Species

2.2.1 Vascular plants

Chamomile (*Chamaemelum nobile*) was recorded at the edge of a track leading over Bosullow Common (*TN13,* SW41613488). This species is listed as a priority species for conservation on the UK BAP and as Vulnerable by Cheffings & Farrell (2005).

3 Condition Assessment

3.1 Humid Heath (H4c/H4a)

Twelve samples were taken distributed throughout humid heath stands within the site; nine of the sampling points relate to **H4c**, two relate to **H4a**, one relates to **U20b**.

Overall, the humid heath is assessed as **unfavourable/ no change**. Habitat features fail on one mandatory attribute vegetation structure; stands are generally even aged and lack physiognomic diversity being for the most part overwhelmingly composed of building/mature specimens. This is presumably largely an artefact of the lack of disturbance within most stands associated with the historic cessation of grazing. It is surprising perhaps in view of this that mandatory attributes for vegetation composition and the extent of bare ground are met by the samples. Not surprisingly the areas of greatest species-richness tend to be found where there is a lower, more open canopy of sub-shrubs. This is seen in samples such as C1 and C2 (taken from Bosullow Common) and C5 (taken from near the summit of Watch Croft hill) where exposure and shallow soils seem to inhibit growth.

3.2 Dry Heath (H8a/U20b)

Nine samples were taken distributed throughout areas of dry heath within the site. (Using the same dry heath forms, 3 points were also sampled to assess the condition of bracken heath habitat assigned to U20b.)

Overall, dry heath is assessed as **unfavourable/ no change**. The community fails on mandatory attributes for bare ground, vegetation structure, vegetation composition and negative indicators. Overall there is an absence of bare ground, an even-age structure and a general floristic paucity, with respect to graminoids and forbs. These failures seem again to relate to too low a level of disturbance within most stands and are a likely facet of abandonment. As a corollary, grazing stock would seem to be having a positive impact along the western site boundary although no dry heath CSM samples were taken here and as

much of this area was not included in the previous (2008/9) survey this cannot be substantiated. Samples fail under the negative indicators criterion due to the incidence of “coarse grasses” (namely purple moor-grass) which is generally over-represented across the site (see *Section 2.1.3*). Not surprisingly U20b samples show a marked increase in the cover of bracken and to a lesser extent, bramble.

3.3 Acid Grassland (U4/U20a)

Ten samples were taken, distributed throughout the acid grassland and grassy bracken stands across the site (5 within U4 and 5 within U20b). As only a minor component of the vegetation at Watch Croft condition assessed together as ‘U4/U20 related’ on the lowland acid grassland CSM form.

Overall assessed as **unfavourable/ no change**, fails the following mandatory attributes for sward composition: frequency of positive indicator species, incidence of bracken and cover of coarse grasses. Also fails optional attribute for sward structure. The lack of floristic diversity and general rankness may again be derived from lack of management. Absence of grazing pressure or other disturbance allows more competitive species such as Yorkshire fog to dominate at the expense of a richer array of finer grasses and more diminutive forbs which might otherwise be present. The reduction in the extent of U20a mapped following the present survey as compared to that undertaken in 2008/2009 would seem to lend credence to this.

Table 1 Summary of habitats and vegetation communities

Watch Croft 31-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W1		0.50	N/A	Wet woodland 0.50
	W23c	2.10	3.78		N/A
	W25b	1.31	12.79		
Acid grassland	U4a		0.21	UFNC	Lowland dry acid grassland 1.20
	U4b	5.71	0.99		
Bracken	U20a	11.40	2.05	N/A	N/A
	U20b	10.80	38.46		
Dry heath	H8a	14.30	23.22	UFNC	Lowland heathland 68.57
	H8b		1.87		
	H4a	9.28	4.90		
Humid heath	H4 (unassigned)	2.92			
	H4c	36.20	38.58	UFNC	
Mosaic	Mosaic	7.22	7.94	N/A	N/A
Open water	Open water		0.09	N/A	Ponds 0.09
Total Area Mapped		101.20	135.38		

Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD)

Appendix 1

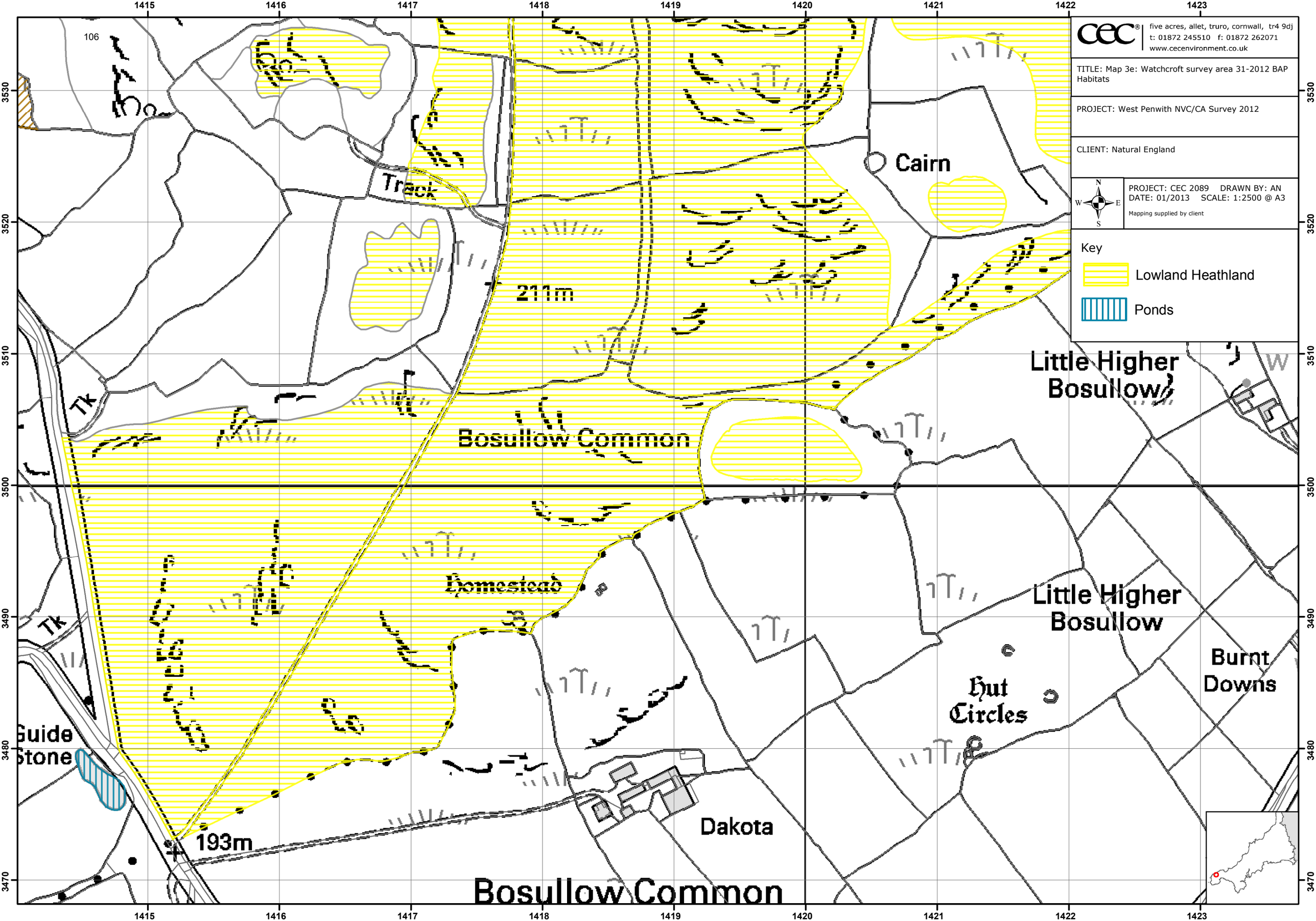
Maps (1: Location, 2: NVC, 3: BAP habitat)

See separate folder on CD

Map 2 Target Notes Watch Croft (Survey Area 31 – 2012)

TN. No.	Grid Ref.	Text
1	SW41843524	‘Advanced' form of H4a (as at Q5) *Molinia caerulea* is over-represented and abundant. *Agrostis curtisii* is still frequent but *Erica tetralix* is absent
2	SW41823549	Similar to TN1 - possibly moving towards H8
3	SW41893609	Poor, scrubby form of U20b *Ulex europaeus* LF but Ericoids still present especially around spoil heaps/surface working could show as W25/W23 but approach is to give heathy vegetation the benefit of the doubt and map as heath. *Pteridium aquilinum* within U20a field to the north is all fresh and young - has possibly been cut/grazed this year.
4	SW42023615	*Rhododendron ponticum.*
5	SW41473477	Grown in pond - not extensively surveyed due to difficulty of access - appears somewhat enriched/degraded. Species present include: *Eleocharis palustris, Sphagnum fallax, Potomageton, Juncus effusus, Hydrocotyle vulgaris, Gallium palustre, Glyceria fluitans.* Snipe flushed.
6	SW41333532	U4b surrounded by open W23 - cattle grazed - some *Salix cinerea*
7	SW41333577	Sward appears to have been cut to expose settlement
8	SW41463570	*Ulex gallii* c1m high, punctuated by *Erica cinerea*, some *Calluna vulgaris* clumps, *Pteridium aquilinum* and *Rubus fruticosus* F. Quite scrubby, cattle grazed.
9	SW41523577	Area shown as H4a lacks *Erica tetralix* but *Agrostis curtisii* F and constant. Closed shrubby canopy to c50cm. *Ulex gallii*, *Calluna vulgaris*, *Erica cinerea*. Some *Molinia caerulea.* Possibly on the way to H8
10	SW41473545	Hard to decide between W23/W25/U20b - could see it as a mosaic. More scrubby downslope and heathy over freer draining rocky ground upslope and in centre. Cattle grazed.
11	SW41553539	Shown as mosaic: sea of W25 with islands of W23 - cattle making occasional in-roads. H8 fragments to E.
12	SW41623531	Again could be seen as a mosaic but there is a discernable central core of H8 as mapped.
13	SW41613488	*Chamaemelem nobile*
14	SW41983502	Formerly H4a. *Agrostis curtisii* still present but this subordinate to *Molinia caerulea, Erica tetralix* and *Carex binervis*. Short stature with F bryophytes and lichens

15	SW42223538	*Erica tetralix* drops out upslope, dense canopy of *Calluna vulgaris* and *Ulex gallii* to 75cm. *Molinia caerulea* A. Referable to H8 with LA *Pteridium aquilinum*.
16	SW42123543	*Succsia pratensis* LF.
17	SW42203560	U4 patches too small to map. W25 seems to have come from U4/U20a
18	SW42303549	W25 has come form U4/U20a but *Rubus fruticosus* +/- constant and F. Adjacent H8 is v.poor and +/- just *Ulex gallii.*
19	SW42703559	Pond (possibly only seasonal) species poor: *Lythrum portula, Callictriche* sp., *Glyceria fluitans, Juncus effusus, Juncus bufonius, Juncus articulatus.* C10cm deep and c10m diameter possibly dug for stack watering.
20	SW42703568	*Succsia pratensis*
21	SW42363566	Surface workings/spoil. H8/W25 linear strip heading +/- N-S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N
W
E
S
PROJECT: CEC 2089 DRAWN BY: AN
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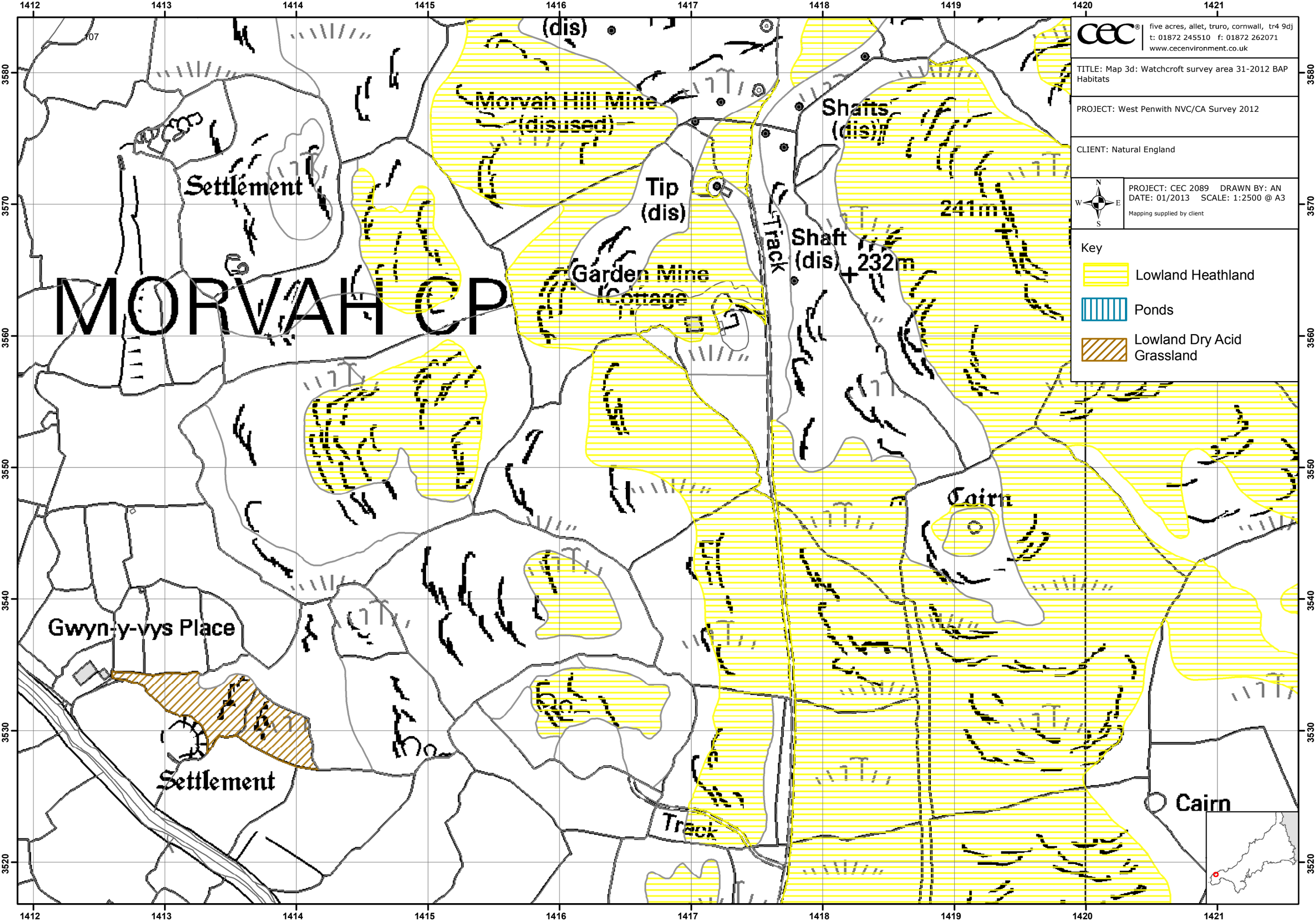
Key
Lowland Heathland
Ponds
1415
1416
1417
1418
1419
1420
1421
1422
1423
3530
3520
3510
3500
3490
3480
3470
106
Track
Cairn
211m
Little Higher Bosullow
Bosullow Common
Tk
Tk
Homestead
Little Higher Bosullow
Burnt Downs
Hut Circles
Guide Stone
193m
Dakota
Bosullow Common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1413
1414
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1416
1417
1418
1419
1420
1421
3580
3570
3560
3550
3540
3530
3520
(dis)
Morvah Hill Mine
(disused)
Shafts
(dis)
Settlement
Tip
(dis)
Track
Shaft
(dis)
232m
241m
Garden Mine
Cottage
MORVAH CP
Cairn
Gwyn-y-vys Place
Settlement
Track
Cairn
five acres, allet, truro, cornwall, tr4 9dj
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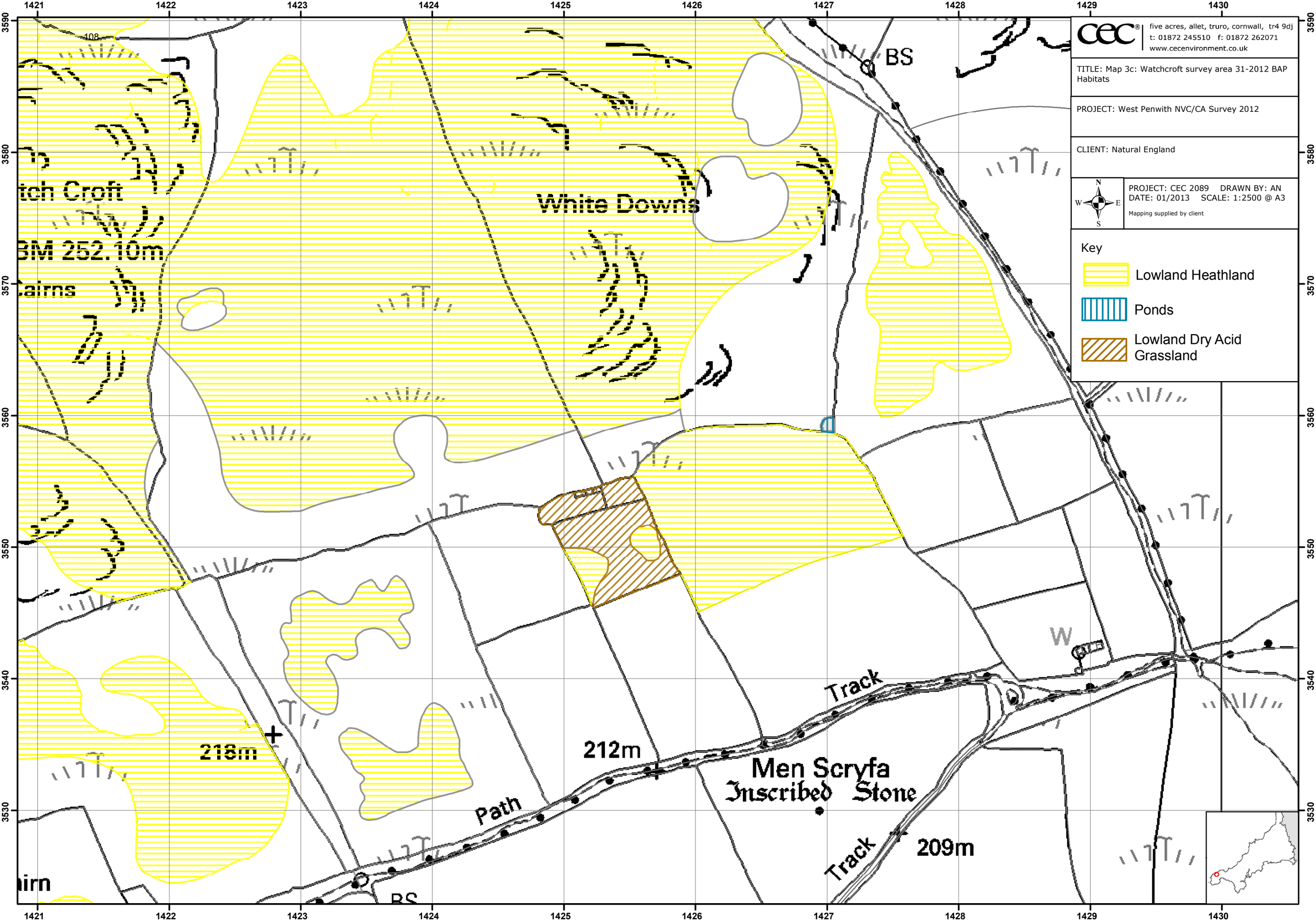
Key
Lowland Heathland
Ponds
Lowland Dry Acid Grassland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Mapping supplied by client
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Lowland Heathland
Ponds
Lowland Dry Acid Grassland
White Downs
Men Scryfa
Inscribed Stone
Track
Path
Track
212m
209m
218m
BS
BS
W
1421
1422
1423
1424
1425
1426
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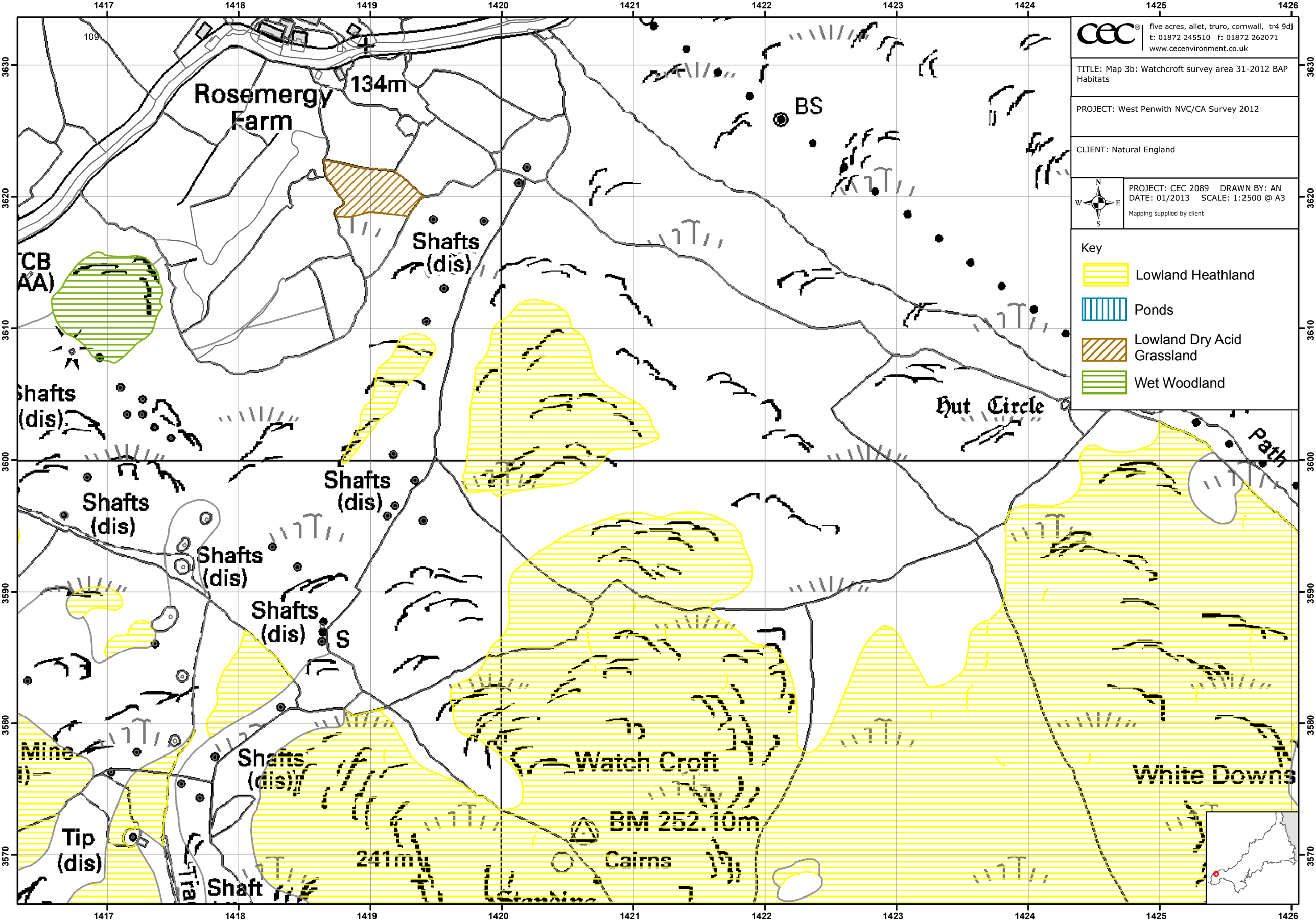
3530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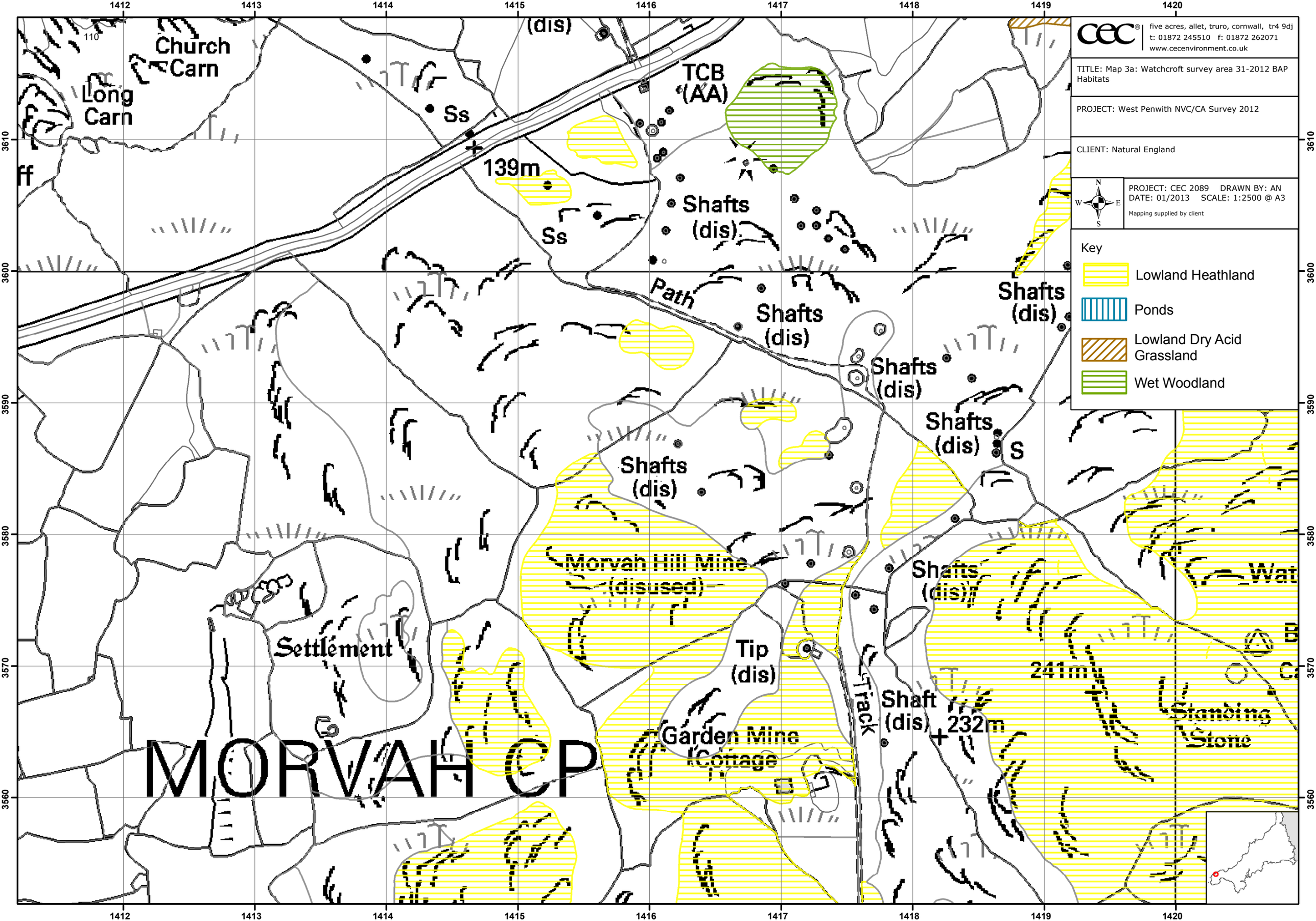
Key
Lowland Heathland
Ponds
Lowland Dry Acid Grassland
Wet Woodland
Rosemergy Farm
134m
BS
Shafts (dis)
Hut Circle
Path
Watch Croft
White Downs
BM 252.10m
Cairns
241m
Tip (dis)
Shaft
Mine
S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Lowland Heathland
Ponds
Lowland Dry Acid Grassland
Wet Woodland
Church Carn
Long Carn
TCB (AA)
Ss
139m
Shafts (dis)
Path
Morvah Hill Mine (disused)
Settlement
Tip (dis)
Track
Shaft (dis)
232m
241m
Garden Mine Cottage
Standing Stone
MORVAH CP
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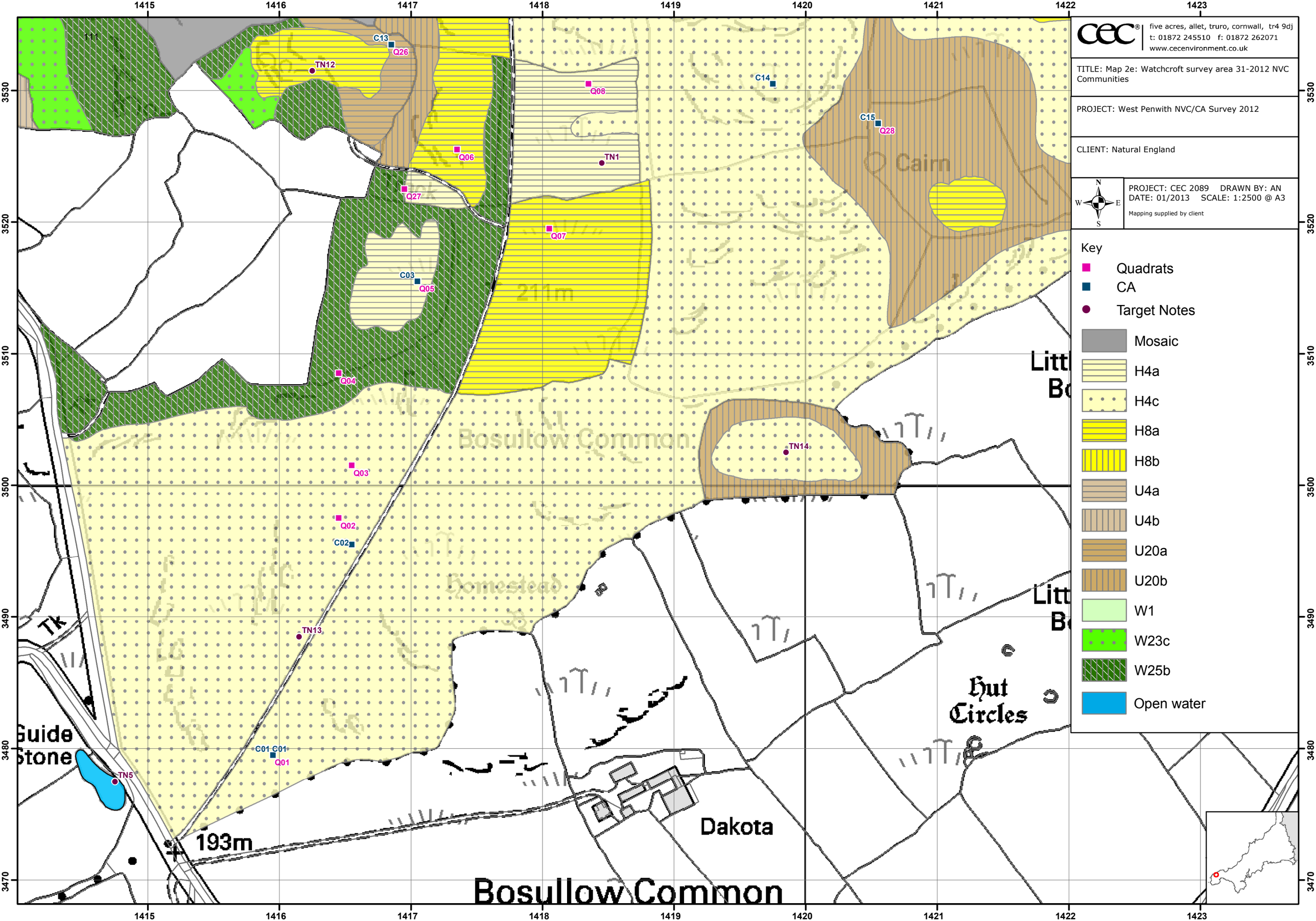
3560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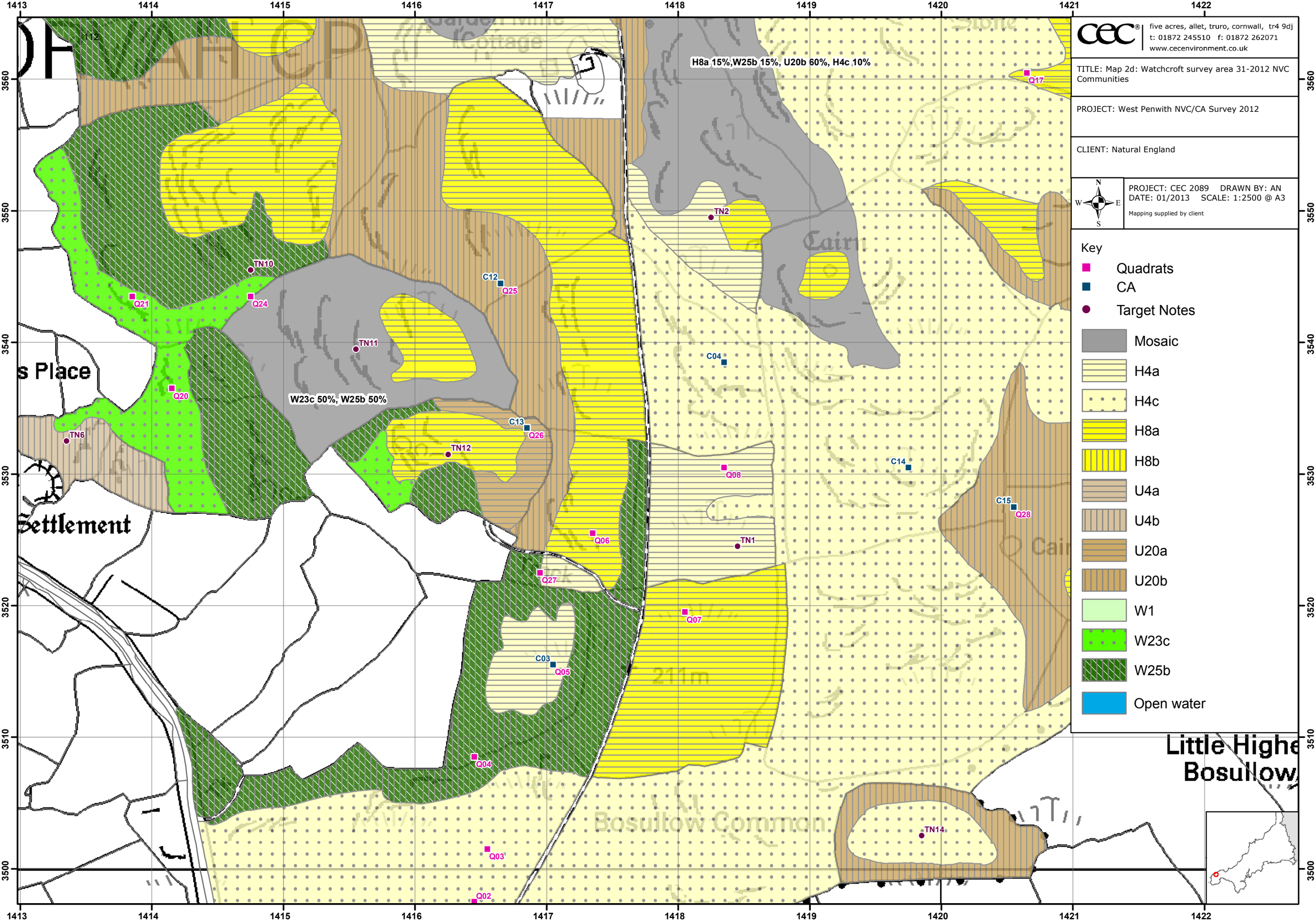
Key
Quadrats
CA
Target Notes
Mosaic
H4a
H4c
H8a
H8b
U4a
U4b
U20a
U20b
W1
W23c
W25b
Open water
Bosullow Common
Dakota
Hut Circles
Cairn
211m
193m
Guide Stone
Homestead
TK
C13
Q26
TN12
Q08
C14
C15
Q28
Q06
TN1
Q27
Q07
C03
Q05
Q04
Q03
TN14
Q02
C02
TN13
C01 C01
Q01
TN5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Quadrats
CA
Target Notes
Mosaic
H4a
H4c
H8a
H8b
U4a
U4b
U20a
U20b
W1
W23c
W25b
Open water
H8a 15%,W25b 15%, U20b 60%, H4c 10%
W23c 50%, W25b 50%
Settlement
Bosullow Common
Little Highe
Bosullow
211m
Q17
TN2
TN10
Q21
Q24
C12
Q25
TN11
C04
Q20
TN6
C13
Q26
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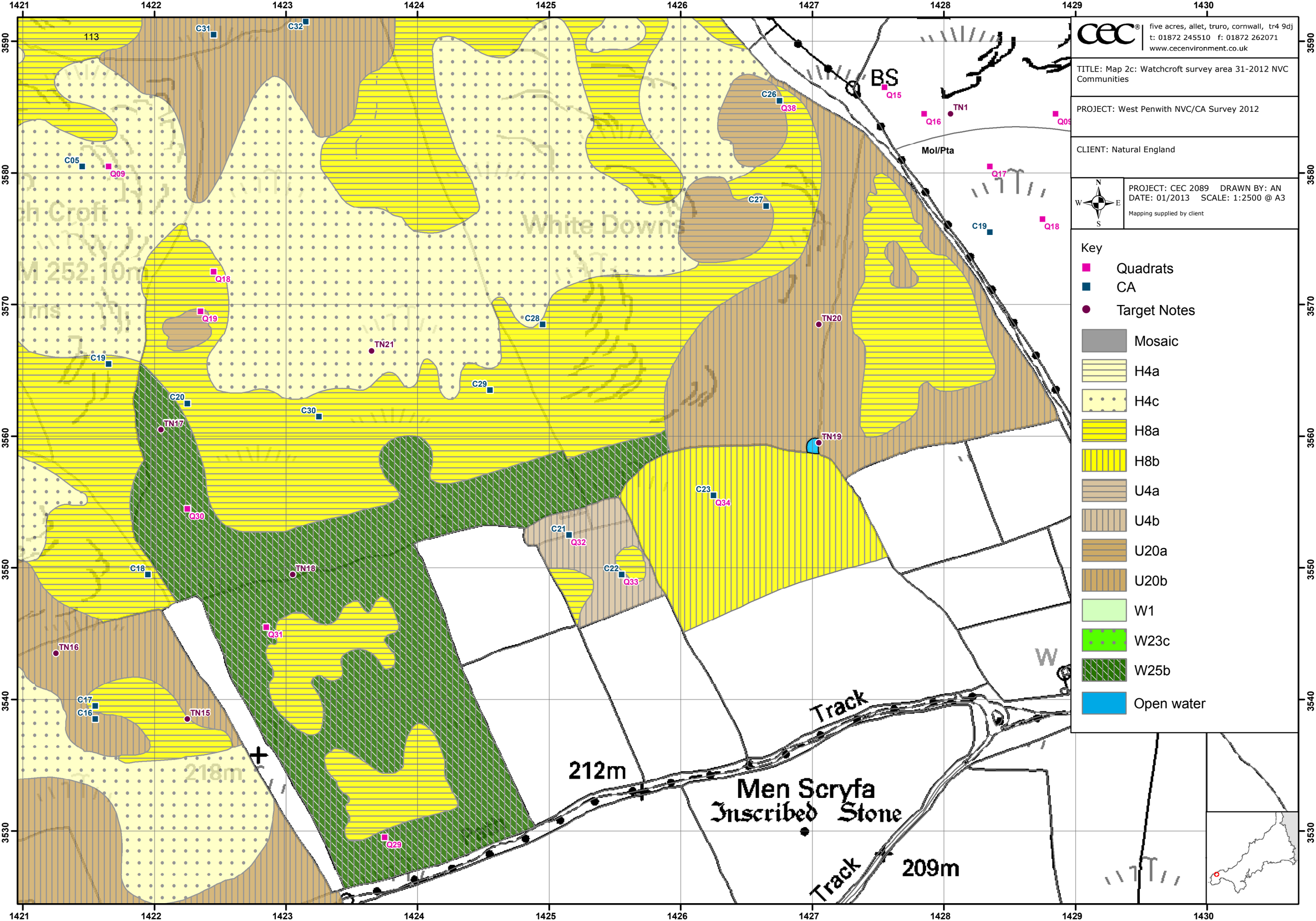
Q04
TN14
Q03
Q02



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TITLE: Map 2c: Watchcroft survey area 31-2012 NVC Communities

PROJECT: West Penwith NVC/CA Survey 2012

CLIENT: Natural England

PROJECT: CEC 2089 DRAWN BY: AN
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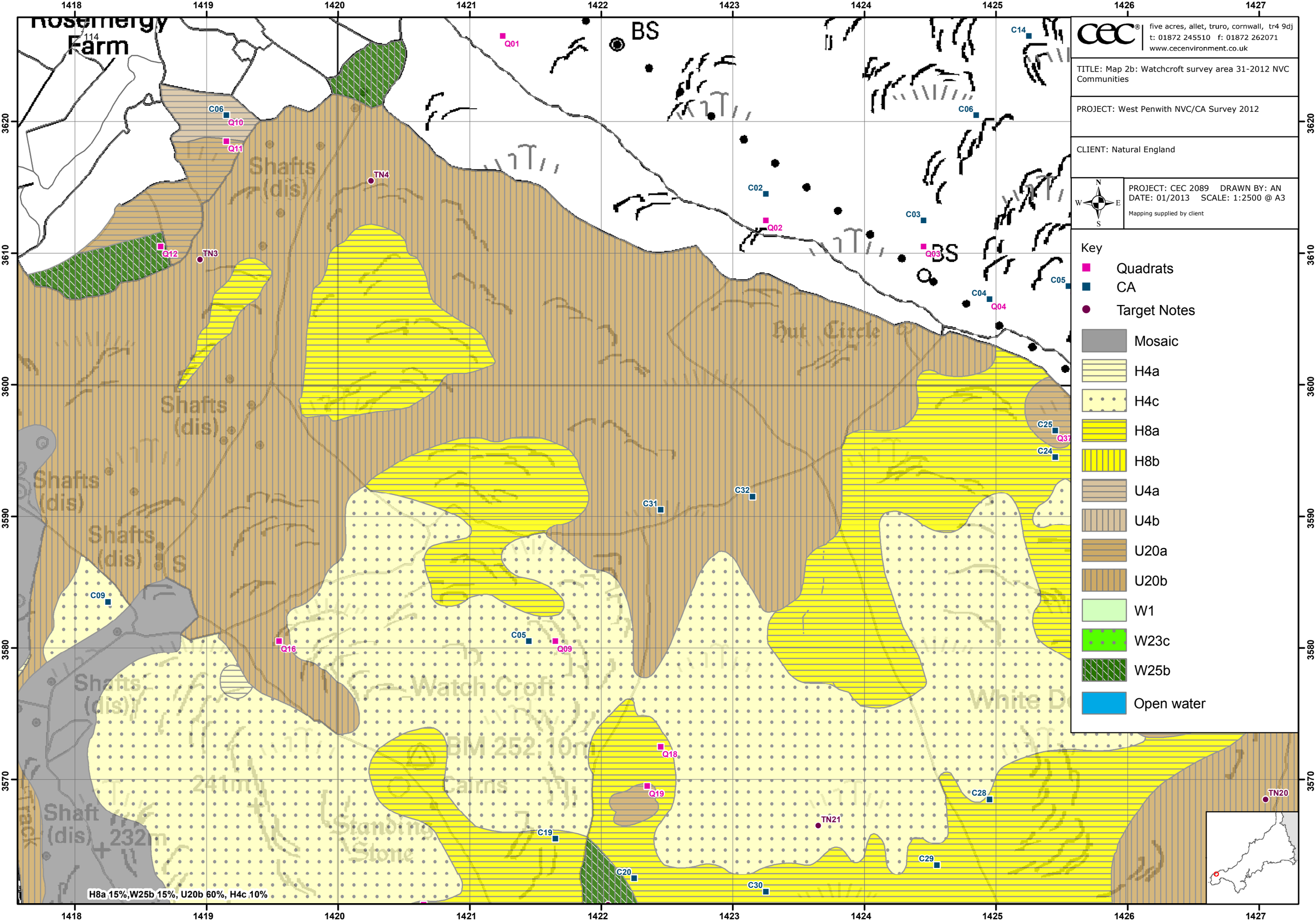
Mapping supplied by client

Key

- Quadrats
- CA
- Target Notes
- Mosaic
- H4a
- H4c
- H8a
- H8b
- U4a
- U4b
- U20a
- U20b
- W1
- W23c
- W25b
- Open water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five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2b: Watchcroft survey area 31-2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mosaic
H4a
H4c
H8a
H8b
U4a
U4b
U20a
U20b
W1
W23c
W25b
Open water
Rosemergy Farm
Shafts (dis)
Hut Circle
Watch Croft
Cairns
Standing Stone
BM 252.10m
241m
232m
H8a 15%,W25b 15%, U20b 60%, H4c 10%
Q01
Q02
Q03
Q04
Q09
Q10
Q11
Q12
Q16
Q18
Q19
Q37
TN3
TN4
TN20
TN21
C02
C03
C04
C05
C06
C09
C14
C19
C20
C24
C25
C28
C29
C30
C31
C32
1418
1419
1420
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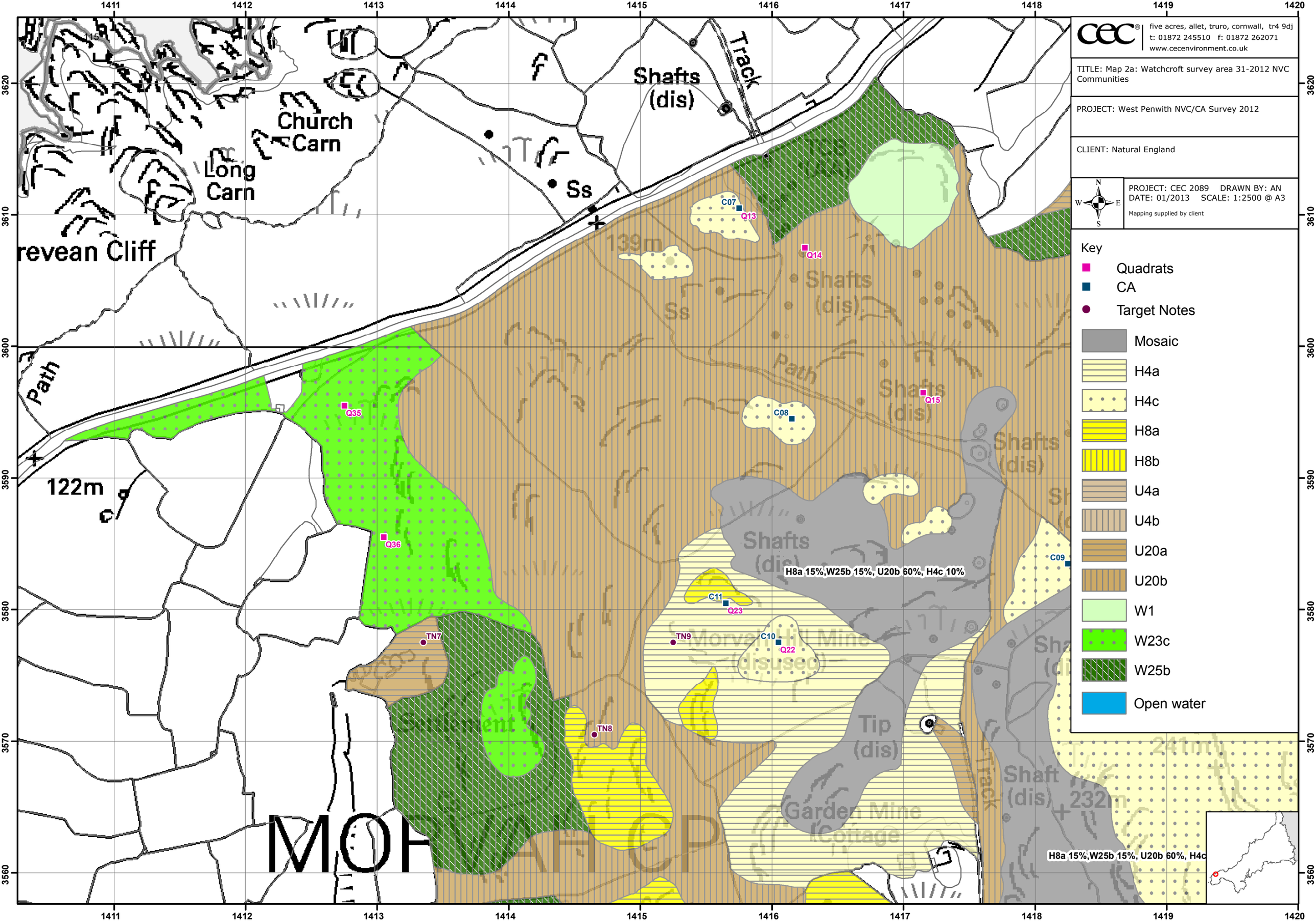
1422
1423
1424
1425
1426
1427
3620
3610
3600
3590
3580
3570


cec®
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2a: Watchcroft survey area 31-2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mosaic
H4a
H4c
H8a
H8b
U4a
U4b
U20a
U20b
W1
W23c
W25b
Open water
Church Carn
Long Carn
revean Cliff
Shafts (dis)
Track
Ss
139m
Path
122m
Q35
Q36
Q13
Q14
Q15
Q23
Q22
C07
C08
C09
C10
C11
TN7
TN8
TN9
H8a 15%,W25b 15%, U20b 60%, H4c 10%
Morvah Hill Mine (disused)
Tip (dis)
Garden Mine (Cottage)
Shaft (dis)
232m
241m
H8a 15%,W25b 15%, U20b 60%, H4c

Appendix 2 Plant species recorded during survey

Latin Name	Common Name	Bracken	Dry heath	Humid heath	Acid grassland	Hedge	Scrub
Achillea millefolium	Milfoil	R					
Aegopodium podagraria	Ground-elder						R
Agrostis canina	Velvet bent	R			R		
Agrostis capillaris	Common bent-grass	LA		O/LF	D	F/LA	O
Agrostis curtisii	Bristle bent-grass	0/LF	LF	F/LA		LF	
Agrostis stolonifera	Creeping bent						R
Angelica sylvestris	Wild angelica						O
Anthoxanthum odoratum	Sweet vernal grass	LF			F	LF	
Anthriscus sylvestris	Cow parsley						R
Blechnum spicant	Hard fern	R			O		
Calluna vulgaris	Heather/ ling	O/LF	F/LA	F		LF	
Campylopus flexuosus	A moss			LF			
Campylopus introflexus	A moss	O	O	LF			
Carex binervis	Green-ribbed sedge	O/LF	LF		LF		
Carex panicea	Carnation sedge			R			
Carex pilulifera	Pill sedge		R	R	O		
Chamaenerion angustifolium	Rosebay willowherb						R/LA
Cladonia portentosa	A lichen	LF	LF	LF			
Cladonia uncilalis	A lichen			R			
Crataegus monogyna	Hawthorn					R	R
Crocosmia x crocosmiiflora	Montbretia						R

Latin Name	Common Name	Bracken	Dry heath	Humid heath	Acid grassland	Hedge	Scrub
Dactylis glomerata	Cock's foot	O	R		LF	LF	O
Danthonia decumbes	Heath grass		R				
Dicranum scoparium	A moss	F	LF	F			
Digitalis purpurea	Foxglove	R	R			LF	LF
Dryopteris dilatata	Broad buckler fern	O	O			O	F
Erica cinerea	Bell-heather	O/LF	F	O		LF	
Erica tetralix	Cross-leaved heath		R	F/LA			
Festuca rubra	Red fescue	O/LF			F/A	LF	O
Galium saxatile	Heath bedstraw	O	O	O	F	O	O
Geranium robertianum	Herb-robert	R				O	O
Hedera helix	Ivy	LF				LA	F/LA
Heracleum sphondylium	Hogweed,cow parsnip						R
Holcus lanatus	Yorkshire fog	F/LA	O		F/LA	LF	O
Holcus mollis	Creeping soft-grass	R	R				R
Hyacinthoides non-scripta	Bluebell	R					
Hypochaeris radicata	Common sat’s-ear	R			R		
Hypnum cupressiforme	A moss	F	LF				F
Hypnum jutlandicum	A moss	F/LA	O				F
Hypnum lacunosum	A moss		R				
Hypochaeris radicata	Common cat's ear	R				O/R	
Jasione montana	Sheep's-bit	R				R	
Juncus effusus	Soft rush	R			LF		R
Lonicera periclymenum	Honeysuckle	LF				O	O
Mentha sp	Mint species						R

Latin Name	Common Name	Bracken	Dry heath	Humid heath	Acid grassland	Hedge	Scrub
Molinia caerulea	Purple moor-grass	LF	LF	A/LD	LF		
Oxalis acetosella	Wood-sorrel	LF				O	O
Pedicularis sylvatica	Lousewort	R					
Plantago lanceolata	Ribwort plantain						R
Pleurozium screberi	A moss	R					
Polypodium vulgare	Common polypody	O					
Polytrichum piliferum	A moss	R/O		O			
Potentilla erecta	Common tormentil	F	F		O	F	O
Prunus spinosa	Blackthorn					R	R
Pteridium aquilinum	Bracken	D	D/LF	R	O	F/LA	A
Ranunculus repens	Creeping buttercup				LF		
Rhytidiadelphus loreus	A moss	O	R				
Rhytidiadelphus squarrosus	A moss	LF	O		F	LF	LF
Rubus fruticosus agg.	Blackberry/bramble	F/LA	O			F	A/LD
Rumex acetosa	Common sorrel	F/LA			F	F	F
Rumex acetosella	Sheep's sorrel	O			F	O	
Salix cinerea	Grey willow	O/LF					R
Scleropodium purum	A moss	F		O		F	F
Sedum anglicum	English stonecrop	R(E)				F	
Silene dioica	Red campion	F	O			O	LF
Solidago virgaurea	Goldenrod	O	R		R		R
Stellaria uliginosa	Bog stitchwort	R					
Stellaria holostea	Greater stitchwort	O					O
Succisa pratensis	Devil’s-bit scabious	R					
Teucrium scordium	Water germander	F	O			F	F

Latin Name	Common Name	Bracken	Dry heath	Humid heath	Acid grassland	Hedge	Scrub
Ulex europaeus	European gorse	R	R			R	LD
Ulex gallii	Western gorse	F	A/LD	A/LD		LA/F	
Umbilicus rupestris	Navelwort	O(E)				O	
Vaccinium myrtillus	Bilberry	LF	LF			O	
Veronica officinalis	Common speedwell	R					
Viola riviniana	Common dog-violet	O/R				R	O

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally, E = Edge

Appendix 3 NVC Quadrat data and photos

See separate folder on CD

Survey	Carn Galver					Recorder	MD		Date	270912	
Vegetation type	Humid heath H4c										
Species	Q3	Q5	Q7	Q9	Q14	Species	Q3	Q5	Q7	Q9	Q14
Ulex gallii	8	5	7	7	6						
Calluna vulgaris	6	7	6	4	4						
Erica tetralix	4	5	5	5	6						
Erica cinerea	3	2	0	3	0						
Molinia caerulea	4	4	5	3	6						
Potentilla erecta	3	3	3	4	0						
Cladonia squamosa	0	2	0	0	0						
Agrostis curtisii	0	3	3	7	0						
Carex binervis	0	0	1	0	0						
Dicranum scoparium	0	0	0	0	4						
Sphagnum denticulatum	0	0	0	0	4						
Carex panicea	0	0	0	0	1						
Trichphorum germanicum	0	0	0	0	11						
Bare ground											

Quadrats

	Q3	Q5	Q7	Q9	Q14
Grid. ref.	SW4244 3610	SW4255 3607	SW4262 3598	SW4288 3584	SW4310 3555
Photo. No.					
Survey method					
Slope	Slight	Slight	Slight	Slight	V. Slight
Aspect	W	W	W	S	W
Soil type					
Quadrat area	4m sq	4m sq	4m sq	4m sq	4m sq
Vegetation height (mm)	400	300	250	200	250
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Tall, dense cover with dwearf shrubs dominant; Small stands of H4c within more extensive area of U20b.	Shorter, more open vegetation where bryopyhtes and cladonia can persist. Fall in Ug.	Shorter more open vegetation with no clera dominant in sub-shrubs.	Area of H4c burnt sincve 2009 survey, but recovering with increase in A curt. Other parts of original H4c stand have been re-assigned to	Extensive sytand of H4c at southern end of Cran galver. H8a encroaching into H4c from edge of field.

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

Survey	Watchcroft					Recorder	JS		Date	21/09/2012	
Vegetation type	H4a										
Species	Q5	Q8	Q23			Species	1	2	3	4	5
Ulex gallii	5	6	6								
Erica cinerea	6	5	3								
Calluna vulgaris	5	1	6								
Potentilla erecta	4	5	4								
Molinia caerulea	5	4	8								
Pteridium aquilinum	5	5									
Rubus fruticosus	4		3								
Agrostis curtisii	7	7	6								
Teucrium fruticosus	3										
Cladonia sp.			1								
Bare ground											

Quadrats

	Q5	Q8	Q23		
Grid. ref.	SW41703515	SW41833530	SW41563580		
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle		
Aspect	N	W	N		
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq		
Vegetation Height	60cm	60cm	20cm		
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Lots of Molinia, not much Ag curtisii possibly moving towards Mol/Ug	Seperation from area to south mapped as H8a predicated on abundance of Agrostis curtisii			

Survey	Watchcroft					Recorder	JS		Date	21/09/2012	
Vegetation type	H4c										
Species	Q1	Q2	Q9	Q13	Q22	Species	1	2	3	4	5
Calluna vulgaris	6	7	7	6	7						
Erica tetralix	6	5	5	8	3						
Molinia caerulea	6	6	5	5							
Agrostis curtisii	4	6	4	3	5						
Ulex gallii	6	7	7	5	5						
Carex panicea	4										
Potentilla erecta	3	4	3	3							
Carex binervis	4		2		5						
Erica cinerea	3	3	2		3						
Caldonia sp	2			2	3						
Campylopus introflexus	2			2							
Caldonia sp	1										
Pedicularis sylvestris				1							
Bare ground	1		2								

	Quadrats				
	Q1	Q2	Q9	Q13	Q22
Grid. ref.	SW41593479	SW41643497	SW42163580	SW41573610	SW41603577
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle	Gentle	Gentle
Aspect	S	S	NE	W	NW
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	4 m Sq
Vegetation height (mm)	15cm	20cm	25cm		10cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Short homogeneous sward, bare patches, crispy and dry, probably seasonally wet	Slightly taller, possibly transitional to area previously mapped as H4a, more Ag curtisii present to E but now all assigned to H4c	Small opening surrounded by Pta		Localised H4c surrounded by HH4a where Erica tetralix disappears. Atypically no Molinia.

Survey	Watchcroft					Recorder	JS		Date 21/09/2012		
Vegetation type	**H8a (dry heath)**										
Species	**Q3**	**Q6**	**Q7**	**Q17**	**Q18**	**Species**	**1**	**2**	**3**	**4**	**5**
Calluna vulgaris	7	5		9	7						
Ulex gallii	9	8	9		9						
Erica cinerea	4	6	4	3	3						
Molinia caerulea	2	4	6		2						
Potentilla erecta	4		1	1	2						
Agrostis curtisii	4				3						
Rubus fruticosus		1									
Pteridium aquilinum			1	3	2						
Lotus pedunculatus				3							
Teucrium scorodonia				2							
Polytrichum commune				3							
Polypodium vulgare				2							
Hypnum cupressiforme				5							
Solidago virgaurea				2							
Vaccinium myrtillus				3							
Hedera hibernica				3							
Danthonia decumbens				1							
Bare ground											

Quadrats

	Q3	Q6	Q7	Q17	Q18
Grid. ref.	SW41653501	SW41733525	SW41803519	SW42063560	SW42243572
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	none
Aspect	S	W	NW	N	
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	4 m Sq
Vegetation height (mm)	30cm	1m	1m	75cm	1m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Localised transitions to this community where Molinia and E tet drop out. Ag curt occasional (previouslyburt and mapped as H4a)	Molinia locally over-represented	Molinia over-represented previously burnt and mapped as Mol/Ug (still present locally) seems to be coming back as heath. Ag curt v. Scarce	Cv overwhelmingl y dominant, Ug occasional. Mature/ degenerate. Slow worm seen nearby.	At gradual transition to H4c - very hard to map

Survey	Watchcroft					Recorder	JS		Date	21/09/2012	
Vegetation type	**W25b**										
Species	**Q4**	**Q12**	**Q27**	**Q29**	**Q31**	**Species**	**1**	**2**	**3**	**4**	**5**
Pteridium aquilinum	9	8	9	7	8						
Rubus fruticosus	6	6	7	7	7						
Anthoxanthum odoraum	6		1		5						
Agrostis capillaris	4		1		6						
Teucrium scorodonia	5		4								
Succsia pratensis	1										
Galium saxatile	3										
Hyacinthoides non-scripta	3										
Stellaria holostea	3	4	1								
Rumex acetosa	2	4	3	2	1						
Holcus lanatus	2	4									
Solidago vigaurea	3	4									
Potentilla erecta	1		1	1							
Silene dioica	2			4	1						
Geranium robertianum		5									
Holcus mollis		2									
Chamerion angustifolium		3		3	4						
Molinia caerulea			1								
Agrostis curtisii			1	4							
Dactylis glomerata			1								
Pseudoscleropodium purum			1		3						
Bare ground											

	Quadrats				
	Q4	**Q12**	**Q27**	**Q29**	**Q31**
Grid. ref.	SW41643508	SW41863610	SW41693522	SW42373529	SW42283545
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	S	NW	W	S	S
Soil type					
Quadrat area	2x2m	2x2m	2x2m	2x2m	2x2m
Vegetation height (mm)	1m	1m	1.1m	1.1m	1.2m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Previously mapped as U20a - Rf spreading into field from hedge			Previously U20a. Patchy U4 elements persist at a scale too small to map in extreme SW corner.	

Survey	Watchcroft					Recorder	JS		Date	28/09/2012	
Vegetation type	W23										
Species	**Q20**	**Q21**	**Q24**	**Q35**	**Q36**	**Species**	**1**	**2**	**3**	**4**	**5**
Ulex europaeus	20	7	9	8	7						
Rubus fruticosus	9	7	5	8	9						
Anthoxanthum odoratum	5	7	5	3	5						
Agrostis capillaris	5			3							
Holcus lanatus	4										
Silene dioica	4	3		3							
Rumex acetosa	3	2	2	2	3						
Cerastium holosteoides	2	3		1	1						
Oxalis acetosella	1	3									
Lonicera periclymenum		4	4		1						
Agrostis stolonifera		1	2								
Digitalis purpurea		3	4								
Dryopteris dilitata		1		2	1						
Teucrium scorodonia		1		3							
Hedera atlantica			1								
Bare ground											

	Quadrats				
	Q20	**Q21**	**Q24**	**Q35**	**Q36**
Grid. ref.	SW41413536	SW41383543	SW41473543	SW41273595	SW41303585
Photo. No.					
NVC method					
Slope	Slight	Slight	Moderate	Slight	Slight
Aspect	W	W	W	N	
Soil type					
Quadrat area	5X5m	5X5m	5X5m	5X5m	5X5m
Vegetation height (mm)	1.75m	2m	1.75m	2m	1.75m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazing opening up paths between coalesced Ue. Scattered but frequent W25 in between shrub masses.	Transitional to W25 upslope whole area could be contrued as W23/W25 mosaic	Cattle grazing making in-roads through scrub		Sxci LF

Survey	Watchcroft					Recorder	JS		Date 27/09/2012		
Vegetation type			U4								
Species	**Q10**	**Q30**	**Q32**	**Q33**	**Q34**	**Species**	**1**	**2**	**3**	**4**	**5**
Agrostis capillaris	8	10	7	10	10						
Holcus lanatus	4	3	8	3	5						
Ranunculus repens	3		6								
Trifolium repens	3										
Cirsium pallustre	2										
Achillea millefolium	3										
Anthoxanthum odoratum	4	7	3	5	3						
Rumex acetosa	3		1	1							
Dactylis glomerata	4										
Rhytidiadelphous squarrosus	3	6									
Hypochaeris radicata	1	3	1								
Erica cinerea		2			2						
Potentilla erecta		6		6	4						
Molinia caerulea					2						
Calluna vulgaris		1			1						
Carex binervis		4									
Carex pilulifera		4									
Solidago virgaurea		3									
Galium saxatile		1									
Festuca rubra		6			3						
Cirsium vulgare			1								
Lotus pedunculatus					3						
Erica cinerea											
Calluna vulgaris											
Agrostis stolonifera					3						
Bare ground											

Quadrats

	Q10	**Q30**	**Q32**	**Q33**	**Q34**
Grid. ref.	SW41913620	SW42223554	SW42513552	SW42553549	SW42623555
Photo. No.					
NVC method					
Slope	Slight	Slight			
Aspect	N	SW	S		
Soil type					
Quadrat area	2 m sq	2 m sq	2 m sq	2 m sq	2 m sq
Vegetation height (mm)	5cm	20cm	10cm	40cm	40cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Grazed possibly U4b	Small linear stand within W25	V poor possibly U4b	Rather rank - U4a?	Rank U4b

Survey	Watchcroft					Recorder	JS		Date	27/09/2012	
Vegetation type	**U20b**										
Species	**Q11**	**Q19**	**Q26**	**Q37**	**Q38**	**Species**	**1**	**2**	**3**	**4**	**5**
Dactylis glomerata	4										
Agrostis capillaris	7	6	6	3	6						
Anthoxanthum odoratum	7	9	8	9	8						
Rumex acetosa	3	3	3	3	3						
Viola riviniana	4										
Lotus pedunculatus	3	3									
Achillea millefolium	3										
Trifolium repens	3		3								
Pteridium aquilinum	5	6	5	7	6						
Hypochaeris radicata	2		2								
Rhytidiadelphus squarrosus	3										
Rubus fruticosus	3	4	5	3							
Oxalis acetosella	1				3						
Holcus lanatus		3	4	5	4						
Hyacinthoides non-scripta		1									
Potentilla erecta		1	2	1	4						
Ranunculus repens			2								
Galium saxatile			1	1	1						
Pseudoscleropodium purum			4								
Veronica officinalis			1								
Stellaria alsine				2							
Molinia caerulea					4						
Succsia pratensis					3						
Festuca rubra					3						
Bare ground											

Quadrats

	Q11	Q19	Q26	Q37	Q38
Grid. ref.	SW41913618	SW42233567	SW41683533	SW42543596	SW42673585
Photo. No.					
NVC method					
Slope	Slight	V Slight	Slight	Slight	Slight
Aspect	N	E	W		N
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	50cm	60cm	40cm		60cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Overgrown corner of field around rocks. Cattle grazed		Cattle grazed	Rf LF going towards W25? Rank and poor	Rank

Survey	Watchcroft					Recorder	JS		Date	27/09/2012	
Vegetation type	**U20b**										
Species	**Q14**	**Q15**	**Q16**	**Q25**	**Q28**	**Species**	**1**	**2**	**3**	**4**	**5**
Pteridium aquilinum	7	7	6	6	6						
Ulex gallii	3		2	5							
Rubus fruticosus	5	4	4	2	1						
Erica cinerea	3	2	1	4	1						
Molinia caerulea	5										
Potentilla erecta	4	1			3						
Agrostis capillaris	4				1						
Holcus lanatus	4										
Calluna vulgaris	2	4	6	7	5						
Lonicera periclymenum	1										
Teucrium scorodonia	1	4	2	1	3						
Anthoxanthum odoratum	4		2								
Carex pilulifera		4									
Viola riviniana		3			2						
Cerastium holosteoides		3		2							
Agrostis curtisii		5	3		1						
Polypodium vulgare		2	1								
Hedera atlantica		3		2	4						
Hypnum cuppressiforme		4	5								
Digitalis purpurea		1									
Solidago vigaurea											
Vaccinium myrtilus			4		6						
Chamerion angustifolium			1								
Oxalis acetosella			3								
Jasione montana			2								
Dicranum scoparium			1								
Kinbergia praelonga			3	3							
Rumex acetosa				1							
Bare ground			5								

Quadrats

	Q14	**Q15**	**Q16**	**Q25**	**Q28**
Grid. ref.	SW41623607	SW41713596	SW41953580	SW41663544	SW42053527
Photo. No.					
NVC method					
Slope	V. Slight	Slight	Slight	Slight	Slight
Aspect	W	NW	N	SW	N
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	1m	1m	60cm	75cm	75cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

road at (*TN15*). The shade levels beneath the willow canopy limits development of a rich pond flora to sparse shoots of soft rush, marsh pennywort (*Hydrocotyle vulgaris*), marsh bedstraw (*Galium palustre*), and common water starwort (*Callitriche stagnalis*), with Atlantic ivy around drier margins. The pond has been mapped as W1 woodland.

Plate 11 33-2009 Impounded pond with willow carr around margin.

2.1.7 Running water

A short stretch of a narrow, fast-flowing stream marks part of the eastern boundary of the Carn Galver site, crossing the road via a bridge (TN16). The stream flows west at this point before veering northeast to drain into the sea at Porthmeor Cove. The stream flows through adjacent areas of W1 woodland, with short sections of open banks north of the bridge carrying marginal vegetation comprising hemlock water dropwort (*Oenanthe crocata*), fool's water-cress (*Apium nodiflorum*), wild angelica and common nettle. Newly restored sections of drain along the southern road frontage of Carn Galver drain northeast into the stream. In the north western corner of site (32), water that collects on land between Carn Galver and Watch Croft creates a shallow, seasonal flow that drains north under the road to eventually feed into the pond west of the chimneys (site 33). Other

CARN GALVER (Survey Areas 32 - 2012 and 33 – 2012)

NVC and Condition Assessment surveyor	Michael Davies	Dates surveyed	27th September and 4th, 5th, 9th,10th and 15th October 2012
Report compiled by	Michael Davies	10th December 2012	

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Carn Galver
Site No.	32 (Land south of B3306)
Site No.	33 (Land north of B3306)
County	Cornwall
District	Penwith
Parishes	Zennor
Map Reference	Access at SW42043633, SW42743676, SW43083684 and SW42113670
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith 156

The locations of the sites are shown on *Map 1*.

1.2 Summary description

Area	c.131ha
Altitude	55 – 229m AOD
Aspect	South of the B3306 road, the site (site no. 32) mainly comprises the steep sided slopes of the Carn Galver ridge and the western slopes of the adjacent Hannibal's Carn. Long established paths have been maintained along the wide valley floors between Carn Galver and Hannibal's Carn and between Carn Galver and neighbouring Watch Croft. The slopes below Hannibal's Carn and more particularly Carn Galver are characterised by abrupt changes in slope that are often reflected in

similarly abrupt changes in vegetation type. Exposed granite tors and associated clitter slopes occur along the two ridge lines. Wetter, gentler slopes dominant the land south of Carn Galver and Little Galver and northeast of Hannibal's Carn. Land north of the road (site no. 33) is characterised by flat to gentle slopes, though earth workings presumably associated with active mining of the site has created a more varied hump and hollow topography in the northwest corner of the site.

Drainage — Most of the rain falling onto Carn Galver appears to drain east and south feeding streams that flow northwest towards Porthmeor or south toward Lanyon Farm. A short stretch of the stream that eventually drains into the sea at Porthmeor flows along the northeast boundary of the site through an area of willow carr. The impounded pond west of the old engine house appears to be fed from water draining off the valley slopes between Carn Galver and Watch Croft and also from unmarked ditches that drain farmland to the west. A stretch of the ditch south of the road that eventually feeds into the Porthmeor stream was re-excavated in 2009 as part of boundary works at Carn Galver. A similar section of ditch and bank has been re-profiled along the southern boundary of the site.

1.3 Access

A public footpath along the valley floor follows close to the western boundary of Carn Galver. Two other tracks aligned north south occur in the eastern half of the site; one along the valley floor east of Carn Galver and the other a newly cleared path that allows access onto Hannibal's Carn along the eastern boundary. North of the B3306 (site no.33) there is a section of public footpath along the northeast boundary between Rosemergy and Bosigran Farm and another public footpath along the Porthmeor valley.

1.4 Tenure

The site is owned by the National Trust and managed by a tenant farmer in partnership with the National Trust.

2 Biological Description

2.1 Habitats

There are four main habitats present within the site (sites 32 and 33): scrub, bracken, dry dwarf heath and wet/humid dwarf heath. Other, minor, habitats occurring within the site are: acid grassland, mire, standing water, running water, other exposure and earth and stone banks. These habitats are described in more detail below, with a list of plant species recorded within each habitat provided in *Appendix 2*.

The National Vegetation Classification (NVC) communities identified during the survey are described below under the habitat in which they occur, and their distribution is shown on *Map 2* in *Appendix 1.*

The location and reference number of target notes (TNs) made during the vegetation survey visits are annotated onto *Map 2* and appended to this report. Photographs taken during the six field visits in September and October are included in the text where these are considered useful in illustrating particular points of discussion. A full set of photographs covering both NVC quadrat points and condition assessment (CA) sampling points is appended to this report as a named subfolder on CD (*Appendix 3*).

2.1.1 Bracken

All vegetation stands in which bracken (*Pteridium aquilinum*) is dominant or co-dominant were mapped as bracken habitat. The only exception to this is in stands where bracken is co-dominant with bramble (*Rubus fruticosus* agg.) when, based on the importance of the latter as a discriminator species in the NVC, such vegetation was classified as scrub (see 2.1.2).

Along with dry and humid heath, bracken is one of the principal habitats over much of the site, forming particularly extensive stands over the moderate eastern and northern slopes of Carn Galver and the somewhat gentler, lower slopes north of Hannibal's Carn. Bracken habitat also occurs over parts of Carn Galver north of the road, though here it is sub-ordinate to bramble scrub, which nonetheless has bracken as a prominent element. Bracken habitat tends to give way to

dry heath over steeper slopes and is replaced by humid heath or derivations from it over gentler slopes and level ground.

Most of the bracken habitat on Carn Galver has been assigned to **U20b *Vaccinium myrtillus – Dicranum scoparium* sub-community of *Pteridium aquilinum – Galium saxatile* community**. Typically, this more heathy bracken community forms coarse mosaics with dry heath (H8) and generally occupies moderate slopes, with replacement by dry heath over steeper ground along the ridgelines of Carn Galver and Hannibal's Carn.

Plate 1 32-2012-Q1, U20b vegetation with bracken canopy over scattered heath shrub field layer

On gentler slopes, often over deeper, possibly richer, soils it grades to **W25, *Pteridium - Rubus* underscrub**. Although this sub-community of U20 shares many species with W25b, the presence sometimes at high cover of dwarf heath shrubs, including Western gorse (*Ulex gallii*) and bilberry (*Vaccinium myrtillus*) in the absence or significantly reduced cover of bramble give it a very distinctive appearance.

Beneath the bracken canopy, the dwarf shrubs typically occur as scattered elements within a grassy, woodland field layer. Heather (*Calluna vulgaris*) and bell heather (*Erica cinerea*) can be locally abundant. European gorse (*Ulex europaeus*) can be locally abundant within this vegetation community over ground subject to enrichment or

disturbance, for example along roads, paths or within enclosed fields. Grasses can figure in this sub-community, particularly sweet vernal grass (*Anthoxanthum odoratum*), common bent (*Agrostis capillaris*) and creeping bent (*Agrostis stolonifera*), with purple moor-grass (*Molinia caerulea*) and bristle bent (*Agrostis curtisii*) occasional. A limited suite of broadleaved herbs (forbs) include red campion (*Silene dioica*), common dog violet (*Viola riviniana*), common sorrel (*Rumex acetosa*), foxglove (*Digitalis purpurea*) and more locally greater stitchwort (*Stellaria holostea*) and tormentil (*Potentilla erecta*). Wood sage (*Teucrium scorodonia*) is frequent throughout and Atlantic ivy (*Hedera helix* ssp. *hibernica*) is prominent in more shaded stands.

Bracken is also one of the main players in the unassigned **Mol/Pta community**, where it typically shares dominance with purple moor-grass, with bramble occasional. Yorkshire fog (*Holcus lanatus*) and common bent (*Agrostis capillaris*) can be locally frequent, though always sub-ordinate in cover to purple moor-grass. Bristle bent is occasional to locally frequent throughout. There is a limited suite of broadleaved herbs including tormentil (*Potentilla erecta*), heath bedstraw (*Galium saxatile*), goldenrod (*Solidago virgaurea*) and common sorrel (*Rumex acetosa*. Western gorse (*Ulex gallii*) is occasional. Although the origin of this community is uncertain in common with other sites where it has been mapped within the West Penwith area it seems likely to be an artefact of past management of humid heath (namely burning).

2.1.2 Continuous scrub

This habitat is confined mainly to areas of Carn Galver north of the road, where four distinct forms occur. Wet woodland, dominated by grey willow (*Salix cinerea* ssp *oleifolia*), covers the steep slopes of the Porthmeor valley in the northeast corner of the site. Smaller, discrete patches of dry scrub dominated by either European gorse or blackthorn (*Prunus spinosa*) occur in the western half of the site north of the road, with more extensive stands of both occurring as part of a coarse mosaic with acid grassland within a series of fields north of the Mountain Rescue Post; these fields which cover c.4ha, were not included as part of the survey of Carn Galver carried out in 2008/9. The fourth type of scrub vegetation found at Carn Galver has a shorter

canopy characterised by the co-dominance of bracken and bramble. This comparatively shorter scrub type dominates extensive parts of Carn Galver north of the road, but also occurs more patchily on land to the south. Grey willow also occurs in the drier western half of the site north of the road, where it forms scattered or occasionally closed scrub habitat that is very distinct from its wetter analogue. Although willow is a prominent component of the vegetation in this part of the site, it has generally been mapped as scattered scrub over other vegetation types, mainly bracken dominated habitat assigned to U20b and bramble scrub assigned to W25b.

Areas of wetland habitat dominated by grey willow have been assigned to W1 woodland. All areas of blackthorn dominated scrub have been mapped as W22a, while scrub dominated by European gorse, mainly associated with areas of previous mining activity, or areas of former pasture, are assigned to W23c. Scrub vegetation in which bramble and bracken are co-dominant is assigned to W25b.

W1 *Salix cinerea – Gallium palustre* woodland

Invariably wet underfoot, a comparatively small area of W1 woodland comprising a 4-5m high, closed canopy of grey willow dominates the northeast corner of Carn Galver. Bramble and honeysuckle (*Lonicera periclymenum*) are the only other constant shrubs, though W1 occurs in coarse mosaics with blackthorn dominated W22a stands to the west. A tall, species-rich field layer beneath the shrub canopy is characterised by marsh species such as soft rush (*Juncus effusus*) and wild angelica (*Angelica sylvestris*) and the remains of large ferns most notably royal fern (*Osmunda regalis*), lady fern (*Athyrium filix femina*) and broad buckler fern (*Dryopteris dilatata*). Grasses are poorly represented, though Yorkshire fog occurs around the edges of stands. Bryophytes, in contrast, are prominent in a ground flora that also includes abundant Atlantic ivy. Common pleurocarpous species such as *Eurhynchium praelongum* and *Thuidium tamariscinum* are abundant, with extensive patches of *Sphagna* (*S. palustre*, *S. fimbriatum* and *S. subnitens*) occurring in wetter hollows. Fruticose and foliose lichens festoon the smaller branches and upper stems of the willows, including *Ramalina farinacea*, *Usnea cornuta* and *Evernia prunastri*.

Plate 2 33-2012-Q50, Willow carr in northeast corner of Carn Galver

W1 woodland fringing the pond in the northwest corner of Carn Galver is comparatively species-poor, with development of a rich field layer constrained by either heavy shade or more likely waterlogged conditions.

W22a *Prunus spinosa – Rubus fruticosus scrub, Hedera helix – Silene dioica* sub-community

The density and height (*c*. 2-3m) of blackthorn within these isolated stands made access very difficult and most sampling was carried out from the edges, which may have exaggerated species-richness and, in particular, the contribution of grass species to the field layer. Blackthorn is always the overwhelming dominant in stands of W22a, with bramble and European gorse constant to frequent, but other shrubs generally absent. Typically, the shade developed beneath the canopy of blackthorn limits the field layer to a small number of woodland species, notably Atlantic ivy, common sorrel and red campion.

Plate 3 33-2012-Q49, dense stand of blackthorn scrub assigned to W22a

W23c *Ulex europaeus – Rubus fruticosus scrub, Teucrium scorodonia* sub-community

This type of scrub occurs over disturbed ground west of the engine houses, where it forms coarse mosaics with bracken habitat, and within fields of former pasture, where it forms a mosaic with acid grassland. Typically it is characterised by tall, dense, species-poor stands dominated by European gorse. Bramble is the only other frequent shrub species. Atlantic ivy, red campion, common sorrel and wood sage can be frequent, but other broadleaved herbs and grasses, including Yorkshire fog and cock's-foot, are generally sparse and confined to edges and occasional gaps in more open stands.

Plate 4 33-2012-Q38, European gorse shrubs coalescing to form W23c stands within matrix of acid grassland

W25b *Pteridium aquilinum - Rubus fruticosus underscrub, Teucrium scorodonia* sub-community

All stands of bracken habitat within the site in which bramble was frequent to co-dominant are mapped as W25b underscrub, with differentiation at the sub-community level based on the frequency of wood sage. Bluebell (*Hyacinthoides non-scripta*), which is more indicative of the other sub-community, W25a, was generally scarce though at this time of year it should be noted that old flower heads of bluebell can be easily missed. Stands of this community occur most often along boundaries, roads and paths. A large area of W25b vegetation east of the track to Bosigran Farm has been recently cut, possibly to improve access by grazing stock.

Plate 5 33-2012-Q33. Stand of W25b showing co-dominance of bracken and bramble

2.1.3 Dry dwarf heath

Extensive, often sinuous, stands of dry dwarf heath habitat occur along the moderate to steep slopes along the ridge lines of Carn Galver and Hannibal's Carn. Here, the usual pattern of distribution has bracken dominated vegetation, mainly U20b or W25b, replacing dry dwarf heath over more moderate slopes, possibly associated with deeper soils; the two habitats forming a coarse mosaic along the ridges. Typically, these dry dwarf heath stands are characterised by a tall, closed, dwarf shrub canopy dominated by Western gorse, but within which heather and bell heather can both be abundant. Bilberry can occur in more open stands around rock outcrops, but is generally unable to persist beneath the dense shade created by the main shrub species. For the same reasons, a poorly developed field layer comprises occasional sparse shoots of species such as tormentil, wood sage and Atlantic ivy. Bracken can be frequent at low cover throughout the habitat, with bramble occurring more locally. A second, more localised type of dry heath that typically has a shorter, more open canopy, with abundant bristle bent and little, if any, cross-leaved heath occurs over level ground in the southern half of Carn Galver.

Analysis of the quantitative sample data for the taller heath vegetation showed a generally close match with descriptions for **H8a species-poor sub-community of *Calluna vulgaris – Ulex gallii* heath**. Stands of shorter dry heath with a high cover of bristle bent are representative of **H4a, *Agrostis curtisii – Erica cinerea* sub-community of *Ulex gallii – Agrostis curtisii* heath**. There is little evidence of any management within the stands of H8a heath. In contrast, stands of H4a appear to develop as an early stage in the regeneration of heathland following burning, either planned or accidental.

Plate 6 32-2012-Q18. Abrupt transition between stand of H4a (foreground) and shrub dominated H8a

2.1.4 Wet/humid dwarf heath

Humid heath dominates extensive parts over gentle to flat ground in the southern third of the site, with smaller stands occurring over similar topography both sides of the road and adjacent to the main paths west of Carn Galver and between Carn Galver and Hannibal's Carn.

In the field, initial differentiation of humid heath from drier heath types is based on the presence/relative abundance of species such as purple moor grass and cross-leaved heath, with the pale coloured leaves of

purple moor-grass particularly prominent at this time of year.

Almost all of the stands of humid heath at Carn Galver have been assigned to **H4c, *Erica tetralix* sub-community of *Ulex gallii* – *Agrostis curtisii* heath**. Although floristically similar with regard to the constants: purple moor-grass, bristle bent, heather, bell heather and Western gorse, the relative abundance of these five species within stands of H4c varies hugely as too does their height and general structure. Stands of H4c over the extensive plateau area at the southern end of Carn Galver are shorter, with no overwhelming dominant amongst the constants. This results in more open stands with greater representation of non-vascular plants, notably *Cladonia* species and mosses such as *Campylopus flexuosus* and *Dicranum scoparium*. Differentiation at the sub-community level to this wetter form of the H4 community is predicated on the relative abundance of cross-leaved heath compared to bristle bent and bell heather. Reduced drainage from this plateau area has led to wetter soils, particularly during winter and spring, favouring development of H4c.

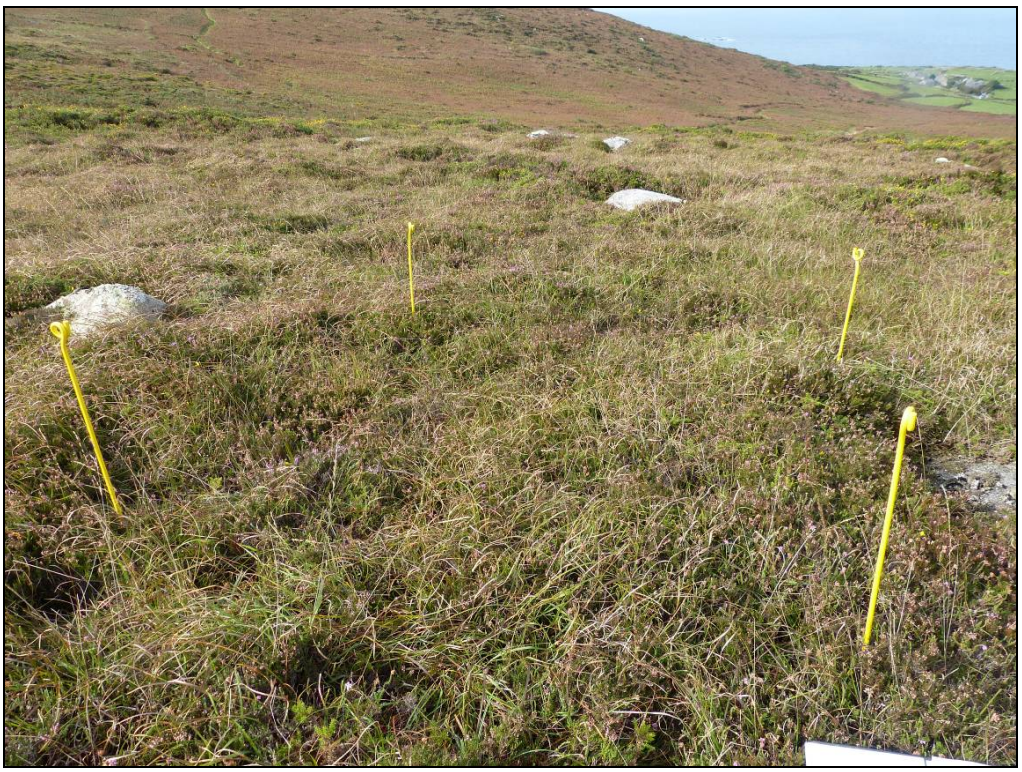


Plate 7 32-2012-Q5. Comparatively large stand H4c on slopes below Carn Galver

The localised occurrence of deer grass (*Trichophorum germanica*) within H4 heath is further evidence of the seasonal wetness of this part

of the site and marks transition to H4d, *Scirpus cespitosum* (synonym, *Trichophorum cespitosum*) sub-community **of *Ulex gallii – Agrostis curtisii* heath**.

Plate 8 32-2012-Q20. Quadrat within H4d, with tussocks of deer grass prominent

Apart from localised path clearance and restoration of boundary features, there is no evidence of recent active management of this part of the site, though there may be some grazing by rabbits and it is possible that the area has been subject to burning. Certainly two extensive patches of H4c heath north of the road showed floristic characters indicative of recent burning when surveyed in 2009, with bristle bent and bell heather particularly prominent in the regenerating sward. All the other stands of H4c are taller (450 - 600mm), with a more closed canopy in which Western gorse and purple moor-grass are generally dominant over the other sub-shrubs. The degree of shade beneath such a dense canopy excludes development of a ground flora and these stands of H4c are, on the whole, more species-poor than those described earlier. Again, there is no evidence of active management and it is possible that these taller, denser generally isolated stands represent a later stage in the natural development of H4c following burning. Interestingly, a large area of gently sloping land in the southeast corner of Carn Galver dominated by Western gorse

and purple moor-grass currently unassigned to an NVC community and simply mapped as **Mol/Ug heath**, may represent a stand of H4 heath that has been subject to uncontrolled burning; damaging the existing vegetation to the extent that the recovering sward is dominated by a restricted number of species, in this case purple moor-grass and Western gorse.

Plate 9 32-2009 Unassigned wet heath vegetation dominated by Western gorse and purple moor-grass.

2.1.5 Mire

This is a minor habitat within Carn Galver; a small isolated mire (TN8) occurring in an area of wet dwarf heath close to the southern boundary of the site. The mire has been assigned to **M6c *Carex echinata - Sphagnum recurvum/auriculatum* mire** and comprises soft rush over *Sphagnum fallax*, with purple moor grass invading and cross leaved heath occasional (Plate 10). Although checked in 2012, this small mire feature was not re-sampled quantitatively as there appeared to be little change from the time of the previous survey in 2009.

Plate 10 32-2009 M6 mire vegetation dominated by soft rush and *Sphagna*

2.1.6 Standing water

A large pond, impounded by construction of a damn at its northwest end and fed by a stream that collects over Carn Galver has been created at the northwest corner of the site. The pond may have been a water source when the area was actively mined. The comparatively large pond is enclosed by steep banks to the south and west (mainly supporting W25b). Patches of M6c (Je) mire vegetation have developed around the southern margins, with soft rush overtopping a ground flora comprising *Sphagnum denticulatum* and floating club rush (*Isolepis fluitans*). The floating club rush forms more extensive stands over the surface of the pond. Grey willow dominates the eastern and part of the southern end of the pond; its shade limiting development of aquatics to scattered plants of floating club rush and creeping forget-me-not (*Myosotis secunda*). Branched bur-reed (*Sparganium erectum*) forms a single species stand in the southwestern end of the pond. Six photos were taken on the day of survey. No NVC assessment was carried out though provisional communities have been assigned. A second, much smaller pond enclosed and completely overtopped by grey willow occurs immediately north of the

agricultural ditches offsite drain into this pond.

2.1.8 Other exposure (granite tors)

Dry heath vegetation (H8a) is more broken around the exposed granite tors that occur along the ridges of Carn Galver and Hannibal's Carn. Here, Atlantic ivy and great wood-rush (*Luzula sylvatica*) are locally abundant, sheep's-bit (*Jasione montana*) is frequent, with occasional bracken. Where heath vegetation manages to maintain a foothold, heather and Western gorse are locally dominant over bell heather. Grasses are locally abundant in crevices between rocks with polypody (*Polypodium vulgare*). Here, a broad range of a species includes Yorkshire fog, bristle bent, common bent and red fescue, and more locally sheep's-fescue (*Festuca ovina*). Deeper, darker crevices at the northern end of Carn Galver that offer more sheltered conditions are known to support Wilson's filmy-fern (*Hymenophyllum wilsonii*), though this was not seen during any of the field visits.

Plate 12 32-2009 Granite tor at southern end of Carn Galver ridge

2.1.9 Earth and stone banks

Earth and stone banks mark the external boundaries of the Carn Galver site, though sections of these are no longer stock proof and are

often supplemented with post and wire fencing. A section of earth and stone bank, mainly earth, along the southern boundary was restored in 2009 using a mechanical excavator, the excavated soil being stacked to form the new bank, with a ditch created immediately adjacent. New, shorter sections of earth and stone banks have been constructed adjacent to two cattle grids that have been installed on the road close to the western and eastern ends of Carn Galver. The lines of existing boundaries are shown on the Ordnance Survey maps and are, therefore, not marked as part of the NVC survey. Typically, for West Penwith, the lower sections of the banks comprise a series of large rounded to angular stones above which are arranged several courses of smaller stones. In contrast to Cornish hedges in the east of the county, few of these boundary walls have any associated shrub flora, except where boundaries abut heath habitat when the tops of banks often support dwarf shrub heaths. European gorse, blackthorn and bramble are occasional and can sometimes become locally abundant. With the exception of short sections of new boundaries, none of the walls are above 1.5m high and the majority are much lower, with many assessed as defunct, with none being considered stockproof.

Plate 13 32-2009 Earth and stone bank northeast of Hannibal's Carn supporting heath vegetation.

None of the boundaries were assessed as part of the NVC survey, with

communities in most cases likely to reflect those of adjacent habitats. Certainly this is the case where boundaries are low and overgrown.

2.2 Species

2.2.1 Vascular plants

No notable plant species were species recorded during the survey, but Wilson's filmy-fern (*Hymenophyllum wilsonii*) is known to occur within darker granite tor crevices at the northern end of Carn Galver.

3 Condition Assessment

3.1 Humid Heath (H4c/H4d)

13 sample points distributed throughout humid heath stands within Carn Galver (site 32); three of the sampling points relate to H4d.

Overall, the humid heath is assessed as unfavourable/no change based on the recent field visit and visits carried out by the same surveyor in 2008/2009. Habitat feature fails on three mandatory attributes: absence of bare ground; even-age structure and floristic paucity, particularly with respect to forbs. In reality, all three attribute failures relate to too low a level of vegetation disturbance within most of the humid heath stands that are typically even-aged (building/mature), tall dense dwarf shrub communities, with a limited scope for less competitive forbs and non-vascular plants.

3.2 Dry Heath (H8a)

12 sample points distributed throughout areas of dry heath within Carn Galver (site 32).

Overall, the dry heath is assessed as unfavourable/no change based on the recent field visit and visits carried out by the same surveyor in 2008/2009.

Habitat feature fails on three of the mandatory attributes: absence of bare ground; even-age structure and floristic paucity, particularly with respect to forbs. In reality, all three attribute failures relate to too low a level of vegetation disturbance within most of the humid heath stands that are typically even-aged (building/mature), tall dense dwarf shrub communities, with a limited scope for less competitive forbs and non-vascular plants. The recent introduction of grazing stock has, so far, had limited positive impact on the disturbance levels within areas of dry heath at Carn Galver.

In addition to above failures, there is a failure for negative indicators for bracken cover and concern for levels of bramble and rosebay willowherb within some of the dry heath stands.

Using the same dry heath forms, 10 points were sampled to assess the condition of bracken heath habitat assigned to U20b at Carn Galver. Although unlikely to be a BAP habitat, the extent of this community at

Carn Galver and its obvious relationship with other heath types encouraged assessment using the dry heath forms as a possible measure of potential for restoration.

Overall, stands of U20b were assessed as unfavourable/no change based on the recent field visit and visits carried out by the same surveyor in 2008/2009 and in general there was strong similarity between scoring of these stands and the scoring of stands of H8a. In addition to mandatory failures relating to low levels of disturbance a key feature affecting conservation status of U20b stands is the dominance of bracken and to a lesser extent, encroachment of bramble.

3.3 Acid Grassland

Though qualifying as a BAP habitat, acid grassland represents a very minor component of the vegetation communities at Carn Galver and as such, no condition assessment was carried out

Table 1 Summary of habitats and vegetation communities

Carn Galver 32 and 33-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W1	1.11	3.07	N/A	Wet woodland 3.07
	W22a	0.45	0.90		N/A
	W23c	0.36	1.84		
	W25b	11.07	15.31		
Acid grassland	U4a	-	0.11	N/A	Lowland dry acid grassland 1.47
	U4b	-	1.36		
Bracken	U20b	36.10	39.30	N/A	N/A
Dry heath	H8a	32.5	41.80	UFNC	Lowland heathland
	H4a	-	0.85	N/A	

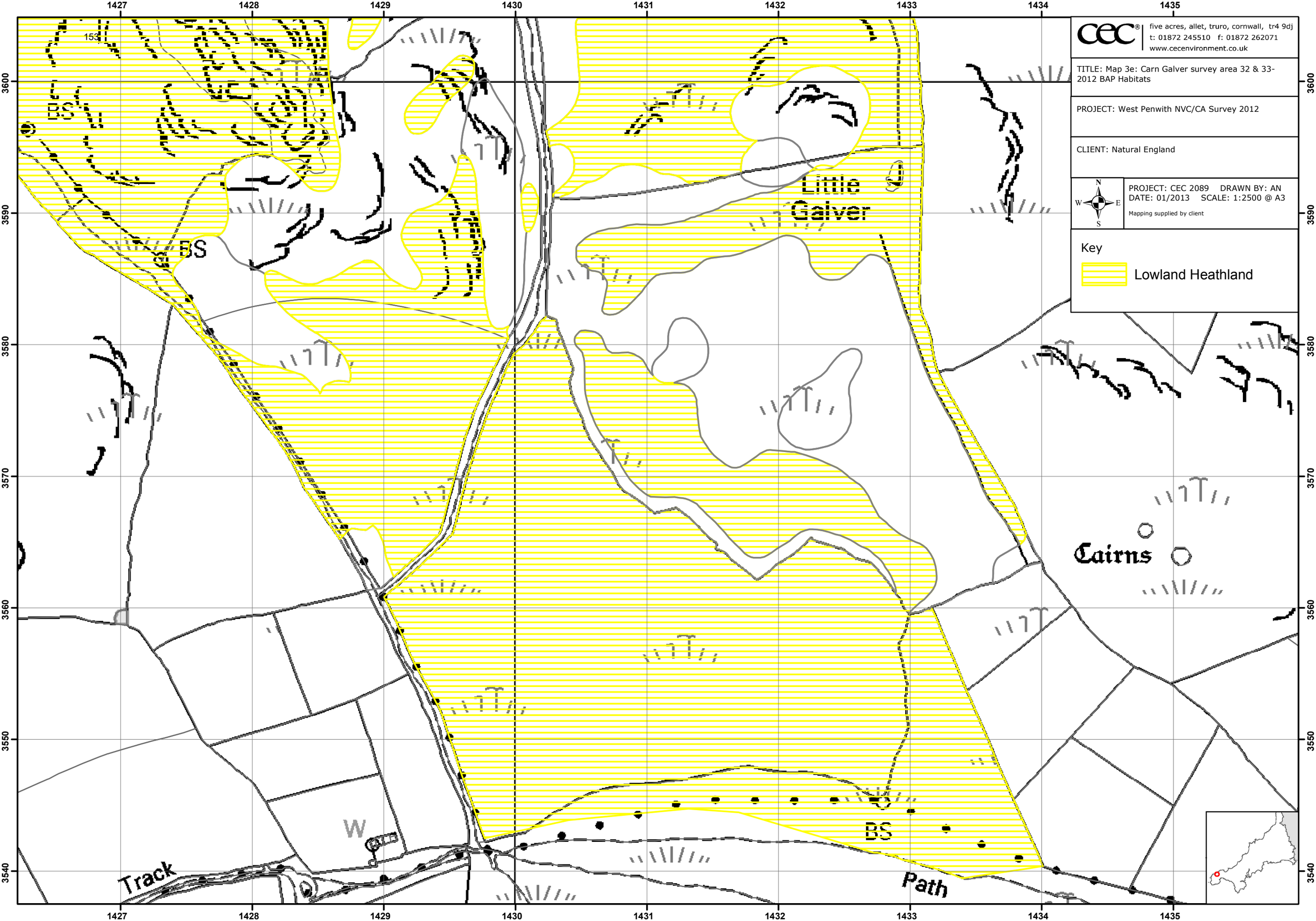
Carn Galver 32 and 33-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Humid heath	H4c	29.4	18.04	UFNC	61.49 (excludes Mol/Ug)
	H4d	<0.2	0.80		
	Mol/Ug	7.36	4.44	N/A	N/A
Mire	Mol/Pta	1.64	1.70	N/A	N/A
Mosaic	Mosaic	2.6	2.34	N/A	N/A
Open water	Open water	0.1	0.10	N/A	Ponds 0.10
Total Area Mapped		**122.7**	**131.96**		

Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD)

Appendix 1

Maps (1: Location, 2: NVC, 3: BAP habitat) See separate Maps Folder on CD

Target Notes



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TITLE: Map 3e: Carn Galver survey area 32 & 33- 2012 BAP Habitats

PROJECT: West Penwith NVC/CA Survey 2012

CLIENT: Natural England

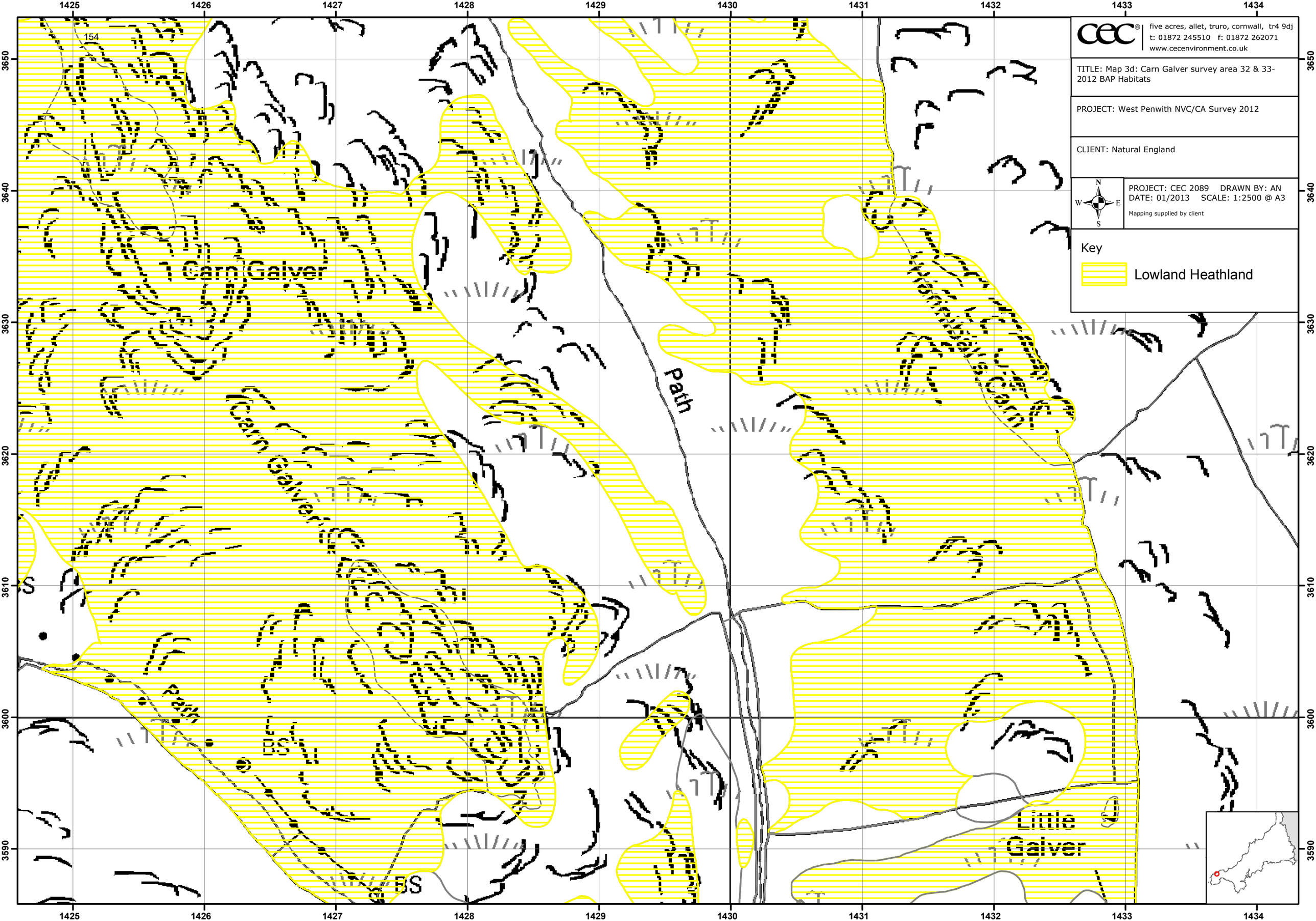
N W E S

PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3

Mapping supplied by client

Key

Lowland Heathland


1425
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3600
3590
154
Carn Galver
Carn Galver
Path
Little Galver
BS
BS
S
cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3d: Carn Galver survey area 32 & 33- 2012 BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
N
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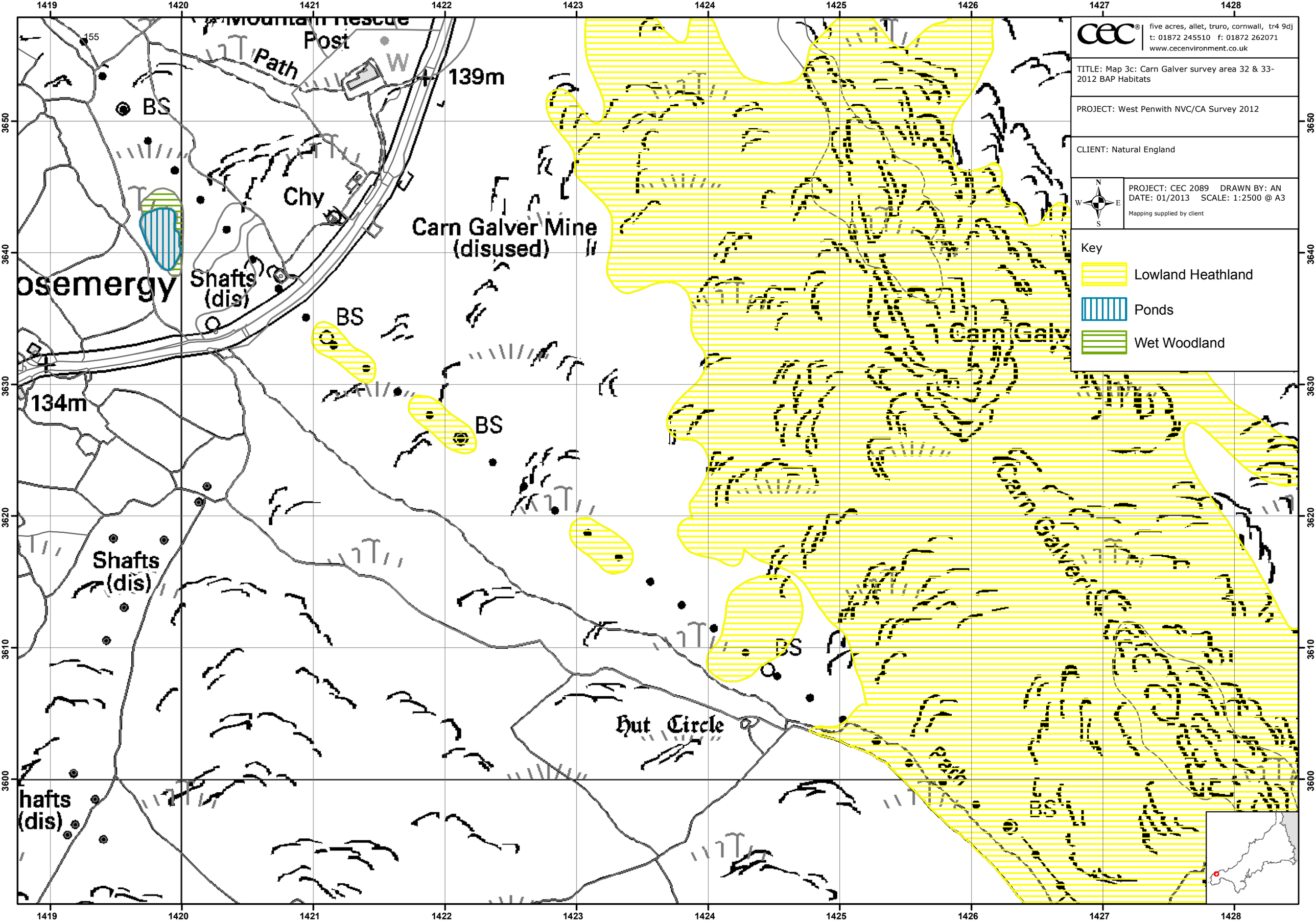
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Heathland


cec®
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3c: Carn Galver survey area 32 & 33- 2012 BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Heathland
Ponds
Wet Woodland
Mountain Rescue Post
Path
139m
BS
Chy
Carn Galver Mine (disused)
osemergy
Shafts (dis)
134m
Shafts (dis)
hafts (dis)
Hut Circle
Carn Galver
1419
1420
1421
1422
1423
1424
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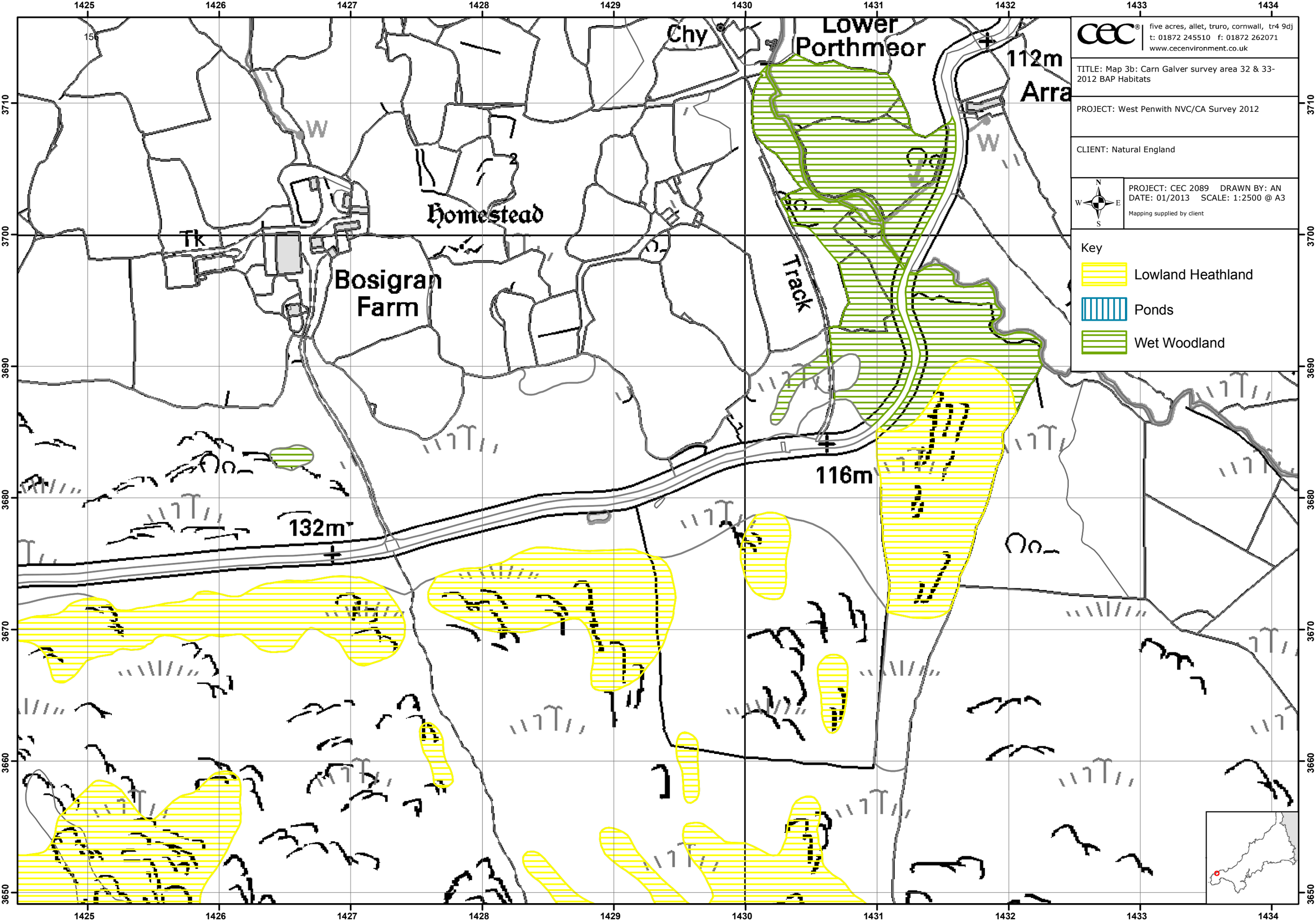
1426
1427
1428
3650
3640
3630
3620
3610
3600


five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3b: Carn Galver survey area 32 & 33- 2012 BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Heathland
Ponds
Wet Woodland
Chy
Lower Porthmeor
112m
Arra
Homestead
Tk
Bosigran Farm
Track
116m
132m
1425
1426
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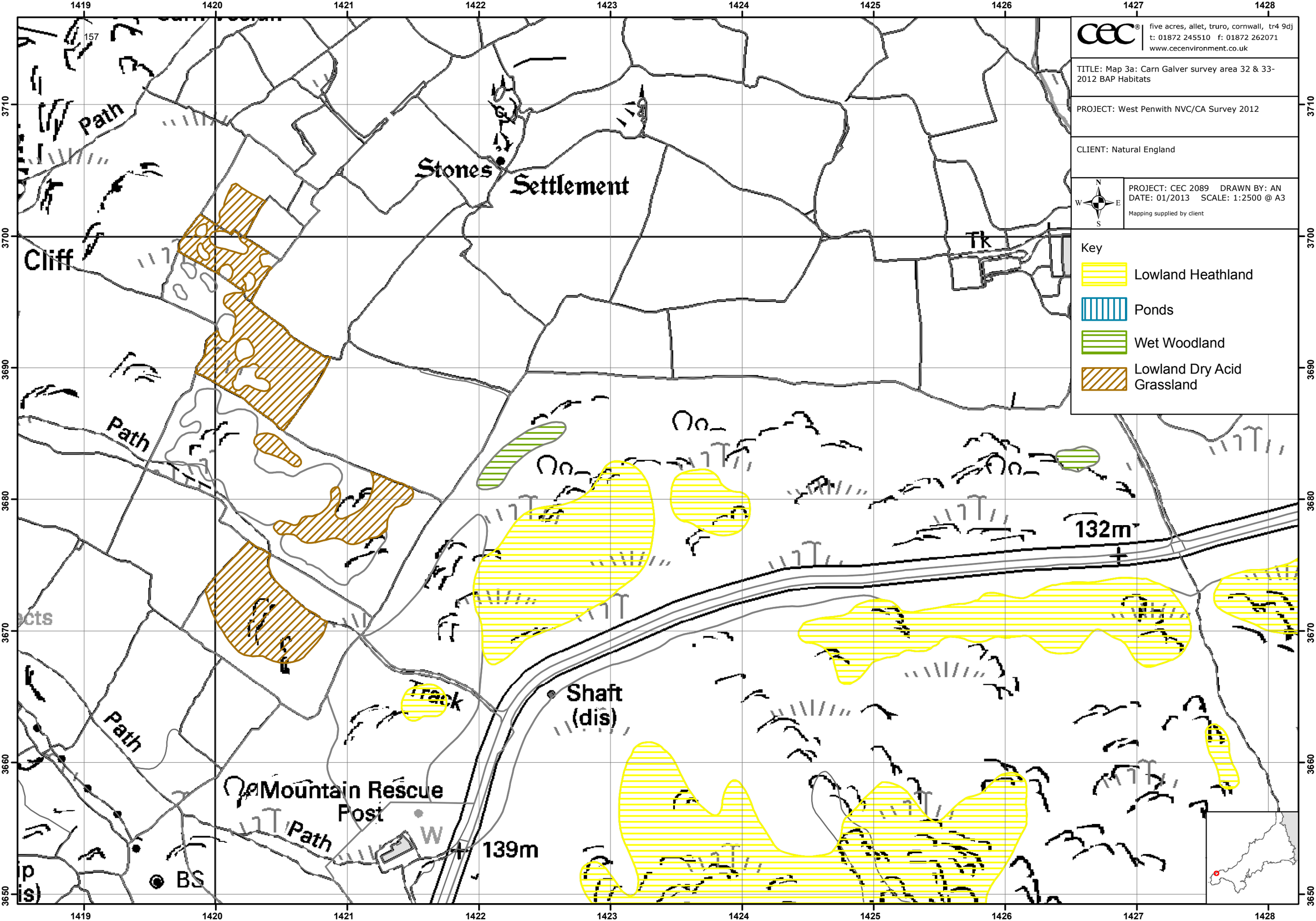
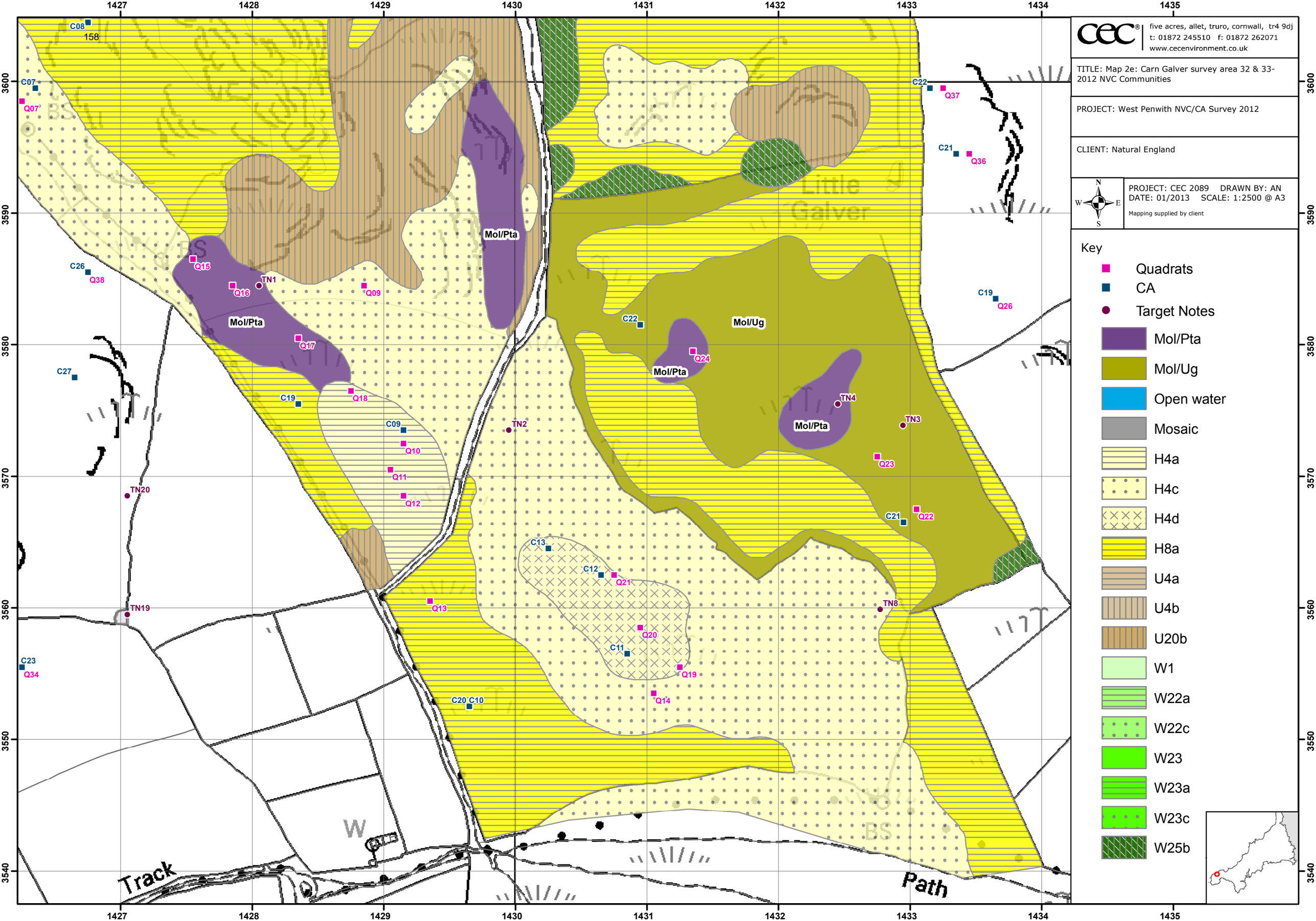
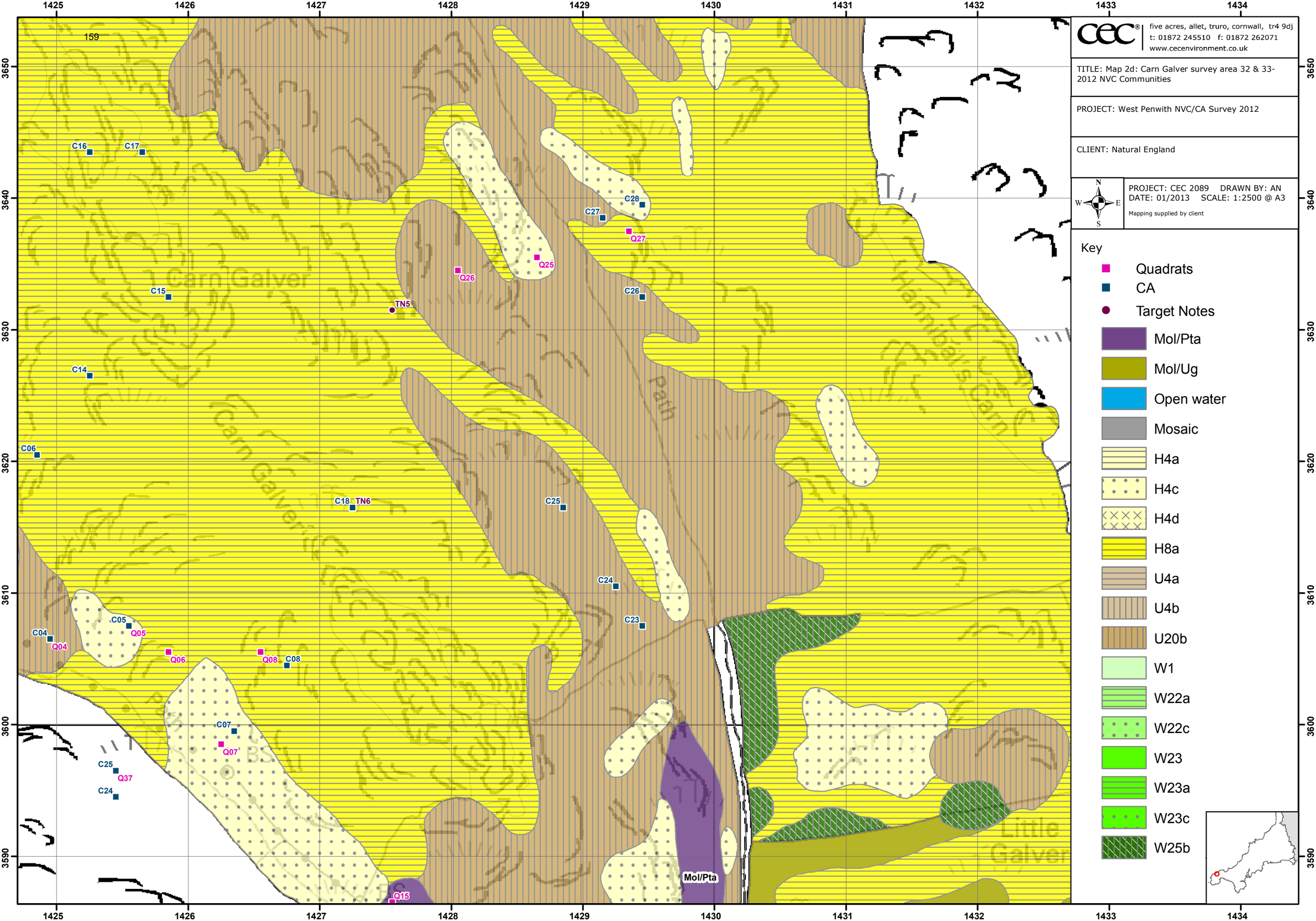
3700
3690
3680
3670
3660
3650


cec®
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3a: Carn Galver survey area 32 & 33-2012 BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
N
W
E
S
Key
Lowland Heathland
Ponds
Wet Woodland
Lowland Dry Acid Grassland
1419
1420
1421
1422
1423
1424
1425
1426
1427
1428
3710
3700
3690
3680
3670
3660
3650
157
Path
Stones
Settlement
Cliff
Tk
Path
132m
Shaft
(dis)
Track
Path
Mountain Rescue
Post
Path
139m
BS


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2e: Carn Galver survey area 32 & 33- 2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mol/Pta
Mol/Ug
Open water
Mosaic
H4a
H4c
H4d
H8a
U4a
U4b
U20b
W1
W22a
W22c
W23
W23a
W23c
W25b
Little Galver
Track
Path
Mol/Pta
Mol/Ug
C08
C07
Q07
C26
Q38
Q15
Q16
TN1
Q09
Q17
C27
C19
Q18
C09
Q10
Q11
Q12
TN2
TN20
TN19
C23
Q34
Q13
C13
C12
Q21
Q20
C11
Q19
Q14
C20 C10
C22
Q37
C21
Q36
C19
Q26
Q24
TN4
TN3
Q23
C21
Q22
TN8



cec®
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk

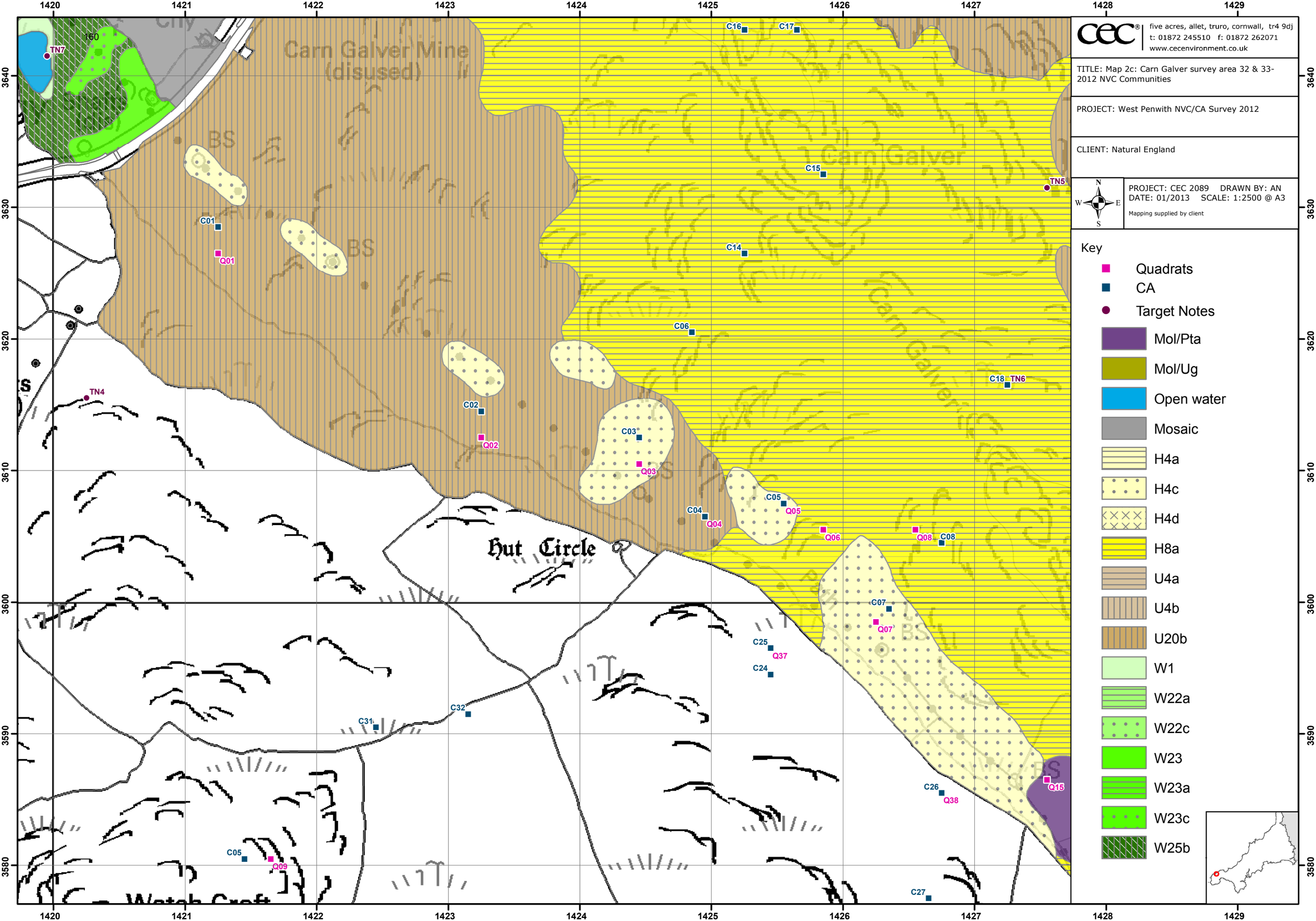
TITLE: Map 2d: Carn Galver survey area 32 & 33- 2012 NVC Communities

PROJECT: West Penwith NVC/CA Survey 2012

CLIENT: Natural England

PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3

Mapping supplied by client



cec®
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk

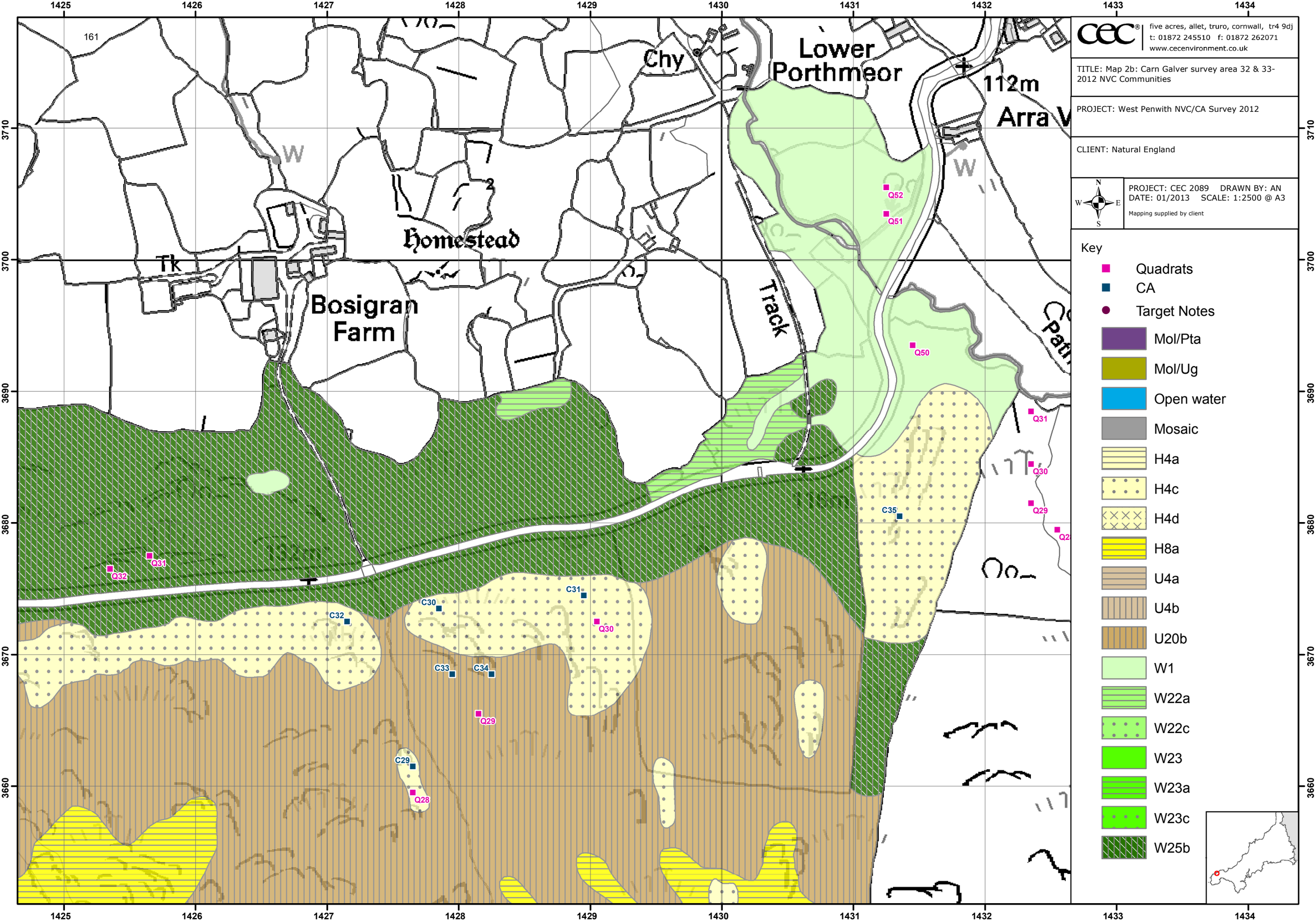
TITLE: Map 2c: Carn Galver survey area 32 & 33- 2012 NVC Communities

PROJECT: West Penwith NVC/CA Survey 2012

CLIENT: Natural England

PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3

Mapping supplied by client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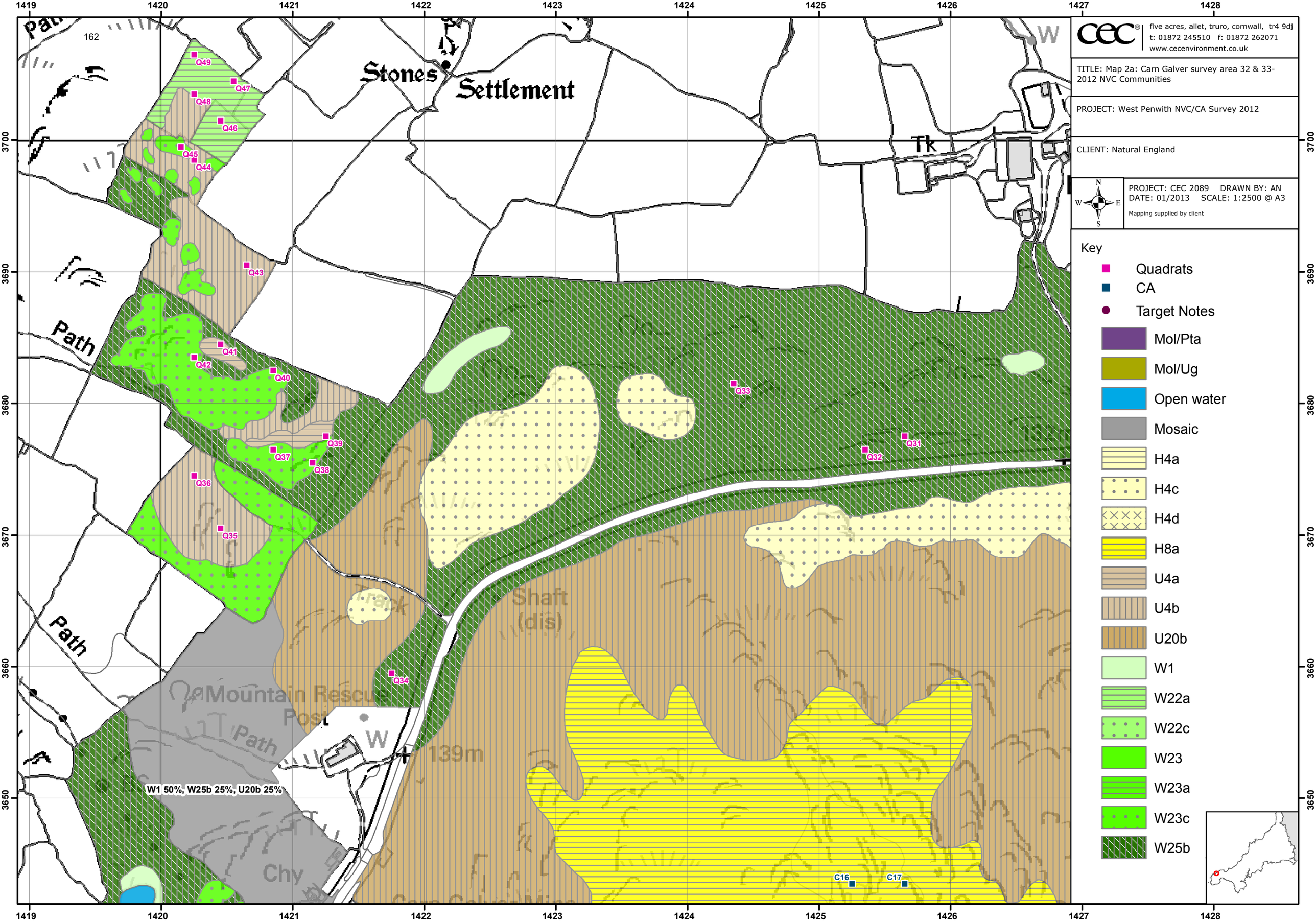
3660
161
Chy
Lower Porthmeor
112m
Arra V
Homestead
Tk
Bosigran Farm
Track
Q52
Q51
Q50
Q31
Q30
Q29
Q32
C35
C31
C30
C32
C33
C34
C29
Q28
cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2b: Carn Galver survey area 32 & 33- 2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
N
W
E
S
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mol/Pta
Mol/Ug
Open water
Mosaic
H4a
H4c
H4d
H8a
U4a
U4b
U20b
W1
W22a
W22c
W23
W23a
W23c
W25b


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2a: Carn Galver survey area 32 & 33- 2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mol/Pta
Mol/Ug
Open water
Mosaic
H4a
H4c
H4d
H8a
U4a
U4b
U20b
W1
W22a
W22c
W23
W23a
W23c
W25b
Stones
Settlement
Tk
Path
Shaft (dis)
Mountain Rescue Post
139m
Chy
W1 50%, W25b 25%, U20b 25%
Q31
Q32
Q33
Q34
Q35
Q36
Q37
Q38
Q39
Q40
Q41
Q42
Q43
Q44
Q45
Q46
Q47
Q48
Q49
C16
C17
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Map 2 Target Notes Carn Galver (Survey Area 32 - 2012 and 33 – 2012)

TN. No.	Grid Ref.	Text
1	SW42803584	Area of Mol/Pta possibly the result of a burn, though stable from 2009. *Ulex gallii* is occasional within grassland, but *Calluna vulgaris* and *Erica cinerea* are rare or absent. *Agrostis curtisii* and *Potentilla erecta*, *Solidago virgaurea* and *Rubus fruticosus* are frequent (P16). *Rubus fruticosus* is occasional to locally abundant and it is possible that this vegetation is transitional to W25b over the next few years if *Rubus* continues to colonise.
2	SW42993573	Large stand of short humid heath. Mosaic of H4c and H4d with bryophytes prominent in shallow wet runnels, e.g., *Sphagnum denticulatum* and *Sphagnum cuspidatum* and *Racomitrium lanuginosum* locally frequent with *Dicranum scoparium* and *Hypnum cupressiforme* over drier areas. Also *Cladonia portentosa* and *Cladonia uncialis*.
3	SW43353576	Area mapped in 2009 as Mol/Ug. There is now significant regeneration of *Ulex gallii* and *Erica cinerea* and where these coalesce there is development of H8a (P35). Likely to develop back to continuous H8a over next few years.
4	SW43243575	Dense grassy vegetation dominated by *Molinia* with frequent *Potentilla erecta*, *Pteridium aquilinum* is locally frequent but dwarf shrubs are infrequent mainly *Ulex gallii*.
5	SW42753631	East facing slope of Carn Galver that is covered in granite boulders. In places *Ulex gallii* and ericoids form more or less continuous canopy, though short (0.5m) with *Pteridium aquilinum* abundant to dominant throughout. *Vaccinium myrtillus* is frequent and from a distance, even in October, vegetation appears to be *Pteridium* dominated.
6	SW42723616	H8a comprising tall, dense stand of *Ulex gallii* and ericoids with Ug dominant, but other two locally abundant. No graminoids and only frequent forb is *Potentilla erecta* and *Teucrium scorodonia* below dense canopy. *Rubus fruticosus* can be locally frequent as can *Pteridium*. Where *Pteridium* increases to dominant and ericoids occur as scattered plants there is transition to U20b.
7	SW41993641	Large pond impounded by construction of damn at northwest end (SW41993641) and fed by stream that collects over Carn Galver. Pond may have been a water source when area was actively mined. Comparatively large pond enclosed by steep banks to south and west (mainly W25b). Patches of M6c (*Juncus effusus*) mire vegetation developed around southern margins, with *Juncus effusus* over *Sphagnum denticulatum* and *Isolepis fluitans*. The Isolepis forming more extensive stands over the surface of the pond. Salix cinerea dominates the eastern and part of the southern end of the pond; its shade limiting development of aquatics to scattered plants of *Isolepis* and *Myosotis secunda*. *Sparganium erectum* forms a single species stand at the southwest end of the pond. No NVC assessment was carried, with the area mapped as open water and target noted.
8	SW43293559	Small M6 mire comprising *Juncus effusus* over *Sphagnum fallax*, with *Molinia* invading and *Erica tetralix* occasional

Appendix 2 Species List - vascular and non-vascular plants

Latin Names	Common Names	Dry Heath	Humid Heath	Acid grassland	Molinia Pta	Bracken	Wet woodland	Dry scrub	Standing water	Running water	Earth stone bank	Other exposure (rocks)	Mire
Agrostis canina	Velvet bent	R							LF				
Agrostis capillaris	Common bent-grass	LA/F		A/LD	O			O (e)					
Agrostis curtisii	Bristle bent-grass		F/LA	F/LA	LF						O	O	
Agrostis stolonifera	Creeping bent	R		O	O								
Angelica sylvestris	Wild angelica		R				O/LF						
Anthoxanthum odoratum	Sweet vernal grass	O		F	O	O/LF					LF	O	
Anthriscus sylvestris	Cow parsley					O (e)							
Athyrium filix-femina	Lady fern						LF						
Bellis perennis	Daisy			O									
Blechnum spicant	Hard fern						F	O			O		
Calluna vulgaris	Heather/ ling	F/LA	F			LF (e)						LF	O (e)
Carex binervis	Green ribbed sedge		LF	O									
Carex panicea	Carnation sedge		LF										O
Carex pilulifera	Pill sedge	R										O	
Chamerion angustifolium	Rosebay willowherb					O/LA		O					
Cirsium palustre	Marsh thistle						O						
Crataegus monogyna	Hawthorn					R							
Crepis capillaris	Smooth hawk's-beard			O							O		
Crocosmia x crocosmiiflora	Montbretia					O	O						
Cynosurus cristatus	Crested dog's-tail			O									
Dactylis glomerata	Cock's-foot	O				O		O (e)			O		
Digitalis purpurea	Foxglove	O		O		O/LF	O	O				O	
Dryopteris affinis	Scaly male fern						O						
Dryopteris dilatata	Broad buckler fern	O			R	O	F	F			O		

Latin Names	Common Names	Dry Heath	Humid Heath	Acid grassland	Molinia Pta	Bracken	Wet woodland	Dry scrub	Standing water	Running water	Earth stone bank	Other exposure (rocks)	Mire
Erica cinerea	Bell-heather	F/LA	O	O	O (e)	LF					O/LF	O	
Erica tetralix	Cross-leaved heath		F/LA										O
Eriophorum angustifolium	Common cotton-grass												LA
Festuca ovina	Sheep's fescue											O	
Festuca rubra	Red fescue	O		O		O						O	
Galium mollugo	Hedge bedstraw										O		
Galium palustre	Common marsh-bedstraw						O/LF						
Galium saxatile	Heath bedstraw	O			R	LF							
Geranium robertianum	Herb-Robert	R						O (e)			O		
Glechoma hederacea	Ground ivy						O				O		
Hedera helix ssp Hibernica	Atlantic ivy	O				LF/A	F/LA				O	LF	
Heracleum sphondylium	Hogweed					O							
Hieracium umbellatum	Hawkweed	O											
Holcus lanatus	Yorkshire fog	O		O			LF						
Holcus mollis	Creeping soft-grass					LF	O						
Hyacinthoides non-scripta	Bluebell					O							
Hydrocotyle vulgaris	Marsh pennywort						LF		O				
Hymenophyllum wilsonii	Wilson's filmy fern											R (record)	
Hypericum humifusum	Trailing St John's-wort			O (e)									
Hypochaeris radicata	Common cat's ear		O	O		O					O	O/LF	
Ilex aquifolium	Holly					R							
Isolepis fluitans	Floating club-rush								F/LA				
Jasione montana	Sheep's-bit	R									O	F	
Juncus bulbosus	Bulbous rush		R										F
Juncus effusus	Soft rush	R		R			F		LA				A

Latin Names	Common Names	Dry Heath	Humid Heath	Acid grassland	Molinia Pta	Bracken	Wet woodland	Dry scrub	Standing water	Running water	Earth stone bank	Other exposure (rocks)	Mire
Leontodon saxatilis	Lesser hawkbit											O	
Lonicera periclymenum	Honeysuckle	F					F/LA	O/LF					
Lotus pedunculatus	Greater bird's-foot-trefoil								LF				
Luzula multiflora	Heath wood-rush			O (e)								O	
Luzula sylvatica	Great wood-rush											F/LD	
Molinia caerulea	Purple moor-grass	O/LF	F/LA		D	O	O				O		F
Myosotis secunda	Creeping forget-me-not								F				
Oenanthe crocata	Hemlock water-dropwort									LA			
Osmunda regalis	Royal fern	R					F/LA						
Oxalis acetosella	Wood sorrel	LF				LF	O				O		
Phyllitis scolopendrium	Hart's tongue	O				O		O			O		
Plantago lanceolata	Ribwort plantain			O			O						
Poa annua	Annual meadow grass			O								O	
Polygala serpyllifolia	Heath milkwort	R				O							
Polypodium vulgare	Polypody											F	
Potentilla erecta	Common tormentil	F		F	R	F						O	
Prunella vulgaris	Selfheal			O									
Prunus spinosa	Blackthorn							F/LD					
Pteridium aquilinum	Bracken	LA	R	R	A	D	O				LF	LF	
Ranunculus repens	Creeping buttercup								LF				
Rhododendron ponticum	Rhododendron					R							
Rubus fruticosus agg.	Blackberry/bramble	F	R		O	F/LA	F	F			F	O	
Rumex acetosa	Common sorrel	O		O		F	O	O			O	O	
Salix cinerea ssp oleifolia	Grey willow		O			LF (e)	D		LA		O		
Sambucus nigra	Elder						R						
Scrophularia auriculata	Water figwort								O	O			

Latin Names	Common Names	Dry Heath	Humid Heath	Acid grassland	Molinia Pta	Bracken	Wet woodland	Dry scrub	Standing water	Running water	Earth stone bank	Other exposure (rocks)	Mire
Sedum anglicum	English stonecrop	O		O (e)								F	
Senecio jacobaea	Ragwort			O (e)							O	O	
Silene dioica	Red campion	O				LF	O	O			O		
Sparganium erectum	Branched bur-reed									LA			
Stachys officinale	Betony										O		
Stachys palustris	Marsh woundwort												
Stachys sylvatica	Hedge woundwort										O		
Stellaria holostea	Greater stitchwort	O				O							
Teucrium scorodonia	Wood sage	O			R	F	F	LF			LF	LF	
Trichophorum germanicum	Deer grass		O										
Ulex europaeus	European gorse	R				LF		LD					
Ulex gallii	Western gorse	A/LD	F/LA		O (e)	F		O					
Umbilicus rupestris	Navelwort	R									O	LF	
Urtica dioica	Common nettle					R		R					
Vaccinium myrtillus	Bilberry	LF				LF					LF	LF	
Veronica chamaedrys	Germander speedwell					R							
Viola riviniana	Common dog-violet	R				LF					O		
Bryophytes													
Aulacomium palustre	Moss	R			R								
Campylopus flexuosus	Moss		LF										
Campylopus introflexus	Moss	O	O	O									
Cladonia diversa	Lichen		O										
Cladonia portentosa	Lichen		O/LF										
Cladonia sp.	Lichen		LF										
Cladonia uncialis	Lichen		O										

Latin Names	Common Names	Dry Heath	Humid Heath	Acid grassland	Molinia Pta	Bracken	Wet woodland	Dry scrub	Standing water	Running water	Earth stone bank	Other exposure (rocks)	Mire
Dicranum scoparium	Moss	LF	LF								O	O	
Diplophyllum albicans											O		
Hypnum cuppressiforme	Moss	F	O		O	F					LF		
Hypnum jutlandicum	Moss	LF	LF	O		F							
Lophocolea bidentata	Moss	O				O							
Pleurozium schreberi	Moss	O				R							
Polytrichum commune	Moss	R											
Polytrichum juniperinum	Moss			R									
Polytrichum piliferum	Moss											LF	
Racomitrium fasciculare	Moss											LF	
Racomitrium heterostichum	Moss		R									LF	
Rhytidiadelphus loreus	Moss	R				R					O		
Rhytidiadelphus squarrosus	Moss			O									
Scleropdium purum	Moss	F	F	F									
Sphagnum cuspidatum	Moss		R										
Sphagnum denticulatum	Moss		LF										
Sphagnum fimbriatum	Moss						LA						
Sphagnum palustre	Moss					LF							
Sphagnum subnitens	Moss		R			LF							
Sphagnum tenellum	Moss		R										
Sphagnum fallax	Moss		R										

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally, E = Edge

Appendix 3 NVC quadrat data and photos

See Carn Galver subfolder on West Penwith CD for quadrat data and photos.

Survey	Carn Galver					Recorder	MD		Date 09/10/2012		
Vegetation type	W25b										
Species	Q31	Q32	Q33	Q34		Species	1	2	3	4	5
Pteridium aquilinum											
Digitalis purpurea											
Teucrium scorodinia											
Potentilla erecta											
Viola riviniana											
Rumex acetosa											
Chamerion angustifolium											
Hedera hibernica											
Anthoxanthum odoraum											
Holcus lanatus											
Agrostis canina											
Carex pilulifera											
Geranium robertianum											
Rubus fruticosus											
Ulex europaeus											
Solidago vigaurea											
Stellaria holostea											
Kindbergia praelonga											
Silene dioica											
Bare ground											

	Quadrats				
	Q31	Q32	Q33	Q34	
Grid. ref.	SW4256 3677	Sw4253 3676	SW4243 3681	SW4217 3659	
Photo. No.					
NVC method					
Slope					
Aspect					
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	
Vegetation height (mm)	600	750	650	750	
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Extensive area of w25b with frequent taller scrub scattered throughout (sxci and Ue). Some areas show transition to U20b with ericoids but Rf too frequent.	As for Q31	More shaded denser stands with grasses reduced in cover. Scrub again scattered, with localised cutting of W25b.		

Survey	Carn Galver					Recorder	MD		Date	27/09/2012	
Vegetation type	Humid heath H4c										
Species	Q3	Q5	Q7	Q9	Q14	Species	Q3	Q5	Q7	Q9	Q14
Ulex gallii	8	5	7	7	6						
Calluna vulgaris	6	7	6	4	4						
Erica tetralix	4	5	5	5	6						
Erica cinerea	3	2	0	3	0						
Molinia caerulea	4	4	5	3	6						
Potentilla erecta	3	3	3	4	0						
Cladonia squamosa	0	2	0	0	0						
Agrostis curtisii	0	3	3	7	0						
Carex binervis	0	0	1	0	0						
Dicranum scoparium	0	0	0	0	4						
Sphagnum denticulatum	0	0	0	0	4						
Carex panicea	0	0	0	0	1						
Trichphorum germanicum	0	0	0	0	11						
Bare ground											

	Quadrats				
	Q3	Q5	Q7	Q9	Q14
Grid. ref.	SW4244 3610	SW4255 3607	SW4262 3598	SW4288 3584	SW4310 3553
Photo. No.					
Survey method					
Slope	Slight	Slight	Slight	Slight	V. Slight
Aspect	W	W	W	S	W
Soil type					
Quadrat area	4m sq	4m sq	4m sq	4m sq	4m sq
Vegetation height (mm)	400	300	250	200	250
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Tall, dense cover with dwearf shrubs dominant; Small stands of H4c within more extensive area of U20b.	Shorter, more open vegetation where bryopyhtes and cladonia can persist. Fall in Ug.	Shorter more open vegetation with no clera dominant in sub-shrubs.	Area of H4c burnt sincve 2009 survey, but recovering with increase in A curt. Other parts of original H4c stand have been re-assigned to	Extensive sytand of H4c at southern end of Cran galver. H8a encroaching into H4c from edge of field.

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

Survey	Carn Galver					Recorder	MD		Date	05/10/2012	
Vegetation type	H4c										
Species	Q25	Q28	Q30			Species	1	2	3	4	5
Ulex gallii	8	8	7								
Calluna vulgaris	6	5	7								
Erica tetralix	6	7	6								
Molinia caerulea	5	5	6								
Agrostis curtisii	2	3	3								
Potentilla erecta	3	3	4								
Sphagnum palustre	0	0	3								
Campylopus flexuosus	0	0	3								
Bare ground											

	Quadrats				
	Q25	Q28	Q30		
Grid. ref.	SW42863635	W4276 3659	SW4290 3672		
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle		
Aspect	NNE	NNE	N		
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq		
Vegetation height (mm)	750	750	300		
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Tall dense vegetation where other assocaites confined to open areas around granite boulders. Stable with no evidence of disturbance.	As for Q25	Comparatively large stand of H4c with some variation in height, occasional pools and exposed granite.		

Survey	Carn Galver					Recorder	MD		Date 27/09/2012		
Vegetation type	H4a										
Species	Q10	Q11	Q12	Q18		Species	1	2	3	4	5
Ulex gallii	7	6	7	7							
Calluna vulgaris	5	5	5	5							
Erica cinerea	3	0	3	3							
Potentilla erecta	4	4	4	4							
Agrostis curtisii	8	8	8	8							
Carex binervis	0	1	0	1							
Hypochaeris radicata	0	0	3	0							
Molinia caerulea	0	0	0	3							
Bare ground											

Quadrats

	Q10	Q11	Q12	Q18	5
Grid. ref.	SW4291 3572	SW4290 3570	SW4291 3568	SW4287 3576	
Photo. No.					
NVC method					
Slope	V Slight	V Slight	V Slight	V Slight	
Aspect	S	S	S	SE	
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Formerly mapped as H4c but burnt since 2009, with Etet low to absent and A curt dominant.	As for Q10	Increase in cover of shrubs particularly Cv and Ug	Northern endc of stand with abrupt transition to H8a to wst, more subtle change to H4c to east.	

Survey	Carn Galver					Recorder	MD		Date 04/10/2012		
Vegetation type			**H4d**								
Species	**Q19**	**Q20**	**Q21**			**Species**	**1**	**2**	**3**	**4**	**5**
Ulex gallii	7	5	7								
Calluna vulgaris	6	6	4								
Erica tetralix	5	5	5								
Molinia caerulea	6	6	8								
Trichphorum germanicum	4	6	5								
Agrostis curtisii	3	0	0								
Cladonia portentosa	3	2	2								
Campylopus flexuosus	0	3	2								
Racomitrium lanuginosum	0	2	0								
Scleropodium parum	0	3	0								
Carex binervis	0	0	3								
Hypnum cupressiforme	0	0	2								
Bare ground	0	0	0								

Quadrats

	Q19	**Q20**	**Q21**		
Grid. ref.	SW4312 3555	SW4309 3558	SW4307 3562		
Photo. No.					
NVC method					
Slope	V slight	V slight	_-		
Aspect	S	S			
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq		
Vegetation height (mm)	450	300	300		
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	As for H4c with addition of T germ	More open with Ug lower in cover and increase in Trich	Similar to Q19 and q20.		

Survey	Carn Galver					Recorder	MD		Date 27/09/2012		
Vegetation type	H8a (dry heath)										
Species	**Q6**	**Q8**	**Q13**	**Q27**		**Species**	**1**	**2**	**3**	**4**	**5**
Ulex gallii	7	9	9	7							
Calluna vulgaris	8	6	6	8							
Erica cinerea	4	3	4	4							
Erica tetralix	2	0	0	0							
Molinia caerulea	1	0	3	0							
Carex binervis	0	1	0	0							
Agrostis curtisii	0	3	0	0							
Pteridium aquilinum	0	1	0	5							
Potentilla erecta	0	0	3	4							
Rubus fruticosus	0	0	0	3							
Vaccinium myrtillus	0	0	0	4							
Teucrium scorodonia	0	0	0	3							
Stellaria holostea	0	0	0	3							
Bare ground											

Quadrats

	Q6	Q8	Q13	Q27	
Grid. ref.	Sw4258 3605	SW4265 3605	SW4293 3560	SW4293 3637	
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	
Aspect	W	W	S	NE	
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	
Vegetation height (mm)	600	600	1200	1110	
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Extensive closed stand of H8a on slopes below Carn Galver. Vegetation in and around scattered granite boulders.	As for Q6	Previously mapped as H4c. Mc present in runnels of tall H8a	Picked out by coallescing of Ug and ericoids. Poa can be locally frequent, but cover is dominated by heath shrubs. Possibly represents	

Survey	Carn Galver					Recorder	MD		Date 04/10/2012		
Vegetation type	Mol/Ug regerating H8a										
Species	Q22	Q23				Species	1	2	3	4	5
Molinia caerulea	7	8									
Ulex gallii	6	5									
Calluna vulgaris	4	3									
Erica cinerea	4	4									
Agrostis curtisii	2	0									
Anthoxanthu odoratum	0	3									
Ulex gallii (burnt)	6	6									
Pteridium aquilinum	0	2									
Bare ground											

Quadrats

	Q22	Q23			
Grid. ref.	SW4330 3567	Sw4327 3571			
Photo. No.					
NVC method					
Slope	Slight	Slight			
Aspect	SW	SW			
Soil type					
Quadrat area	4 m Sq	4 m Sq			
Vegetation height (mm)					
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Previously burnt H8a. When surveyed in 2009 mapped as Mol/Ug, with Ug occasional. Now ericoids all regenerating. Sampling focused on better areas but mich of stand is still referable to Mol/Ug.	also regeneration of Cv and Ecin from below Mol.			

Survey	Carn Galver					Recorder	MD		Date 04/10/2012		
Vegetation type	Mol/Pta										
Species	Q15	Q16	Q17	Q24		Species	1	2	3	4	5
Molinia caerulea	9	9	10	10							
Agrostis curtisii	5	4	3	0							
Pterridium aquilinum	7	7	8	6							
Rubus fruticosus	4	6	0	0							
Chamerion angustifolium	3	0	0	0							
Teucrium scorodonia	4	0	0	0							
Steallaria holostea	0	3	0	0							
Solidago vigaurea	0	1	0	0							
Potentilla erecta	0	2	0	3							
Bare ground											

	Quadrats				
	Q15	Q16	Q17	Q24	
Grid. ref.	SW4275 3586	SW4278 3584	SW4283 3580	Sw4313 3579	
Photo. No.					
NVC method					
Slope			V Slight	V slight	
Aspect			E	W	
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	
Vegetation height (mm)	600	750	750	800	
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Small stand of tall rank vegetation dominated by Mc and Pta. Likely to bew result of burning. Rf encroaching, with Ug occasional.	Rf increasing in cover. Ac drops out and Stellaria apperas. Transition to W25b, which is around.	As for Q16 but Mc and Pta very dominant and no Rf. Ug occasional but not in Quadrat.	Smlal styand within area of H8q and regenerating 88a.	

Survey	Carn Galver					Recorder	MD		Date 09/10/2012		
Vegetation type	**W22a scrub**										
Species	**Q46**	**Q47**	**Q49**			**Species**	**1**	**2**	**3**	**4**	**5**
Prunus spinosa	9	9	9								
Pteridium aquilinum	4	4	3								
Ulex europaeus	5	2	0								
Hedera hibernica	4	4	4								
Teucrium scorodonia	3	0	3								
Festuca rubra	2	0	0								
Anthoxanthum odoratum	2	2	0								
Silene dioica	2	3	3								
Rumex acetosa	2	3	3								
Stellaria holostea	1	0	0								
Digitalis purpurea	1	0	0								
Holcus lanatus	0	3	2								
Angelica sylvestris	0	1	1								
Cirsium palustre	0	1	0								
Dactylis glomerata	0	3	3								
Geranium robertium	0	4	0								
Glechoma hederacea	0	2	0								
Agrostis capillaris	0	0	3								
Lotus pedunculatus	0	0	3								
Rubus fruticosus	4	4	5								
Cirsium arvense	0	0	1								
Urtica dioica	0	0	2								
Bare ground											

Quadrats

	Q46	**Q47**	**Q49**		
Grid. ref.	SW4204 3701	SW4205 3704	SW4202 3706		
Photo. No.					
NVC method					
Slope	V slight	V slight	V slight		
Aspect	NW	NW	NW		
Soil type					
Quadrat area	10 m sq	10 m sq	10 m sq		
Vegetation height (mm)	2000	1500	1500		
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Tall dense stand of W22 covering two small fields and part of a third.	Shorter than Q46 otherwise the same	As for Q47		

Survey	Carn Galver					Recorder	MD		Date		
Vegetation type	W23c										
Species	Q37	Q38	Q40	Q42	Q45	Species	1	2	3	4	5
Ulex europaeus	8	9	8	9	8						
Rubus fruticosus	6	6	6	5	7						
Pteridium aquilinum	6	5	6	6	5						
Silene dioica	4	3	2	3	3						
Cirsium palustre	3	0	0	0	1						
Lotus pedunculatus	3	3	3	3	4						
Rumex acetosa	3	3	3	3	3						
Viola riviniana	3	0	0	3	3						
Juncus effusus	1	2	0	0	0						
Agrostis capillaris	4	4	4	3	3						
Holcus lanatus	5	3	4	4	4						
Hedera hibernica	0	2	0	4	3						
Potentilla erecta	0	2	3	0	3						
Stellaria holostea	0	0	3	0	0						
Teucrium scorodonia	0	0	1	3	0						
Senecio jacobaea	0	0	0	1	0						
Digitalis purpurea	0	0	0	2	0						
Dactylis glomerata	0	0	0	0	5						
Geranium robertianum	0	0	0	0	3						
Bare ground											

	Quadrats				
	Q37	Q38	Q40	Q42	Q45
Grid. ref.	SW4208 3676	SW4211 3675	SW4208 3682	SW4202 3683	SW4201 3699
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	NW	NW	NW	NW	NW
Soil type					
Quadrat area	10 m sq	10 m sq	10 m sq	10 m sq	10 m sq
Vegetation height (mm)	1000-2000	1200	1200	1500	1000
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Forming mosiac with U4a and U4b. This tall scrub component is essentillay W25b plus Ue.		Ug and Sxci occasional within W23. Angelica sylvestrris occasional.	Almost complete cover of Ue within vegetation in this part of field and northwest going to W23 dominant.	Shorter stand of W23 with Dg and Gera rob in field layer forming mosiac with U4b.

Survey	Carn Galver					Recorder	MD		Date	09/10/2012	
Vegetation type	U4a										
Species	**Q39**	**Q41**				**Species**	**1**	**2**	**3**	**4**	**5**
Agrostis capillaris	8	8									
Anthoxanthum odoratum	5	5									
Festuca rubra	5	3									
Holcus lanatus	4	4									
Potentilla erecta	4	5									
Lotus pedunculatus	3	3									
Hypochaeris radicata	3	4									
Rhytidiadelphus squrrosus	2	0									
Poytrichum juniperinum	2	0									
Rumex acetosella	2	0									
Cladonia chlorophaea	1	0									
Calluna vulgaris	4	6									
Cirsium pallustre	2	0									
Ranunculus repens	2	0									
Juncus effusus	1	0									
Carex binervis	1	0									
Pedicularis slvatica	0	4									
Pteridium aquilinum	0	4									
carex pilulifera	0	3									
Teucrium scorodonia	0	2									
Scleropodium parum	0	3									
Plantago lanceolata	0	1									
Bare ground											

Quadrats

	Q39	**Q41**			
Grid. ref.	Sw4212 3677	SW4204 3684			
Photo. No.					
NVC method					
Slope	Slight	Slight			
Aspect	NW	NW			
Soil type					
Quadrat area	2 m sq	2 m sq			
Vegetation height (mm)	250	200			
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	One element in mosaic with u4b/W25b and W23c. Also transitions to Je M23 MG10 but generallty leave as U4 type. Area is grazed.	Grazed field with U4a mosaic with W25 and W23.			

Survey	Carn galver					Recorder	MD		Date 27/09/2012		
Vegetation type	**U20b**										
Species	**Q1**	**Q2**	**Q4**	**Q26**	**Q29**	**Species**	**1**	**2**	**3**	**4**	**5**
Pteridium aquilinum	7	6	6	9	8						
Calluna vulgaris	6	4	0	4	4						
Vaccinium myrtillus	4	3	4	5	4						
Rubus fruticosus	4	5	5	5	4						
Solidago vigaurea	1	0	1	2	2						
Stellaria holostea	3	3	4	4	5						
Potentilla erecta	3	0	3	3	0						
Rumex acetosa	3	3	3	4	4						
Viola riviniana	3	0	0	3	2						
Polypodium vulgare	2	0	1	0	0						
Molinia caerulea	3	3	0	0	2						
Hedera hibernica	4	3	4	0	5						
Erica cinerea	0	6	4	0	3						
Drypoteris dilatata	0	3	0	1	0						
Kindbergia prealonga	0	4	0	3	2						
Ulex gallii	4	6	5	4	4						
Lonicera periclymenum	0	0	3	0	0						
Anthoxanthum odoratum	0	0	0	4	4						
Chamerion angustifolium	0	0	0	3	3						
Rhytidiadelphus squarrosus	0	0	0	4	0						
Agrostis stolonifera	0	0	0	0	3						
Bare ground											

Quadrats

	Q1	**Q2**	**Q4**	**Q26**	**Q29**
Grid. ref.	SW4212 3626	SW4232 3612	SW4249 3606	SW4280 3634	Sw4281 3665
Photo. No.					
NVC method					
Slope	Slight	V Slight	Slight	Slight	Slight
Aspect	NW	NW	NW	E	NNE
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	1000	1000	1000	1000	1200
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Forming extensive stands on lower slopes enclosing lenses of H4c. Little evidence of grazing or disturbnace.	apperance of E cinerea. Sub-shrubs often scattered with cinstants for community balternating.		Covering the whole of esat facing slope of Cran Galver, with H8a largely confined to thinner soils around tors.	Subshrubs form open canopy Pta overly dominant.

Survey	Carn Galver					Recorder	MD		Date 09/10/2012		
Vegetation type	**W1 Wet Woodland**										
Species	**Q50**	**Q51**	**Q52**			**Species**	**1**	**2**	**3**	**4**	**5**
Salix cinerea	9	9	8								
Rubus fruticosus	5	4	6								
Galium palustre	7	3	3								
Atghyrium filix femina	3	4	4								
Hedera hibernica	4	5	5								
Kindbergia praelonga	4	4	4								
Cirsium palustre	3	3	2								
Lonicera periclymenum	3	3	4								
Osmunda regalis	1	5	4								
Spagnum inundatum	2	3	4								
Agrostis canina	3	3	3								
Holcus mollis	0	3	3								
Thiudium tamariscum	0	4	3								
Sphagnum palustree	0	4	2								
Dryopteris dilatata	0	3	5								
Blechnum spicant	0	3	2								
pteridium aquikinum	0	3	3								
Polytrichum commune	0	3	0								
Bare ground											

Quadrats

	Q50	**Q51**	**Q52**		
Grid. ref.	SW4314 3693	SW 4312 3703	SW4312 3705		
Photo. No.					
NVC method	Hall *et al*, 2001	Hall *et al*, 2001	Hall *et al*, 2001		
Slope					
Aspect					
Soil type					
Quadrat area	5 m sq (10 m sq)	5 m sq (10 m sq)	5 m sq (10 m sq)		
Vegetation height (mm)	6000	6000	5000		
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)		Single clump of monbretia os quadrat.	More open canopy. Area crossed by small streams.		

Survey	Carn Galver					Recorder	MD		Date 09/10/2012		
Vegetation type	**U4b**										
Species	**Q35**	**Q36**	**Q43**	**Q44**	**Q48**	**Species**	**1**	**2**	**3**	**4**	**5**
Agrostis capillaris	7	5	6	6	5						
Anthoxanthum odoratum	4	6	6	6	5						
Festruca rubra	4	3	3	3	3						
Holcus lanatus	5	7	6	7	8						
Trifolium repens	3	4	5	5	5						
Ranunculus repens	3	3	3	3	4						
Lotus pedunculatus	4	3	3	2	2						
Rumex acetosella	3	2	0	0	3						
Cirsium palustre	2	0	0	1	0						
Hypnum jutlandicum	1	0	0	0	0						
Rumex acetosa	0	3	3	3	3						
Cerastium fontanum	0	0	1	2	2						
Achillea millifolium	0	0	1	0	0						
Rubus fruticosus	0	0	2	2	0						
Pteridium aquilinum	0	0	2	2	0						
Taraxacum officinale	0	0	1	2	0						
Kindbergia praelonga	0	0	1	0	0						
Veronica chamaedrys	0	0	0	2	0						
Viola riviniana	0	0	0	1	2						
Plantago lanceolata	0	0	0	0	2						
Ajuga reptans	0	0	0	0	3						
Lotus corniculatus	0	0	0	0	3						
Cirsium arvense	0	0	0	0	1						
Bare ground											

Quadrats

	Q35	**Q36**	**Q43**	**Q44**	**Q48**
Grid. ref.	SW4204 3670	SW4202 3674	SW4206 3690	SW4202 3698	SW4202 3703
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	NW	NW	NW	NW	NW
Soil type					
Quadrat area	2 m sq	2 m sq	2 m sq	2 m sq	2 m sq
Vegetation height (mm)	150	150	200	150	150
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Coarse sward witl localised grazing. Some granite stones covered by W25 and W23 veg. Evidence of sheep and cattle grazing.	As for Q50	Pteridoum locally frquentm but not dominant. U4b cf U20a. Pta more abundant within W23c islands occasional Ug with Ue in W23c.	Grazed field comprising mosaic of U4b and W23c. Pta locally frequent associated with Ue islands.	Ps dominating half of fields ome grazing of remainder. Cattle starting to break up W22a.

BOSPORTHENNIS (Survey Area 34 – 2012)

NVC surveyor	John Sproull/Michael Davies	Date surveyed	9th,10th,12th &15th October 2012
CSM surveyor	John Sproull		
Report compiled by	John Sproull		

1 General Information

1.1 Location

Site Name/ No.	Bosporthennis
County	Cornwall
District	Penwith
Parishes	Zennor
Map Reference	Centre at SW 43653605; access at SW 43203685
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

The site is situated on the western side of Porthmeor Valley encompassing an area of predominantly rough ground to the west of the stream in the valley bottom stretching from Brook Cottage to the south almost as far as the B3306 in the north. The boundary with Carn Galver to the west is marked by a ridge running between Little Galver and Hannibal's Carn. The eastern limits of the main body of the site correspond with those of the in-bye land associated with Bosporthennis Farm (excepting some more modern in-take on the hillside). Most of this core area was previously surveyed in 2008; the area surveyed during 2012 includes additional outlying areas such as a series of fields to the south of Bosporthennis Farm Cottage and a crescent shaped parcel on the east-facing valley-side near Arra Venton.
Whilst freer-draining upper slopes support dry heath, wet / humid heath comes to the fore over gentler slopes within the valley bottom and on the hilltop plateau. Acid grassland dominates within a series of agricultural fields; elsewhere more marginal land supports various forms of scrub and bracken habitat. The location of the site is shown on *Map 1.*

1.2 Summary description

Area	51.47ha
Altitude	233m AOD
Aspect	Moderate to steep north east, east and west - facing slopes

Drainage	A stream flows to the north-west along Porthmeor Valley, in part marking the eastern site boundary. Some impeded drainage and localised flushes over gently sloping and level ground towards the valley bottom. Slopes are generally well-drained.

1.3 Access

There is a public footpath along Porthmeor Valley bottom which marks part of the eastern site boundary. Access is also possible from the adjoining ridge between Little Galver and Hannibal's Carn, though progress over the ground is often slow and hazardous. The majority of the site is owned by the National Trust and designated as open access land under the CRoW Act (2000).

1.4 Tenure

The site is owned by the National Trust and managed by a tenant farmer in partnership with the National Trust.

Plate 1 34-2012-C24 view from SW43313621 looking north-east across Porthmeor Valley.

2 Biological Description

2.1 Habitats

The main habitat types present within the site include: scrub, acid grassland, bracken and heath (both dry and wet/humid). Boundaries are marked by extant and relict Cornish hedges of a style typical to the area. Habitats are

described in more detail below and their distribution within the site is shown on *Map 2* in *Appendix 1*. A list of plant species recorded within each habitat is provided in *Appendix 2*.

Field notes made during the vegetation survey visits are annotated onto *Map 2* and included as Target Notes in *Appendix 1.* Photographs taken during the field visits are included in the text where they are considered useful in illustrating particular points of discussion. Photographs relating to each quadrat and CSM sampling point (as annotated onto *Map 2*) are appended (with quadrat data) to this report as a named subfolder on CD (*Appendix 3*).

2.1.1 Scrub

Scrub is widespread across northern parts of the site and has been assigned to four communities within the NVC as follows:

W1 *Salix cinerea - Galium palustre* woodland, W25 *Pteridium aquilinum - Rubus fruticosus* underscrub, **W23 *Ulex europaeus – Rubus fruticosus* scrub** and **W22 *Prunus spinosa – Rubus fruticosus* scrub.** The distribution and general composition of each of the communities as they occur within the site is described below.

Wet willow scrub **W1 *Salix cinerea - Galium palustre* woodland,** occupies a small area in the northernmost corner of the site to the south of the stream. Sampling was carried out around the edges of the stand as access allowed. Grey willow (*Salix cinerea*) is dominant forming a relatively open canopy about 7m high. Associated species are varied but typically include bramble (*Rubus fruticosus*), soft rush (*Juncus effuses*) lady fern (*Athyrium felix-femina*) and Atlantic ivy (*Hedera hibernica*). Poor fen species are occasional to locally frequent including royal fern (*Osmunda regalis*), marsh violet (*Viola palustris*), lesser skullcap (*Scutellaria minor*), and ivy-leaved bellflower (*Wahlenbergia hederacea*) (in Q31).

Stands where bramble has gained a foothold to the extent that it impedes easy access are assigned to **W25b *Pteridium aquilinum - Rubus fruticosus* underscrub,** the ***Teucrium scorodonia* sub-community.** Here the two dominants, bracken and bramble, form a more or less continuous cover. Woodsage (*Teucrium scorodonia*), is constant and other acidic grassland species (also typical of this sub-community), such as sweet vernal grass (*Anthoxanthum odoratum*), common bent (*Agrostis capillaris*) and to a lesser extent Yorkshire fog (*Holcus lanatus*) can be frequent at low levels of abundance. Purple moor-grass (*Molinia caerulea*) is often over-represented and there is occasionally some tormentil (*Potentilla erecta*) or heath bedstraw (*Galium saxatile*). Bracken – bramble scrub is the dominant community over northern parts of the site. To the west of the stream it gives way to pockets of mire and wet woodland over wetter ground and a small stand of blackthorn scrub where there is some edaphic amelioration (see below). **W25** is of sporadic occurrence within the southern part of the site where there are a few stands within neglected field corners. Within the outlier parcel to the east where it dominates a series of abandoned fields it appears interspersed with more localised patches dominated by European gorse (*Ulex europaeus*).

These areas are assigned to **W23c** the ***Teucrium* sub-community** of ***Ulex europaeus – Rubus fruticosus* scrub.** Although generally scarce across the rest of the site, European gorse does occur as a minor component (with local frequency) within disturbed areas of heath and bracken. The most extensive stand of this community however can be found dividing an area of wet/humid heath towards the centre of the main part of the site. Within these areas gorse forms a tall canopy up to about 2m high, limiting the number of associate species. Bracken and bramble tend to remain constant; Atlantic ivy and wood sage, both preferential to this sub-community, are more or less frequent. Purple moor-grass (as above) is frequently over-represented.

Plate 2 34-2012-Q53. W25 interspersed with W23 within outlying land parcel to east of site.

The small area dominated by blackthorn with its scattered ground-cover of Atlantic ivy and gloomy interior suggests **W22a,** the ***Hedera helix – Silene dioica* sub-community** of ***Prunus spinosa – Rubus fruticosus* scrub**, this sub-community being the form of **W22** typically associated with more acidic profiles.

2.1.2 Acid grassland

Grassland at Bosporthennis is predominantly found within a series of grazed and/ or cut fields. Within the valley-bottom these take the form of small, irregularly shaped parcels whilst those found to the west on steeper slopes leading up to Little Galver are distinctively straight-sided and regular in comparison and presumably of more recent origin.

These swards, ultimately won from the surrounding heath, are of a type characteristic of poorer quality grazing land over acid soils peripheral to moorland areas in the South West. Common bent dominates, often with sweet vernal grass and generally with varying amounts of Yorkshire fog. Frequent associates are few but tormentil and common sorrel are typical. This type of community is best placed within **U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland.**

Plate 3 34-2012 from SW43393600 showing more modern intake (in centre) supporting acid grassland (contrast with irregularly shaped fields in valley bottom in plate 1)

The samples reflect varying degrees of improvement across the site. The apparent absence of sheep's fescue (*Festuca ovina*) is atypical of the community as a whole but seems often to be a feature of this community as it occurs within Cornwall. Wetter, more acidic stands are assigned to **U4a typical sub-community.** Here there tends to be a general absence of perennial rye-grass (*Lolium perenne*) and a reduction in the amount of Yorkshire fog with an occasional attendant increase in calcifuge grasses such as velvet bent (*Agrostis canina*) and mat grass (*Nardus stricta*). The sward is typically more species rich with locally frequent to abundant carices (sedges) and bryophytes (mosses and liverworts); soft rush is also locally frequent to abundant within some fields. Over freer-draining and perhaps more tractable/ accessible ground the presence of perennial rye-grass, greater abundance of Yorkshire fog and occurrence of more competitive dicot herbs, such as creeping buttercup (*Ranunculus repens*) and white clover (*Trifolium repens*) is more suggestive of improvement and **U4b,** the ***Holcus lanatus – Trifolium repens* sub-community.**

The addition of fertilisers or top-seeding, can further facilitate a transition of such swards towards more mesophytic conditions associated with **MG6** grassland (***Lolium perenne – Cynosurus cristatus* grassland**). Accurate assessment of grassland at this time of year is difficult; in particular crested dog's-tail (*Cynosurus cristatus*) a species key to separating **U4b** from **MG6** is hard to spot, even more so where swards are cut and/ or grazed as is often the case at Bosporthennis. A fuller assessment of the grassland here would be better undertaken at a more favourable time of year.

Plate 4 34-2012-Q8: typical U4a sward

2.1.3 Bracken

The general extent of bracken across much of the rough ground within West Penwith can make large areas appear morphologically similar and make the mapping of localised transitions problematic but closer inspection reveals that the habitat takes various forms.

Where bracken is dominant without abundant bramble stands are assigned to **U20 *Pteridium aquilinum- Galium saxatile* calcifugous grassland.** The most extensive areas are found over moderate slopes below Hannibal's Carn towards the centre of the site generally giving way to dry heath over higher, more exposed ground and humid heath within the valley-bottom. Typically within the community dwarf heath shrubs are at least locally frequent. On this basis most stands have been assigned to the heathy ***Vaccinium myrtillus-Dicranum scoparius* sub-community U20b.** Within a few neglected fields towards the southern part of the site a more open covering of bracken appears super-imposed over an acid grassland ground flora; these stands are better placed within **U20a** the ***Anthoxanthum odoratum* sub-community.**

Where bramble has gained a foothold to the extent that it impedes easy access, stands are placed within **W25 scrub** (described above)**.**

U20a *Pteridium aquilinum- Galium saxatile* calcifugous grassland *Anthoxanthum odoratum* sub-community.
Here there is a diffuse bracken layer over a grassy field layer particularly of common bent, sweet vernal-grass and Yorkshire fog. Associated forbs are few but include tormentil and heath bedstraw. Common acid grassland bryophytes such as *Pseudoscleropodium purum* and *Rhytidiadelphus squarrosus* can be frequent. This type of bracken habitat is of restricted occurrence at Bosporthennis such as within a few small neglected fields containing archaeological remains (perhaps maintained by only occasional grazing and/ or cutting).

Plate 5 34-2012-Q6 U20b note heathy elements over boulder and western gorse.

U20b *Pteridium aquilinum- Galium saxatile* calcifugous grassland, *Vaccinium myrtillus – Dicranum scoparium* sub-community.
Stands with a more or less constant presence of sub-shrubs (although at low levels of abundance), in particular western gorse but also, on close inspection, scattered sprigs of any of heather (*Calluna vulgaris*), bell heather (*Erica cinerea*) or bilberry (*Vaccinium myrtillus*) have been mapped as **U20b**. The abundance of western gorse in some stands of **U20b** sits uneasily with published descriptions of this community, but this species would appear to be at its climatic optimum within the British Isles in the extreme south west and in consequence can appear over-represented in certain communities. Notwithstanding this, the presence of an, albeit difficult to spot, heathy sub-shrub element suggests a heathland origin for this type of vegetation and the

approach in surveying has been to favour heath and to map bracken dominated stands as **U20b** wherever ericoids and/or western gorse are more or less constant. **U20b** is a community which commonly intervenes in the absence of further management following the burning of heathland. This may be what has happened where the community finds maximum expression within the northern part of the site.

2.1.4 Dry heath

Dry heath tends to occupy steeper, freer-draining, rocky slopes within southern parts of the site and dominates along the ridge between Little Galver and Hannibal's Carn. Western gorse dominates with varying amounts of bell heather and heather. Cross-leaved heath (*Erica tetralix*) is noticeably more or less absent; bristle bent (*Agrostis curtisii*) is typically scarce but abundant within recently burnt stands down slope. Purple moor-grass is once again over-represented. Whilst the bulk of the dry heath is referable to **H8 *Calluna vulgaris – Ulex gallii* heath** burnt areas have been assigned as a form of **H4 *Ulex gallii - Agrostis curtisii* heath**; each is described below.

H8a *Calluna vulgaris – Ulex gallii* heath, species poor sub-community
Western gorse dominates forming a generally rather tall canopy 0.75-1.3m high. Both bell heather and heather can be locally abundant but are often reduced to leggy sprigs punctuating an overwhelmingly species poor gorse canopy. Tormentil is the only typical associate to maintain a constant presence; both bracken and purple moor-grass tend to be more or less constant at low levels of abundance. The most extensive stands are found over the slopes the area to the north of Brook Cottage.

Plate 6 34-2012-Q23 Typical H8a dry heath.

H4a *Ulex gallii - Agrostis curtisii* heath, *Agrostis curtisii – Erica cinerea* sub-community.

Recently burnt areas towards the centre of the southern part of the site are marked out by a local abundance of bristle bent within the ground flora (a species usually absent from **H8**). Whilst bell-heather and heather are more or less constant here at low levels of abundance the almost total absence of cross-leaved heath and attendant increase in bristle bent gives a particular stamp to the appearance of the vegetation. As usual purple moor-grass, bracken and tormentil are constant but not abundant. More noticeably though the opening up of the canopy allows for more diminutive species such as common milkwort (*Polygala vulgaris*), carnation and pill sedge (*Carex panacea* and *C. pilulifera*), as seen within several of the quadrat samples.

Plate 7 34-2012-C14. Recently burnt area assigned to H4a

At Bosporthennis **H4a** takes two forms; recently burnt areas further to the south (believed to have been burnt during 2012) are drier and marked out by the blackened, skeletal remains of western gorse (Plate 7). Wetter areas to the north, less recently burnt, lack the dead shrub canopy and are characterised instead by uniform grassy tussocks tending to harbour quite dense shrubby re-growth with open runnels in between.

Bristle bent is a species known to monopolise the ground in the early years of recovery following fires. Not only does it set abundant seed and so is readily able to colonise bare ground but the bases of established tussocks are fire resistant and are quickly able to re-sprout following a burn; enabling the grass to attain ascendency over slower-growing shrubby elements. In the absence of other factors (such as grazing) this state of affairs is temporary, such that **H4a** frequently marks a post-burn recovery phase to be superseded by

another sub-community (here **H4c** or perhaps **H8a** over drier soils) once surviving shrubs re-establish themselves.

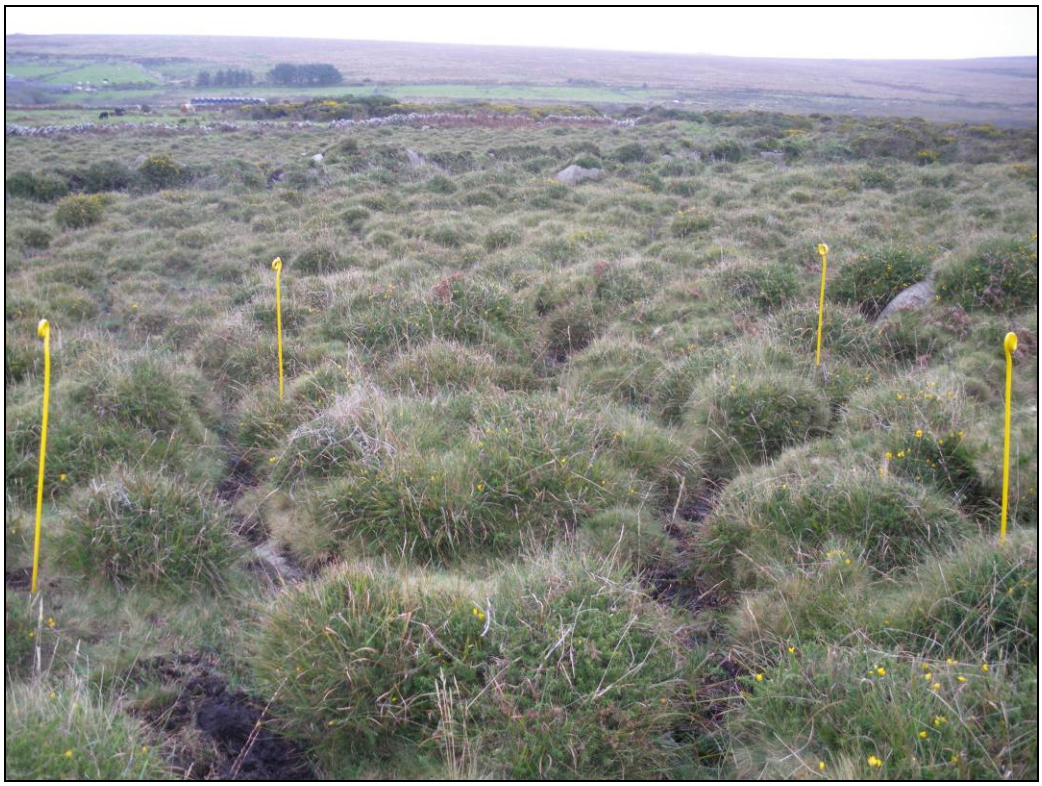


Plate 8 34-2012-Q46 tussocky form of H4a

2.1.5 Humid heath

Humid heath referable to **H4c (*Ulex gallii - Agrostis curtisii* heath, *Erica tetralix* sub-community)** has been mapped over much of the gentler sloping ground toward the valley bottom and over part of the hill-top plateau. Separation from **H8a** and **H4a** is predicated primarily upon the presence here of cross-leaved heath. Cover of purple moor-grass and/ or bristle bent (neither typically abundant within **H8**, the latter abundant in **H4a**) is not a reliable guide. Both species are over-represented generally within the South West and it seems (along with bracken) within the site as a result of past management.

H4c *Erica tetralix* sub-community

Wetter than **H4a** this sub-community generally occurs over flatter ground, presumably with impeded drainage, cross-leaved heath is more or less constant. Typically (though it may still retain frequency) an accompanying reduction in the amount of bristle bent gives these stands a markedly different appearance to those assigned to **H4a**. For the most part the sward is closed,, up to *c.*50cm high, rather species-poor and dominated by western gorse with frequent ericoids and tussocks of purple moor-grass punctuating the canopy. Grazed and/ or previously burnt stands (such as C37) although not mapped as such show a shift towards **H4b** being quite open with grassy tussocks and runnels in between.

Plate 9 34-2012-Q5 typical dense H4c.

2.1.6 Mire

At the northern end of the site is an area dominated by a mixture of grasses and rushes mapped as **M25 *Molinia caerulea – Potentilla erecta* mire.** This habitat is found in two fields within cattle-grazed openings in association with bracken-bramble and wet willow scrub. Purple moor-grass is more or less co-dominant with soft rush; velvet bent and Yorkshire fog are frequent but more or less constant. Carices and sphagna are common, star sedge (*Carex echinata*) is the most frequent with lesser amounts of green-ribbed, yellow and carnation sedge. *Sphagnum auriculatum* and *S. fallax* are locally frequent with other moss species such as *Aulacomnium palustre* and *Polytrichum commune.* This type of rather species rich assemblage is suggestive of **M25a** the ***Erica tetralix* sub-community.**

Within this area localised flushes with a notable increase in Sphagna and carices and the addition of species such as bog asphodel (*Narthecium ossifragum*) are suggestive of transitions to **M6** and/or **M21** but it has not been possible to separately sample and map these areas at the scale of the present survey.

Plate 10 34-2012-C20 M25

Within the samples Q1 is notable in providing a *locus* for the near threatened ivy-leaved bellflower (*Wahlenbergia hederacea*). This species is also present as part of a suite of notable plants within an area of rich marshy grassland (not mapped but probably referable to **M23**) beyond the site boundary at SW43403685 and along a wet track at SW43383687, see *TN10*. Here a number of rare species associated with disturbed, bare ground were recorded along a rutted farm access track running with water at the time of the survey. The assemblage included a number of species of conservation importance: ivy-leaved bell-flower as well as coral necklace (*Illecebrum vericillatum*) a nationally scarce, vulnerable and UKBAP species, allseed (*Radiola linoides*) and chaffweed (*Anagalis minima*), both near threatened. Associated species included blinks (*Montia fontana*), bog pimpernel (*Anagallis tenella*), marsh St. John's-wort (*Hypericum elodes*), yellow bartsia (*Parentucellia viscosa*) and round-leaved crowfoot (*Ranunculus omiophyllus*).

To the south of Bosporthennis Farm Cottage (*TN9*) there is a further area mapped (though not quantitively sampled) as **M23**. This assemblage appeared to be reasonably species rich and becomes more extensive along the valley-bottom towards the stream (beyond the site boundary). Sharp-flowered rush (*Juncus acutiflorus*) dominates with poor fen associates including wild angelica (*Angelica sylvestris*) and greater birds's-foot trefoil (*Lotus pedunculatus*) and ranker patches alongside the farm access track with patches of Yorkshire fog, creeping buttercup, broad-leaved dock (*Rumex conglomeratus*) and common nettle,(*Urtica dioica*).

A further area shown as a mosaic towards the centre of the site contains elements of mire (see below).

Plate 11 Coral necklace (visible in centre) habitat along wet access track at SW43383687

Plate 12 close up of coral necklace

2.1.7 Hedges

The site is sub-divided by a series of extant and relict Cornish hedges (stone-faced earth banks). Those enclosing agricultural fields are mostly stock-proof.

Some are of great size and incorporate archaeological features, the remains of hut circles etc.

Hedges tend to be sparsely vegetated dominated by grasses, notably Yorkshire fog and common bent. Atlantic ivy is common, with locally frequent navelwort (*Umbilicus rupestris*) and bilberry. Heather, common sorrel, wood sage, bluebell (*Hyacinthoides non-scripta*), English stonecrop (*Sedum anglicum*) and ferns such as common polypody (*Polypodium vulgare*) are occasional. There is a diverse suite of lichens and bryophytes.

2.1.8 Mosaic

Toward the centre of the site is an area in the valley bottom supporting discrete bracken dominated areas with scattered heath attributable to **U20b** interspersed with grazed **U4** 'lawns' and more intermittent flushes with soft rush, sphagna and caricies (possibly attributable to **M6**). This area was not sampled and has been mapped as a mosaic.

2.2 Species

2.2.1 Vascular plants

A suite of notable plants was recorded along a rutted farm access track running with water beyond the site boundary at SW43383687. Included were coral necklace (*Illecebrum vericillatum*), a nationally scarce, vulnerable, BAP species, ivy-leaved bell-flower (*Wahlenbergia hederacea*), allseed (*Radiola linoides*) and chaffweed (*Anagalis minima*) (all three of which are near threatened).
A similar species assemblage is present within area of rich marshy grassland/rush pasture at SW43403685 (not mapped).

3 Condition Assessment

3.1 Humid Heath (H4a/H4c)

Eleven samples were taken distributed throughout humid heath stands within the site; four of the sampling points relate to **H4a**, seven relate to **H4c**.

Overall the majority of samples fail compulsory attributes for vegetation structure. Total shrub cover is generally outside the target 60-90% range. Within this gorse tends to be over-represented and there is insufficient physiognomic diversity within the sward. Nevertheless swaling and extensive cattle grazing appears to be having a beneficial effect and other attributes for vegetation composition and occurrence of negative indicators are met. On this basis humid heath within the site was assessed as **unfavourable recovering.**

3.2 Dry Heath (H8a/U20b)

Eight sample points were distributed throughout areas of dry heath within the site. Using the same dry heath forms, four points were also sampled to assess the condition of bracken heath habitat assigned to **U20b**.

As above, this community fails mandatory attributes for vegetation structure, total shrub cover is outside the prescribed range and there is insufficient structural variation as shown by the general lack of bare ground and insufficient age range within the ericoids. These failures would seem to relate to very low levels of disturbance within most stands and are a likely facet of abandonment. Grazing stock and controlled burning nevertheless seems to be having a positive impact and other assessment criteria are met.

Overall therefore dry heath is assessed as **unfavourable recovering**.

3.3 Acid Grassland (U4/U20a)

Ten samples were taken distributed throughout acid grassland and grassy bracken stands across the site (five within **U4** and five within **U20b**). Condition assessed together as '**U4/U20** related' on the lowland acid grassland CSM form.

Samples pass mandatory attributes for sward composition, although this is generally an inherently species poor community there is a reasonable frequency of positive indicator species; the incidence of bracken and negative indicator species are also within desired limits. However there is a marked over representation of coarse grasses, namely Yorkshire fog within the sward. This may reflect past agricultural improvement within areas of **U4** which may have allowed more competitive grass species to dominate at the expense of a richer array of finer calcifuge grasses.

In consequence the community is assessed as **unfavourable no change.**

3.4 Mire (M25a)

As only a minor habitat within the site only two CSM samples were taken within this community.

Samples pass the mandatory attribute for sward composition. The sward is relatively species rich, there is a good representation of positive indicator species and no negative indicator species were recorded. They fail one optional attribute for sward structure due to the average height of the sward which exceeds 2cm with more than 25% also exceeding 15cm due to the prevalence of soft rush (and tall purple moor-grass).

Cattle grazing in this area appears to be having a beneficial effect creating openings in the sward and allowing a range of species to persist. Overall, the area of **M25** is assessed as **favourable maintained**.

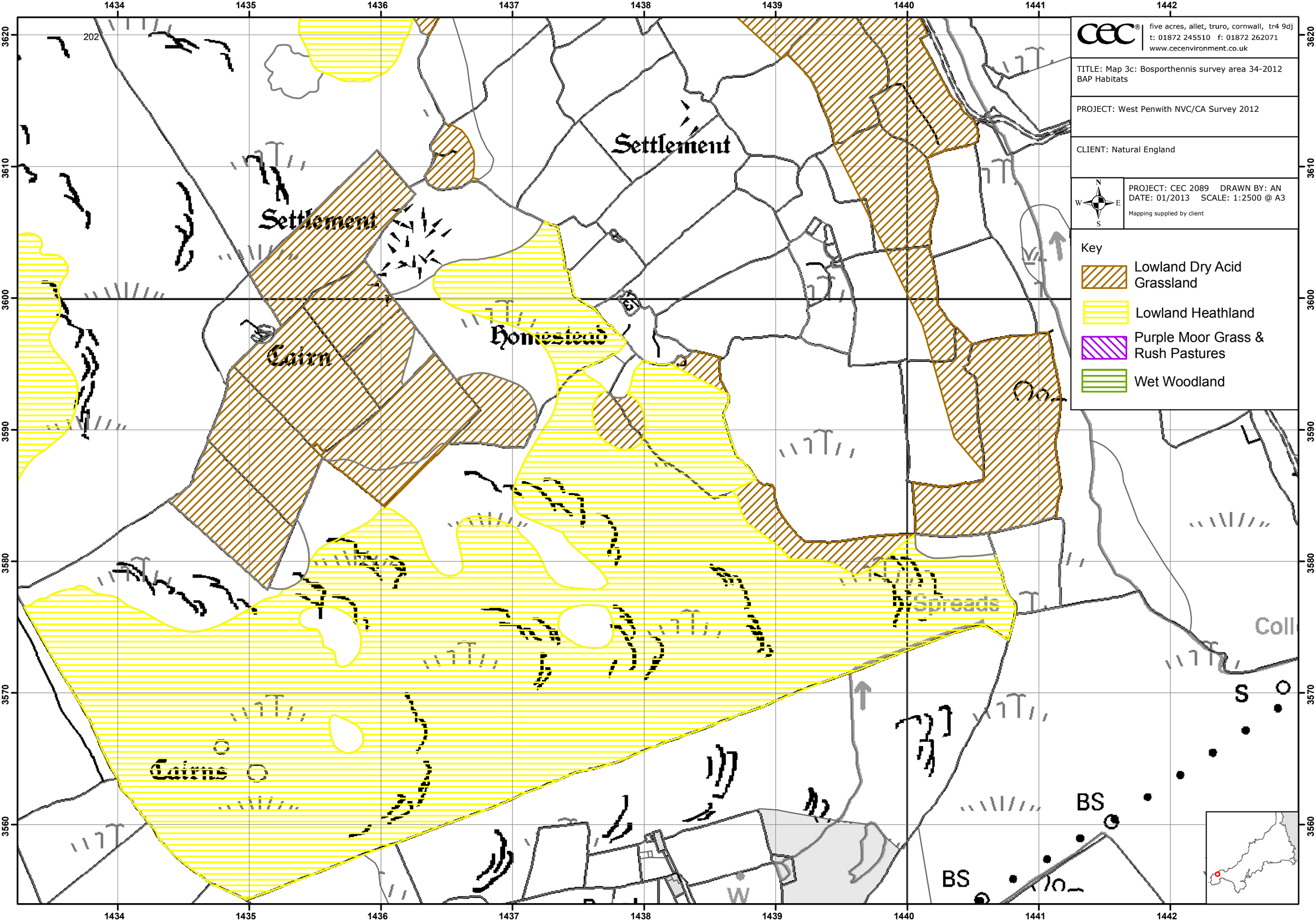
Table 1 Summary of habitats and vegetation communities

Bosporthennis 34-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W1		0.90	N/A	Wet woodland 0.90
	W22a	0.06	0.21		N/A
	W23c	1.13	1.28		
	W25b	2.26	6.35		
Acid grassland	U4a		4.89	UFNC	Lowland dry acid grassland 9.36
	U4b	3.37	4.47		
Bracken	U20a	13.10	0.74	N/A	N/A
	U20b		13.83		
Dry heath	H8a	5.00	7.53	UFR	Lowland heathland 17.02
	H8e	10.8	-		
	H4a		2.39		
Humid heath	H4c	1.81	7.10	UFR	
Mire	M25a		1.02	F	Purple moor grass and rush pastures 1.02
Total Area Mapped		37.53	51.47		

Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD)

Appendix 1 Maps (1: Location, 2: NVC, 3:BAP habitat)

See separate maps folder on CD.


cec®
five acres, allet, truro, cornwall, tr4 9dj
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www.cecenvironment.co.uk
TITLE: Map 3c: Bosporthennis survey area 34-2012 BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Dry Acid Grassland
Lowland Heathland
Purple Moor Grass & Rush Pastures
Wet Woodland
Settlement
Settlement
Homestead
Cairn
Cairns
Spreads
BS
BS
S
1434
1435
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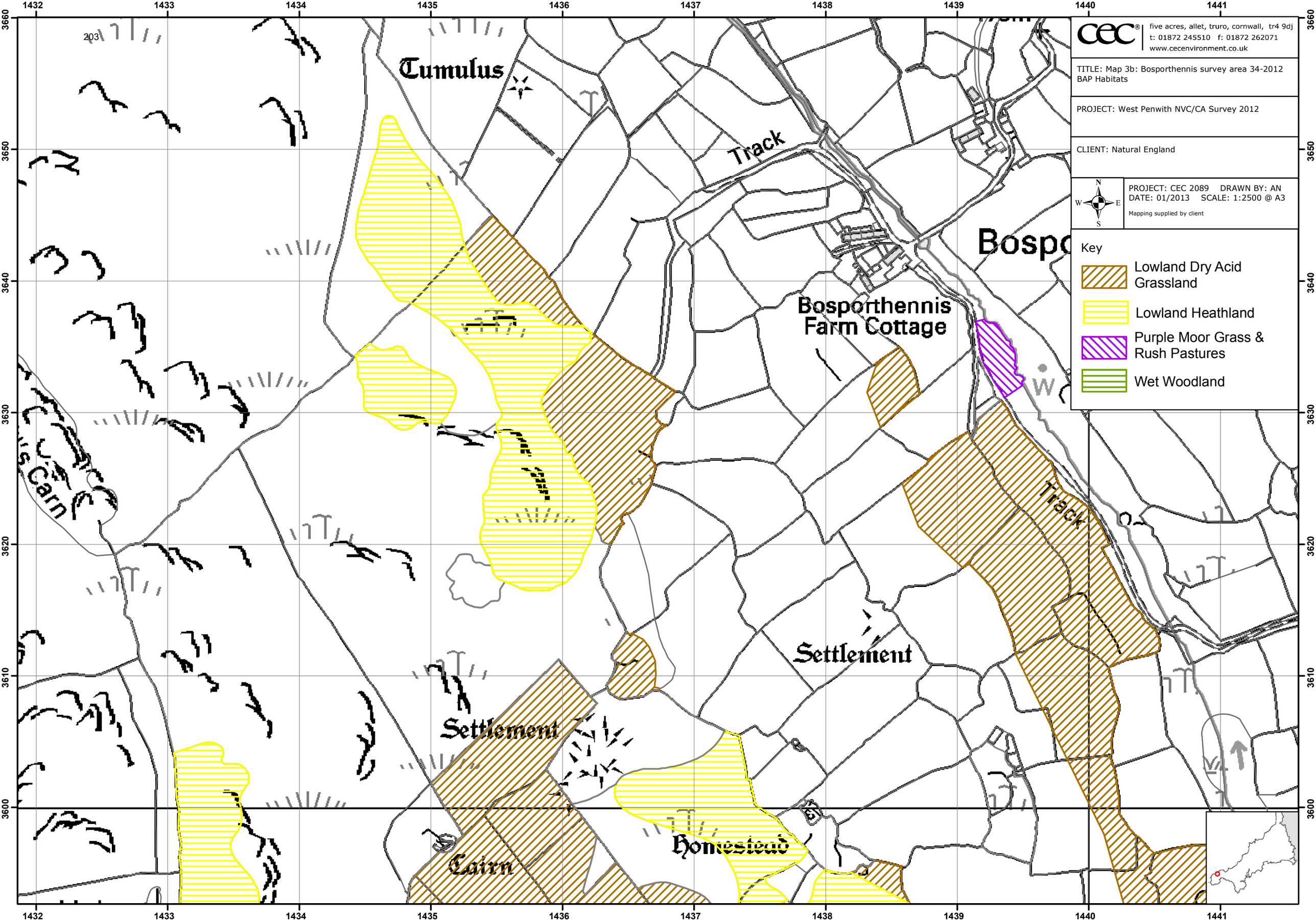
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3610
3600
203
Tumulus
Track
Bosporthennis
Farm Cottage
Bospo
Track
Settlement
Settlement
Homestead
Cairn
's Carn
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3b: Bosporthennis survey area 34-2012
BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
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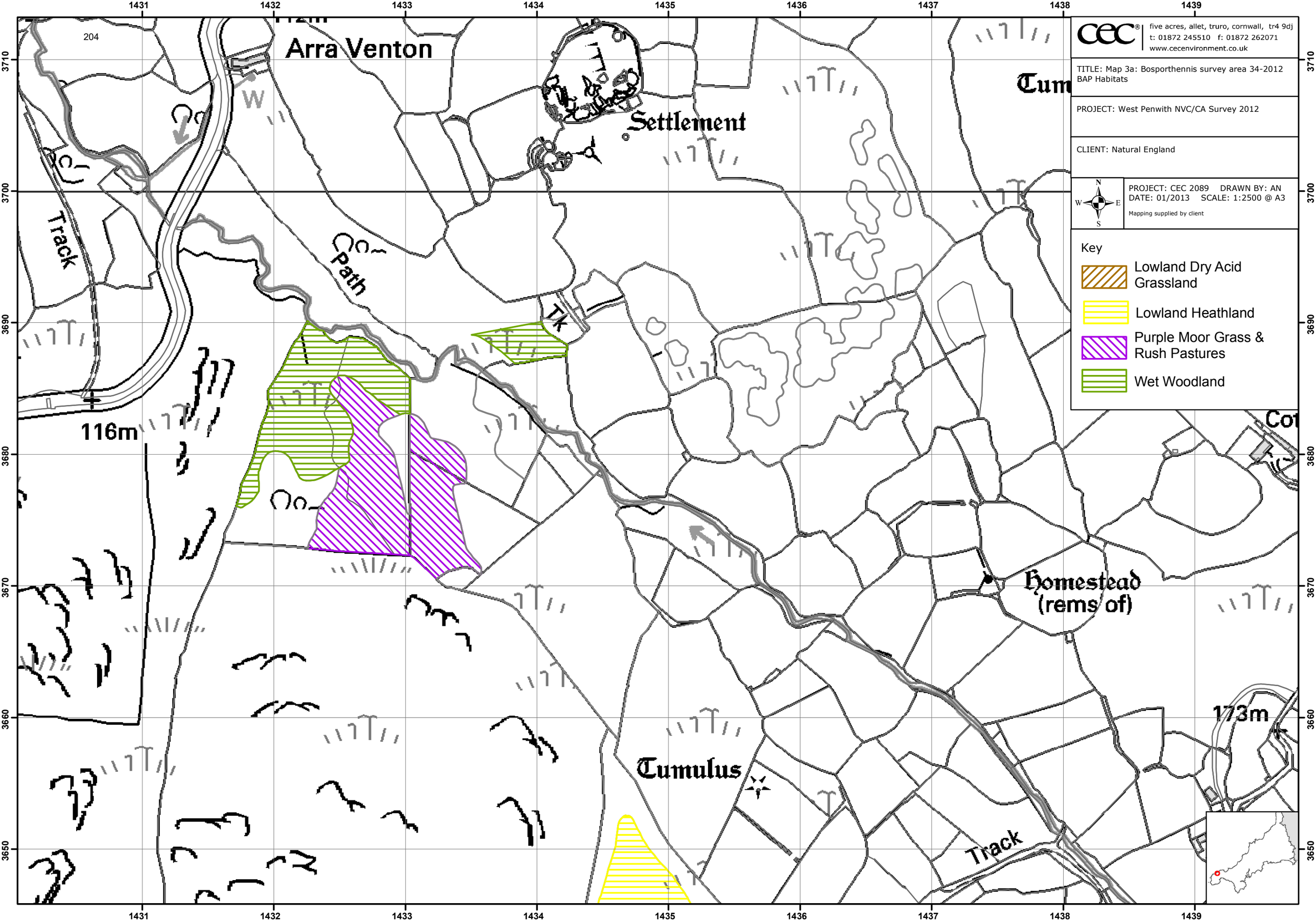
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Dry Acid Grassland
Lowland Heathland
Purple Moor Grass & Rush Pastures
Wet Woodland


cec®
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3a: Bosporthennis survey area 34-2012
BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Dry Acid Grassland
Lowland Heathland
Purple Moor Grass & Rush Pastures
Wet Woodland
Arra Venton
Settlement
Track
Path
Tk
116m
Homestead (rems of)
173m
Tumulus
Track
204
1431
1432
1433
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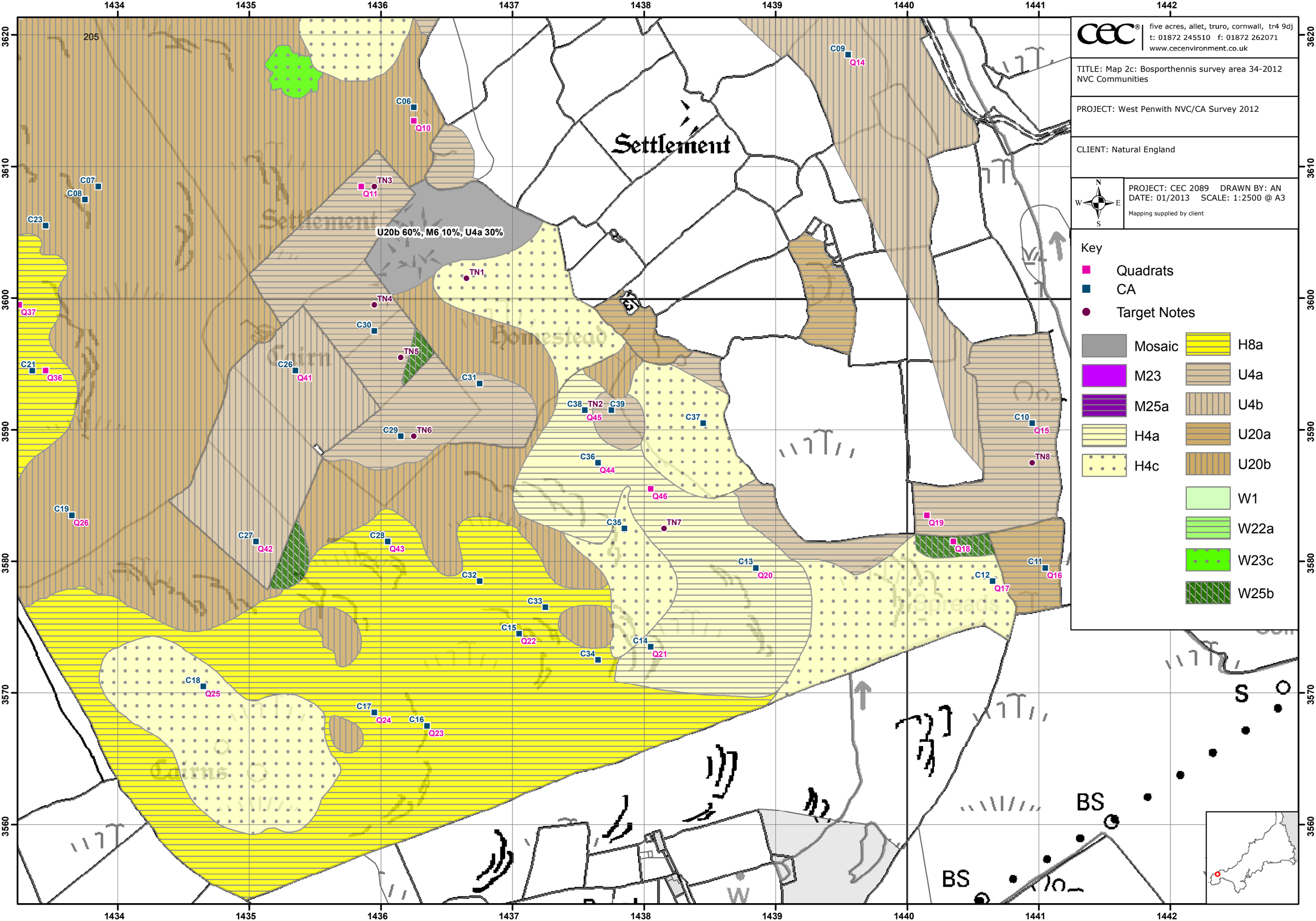
3650


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2c: Bosporthennis survey area 34-2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mosaic
M23
M25a
H4a
H4c
H8a
U4a
U4b
U20a
U20b
W1
W22a
W23c
W25b
Settlement
U20b 60%, M6 10%, U4a 30%
Settlement
Homestead
Cairn
Cairns
205
C06
Q10
C09
Q14
C07
C08
C23
TN3
Q11
TN1
TN4
C30
TN5
Q37
C21
Q36
C26
Q41
C31
C38
TN2
C39
Q45
C37
C10
Q15
TN8
C29
TN6
C36
Q44
Q46
C19
Q26
C35
TN7
Q19
Q18
C27
Q42
C28
Q43
C13
Q20
C11
Q16
C12
Q17
C32
C33
C15
Q22
C14
Q21
C34
C18
Q25
C17
Q24
C16
Q23
BS
BS
1434
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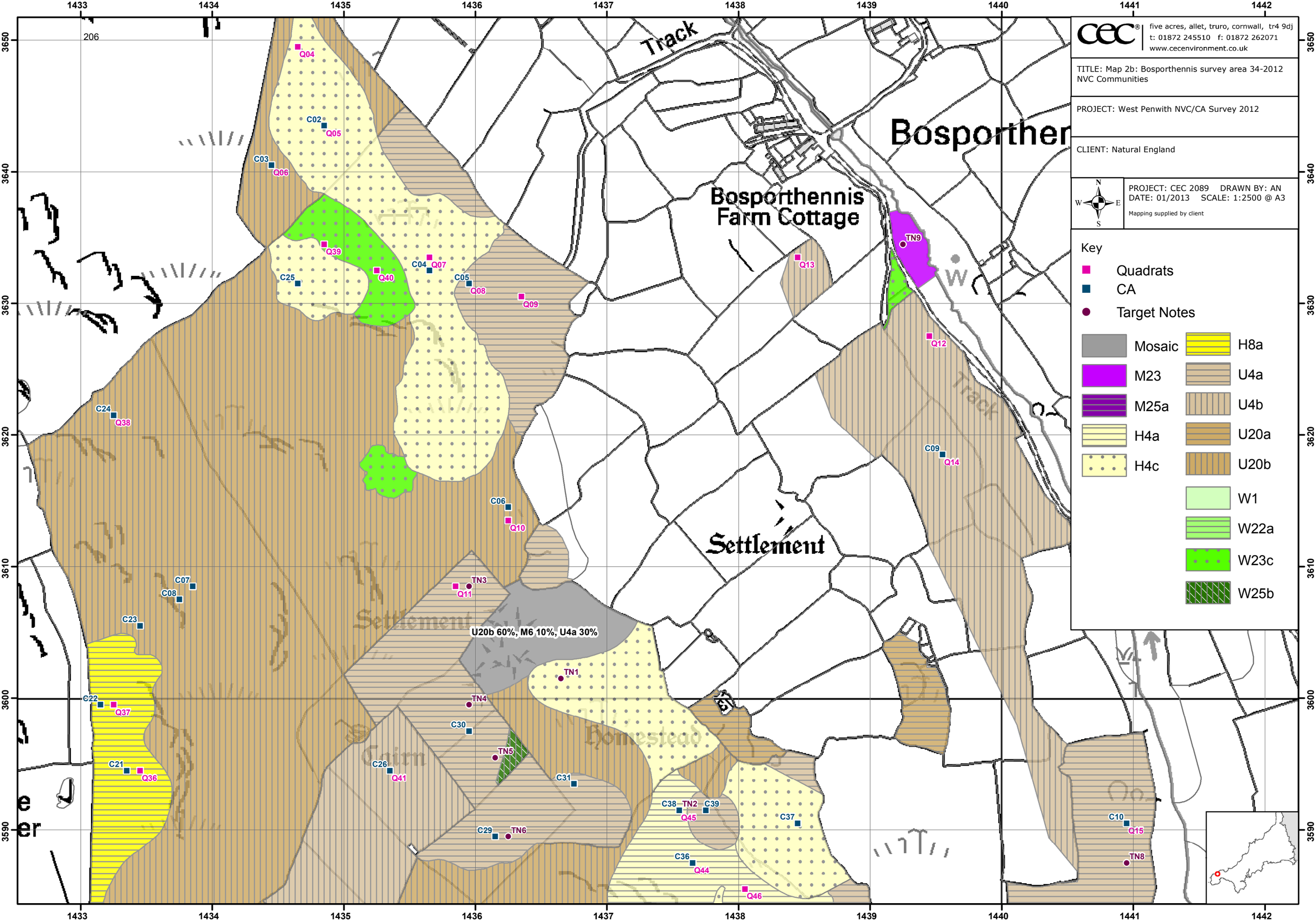
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five acres, allet, truro, cornwall, tr4 9dj
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www.cecenvironment.co.uk
TITLE: Map 2b: Bosporthennis survey area 34-2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mosaic
M23
M25a
H4a
H4c
H8a
U4a
U4b
U20a
U20b
W1
W22a
W23c
W25b
Bosporthennis Farm Cottage
Bosporther
Settlement
Track
U20b 60%, M6 10%, U4a 30%
Settlement
Cairn
Homestead
Q04
C02
Q05
C03
Q06
Q39
C04
Q07
C25
Q40
C05
Q08
Q09
C24
Q38
C06
Q10
C07
C08
TN3
Q11
C23
C22
Q37
TN1
TN4
C30
TN5
C21
Q36
C26
Q41
C31
C38
TN2
C39
Q45
C37
C29
TN6
C36
Q44
Q46
C10
Q15
TN8
TN9
Q13
Q12
C09
Q14
206
1433
1434
1435
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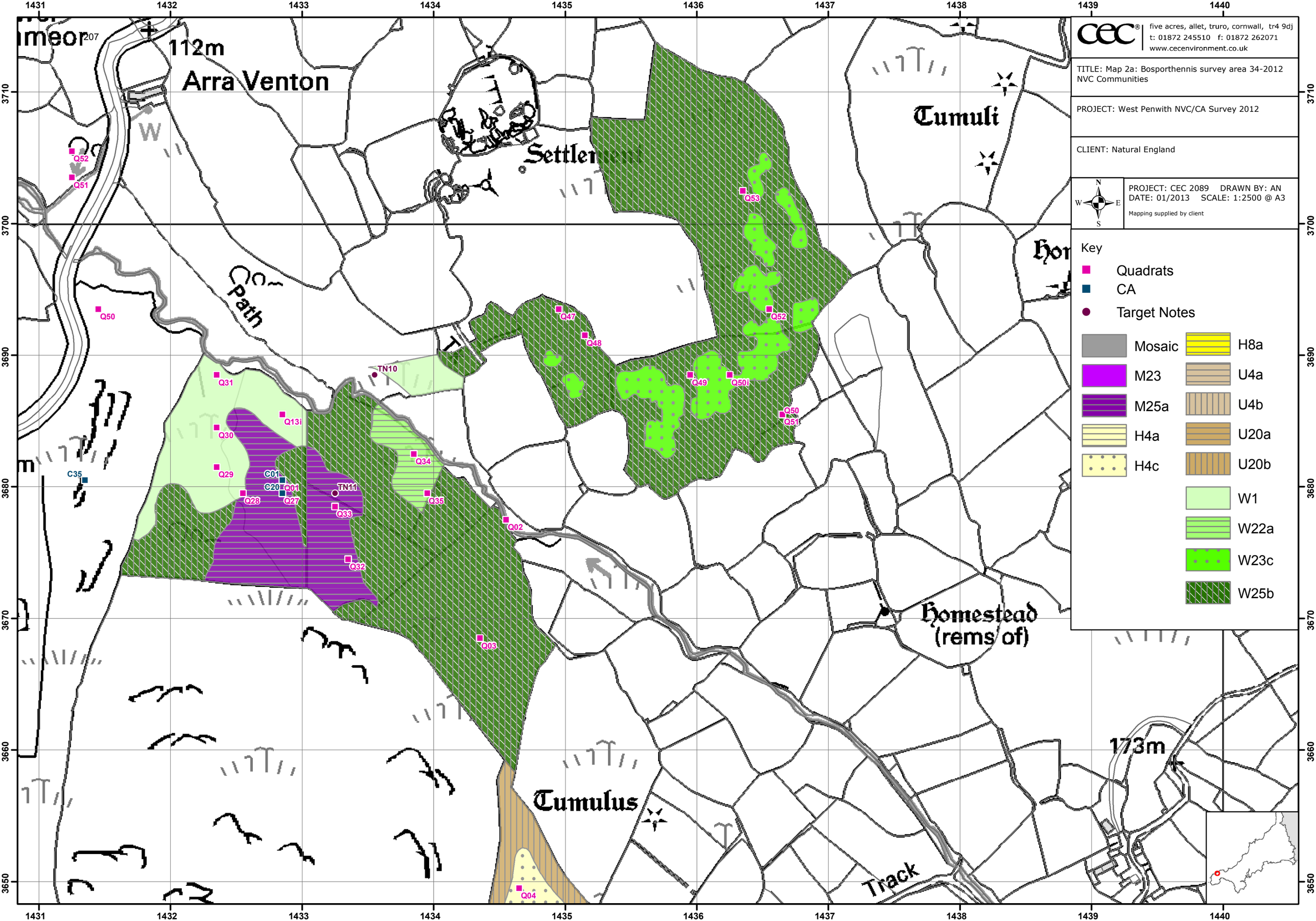
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2a: Bosporthennis survey area 34-2012
NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mosaic
M23
M25a
H4a
H4c
H8a
U4a
U4b
U20a
U20b
W1
W22a
W23c
W25b
112m
Arra Venton
Settlement
Tumuli
Homestead
(rems of)
173m
Tumulus
Track
Path
Q52
Q51
Q50
Q53
Q47
Q48
Q49
Q50i
Q31
Q13i
Q30
Q29
Q28
Q27
Q33
Q34
Q35
Q02
Q03
Q04
TN10
TN11
C35
C01
C20
Q01

Map 2 Target Notes Bosporthennis (Survey Area 34 – 2012)

TN. No.	Grid Ref.	Text
1	SW43663601	Dryish *Molinia caerulea* hummocks with *Agrostis curtisii* presumably previously burnt - wetter runnels in-between with *Erica tetralix* and some sphagna - assign to **H4c** (though has elements of both **H4a** and **M25**) cattle grazed
2	SW43753591	Morphologically similar to TN3 - formerly burnt and subsequently cattle grazed – *Molinia caerulea* tussocks with *Agrostis curtisii* as well as **U4** species with very few ericoids - **H4a**
3	SW43593608	Localised patches within U4 dominated by *Juncus effusus* (not mapped) elements of MG10/M6/M23?
4	SW43593599	
5	SW43613595	
6	SW43623589	
7	SW43813582	More recently burnt area (swaling understood to have been undertaken by National Trust during 2012) Snipe flushed, hen harrier flying overhead.
8	SW44093587	Bracken F/LA within **U4a** with occasional clumps of European gorse
9	SW43923634	Unsampled area probably attributable to **M23**: *Juncus acutiflorus* D, *Angelica sylvestris, Lotus pedunculatus, Holcus lanatus, Galium palustre* F, *Rumex acestosa, Rumex conglomeratus, Urtica dioica, Epilobium* sp, *Ranunculus repens* LF. More extensive along valley-bottom towards stream (beyond site boundary).
10	SW43353688	Suite of notable plants along rutted farm access track running with water including *Illecebrum vericillatum*, *Wahlenbergia hederacea*, *Radiola linoides* and *Anagalis minima*. Similar species assemblage is present within area of rich marshy grassland (not mapped, beyond the site boundary at SW43403685).
11	SW43323679	Localised patches possibly referable to **M21**- linear stands with *Narthecium ossifragum, Sphagnum papillosum, S. denticulatum, S. palustre, S. subnitens, Hypericum elodes, Anagallis tenellum, Eriophorum angustifolium, Juncus bulbosus,*

Appendix 2 Species list – Vascular and non-vascular plants

Species	Common Name	Scrub	Acid grassland	Bracken	Dry Heath	Humid Heath	Boundary habitat	Mire	
Agrostis canina	Velvet bent	R	O	O				F	
Agrostis capillaris	Common bent-grass	O	LA	O	O	F	O		
Agrostis curtisii	Bristle bent-grass				O/LA	F			
Anagalis tenellum	Bog pimpernel							O	
Angelica sylvestris	Angelica	R							
Anthoxanthum odoratum	Sweet vernal grass	O	LF	O					
Arrhenatherum elatius	False oat-grass	R							
Athyrium felix- femina	Lady fern	O							
Aulacomnium palustre	A moss							O	
Brachythecium rutabulum	A moss		R						
Calliergonella cuspidata	A moss							LF	
Calluna vulgaris	Heather/ ling				A	F			
Campylopus sp.	A moss				R	R			
Cardamine pratensis	Cuckoo flower							R	
Carex binervis	Green ribbed sedge	O	O		O	O		O	
Carex echinata	Star sedge	R						F	
Carex panicea	Carnation sedge		O		LF	R		F	
Carex pilulifera	Pill sedge		R		LF				
Carex remota	Remote sedge	R							
Carex sylvatica	Wood sedge	R							

Species	Common Name	Scrub	Acid grassland	Bracken	Dry Heath	Humid Heath	Boundary habitat	Mire	
Carex viridula	Yellow sedge							R	
Cerastium fontanum	Common mouse-ear		R						
Cirsium palustre	Marsh thistle		O						
Cladonia sp.	A moss				R	R		O	
Crataegus monogyna	Hawthorn	R					R		
Dicranum scoparium	A moss	R		O	R				
Digitalis purpurea	Foxglove	R		R	R		R		
Drepanocladus sp.	A moss							O	
Dryopteris dilatata	Broad buckler fern	R		R	R				
Epilobium tetragonum	Square-stalked willowherb	R		O				R	
Erica cinerea	Bell-heather	R		R	F	F	R		
Erica tetralix	Cross-leaved heath	R		R	R	F/LA		R	
Eriophorum angustifolium	Cotton-grass							O	
Eurhynchium praelongum	A moss	O L/F	R	F	F				
Eupatorium cannibinum	Hemp agrimony			R					
Festuca ovina	Sheep's fescue	R							
Festuca rubra	Red fescue		R						
Galium saxatile	Heath bedstraw	R		R	R		R		
Geranium robertianum	Herb-robert	R							
Glyceria fluitans	Floating sweet-grass	R							
Hedera helix ssp Hibernica	Atlantic ivy	O		O			O		

Species	Common Name	Scrub	Acid grassland	Bracken	Dry Heath	Humid Heath	Boundary habitat	Mire	
Holcus lanatus	Yorkshire fog	O	LF	O				O	
Holcus mollis	Creeping soft-grass	R		O					
Hyacinthoides non-scripta	Bluebell	O		O	O		O		
Hydrocotyle vulgaris	Marsh pennywort	R						LF	
Hypnum cuppressiforme	A moss	R		O	O				
Hypnum jutlandicum	A moss			R					
Hypochaeris radicata	Common cat's ear	R	R		R				
Ilex aquifolium	Holly	R							
Isolepis fluitans	Floating club-rush	R							
Isolepsi cernua	Slender club-rush	R							
Juncus bulbosus	Bulbous rush	R						O	
Juncus effusus	Soft rush		LF					F	
Lonicera periclymenum	Honeysuckle	O		O LF					
Lotus pedunculatus	Greater bird’s-foot trefoil							F	
Luzula campestris	Field woodrush		R						
Luzula multiflora	Heath wood-rush		R						
Lythrum portula	Water purslane							O	
Mnium hornum	A moss	R							
Molinia caerulea	Purple moor-grass	O		O	LF	A	O	F	
Oenanthe fluviatile	Hemlock water-dropwort	R							
Osmunda regalis	Royal fern	R							

Species	Common Name	Scrub	Acid grassland	Bracken	Dry Heath	Humid Heath	Boundary habitat	Mire	
Oxalis acetosella	Wood sorrel	O		O	R				
Pedicularis sylvestris	Common lousewort							O	
Poa annua	Annual meadow grass		R		R				
Polygala vulgaris	Common milkwort				LF				
Polypodium vulgare	Common polypody			O			O		
Potentilla erecta	Common tormentil	R	R	R	F	F		F	
Prunella vulgaris	Selfheal		R						
Prunus spinosa	Blackthorn	LA							
Pteridium aquilinum	Bracken	O	R	LD	O	LF			
Ranunculus ficaria	Lesser celandine			R					
Ranunculus repens	Creeping buttercup	R	O	O					
Rhytidiadelphus squarrosus	A moss		LF/A	R	O				
Rubus fruticosus agg.	Blackberry/bramble	A/LD		F	O/LF	O/LF			
Rumex acetosa	Common sorrel	F	F	F	R		R		
Scleropodium purum	A moss	LF	F	O	R				
Scutellaria minor	Lesser skullcap	R							
Sedum anglicum	English stonecrop						O		
Silene dioica	Red campion	R/LF		R				LF	
Spahgnum fallax	Sphagnum							LA	
Sphagnum auriculatum	Sphagnum	LF						LF	
Stellaria holostea	Greater stitchwort	O		O					

Species	**Common Name**	**Scrub**	**Acid grassland**	**Bracken**	**Dry Heath**	**Humid Heath**	**Boundary habitat**	**Mire**	
Taraxacum officinale agg.	Dandelion		O						
Teucrium scorodonia	Wood sage	F		F	O		R		
Thuidium tamariscinum	A moss	R		R					
Trifolium repens	White clover		O						
Ulex dioica	Common nettle	R							
Ulex europaeus	European gorse	LD			O	R			
Ulex gallii	Western gorse	O		F	A/LD	A/LD			
Umbilicus rupestris	Navelwort	R		R			LF		
Vaccinium myrtillus	Bilberry	O		LF	O		LA		
Viola palustris	Marsh violet	R						O	
Viola riviniana	Common dog-violet	O		R					
Wahlengbergia hederacea	Ivy-leaved bellflower	R						R	

DAFOR: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally

Appendix 3 NVC quadrat data and photos

See separate folder on CD.

Survey	Bosporthennis					Recorder	JS		Date	10/10/2012	
Vegetation type			**H4a**								
Species	**Q20**	**Q21**	**Q44**	**Q45**	**Q46**	**Species**	**1**	**2**	**3**	**4**	**5**
Ulex gallii (live)	6	6	6	7	8						
Molinia caerulea	5	3	4	3	5						
Agrostis curtisii	7	8	8	8	7						
Potentilla erecta	4	4	3	3	3						
Carex panicea	2		4	3							
Pteridium aquilinum	3	3	3	3	2						
Polygala vulgaris	4	4	3	3	1						
Erica tetralix	1										
Carex pilulifera	3	2	1	4	2						
Poa annua	1										
Calluna vulgaris	1	3	2		1						
Carex viridula	1										
Vaccinium myrtilus	1										
Erica cinerea	3	4	4	3	3						
Ulex gallii (burnt)	8	9									
Erica cinerea (burnt)		4									
Anthoxanthum odoratum		3									
Teucrium scorodonia		2									
Carex binervis			2	4	3						
Hypochaeris radicata				1							
Holcus lanatus				3							
Danthonia decumbens					2						
Bare ground	5	4		4	3						

Quadrats

	Q20	**Q21**	**Q44**	**Q45**	**Q46**
Grid. ref.	SW43883579	SW43803573	SW43763587	SW43753591	SW43803585
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle	Gentle	Gentle
Aspect	E	E	E	E	E
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	4 m Sq
Vegetation height	10cm	10cm	50cm	60cm	40cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Recently burnt dry, spp poor. Presumably has come from H8a (although E tet is present at low abundance)	Steeper, upslope of U20, taller remnant canopy of burnt Ug - come from H8a	Cattle grazed. Further advanced post burn (no dead/burnt stems visible but uniform 'hedgehog tussocks'). *Ag. curt.* between shrubs	Cattle grazed. Drier. Burnt. No *E. tet.*	Cattle grazed *E.tet* . present nearby though not in quadrat. Transitional to H4c as slope lessens in valley-bottom.

Survey	Bosporthennis					Recorder	JSp		Date	10/10/2012	
Vegetation type	H4c										
Species	Q4	Q5	Q7	Q17	Q25	Species	1	2	3	4	5
Ulex gallii	9	9	9	9	8						
Calluna vulgaris	8	7	5	5	5						
Erica tetralix	5	6	3	3	4						
Molinia caerulea	5	5	4	4	4						
Erica cinerea	4	3	5	5	5						
Agrostis curtisii	3	3			3						
Salix repens	2										
Potentilla erecta	3	3	3	3	3						
Hypnum cupressiforme	3										
Pteridium aquilinum			2	2							
Bare ground											

Quadrats

	Q4	Q5	Q7	Q17	Q25
Grid. ref.	SW43463649	SW43483643	SW43563633	SW44063578	SW43463570
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle		
Aspect	NNE	NNE	N		
Soil type					
Quadrat area	2 x 2m	2 x 2m	2 x 2m	2 x 2m	2 x 2m
Vegetation height (mm)	40cm	40cm	75cm	1m	75cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Lightly cattle grazed	As for Q4. *Spahgnum fallax* and *Carex binervis* in runnels	Taller than Q5 and Q4. No signs of grazing	Unmanaged. Morphologically like H8. *E. tet* and *Mol.* are of low abundance but +/- constant, *Ag. curt.* is +/- absent.	Closed sward, transitional to H8 at break of slope. Quadrat is taken on flat plateau.

Survey	Bosporthennis					Recorder	JSp		Date 09/10/2012		
Vegetation type	H8a (dry heath)										
Species	**Q22**	**Q23**	**Q36**	**Q37**	**Q43**	**Species**	**1**	**2**	**3**	**4**	**5**
Ulex gallii	9	9	9	9	8						
Calluna vulgaris	5	4	3	3	3						
Erica cinerea	7	5	5	5	5						
Molinia caerulea	5	4	2	2	3						
Pteridium aquilinum	4	3	3	3	3						
Potentilla erecta	3	3	3	2	3						
Agrostis curtisii		1									
Polygala vulgaris		1									
Galium saxatile		1									
Rubus fruticosus			1	2							
Bare ground											

Quadrats

	Q22	Q23	Q36	Q37	Q43
Grid. ref.	SW43703574	SW43633567	SW43343594	SW43323599	SW43603581
Photo. No.					
NVC method					
Slope	Moderate	Moderate	Gentle	Gentle	Moderate
Aspect	E	E	NE	E	NE
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	
Vegetation height (mm)	75cm	1m	1.2m	1.3m	1m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Ag curt is present along edges of tracks/runnels but not within this community therefore not H4a. Occ. In roads from grazing cattle	A curt and E tet present along edges of stand in runnels/paths	Cattle grazed, U4/U20b around edges with coalesced islands of Ulex gallii	Cattle grazed	Some in roads from grazing cattle in surrounding area. E tet and Ag curt present at low levels on edges but not constant and therefore not

Survey	Bosporthennis					Recorder	MD		Date 26/09/2012		
Vegetation type			**U4a**								
Species	**Q8**	**Q9**	**Q11**	**Q15**	**Q19**	**Species**	**1**	**2**	**3**	**4**	**5**
Anthoxanthum odoratum	7	6	5	4	4						
Agrostis capillaris	8	7	5	8	8						
Molinia caerulea	4	3									
Potentilla erecta	5	5	4	4	4						
Rubus fruticosus	3			3							
Holcus lanatus	2	3	3	5	6						
Gallium saxatile	3			4	3						
Oxalis acetosella	1										
Pseudoscleopodium purum	3			3	4						
Festuca rubra	4			4							
Agrostis canina		5	7								
Nardus sctricta		4									
Carex binervis		3	3								
Carex panicea		4	4								
Carex pilulifera		3									
Rhytidiadelphus squrrosus		3		8	6						
Rumex acetosa		1		2	3						
Juncus effusus		2	3								
Juncus acutiflorus			3								
Cirsium palustre			1								
Leontodon autumnalis			2								
Carex viridula			2								
Hydrocotyle vulgaris			3								
Ranunculus repens]			3		1						
Trifolium repens			3		2						
Pedicularis sylvatica			2								
Juncus bufonius			1								
Hypochaeris radicata			1								
Poa annua			1								
Pteridium aquilinum				6	3						
Luzula sylvatica					4						

	Pedicularis slvatica
	Pteridium aquilinum
	carex pilulifera
	Teucrium scorodonia
	Scleropodium parum
	Plantago lanceolata

Quadrats

	Q8	**Q9**	**Q11**	**Q15**	**Q19**
Grid. ref.	SW43593631	SW43633630	SW43583608	SW44093590	SW44013583
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	N	N	NE		
Soil type					
Quadrat area	2 m sq	2 m sq	2 m sq	2 m sq	2 m sq
Vegetation height (mm)	5cm	10cm	10cm	10cm	5cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Short grazed turf	Short grazed turf	Cattle grazed, lower slopes of field wetter	U4b locally but more but within this quadrat less Holcus and no Lollium, markedly less improved with occasional Ug clumps	Occasionally grazed (?)

Survey	Bosporthennis					Recorder	JSp		Date	09/10/2012	
Vegetation type			**U4b**								
Species	**Q12**	**Q13i**	**Q14**	**Q41**	**Q42**	**Species**	**1**	**2**	**3**	**4**	**5**
Agrostis capillaris	7	5	7	8	8						
Ranunculus repens	4	4	4	5	3						
Trifolium repens	5			4	3						
Holcus lanatus	5	8	7	5	6						
Lolium perenne	5	6	3	4							
Juncus bulbosus	2										
Agrostis stolonifera	5	3	4								
Rumex acetosa		4	3		3						
Taraxacum officinale		3	3	1	1						
Rumex aobtusifolius			2								
Cirsium arvense				1	3						
Luzula sylvatica				1	1						
Prunella vulgaris					3						
Polygala serpylifolia					1						
Cynosurus cristatus					3						
Bare ground											

Quadrats

	Q12	**Q13**	**Q14**	**Q41**	**Q42**
Grid. ref.	SW43943627	SW43843633	SW43953618	SW43533594	SW43503581
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	N	N	N	N	N
Soil type					
Quadrat area	2 m sq	2 m sq	2 m sq	2 m sq	2 m sq
Vegetation height (mm)	5cm	5cm	5cm	5cm	5cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazed wet signs of imporvement suggest a move towards MG6	Grazed as before possible move to MG6 bt hard to see grasses at this time of year	Sheep grazed	Cattle grazed	Cattle grazed

Survey	Bosporthennis					Recorder	JSp		Date 27/09/2012		
Vegetation type	U20a										
Species	Q16					Species	1	2	3	4	5
Pteridium aquilinum	7										
Agrostis capillaris	7										
Holcus lanatus	7										
Anthoxanthum odoratum	6										
Rubus fruticosus	4										
Potentilla erecta	3										
Rumex acetosa	3										
Campylopus sp	1										
Pseudoscleropodium purum	4										
Rhytidiadelphus squarrosus	4										
Galium saxatile	2										
Bare ground											

Quadrats

	Q16				
Grid. ref.	SW44103579				
Photo. No.					
NVC method					
Slope					
Aspect					
Soil type					
Quadrat area	2 x 2m				
Vegetation height (mm)	40cm				
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Grazed. Vaccinium on some hummocks but mostly grassy and not enough for U20b				

Survey	Bosporthennis					Recorder	MD/JSp		Date 26/09/2012		
Vegetation type	U20b										
Species	Q6	Q10	Q24	Q26	Q38	Species	1	2	3	4	5
Pteridium aquilinum	5	6	7	6	6						
Rubus fruticosus	3	3	4		3						
Ulex gallii	3				4						
Erica cinerea	4			4	4						
Molinia caerulea	5	3		2	1						
Potentilla erecta	3	3	3	3	3						
Vaccinium myrtillus	4	5	4	3	4						
Teucrium scorodonia	3	4	3		4						
Galium saxatile	4										
Anthoxanthum odoratum	6	4	3	1	3						
Agrostis capillaris	5	6	5	7	3						
Rumex acetosa	3	4	7	6	6						
Solidago virgaurea	1	3	3	3	1						
Polygala serpyllifolia	3										
Viola riviniana	3		2		1						
Agrostis canina	2				3						
Hedera hibernica	3	4									
Carex pilulifera	4				5						
Oxalis acetosella	2	4									
Dicranum scoparium	3	2	2	2	4						
Mnium hornuum	2	4	4		3						
Campylopus introflexus	2										
Pseudoscleropodium purum	6	4	8	6	4						
Isothecium myosuroides	3	3			4						
Digitalis purpurea		3									
Polytrichum commune		4									
Cerastium holosteoides		3			2						
Dryopteris dilatata		2			1						
Holcus mollis		2									
Calluna vulgaris			4		2						
Agrostis curtisii			3								
Prunus spinosa			1								
Hypnum cupressiforme			4		3						
Festuca rubra			3	3							
Rhytidiadelphus squarrosus				5							
Rhytidiadelphus triquetrus					4						

	Quadrats				
	Q6	Q10	Q24	Q26	Q38
Grid. ref.	SW43443640	SW43623613	SW43593568	SW43363583	SW43323621
Photo. No.					
NVC method					
Slope	Slight	Slight	Moderate	Moderate	Moderate
Aspect	N	NE	E	E	E
Soil type					
Quadrat area	4x4m	4x4m	4x4m	4x4m	4x4m
Vegetation height (mm)	60cm	60cm	60cm	60cm	50cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazed, frequent heathy hummocks	Cattle grazed. Vaccinium frequent on hummocks, few other heath species	Cattle grazed. Hummocks with heathy spp. and Pta. Grassy runnels in between becoming H4c upslope where gradient lessens		Cattle grazed. Quite open with U4 grasses

Survey	Bosporthennis					Recorder	JS/MD		Date	12/10/2012	
Vegetation type	W22a scrub										
Species	Q34	Q35				Species	1	2	3	4	5
Prunus spinosa	10	10									
Dryopteris affinis	1										
Lonicera periclymenum	3	2									
Pteridium aquilinum	4	5									
Angelica sylvestris	2										
Geranium robertium	3	1									
Rumex acetosa	3	3									
Hedera hibernica	5	4									
Oxalis acetosella	2	3									
Rubus fruticosus	3	5									
Dryopteris dilatata	1										
Kinbergia praelongum	2										
Stellaria holostea	2	1									
Potentilla erecta	2										
Silene dioica		1									
Veronica chamaedrys		3									
Sambucus nigra		1									
Ranunculus repens		2									
Holcus mollis		2									
Holcus lanatus		1									

Quadrats

	Q34	Q35			
Grid. ref.	SW43383682	SW43393679			
Photo. No.					
NVC method					
Slope	V slight	V slight			
Aspect	NW	NW			
Soil type					
Quadrat area	4x4m	4x4m			
Vegetation height (mm)	2m	1.75m			
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

Survey	Bosporthennis					Recorder	JS		Date	10/10/2012	
Vegetation type	M25a										
Species	Q1	Q27	Q32	Q33		Species	1	2	3	4	5
Molinia caerulea	7	5	7	6							
Juncus effusus	5	5	2	3							
Holcus lanatus	3	3	2	2							
Agrostis canina	4	5	4	5							
Eriophorum angustifoliu	4	6									
Carex binervis	2		4	3							
Carex echinata	4		4	4							
Potentilla erecta	4	3	4	5							
Anagallis tenellum	3	3	3	3							
Wahlenbergia hederac	3										
Lotus pedunculatus	3	3		3							
Hydrocotyle vulgaris	2	3		3							
Thuidium tamariscinum	2										
Sphagnum fallax	7	3									
Drepanocladus sp	4										
Juncus bulbosus		3	2	3							
Carex panicea		3	4	4							
Sphagnum auriculatum		8	4	6							
Aulacomnium palustre		4	2								
Viola palustre		3		3							
Erica tetralix		2									
Ranunculus falmmula		2									
Agrostis capillaris			3								
Cladonia sp			3								
Polytrichum juniperinum			5								
Carex viridula				4							
Pedicularis sylvestris				4							
Cirsium palustris				1							
Polytrichum commune				2							
Bare ground											

Quadrats

	Q1	Q27	Q32	Q33	
Grid. ref.	SW43283680	SW43283679	SW43333674	SW43323678	
Photo. No.					
NVC method	NVC	NVC	NVC	NVC	
Slope					
Aspect					
Soil type					
Quadrat area	2x2m	2x2m	2x2m	2x2m	
Vegetation height	60cm	60cm	5cm	5cm	
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazed, with evidence of light poaching	Grazed	Poor transition to drier area upslope. Heavily grazed.		

Survey	Bosporthennis					Recorder	JS		Date 26/09/2012		
Vegetation type			**W23c**								
Species	**Q39**	**Q40**	**Q50**	**Q52**	**Q54**	**Species**	**1**	**2**	**3**	**4**	**5**
Ulex europaeus	9	10	10	10	10						
Pteridium aquilinum	4	5	3	4	4						
Ulex gallii	4										
Rubus fruticosus	5	7	4	4	4						
Agrostis capillaris	3										
Potentilla erecta	3										
Galium saxatile	1										
Molinia caerulea	4	3									
Teucrium scorodonia		4		2	2						
Oxalis acetosella		3		4	2						
Dryopteris filix-mas		1									
Hedera hibernica		6	3	4	4						
Kindbergia praelongum		4									
Rhytidiadelphus squarrosus		2									
Dryopteris dilatata			3	4	2						
Silene dioica			3	3	3						
Rumex acetosa			3	3	3						
Anthoxanthum odoratum				2	2						
Hycinthoides non-scripta				3							

	Quadrats				
	Q39	**Q40**	**Q50i**	**Q52**	**Q54**
Grid. ref.	SW43483634	SW43523632	SW43623688	SW43653693	SW43573684
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	E	E	SW	SW	SW
Soil type					
Quadrat area	4x4m	4x4m	4x4m	4x4m	4x4m
Vegetation height (mm)	2m	2.5m	2.5m	2-3m	2-3m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Open U4/Pta between shrub masses	Much denser, taller and more developed	Forming a mosaic with W25b. Limited recent cutting	Small isolated stands within larger areas of W25b	As Q52

Survey	Bosporthennis								Recorder	JSp/MD		Date	26/09/2012	
Vegetation type	W25b													
Species	**Q2**	**Q3**	**Q18**	**Q47**	**Q48**	**Q49**	**Q50**	**Q53**	**Species**	**1**	**2**	**3**	**4**	**5**
Pteridium aquilinum	9	9	8	8	8	8	8	9						
Rubus fruticosus	7	8	7	7	8	8	8	8						
Teucrium scorodinia	4	4	2	3	2	2	3	4						
Oxalis acetosella	4	3	3	3	3	2	3	3						
Stellaria holosteoides	3	3		4	4	4	4	2						
Vaccinium myrtillis	1													
Rumex acetosa	3	3	3	3	3	4	3	3						
Dryopteris dilatata	2		1		3	3	3	2						
Hedera hibernica	4			3	3	3	3	3						
Holcus lanatus		2												
Molinia caerulea		5	6											
Potentilla erecta		3						3						
Solidago virgaurea		1												
Digitalis purpurea			2											
Galium saxatile			1		2	2								
Anthoxanthum odoratum			2		3									
Agrostis capillaris			3											
Silene dioica				2	3	4	4	3						
Lonicera periclymenum				2	2	2		2						
Holcus mollis						2								
Hyacinthoides non-scripta								2						

Quadrats

	Q2	Q3	Q18	Q47	Q48	Q49	Q50	Q53
Grid. ref.	SW43453677	SW43433668	SW44033581	SW43493693	SW43513691	SW43593688	SW43663685	SW43633702
Photo. No.								
NVC method								
Slope				slight	slight	slight	slight	slight
Aspect		NW	E	SW	SW	SW	SW	SW
Soil type								
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	1m	1.2m	1.1m	1m	1m	1.2m	1m	1.2m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Unmanaged, path cut along side through field		Unmanaged, come from U4	Field dominated by uniform tall stand of W25 occasional Ue shrubs	As got Q47	Large field domainted by mosaics of W25b and W23c	As for Q49	Very occasional Ug and Mol, rarely ericoids

Survey	Bosporthennis					Recorder	JSp		Date	09/10/2012	
Vegetation type	**W1 Wet Woodland**										
Species	**Q13**	**Q28**	**Q29**	**Q30**	**Q31**	**Species**	**1**	**2**	**3**	**4**	**5**
Salix cinerea	10	9	9	8	8						
Rubus fruticosus	8	6	4	4	4						
Juncus effusus	1	4	5	6	7						
Dryopteris dilatata	5	3	2								
Athyrium filix-femina		4	3	3	3						
Ranunculus repens	1	4	3	2	2						
Carex remota		3	2		3						
Cirsium palustre		3			1						
Hedera atlantica	8	6	4	4	4						
Galium palustre	1	3	3		1						
Angelica sylvestris	3	3		2							
Carex sylvatica		2									
Osmunda regalis		3	1	1							
Silene dioica	1	1									
Lonicera periclymenum	5	4	2		2						
Rumex acetosa		3	3	3	3						
Prunella vulagis		3									
Sphagnum fallax		2									
Kinbergia praelongum		5									
Isolepis cernua		2									
Pellia endivifolia		4									
Holcus lanatus			5	4	3						
Sphagnum auriculatum			7	7	8						
Viola palustris			2								
Agrostis canina			4	4	4						
Ranunculs flammula			2	2	3						
Blechnum spicant			2	2	2						
Hydrocotyle vulgaris			2		4						
Oxalis acetosella				3							
Isolepis fluitans				5							
Scutellaria minor				3							
Polytrichum commune				3	5						
Thuidium tamariscinum				3							
Lotus pedunnculatus				3							
Carex echinata				3							
Sphagnum Section *acutiflora*				3							
Mnium hornum				3							
Potentilla erecta				2							
Agrostis stolonifera					1						
Wahlenbergia hederacea					1						
Juncus bulbosus					3						
Glyceria fluitans					4						
Rumex obtusifolius	3										
Oenanthe fluviatile	1										
Geranium robertianum	1										
Arrhenatherum elatius	3										
Cerastium holosteoides	3										
Ulex dioica	2										
Oxalis acetosella	2										
Holcus mollis	5										

Quadrats

	Q13	**Q28**	**Q29**	**Q30**	**Q31**
Grid. ref.	SW43283685	SW43253679	SW43233681	SW43233684	SW43233688
Photo. No.					
NVC method					
Slope					
Aspect	W	NW	NW	NW	NW
Soil type					
Quadrat area	5 m sq (10 m sq)				
Vegetation height (mm)	7m	7m	7m	7m	7m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Generally inaccessible. *Impatiens glandulifera* present nearby		More open woodland edge, stream to west. No access further into woodland		Grazed. Prunus laurocerasus on edge of open area to north

CHYKEMBRO 1 (Survey Area 38 – 2012)

NVC surveyor	John Sproull Michael Davies	Date surveyed	18th & 19th October 2012
Report compiled by	John Sproull		

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Chykembo 1
County	Cornwall
District	Penwith
Parishes	Zennor
Map Reference	Approx. centre of site: SW44803735
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

This site occupies part of the hilltop plateau to the north of Gear Common and the predominantly north-facing hillside beyond; Pennance marks the north eastern corner and Gear the north west. The site supports a mixture of acid grassland, heath, bracken and scrub. The site location is shown on *Map 1.*

1.2 Summary description

Area	24.4ha
Altitude	c.130-196m AOD
Aspect	The site is primarily north facing but also includes north eastly and north westerly aspects. Gradients are moderate becoming more gentle to the south over the hill top.
Drainage	There are no open water features within the site.

1.3 Access

The whole site is designated as open access land under the CROW Act (2000). Access was gained from a track leaving the Try Valley road heading north east at SW45003625.

1.4 Tenure

The site is owned by the National Trust and managed by a tenant farmer in partnership with the National Trust.

2 Biological Description

2.1 Habitats

The main habitat types present within the site include: heath, bracken, scrub and acid grassland. Boundaries are marked by extant and relict Cornish hedges of a style typical to the area. Habitats are described in more detail below and their distribution within the site is shown on *Map 2* in *Appendix 1*. A list of plant species recorded within each habitat is provided in *Appendix 2*.

Field notes made during the vegetation survey visits are annotated onto *Map 2* and included as Target Notes in *Appendix 1.* Photographs taken during the field visits are included in the text where they are considered useful in illustrating particular points of discussion. Photographs relating to each quadrat and CSM sampling point (as annotated onto *Map 2*) are appended (with quadrat data) to this report as a named subfolder on CD (*Appendix 3*).

2.1.1 Scrub

A series of neglected fields within the north-western part of the site are dominated by bramble (*Rubus fruticosus*) and have been mapped as scrub and assigned to **W25 *Pteridium aquilinum - Rubus fruticosus* underscrub**. Although bracken (*Pteridium aquilinum*) is typically prominent or even co-dominant within this community, stands where this species is abundant among a more mixed assemblage, with a general absence of bramble are assigned to **U20** (see below).

W25b *Pteridium aquilinum - Rubus fruticosus* underscrub, *Teucrium scorodonia* sub-community

Within areas mapped as **W25** the two dominants, bracken and bramble, form a more or less continuous cover. Broad-buckler fern (*Dryopteris dilatata*) and sweet vernal grass (*Anthoxanthum odoratum*) are constant, wood sorrel (*Oxalis acetosella*) and foxglove (*Digitalis purpurea*) are frequent. Woodsage (*Teucrium scorodonia*), common sorrel (*Rumex acetosa*) and tormentil (*Potentilla erecta*) are occasional. In general this community is unmanaged having presumably resulted from the abandonment of former agricultural land and an ensuing

encroachment of bramble from surrounding hedges. Stands within the large central field however (where Q1 and Q2 were sampled) are accessible to cattle and show signs of trampling and localised disturbance.

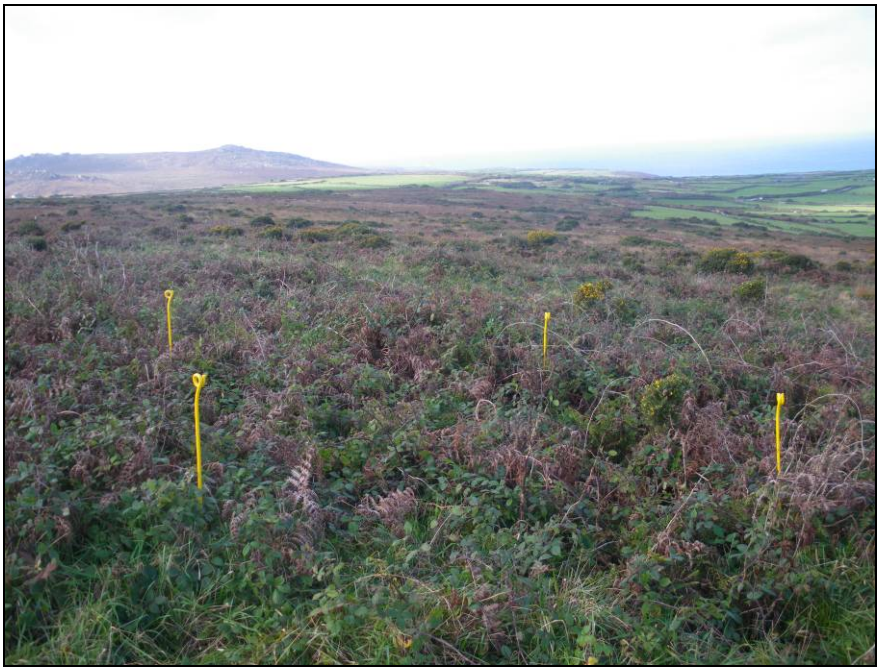

Plate 1 38-2012-Q2 W25b

2.1.2 Acid grassland

Acid grassland occupies three fields and fragments of a further two within the south eastern part of the site. The sward is generally species-poor and cattle grazed occasionally punctuated by clumps of soft rush (*Juncus effusus*) or isolated bushes of European gorse (*Ulex europaeus*). Common bent (*Agrostis capillaris*) dominates with Yorkshire fog (*Holcus lanatus*) generally abundant, frequently with sweet vernal grass. Among the more frequent associates are tormentil and common sorrel, occasionally there is some bramble or bracken. This type of community is best placed within **U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland**. In general the occurrence of typical calcifuges within the samples, such as heather (*Calluna vulgaris*) and green-ribbed sedge (*Carex binervis*), suggests the less agriculturally improved **typical sub-community U4a.** More locally, where the site borders more intensively managed farmland (Q4 and Q11), the occurrence of more-mesic dicot herbs, such as creeping buttercup (*Ranunculus repens*) and white clover (*Trifolium repens*) and

the appearance of small amounts of perennial rye-grass (*Lolium perenne*) is suggestive of a degree of agricultural improvement and **U4b,** the ***Holcus lanatus – Trifolium repens* sub-community.**

U4 is the typical sward type derived from the grazing of **H8** heath and is characteristic of poorer quality grazing land over acid soils peripheral to upland moorland areas in the South West. Improvement, by the addition of fertilisers or top-seeding, can further facilitate a transition towards more mesophytic conditions associated with **MG6** grassland. (Grassland apparently approaching this is visible in fields adjacent to those described but these are outside of the study area).

Plate 2 38-2012-Q27 U4a grassland (occasional heathy elements visible in background).

Open grassy areas within a form of **H8** dry heath (**H8b** or “grass heath”) mapped over adjacent areas show clear floristic continuity with the acid grassland found here (see below). The transition between the two communities is mediated, at least in part, by the extent of grazing.

2.1.3 Bracken

Most of the north facing side of the site supports a mixed assemblage. Intermittently heathy or grassy scrub elements are occasional but in general bramble plays only a minor role. Almost always there is at least about a 25% cover of bracken.

This community is hard to place within the NVC and appears variously disturbed by grazing cattle as well as to bear occasional hallmarks of past burning. Rather than map a heath/grass/scrub mosaic the approach has been to see the bracken as a unifying feature and assign the whole to **U20 *Pteridium aquilinum- Galium saxatile* calcifugous grassland** as a 'best fit'.

For the most part dwarf heath shrubs (including western gorse) are at least locally frequent and on this basis the bulk has been assigned to the heathy sub-community **U20b.** Although mapping localised transitions is problematic where acid grasses become pre-eminent amidst a more scattered covering of bracken stands are better placed within **U20a.**

Atypically, purple moor-grass (*Molina caerulea*) and bristle bent (*Agrostis curtisii*) can be occasional to locally frequent in both of these sub-communities; these species appear generally over-represented across the site relative to their importance in published community descriptions. (This factor is seemingly an accepted south-western anomaly within the NVC, attributable to the mild climate of the region[1]). A suite of associate species also common to both sub-communities includes acid grassland species Yorkshire fog and sweet vernal grass as well as tormentil and common sorrel.

U20a *Pteridium aquilinum- Galium saxatile* calcifugous grassland *Anthoxanthum odoratum* sub-community.

Here the bracken layer is more diffuse over a grassy field layer particularly of common bent, sweet vernal-grass and Yorkshire fog occasionally with red fescue (*Festuca rubra*) and creeping soft-grass (*Holcus mollis*). Ericoid sub-shrubs and bryophytes are sparse and associated forbs are few. These areas are of restricted occurrence within the site relative to the more prominent and overgrown **U20b**.

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[1] Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D., & Yeo, M., (2004) *An Illustrated Guide to British Upland Vegetation* & Rodwell, J.S., Dring, J.C., Averis, A.B.G., Proctor, M.C.F., Malloch, A.J.C., Schaminée, J.N.J., & Dargie T.C.D., (2000) Review of coverage of the National Vegetation Classification

U20a stands presumably mark areas of more concentrated grazing, and/or an earlier stage of bracken colonisation of grassland.

Plate 3 38-2012-Q21 – representative of areas assigned to U20a

Plate 4 38-2012-C17, typical of mixed area assigned to U20b

U20b *Pteridium aquilinum- Galium saxatile* calcifugous grassland, *Vaccinium myrtillus – Dicranum scoparium* sub-community.

Stands with an increased cover of sub-shrubs, in particular western gorse but also, on close inspection, scattered sprigs of any of heather,

bell heather (*Erica cinerea*) or bilberry (*Vaccinium myrtillus*) have been mapped as **U20b**.

The abundance of Western gorse within **U20b** samples (Q8, Q14-17) sits uneasily with published descriptions of this community, but this species would appear to be at its climatic optimum within the British Isles in the extreme south west and in consequence can appear over-represented in certain communities. Notwithstanding this, the presence of an, albeit difficult to spot, heathy sub-shrub element suggests a heathland origin for this type of vegetation and the approach in surveying has been to favour heath where it is present when interpreting bracken dominated stands on this basis. **U20b** is a community which commonly intervenes in the absence of further management following the burning of heathland.

2.1.4 Dry heath

Heath of several types has been mapped over a number of fields in the south eastern part of the site as well as to the south west. It is also of localised occurrence over, freer-draining rocky patches on the hilltop. Varieties of both **H8** and **H4** heath have been identified.

H8b *Calluna vulgaris – Ulex gallii* heath, *Danthonia decumbens* sub-community

Here the cover of sub-shrubs is reduced to a series of islands surrounded by open areas of acid grassland. Within the shrub masses western gorse (*Ulex gallii*) is overwhelmingly dominant and ericoids are poorly represented having presumably been selectively grazed out. Otherwise common bent and sweet vernal grass come to the fore with lesser amounts of Yorkshire fog and green-ribbed and pill sedge (*Carex binervis* and *C. pilulifera* respectively). Associate species mostly reflect variation with the acid grassland element with mesic species such as creeping buttercup present within some samples and less competitive bryophytes in less enriched stands.

Typically this sub-community can occur as an intermediary stage where grazing follows burning and selective browsing of soft sub-shrub re-growth gives rise to what might otherwise be seen as mosaic of **H8a** heath and **U4** grassland. Distinction from **U4** grassland (which as seen above can contain both ericoids and gorse) is based upon the

prevalence and size of the sub-shrub ‘islands’ relative to the extent of the grass sward.

Plate 5 38-2012-Q34. H8b heath

H4a *Ulex gallii - Agrostis curtisii* heath, *Agrostis curtisii – Erica cinerea* sub-community

Distinct from the above, are areas within the central portions of two fields to the south west where bristle bent becomes prominent, mostly with greatly over-represented purple moor-grass and frequent western gorse, bell heather and heather (but infrequent cross-leaved heath (*Erica tetralix*)). Bramble and bracken can also be quite frequent.

Bristle bent is a species known to monopolise the ground in the early years of recovery following fires. Not only does it set abundant seed and so is readily able to colonise bare ground but the bases of established tussocks are fire resistant and are quickly able to re-sprout following a burn; enabling the grass to attain ascendency over slower-growing shrubby elements. In the absence of other factors (such as grazing) this state of affairs is temporary, such that **H4a** frequently marks a post-burn recovery phase to be superseded by another sub-community (generally **H4c** or perhaps **H8a** over drier soils) once surviving shrubs re-establish themselves. This may be what is happening here but as the samples demonstrate purple moor-grass would seem to be ascendant.

Plate 6 38-2012-Q23, H4a heath

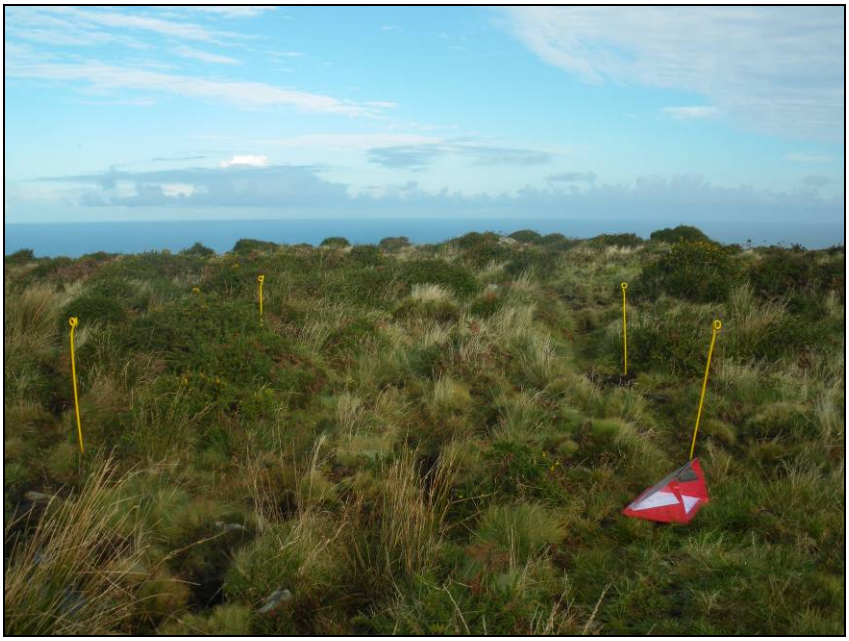


Plate 7 38-2012-Q18 H4b heath

H4b *Ulex gallii - Agrostis curtisii* heath, *Festuca ovina* sub-community

On the hilltop there is quite a different community with a persistent suite of **H4** species: bristle bent and purple moor-grass and the burnt remains of a canopy of western gorse, heather and bell heather. In contrast to **H4a** (the community which tends to supervene immediately after fire, where bristle bent dominates) it is **U4** grasses such as

common bent, sweet vernal grass and Yorkshire fog which make up the bulk of the grass cover here. The opening up of the canopy also allows more diminutive species such as heath bedstraw (*Gallium saxatile*) to make an appearance. This community in analogous to **H8b** in that is appears to originate from grazing of heath following a burn – separation from this community is largely based upon the prevalence of bristle bent and purple moor-grass (neither typically abundant within **H8**). Normally one would also expect an attendant increase in the amount of cross-leaved heath within **H4b**; the absence of this species from these stands of is atypical.

2.1.5 Hedges

Enclosed land within the site is divided by an intricate network of Cornish hedges; these are mostly overgrown and have consequently been mapped as part of the surrounding vegetation. The line of existing boundaries is shown on the Ordnance Survey maps and they have not, in consequence been mapped as part of the NVC survey. Overgrown hedges are generally quite species-poor, though those less heavily shaded can be expected to retain more floristic richness and respond more quickly to restoration. With the exception of some that are already fenced, additional fencing would be likely to be required to ensure stock-proofing in most areas.

2.2 Species

2.2.1 Vascular plants

No notable species were recorded during the field survey. A species list can be found in Appendix 2.

3 Condition Assessment

3.1 Humid Heath (H4a/b)

Ten samples were taken distributed throughout humid heath stands within the site; eight of the sampling points relate to H4a and two relate to H4b.

The community was assessed as **unfavourable/ no change**. Habitat features fail mandatory attributes for vegetation structure and composition. Overall the incidence of ericoid sub-shrubs is low; samples show an average of 35% cover, (outside the target 60-90% range) with only three of the samples within the range. There is also a lack of structural variation, the majority of ericoids being (pseudo) pioneers with only about 2% in the building/mature growth phase. Alongside this, purple moor-grass far exceeds the 30% cover threshold, and appears everywhere over-represented. Different forms of humid heath within the site appear to reflect variation in past treatments across the site. Stands of **H4a** to the west have apparently gone un-grazed since the last burn, in places allowing large tussocks of purple moor-grass to come to the fore. By contrast re-generating ericoids within the smaller, grazed, area of **H4b** may be preferentially targeted by stock and effectively over-grazed.

3.2 Dry Heath (H8b/U20b)

Twelve points were sampled throughout areas of dry heath (**H8b**) within the site. Using the same dry heath forms, seven points were also sampled to separately assess the condition of bracken heath assigned to **U20b**.

Overall, this habitat is assessed as **unfavourable/ no change**. The community fails on mandatory attributes for vegetation structure and composition due to a general paucity of ericoids. This is presumably associated with selective (over) grazing. Western gorse is by far the dominant constituent among sub-shrubs the canopy of which is essentially reduced to a series of rather even aged ‘islands’ within what is otherwise acid grassland.

Although unlikely to qualify as a BAP habitat, the extent of bracken heath habitat (**U20b**) at Chykembro and its obvious relationship with other heath types encouraged some assessment using the dry heath CSM form as a possible measure of potential for restoration. **U20b** is assessed as unfavourable/no change failing the mandatory attribute for vegetation structure on the basis that the total cover of shrubs falls below the 25-90% range and that where shrubs are present they lack structural diversity being wholly in the (pseudo) pioneer growth phase. Not surprisingly stands also fail the negative indicators attribute due to the dominance of bracken.

3.3 Acid Grassland (U4a/b and U20a)

Ten samples were taken, distributed throughout acid grassland across the site. Four samples were also taken within areas assigned to **U20a** using the same lowland acid grassland form.

Both **U4** and **U20a** samples were assessed as **unfavourable/ no change**, due to the lack of positive indicator species, percentage cover of coarse grasses (Yorkshire fog) and an excessive average sward height. These features may be associated with the combined effects of past agricultural improvement and possibly periods of abandonment which have allowed more competitive grasses to dominate at the expense of a more varied suite of positive indicator species and fine-leaved grasses.

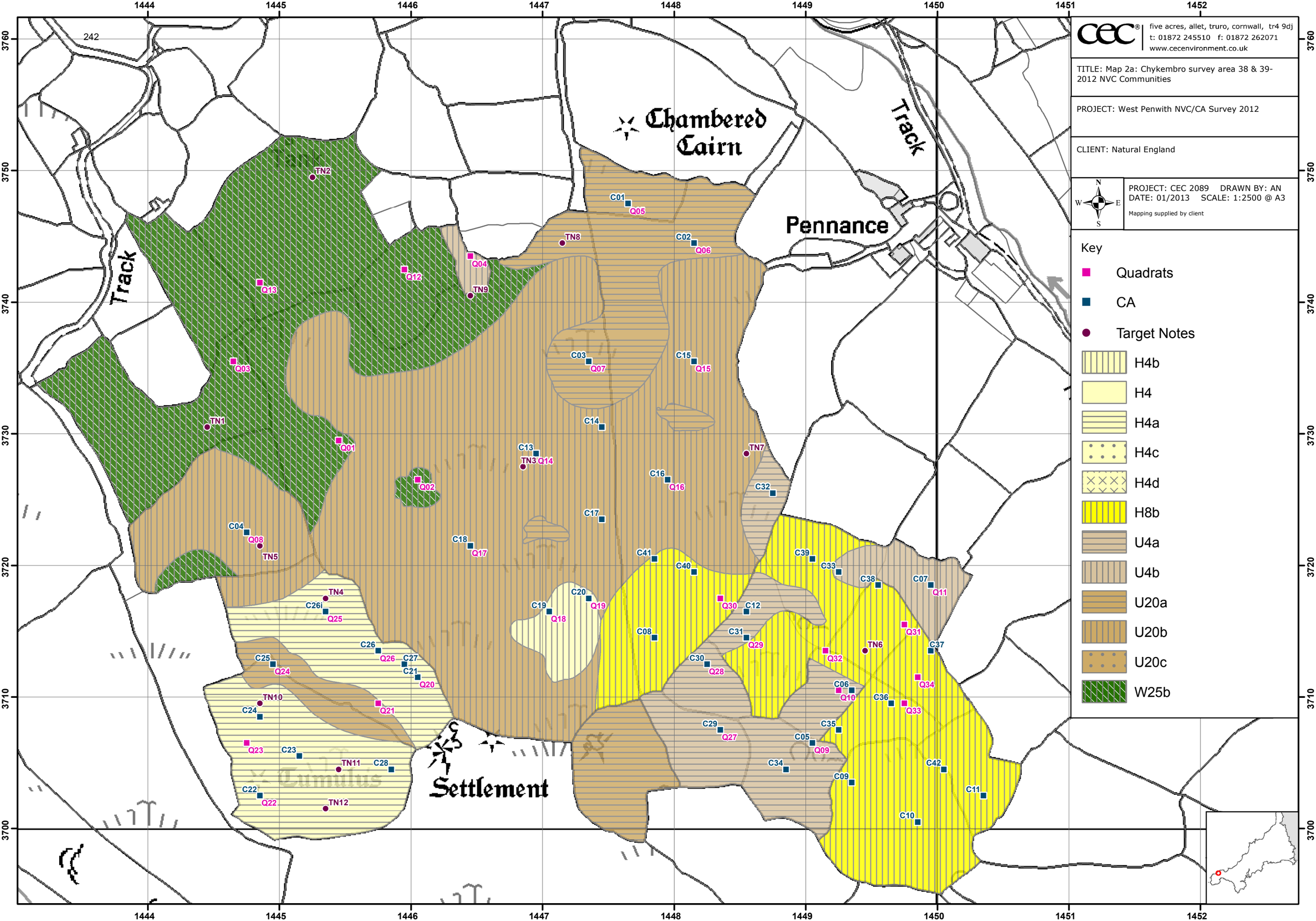
Table 1 Summary of habitats and vegetation communities

Chykembro 1 38-2012				
Habitats	**NVC communities**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W25b	4.79	N/A	N/A
Acid grassland	U4a	1.73	UFNC	Lowland acid grassland 2.20
	U4b	0.47	UFNC	
Bracken	U20a	2.72	N/A	N/A
	U20b	8.46	N/A	
Dry heath	H8b	3.83	UFNC	Lowland heathland 6.31
Humid heath	H4a	2.16	UFNC	
	H4b	0.32	UFNC	
Total Area Mapped		24.48		

Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD)

Appendix 1 Maps (1: Location, 2: NVC, 3: BAP habitat)

See separate folder on CD


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2a: Chykembro survey area 38 & 39- 2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
H4b
H4
H4a
H4c
H4d
H8b
U4a
U4b
U20a
U20b
U20c
W25b
Chambered Cairn
Pennance
Track
Track
Settlement
Tumulus
242
1444
1445
1446
1447
1448
1449
1450
1451
1452
3760
3750
3740
3730
3720
3710
3700
TN1
TN2
TN3
TN4
TN5
TN6
TN7
TN8
TN9
TN10
TN11
TN12
Q01
Q02
Q03
Q04
Q05
Q06
Q07
Q08
Q09
Q10
Q11
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Q20
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Q28
Q29
Q30
Q31
Q32
Q33
Q34
C01
C02
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C04
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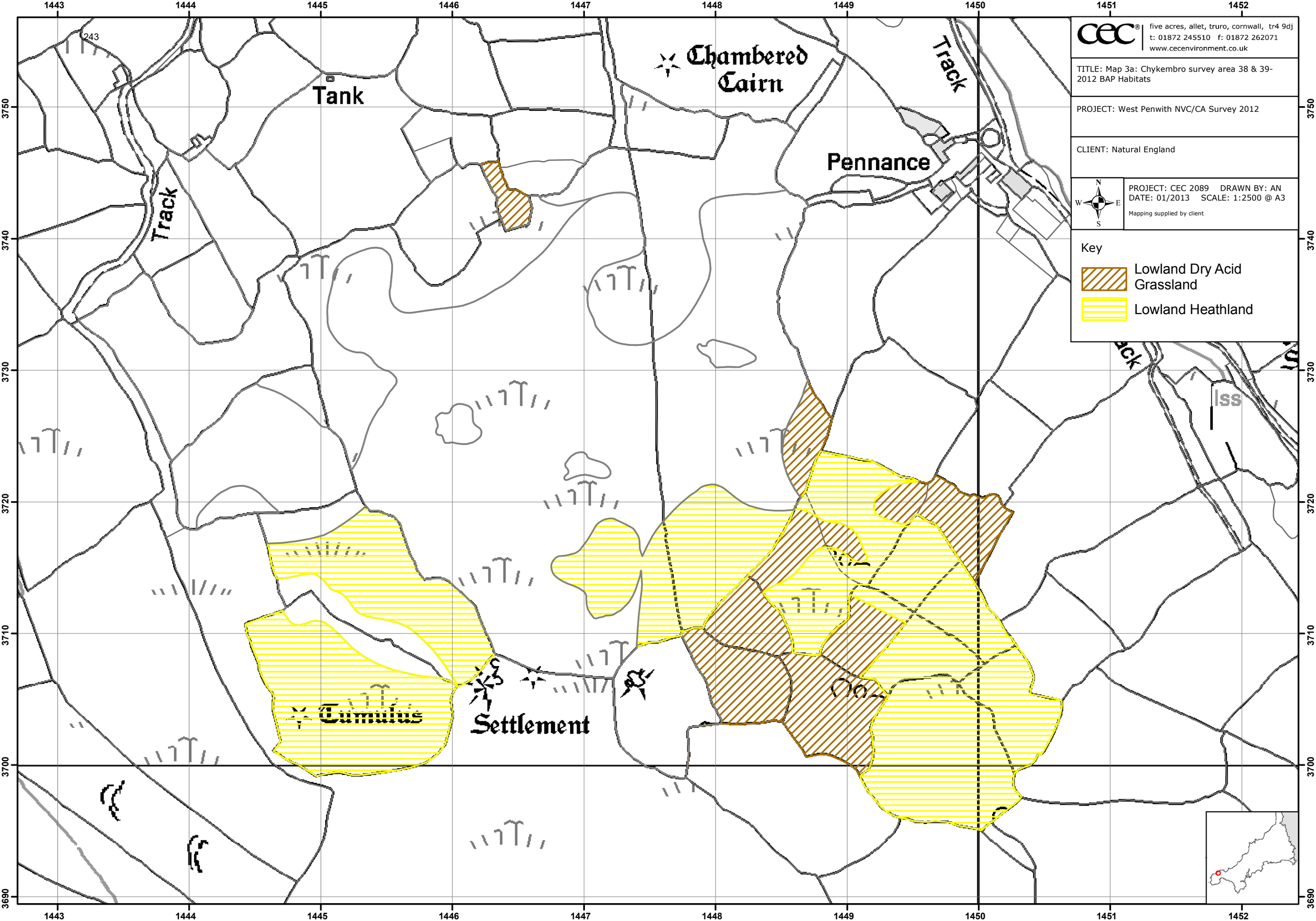
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C26i
C27
C28
C29
C30
C31
C32
C33
C34
C35
C36
C37
C38
C39
C40
C41
C42


cec®
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3a: Chykembro survey area 38 & 39- 2012 BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Dry Acid Grassland
Lowland Heathland
Chambered Cairn
Tank
Track
Pennance
Track
Track
Track
Cumulus
Settlement
lss
1443
1444
1445
1446
1447
1448
1449
1450
1451
1452
3750
3740
3730
3720
3710
3700
3690

Map 2 Target Notes Chykembro 1 (Survey Area 38 – 2012)

TN. No.	Grid Ref.	Text
1	SW44443730	Flushed area in old gateway with *Molinia caerulea* tussocks. Area to west shown as W25 not typical; also incudes occasional *Molinia caerulea* tussocks as well as *Ulex gallii* and *Ulex europaeus.* Some very limited signs of cattle access from south?
2	SW44523749	Scattered *Ulex europaeus*
3	SW44683727	Very localised H8 around cairn (too small to map) best seen as element within U20b
4	SW44538717	Assigned to H4a as 'best fit' but sits uneasily with NVC description. Large areas consist of little more than *Molinia caerulea*, *Ulex gallii* and *Pteridium aquilinum*. *Erica tetralix* and *Agrostis curtisii* are present within more open areas.
5	SW44483721	Swathe of *Molinia caerulea* connects to TN.1
6	SW44943713	U4 openings among clumps of *Ulex gallii* / *Ulex europaeus* with scant *Erica cinerea* - extreme form of H8b
7	SW44853728	*Pteridium aquilinum* +/- 25%/ *Molinia caerulea* tussocks LA with *Agrostis curtisii* elsewhere, Heathy element represented by leggy *Ulex gallii* and *Ulex europaeus*. Ericoids very scarce though *Vaccinium myrtillus* often present as small sprigs. Generally very variable but best seen as U20b to capture elements of both H4 and H8 (and account for *Pteridium aquilinum*).
8	SW44713744	Distinction between U20a and b not always clear cut and potentially tenuous - based in part on abundance of *Ulex gallii* / *Ulex europaeus* 'stands' (heathy element) and/or presence of U4 grasses rather than *Molinia caerulea* and *Agrostis curtisii*.
9	SW44643740	Transition to W25 marked by increase in *Rubus fruticosus* and spp such as *Digitalis purpurea*. Rank U4 elements (mostly *Holcus lanatus*) persist with scattered clumps of *Ulex gallii* and *Ulex europaeus* and occasional ericoids around boulders.
10	SW44483709 & SW44543704	Localised areas of 'good' H4c where overbearing canopy of grasses disappears and *Erica tetralix* becomes LA with a sward to c10cm in height and LA Carices - too small to map. Possibly related to superficial compaction - associated with historic remains (Tumulus marked on map).
11	SW44538701	Though whole area mapped as H4a much of southern end is *Molinia caerulea*/ *Ulex gallii*/*Pteridium aquilinum* – very poor.
12	SW44813719	Distinction of U4 from H8b based on prevalence of ericoids and size of shrub islands relative to extent of grass sward. Floristically (if ignore patch dynamics) U4 and H8 are very similar.

Appendix 2 Plant species recorded during the phase one habitat survey

Latin Name	Common Name	Bracken	Dry heath	Acid grassland	Hedge	Scrub
Agrostis capillaris	Common bent-grass	LA	LA	D	F/LA	O
Agrostis curtisii	Bristle bent-grass	0/LF	LA	O	LF	F
Agrostis stolonifera	Creeping bent		R			R
Angelica sylvestris	Wild angelica	R				
Anthoxanthum odoratum	Sweet vernal grass	LF	LA	A	LF	F
Aphanes arvensis	Parsley piert			R		
Calluna vulgaris	Heather/ ling	O/LF	F/LA	O	LF	
Campylopus introflexus	A moss	O	O			
Carex binervis	Green-ribbed sedge	O/LF	LF	LF		
Carex pilulifera	Pill sedge		LF	LF		
Chamaenerion angustifolium	Rosebay willowherb	O				R/LA
Cynosurus cristatus	Crested dog's-tail			LF		
Dactylis glomerata	Cock's foot	R		R	R	O
Dicranum scoparium	A moss	F	LF	O		
Digitalis purpurea	Foxglove	R	O/LF		LF	LF
Dryopteris dilatata	Broad buckler fern	O	O		O	F
Erica cinerea	Bell-heather	O/LF	F	R	LF	
Erica tetralix	Cross-leaved heath	R	R			
Festuca rubra	Red fescue	O/LF		LF	LF	O
Galium saxatile	Heath bedstraw	O	O	F	O	O
Geranium robertianum	Herb-robert	R			O	O
Hedera helix	Ivy	LF			LA	F/LA
Heracleum sphondylium	Hogweed,					R
Holcus lanatus	Yorkshire fog	F/LA	O	F/LA	LF	O
Holcus mollis	Creeping soft-grass	R/LF	R			R
Hypnum cupressiforme	A moss	F	LF			F
Hypnum jutlandicum	A moss	F/LA	O			F
Hypochaeris radicata	Common cat's ear	R			O/R	
Isothecium myosuroides	A moss	O				
Jasione montana	Sheep's-bit	R			R	
Juncus effusus	Soft rush	R	R	LF		R
Kinbergia praelongum	A moss	F	F	F		F
Lonicera periclymenum	Honeysuckle	LF			O	O
Molinia caerulea	Purple moor-grass	LA	LA	LF		
Oxalis acetosella	Wood-sorrel	F			O	O
Pedicularis sylvatica	Lousewort	R				
Plantago lanceolata	Ribwort plantain					R
Poa annua	Annual meadow grass			R		
Polygala vulgaris	Common milkwort		R			
Polypodium vulgare	Common polypody	O				
Potentilla erecta	Common tormentil	F	F	LF	F	O
Prunella vulgaris	Selfheal			LF		

Latin Name	Common Name	Bracken	Dry heath	Acid grassland	Hedge	Scrub
Pteridium aquilinum	Bracken	D	A/LF	O	F/LA	A
Ranunculus repens	Creeping buttercup			LF		
Rhytidiadelphus squarrosus	A moss	LF	O	F	LF	LF
Rubus fruticosus agg.	Blackberry/bramble	F	O		F	D
Rumex acetosa	Common sorrel	F/LA	O	F	F	F
Rumex acetosella	Sheep's sorrel	O		LF	O	
Scleropodium purum	A moss	F		LF	F	F
Sedum anglicum	English stonecrop				F	
Silene dioica	Red campion	F	O		O	LF
Solidago virgaurea	Goldenrod	O				
Stellaria holostea	Greater stitchwort	F				O
Succisa pratensis	Devil's bit	R				
Teucrium scorodonia	Woodsage	F	O		F	F
Thuidium tamariscinum	A moss	O				
Taraxacum officinale	Dandelion			R		
Ulex europaeus	European gorse	LF	O	R	R	LA
Ulex gallii	Western gorse	F/LA	A/LD	R	LA/F	LF
Umbilicus rupestris	Navelwort				O	
Vaccinium myrtillus	Bilberry	LF	LF		O	
Viola riviniana	Common dog-violet	O/R			R	O

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally, E = Edge

Appendix 3 NVC Quadrat data and photos

See separate folder on CD

Survey	Chykembro 1					Recorder	MD				Date 19/10/2012
Vegetation type			**H8b**								
Species	**Q30**	**Q31**	**Q32**	**Q33**	**Q34**	**Species**	**Q30**	**Q31**	**Q32**	**Q33**	**Q34**
Ulex gallii	6	5	4	6	7	*Lotus pedunculatus*					2
Erica cinerea	3					*Cirsium palustre*					1
Calluna vulgaris	2										
Molinia caerulea	4				2						
Agrostis curtisii	3		3								
Potentilla erecta	3	3	3	3	3						
Anthoxanthum odoratu	4	4	5	5	4						
Agrostis capillaris	6	7	8	8	4						
Teucrium scorodonia	1	2	2	2	3						
Holcus lanatus	3	4	4	4	3						
Carex binervis	4	3	3		2						
Carex pillulifera	2	2	3		3						
Pteridium aquilinum	3	3		2	3						
Rubus fruticosus	2	2	2	2	3						
Scleropodium purum	3		4								
Hypnum cupressiforme	3		2								
Digitalis purpurea	2	2		2	2						
Viola riviniana		2			3						
Galium saxatile		3	3		3						
Prunella vulagris		2									
Hypochaeris radicata		3	3	3	2						
Cynosurus cristatus		3		1							
Ranunculus repens		3									
Plantago lanceolata		2			1						
Luzula campestris		1	2								
Trifolium repens		3			2						
Rumex acetosella				3							
Stellaria holostea				1							
Holcus mollis				3	2						
Aphanes arvensis					2						
Bare ground											

Quadrats

	Q30	**Q31**	**Q32**	**Q33**	**Q34**
Grid. ref.	SW44833717	SW44973715	SW44913713	SW44973709	SW44983711
Photo. No.					
NVC method					
Slope	Slight	Moderate	Slight	Slight	Slight
Aspect	NE	NE	NE	NE	NE
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	
Vegetaation Height	20cm-1m	15cm-1m	20cm-1m	15-75cm	15cm-1m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazed, grassy heath with areas of adjacent U4a	Similat phsiogonomy to Q1 but more mesic with spp indicative oof U4b - less Ericoids	as for Q2	Ericoids again absent, wtihin otherwise grassy heath. Cattle grazed with localised light poaching	More distrbed - some encroachment of Rf and Pta. Ue locally frequent.

Survey	Chykembro 1					Recorder	JS		Date	19/10/2012	
Vegetation type	H4a										
Species	Q20	Q22	Q23	Q25	Q26	Species	1	2	3	4	5
Molinia caerulea	8	9	3	8	6						
Pteridium aquilinum	5	3	4	2	5						
Ulex gallii	3	5	5	5							
Calluna vulgaris	4	5	7	7	3						
Agrostis curtisii	5	3	9	4	5						
Rubus fruticosus	4		1	2	3						
Dryopteris dilatata	1										
Potentilla erecta	3		3	3	3						
Erica cinerea	2	4	4	4							
Rumex acetosa	1										
Digitalis purpurea	1										
Anthoxanthum odoratu	1				6						
Erica tetralix		2	1								
Carex pillulifera		1		1							
Polygala vulgaris			1								
Carex binervis				3							
Campylopus introflexus				3							
Teucrium scorodonia					2						
Galium saxatile					2						
Holcus lanatus					1						
Bare ground											

Quadrats

	Q20	Q22	Q23	Q25	Q26
Grid. ref.	SW44603711	SW44483702	SW44473706	SW44533716	SW44573713
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle	Gentle	Gentle
Aspect	W	W	W	N	N
Soil type					
Quadrat area	4 m Sq	4 m Sq	4 m Sq	4 m Sq	
Vegetaation Height	1m	1m	40cm	1.1m	75cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Unmanaged presumably burnt. Too much Molinia over and Ericoids under-represented.	Unmanaged, overgrown with Moilina. Erica tetralix v. Scarce but present	Localised transitions to H4c where canopy c10cm with E.tet A but too small to map.	Overgrown with Molina, Pta and Ulex gallii. Unmanaged.	Very grassy, unmanaged.

Survey	Chykembro 1					Recorder	JS		Date	19/10/2012	
Vegetation type	H4b										
Species	Q18	Q19				Species	1	2	3	4	5
Ulex gallii	5	4									
Pteridium aquilinum	3	3									
Calluna vulgaris	4	4									
Agrostis curtisii	6	7									
Carex binervis	5	4									
Erica cinerea	3	3									
Potentilla erecta	3	3									
Molinia caerulea	4	3									
Agrostis capillaris	4	5									
Holcus lanatus	3	3									
Anthoxanthum odoratum	3	5									
Teucrium scorodonia	2										
Carex pilulifera	3	3									
Rumex acetosella	1										
Galium saxatile	1										
Campylopus introflexus		3									
Juncus effusus		1									
Rubus fruticosus		1									
Bare ground	2	1									

Quadrats

	Q18	Q19			
Grid. ref.	SW44703716	SW44733717			
Photo. No.					
NVC method					
Slope	N/a	N/a			
Aspect	-	-			
Soil type					
Quadrat area	4 m Sq	4 m Sq			
Vegetation height (mm)	75cm	75cm			
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazed seperation from H8b based on abundance of Agrostis curtisii. Absence of Erica tetralix is atypical	Cattle grazed more grassy.			

Survey	Chykembro 1					Recorder	JS		Date 19/10/2012		
Vegetation type	**W25b**										
Species	**Q1**	**Q2**	**Q3**	**Q12**	**Q13**	**Species**	**1**	**2**	**3**	**4**	**5**
Pteridium aquilinum	6	5	7	7	7						
Rubus fruticosus	7	6	9	6	9						
Ulex gallii	5	1									
Dryopteris dilatata	3	4	1	5	3						
Agrostis curtisii	1										
Hypnum cupressiforme	4	4									
Digitalis purpurea	3	3		1	4						
Anthoxanthum odoraum	4	6	1	5	4						
Oxalis acetosella		6	3	4	4						
Holcus mollis			4	3							
Silene dioica			1								
Agrostis capillaris			4	3							
Holcus lanatus			3		3						
Teucrium scorodonia			4		4						
Potentilla erecta			1	1							
Hedera atlantica			4		4						
Viola riviniana			3	3							
Rumex acetosa			2	3	3						
Lonicera periclymenum					3						
Kinbergia praelongum					3						
Bare ground											

Quadrats

	Q1	**Q2**	**Q3**	**Q12**	**Q13**
Grid. ref.	SW44543729	SW44603726	SW44463735	SW44593742	SW44483741
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle	Gentle	Gentle
Aspect	N	N	N	N	N
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	75cm	75cm	1.2m	75cm	1.3m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazed	Cattle grazed. Grassier areas nearby with lMolinia and less Pta & Rf	Unmanaged, dense Rf		Unmanaged, dense Rf

Survey	Chykembro 1					Recorder	JS			Date 19/10/2012	
Vegetation type	**U20a**										
Species	**Q5**	**Q6**	**Q7**	**Q21**	**Q24**	**Species**	**1**	**2**	**3**	**4**	**5**
Pteridium aquilinum	7	6	6	7	5						
Rubus fruticosus	2	3	3	3							
Holcus lanatus	5	8	8	7	7						
Anthoxanthum odoratum	5	4	5	4	5						
Agrostis capillaris	5	3	4	5	6						
Rumex acetosella	3	2	1	1	1						
Potentilla erecta	3	1	3	4	3						
Holcus mollis	3	3									
Teucrium scorodonia	2	1									
Oxalis acetosella	2	2	3								
Molinia caerulea		2			4						
Stellaria holostea		1									
Galium saxatile			4								
Vaccinium myrtillus			3								
Thuidium tamariscinum			3								
Digitalis purpurea			1	1	4						
Agrostis curtisii				1							
Succisa pratensis					3						
Pseudoscleropodium purum					3						
Festuca rubra					3						
Bare ground											

	Quadrats				
	Q5	**Q6**	**Q7**	**Q21**	**Q24**
Grid. ref.	SW44763747	SW44813744	SW44733735	SW44573709	SW44493712
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle	Moderate	Gentle
Aspect	N	N	N	NW	NW
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	1.2m	1.2m	1m	60cm	40cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazed, trampled	Cattle grazed.	**Cattle grazed. Scattered Ue nearby**	Unmanaged fringe to H4a	

Survey	Chykembro 1					Recorder	JS		Date	19/10/2012	
Vegetation type	**U20b**										
Species	**Q8**	**Q14**	**Q15**	**Q16**	**Q17**	**Species**	**1**	**2**	**3**	**4**	**5**
Pteridium aquilinum	6	6	5	6	5						
Rubus fruticosus	4	3	3	2	6						
Ulex gallii	5	4	6	6	6						
Molinia caerulea	5			7							
Agrostis curtisii	5	4	4	2	3						
Potentilla erecta	3	3	3	3	3						
Teucrium scorodonia	3		3	3							
Galium saxatile	3	3	3		3						
Pseudoscleropodium purum	3	3									
Holcus lanatus	5	7	4	3							
Anthoxanthum odoratum	5	7	6		6						
Rumex acetosa	2	3	3	3							
Vaccinium myrtilus		3	3	1							
Polypodium vulgare		3									
Calluna vulgaris		4			4						
Viola rivinniana		3									
Hypnum cupressiforme		3									
Dicranum scoparium		3									
Oxalis acetosella		3		2							
Lonicera periclymenum		3									
Cerastium holosteoides		1		2							
Isothecium myosuroides		3									
Kinbergia praelongum		3									
Pseudoscleopodium purum		3			2						
Agrostis capillaris		3	7								
Dryopteris dilatata		1			2						
Holcus mollis			6	4							
Solidago virgaurea			1								
Rumex acetosella			2								
Digitalis purpurea				1	1						
Erica cinerea				1	4						
Bare ground		2			1						

Quadrats

	Q8	**Q14**	**Q15**	**Q16**	**Q17**
Grid. ref.	SW44473722	SW44693728	SW44813735	SW44793726	SW44643721
Photo. No.					
NVC method					
Slope	Gentle	Gentle	Gentle	Moderate	Gentle
Aspect			E	E	N
Soil type					
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	75cm	60cm	1m	1.1m	75cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Burnt, unmanaged	Cattle grazed quite heathy near cairn not all U20b is nearly this heathy	**Grassy runnels Pta not very abundant but constant and +/- 25% Cattle poached tracks signs of burning nearby**	Molinia locally abundant in big tussocks. Cattle grazed presumably has come form H4	Cattle grazed.

Survey	Chykembro 1					Recorder	JSp		Date 19/10/2012		
Vegetation type			**U4a**								
Species	**Q9**	**Q10**	**Q27**	**Q28**	**Q29**	**Species**	**1**	**2**	**3**	**4**	**5**
Agrostis capillaris	8	8	6	7	7						
Holcus lanatus	7	7	3	7	7						
Holcus mollis	4	3									
Anthoxanthum odoratum	5	4	3								
Potentilla erecta	4		3	3	3						
Pseudoscleropodium purum	5		8		3						
Rumex acetosa	2	3		3	3						
Carex binervis	2		3								
Rhytidiadelphus squarrosus	4										
Ulex gallii	1										
Rubus fruticosus	1	2		2							
Cerastium fontanum		3		2							
Pteridium aquilinum		1		1							
Calluna vulgaris			3								
Molinia caerulea			4								
Festuca rubra			7								
Rumex acetosella					2						
Hypochaeris radicata					1						
Ranunculus repens					1						
Bare ground											

Quadrats

	Q9	**Q10**	**Q27**	**Q28**	**Q29**
Grid. ref.	SW44903706	SW44923710	SW44833707	SW44823712	SW44853714
Photo. No.					
NVC method					
Slope	Slight	Slight			
Aspect	NW	N			
Soil type					
Quadrat area	2x2m	2x2m	2x2m	2x2m	2x2m
Vegetation height (mm)	10cm	20cm	15cm	10cm	5cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazed Ug and Ue occasionally present forming shrubbyislands	Cattle grazed, Ranker than Q9 more Holcus Ue clumps to east	Cattle grazed, heathy elements	Very poor - rather mesic but no Ran rep, Tri rep or Lol per	Cattle grazed. Poor, poached.

Survey	Chykembro 1					Recorder	JS		Date	19/10/2012	
Vegetation type	U4b										
Species	Q4	Q11				Species	1	2	3	4	5
Holcus lanatus	8	6									
Agrostis capillaris	5	7									
Lollium perenne	4										
Ranunculus repens	5	4									
Trifolium repens	5	3									
Rumex obtudifolius	4										
Cerastium fontanum	2	3									
Plantago major		4									
Prunella vulgaris		3									
Aphanes australis		2									
Leontodon autumnalis		3									
Cynosurus cristatus		3									
Poa annua		1									
Taraxacum officinale		2									
Bare ground		3									

Quadrats

	Q4	Q11			
Grid. ref.	SW44643743	SW44993718			
Photo. No.					
NVC method					
Slope	Gentle	gentle			
Aspect	N	N			
Soil type					
Quadrat area	2 m sq	2 m sq			
Vegetation height (mm)	5cm				
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle grazed	Cattle grazed. Some poaching. No Lollium visible. Abundance of Cynosurus hard to estimate.			

CHYKEMBRO 3 (Survey Area 39 – 2012)

NVC surveyor	Michael Davies	Date surveyed	15th and 16th October 2012
Report compiled by	Michael Davies	20th December 2012	

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Chykembro 3
County	Cornwall
District	Penwith
Parish	Zennor
Map Reference	Access at SW 45223655, with centre of site at SW 45403650
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith 156

The location of the site is shown on *Map 1*.

1.2 Summary description

Area	9.5ha
Altitude	195 – 200m AOD
Aspect	Chykembro 3 is a small field that occupies the level to gentle slopes of a low, shallow plateau. The central part of the field is flat, with very gentle slopes toward the field edges, with aspects to the north, east and south.
Drainage	With the exception of small areas of localised wetness resulting from vehicle movements and cattle poaching, in particular around field entrances, the site is free draining. The nearest water body is a relatively large circular pond in the adjacent field to the north. At the time of the field visit this pond was red in colour because of the dominance of water fern (*Azolla filiculoides*).

1.3 Access

There are no public footpaths to or within Chykembro 3, though the whole of the site, which is owned by the National Trust, is designated as open access land. Cattle were grazing Chykembro 3 and adjacent land at the time of the visit and there was evidence of this, with localised poaching around the entrance to fields. The perimeter of the field appeared to be periodically cut to maintain access.

1.4 Tenure

The site is owned by the National Trust and managed by a tenant farmer in partnership with the National Trust.

2 Biological Description

2.1 Habitats

There are two main habitats present within the site: acid grassland and humid heath. Other minor habitats are Cornish earth and stone hedgebanks that mark the boundaries of the field and several small, linear stands of bracken/bramble scrub that occur as a band along the site's eastern boundary but that were considered too small to map. A list of plant species recorded within each habitat is provided in *Appendix 2*.

The National Vegetation Classification (NVC) communities identified during the survey are described below under the habitat in which they occur, and their distribution is shown on *Map 2* in *Appendix 1.*
The location and reference number of target notes made during the field visits are annotated onto *Map 1*. A comprehensive list of target notes is appended to this report. Photographs taken during the field visits are inserted into the text where these are thought useful to illustrate particular points of discussion. A full set of photographs covering both NVC quadrat points and condition assessment (CA) sampling points is appended to this report as a named subfolder on CD (*Appendix 3*).

2.1.1 Continuous scrub

Scrub is a minor habitat at Chykembro 3 and one that is generally confined to relatively small, fragmented stands that occur in a narrow band close to the eastern boundary. Typically, these stands form a 1-2m high community in which bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticusus* agg.) are co-dominant, with European gorse (*Ulex europaeus*) and western gorse (*Ulex gallii*) more localised. Grasses such as Yorkshire fog (*Holcus lanatus*), sweet vernal grass (*Anthoxanthum odoratum*) and common bent (*Agrostis capillaris*) can persist in more open areas, but are generally replaced by Atlantic ivy (*Hedera hibernica*) , wood sage (*Teucrium scorodonia*) and ferns within taller, denser stands. Although too small to sample quantitatively, based on the relative cover of the main species this vegetation is characteristic of **W25b *Teucrium scorodonia* sub-community** of

***Pteridium aquilinum – Rubus fruticosus* underscrub**.

2.1.2 Humid heath

This is the dominant habitat over the site, where it occurs as mature grass-heath vegetation comprising hummocks of dwarf heath shrubs within a shorter, grassy matrix. The heath element is dominated by western gorse, but bell heather (*Erica cinerea*), heather (*Calluna vulgaris*) and cross-leaved heath (*Erica tetralix*) are constant and can be locally abundant. Purple moor-grass (*Molinia caerulea*) and bristle bent (*Agrostis curtisii*) are both prominent in a grazed, grassy sward that otherwise shows similar floristic character to U4a grassland, with pill sedge (*Carex pilulifera*) and green-ribbed sedge (*Carex binervis*) preferential constants. The western half of the grassy heath has been burnt, which has resulted in an increase locally in the cover of bristle bent and the apparent loss of dwarf shrubs. However, closer inspection shows all the above ericoids to be present and bristle bent to be localised in its cover, with most of the grass species seen at TN1 also present at TN2. Based on its patterning and overall floristic composition, stands of grassy heath vegetation at Chykembro 3 have been assigned to **H4b, *Festuca ovina* sub-community of *Ulex gallii* – *Agrostis curtisii* heath**. Although initially assigned to H4a on the basis of the cover of bristle bent and an absence of cross-leaved heath, vegetation at TN2 was subsequently re-assigned to H4b (burnt) see CA sample points C26 – C30.

The site is cattle grazed and there is localised light poaching in places along grassy runnels. Grassy heath here has been recently burnt though it is now regenerating.

Plate 1 39-2012-Q11, area of mature H4b showing distinctive patterning of heath tussocks within grassy matrix.

Plate 2 39-2012-Q4, area of burnt grassy heath H4b; note regenerating ericoids just visible within grassy sward.

2.1.3 Acid grassland

Grassland at Chykembro 3 forms a narrow band around the perimeter of the field, where it typically occurs as a short, closed, grazed turf dominated by common bent, sweet vernal grass and red fescue (*Festuca rubra*), with other grasses including heath grass (*Danthonia decumbens*), purple moor-grass and Yorkshire fog more localised. Other occasional monocots include green-ribbed sedge and pill sedge, though neither is frequent. With the exception of tormentil (*Potentilla erecta*), forbs are, in general, infrequent and rarely achieve cover. Common acrocarps; neat feather-moss (*Pseudoscleropodium purum*) and springy turf moss (*Rhytidiadelphus squarrosus*), are often prominent in the grazed turf. Although absent from the quadrats, heather was occasional in the turf. The localised presence of Yorkshire fog is indicative of more mesic grasslands, but in general few other species indicative of richer conditions or agricultural improvement were seen.

Plate 3 39-2012-Q1, acid grassland (U4a sub-community) around the edge of Chykembro 3 site; note occasional western gorse shrubs.

Despite the presence of Yorkshire fog and the patchy occurrence of other mesic forbs, overall the floristic composition of the acid grassland

supports assignment to **U4a, Typical sub-community of *Festuca ovina – Agrostis capillaris – Gallium saxatile* grassland**.

2.2 Species

The location of any important species and features is shown on *Map 2*.

2.2.1 Vascular plants

The Phase 1 Habitat and NVC surveys in October 2012 recorded a total of c.80 plants, including a small number of non-vascular species. No notable plant species were recorded during this survey.

3 Condition Assessment

3.1 Humid heath

20 sample points distributed throughout the area of humid heath and including several stops within areas of burnt heath within Chykembro 3 (site 39).

Overall, H4b is assessed as being in unfavourable condition, failing in part on vegetation structure; even-aged, with little evidence of ericoid regeneration outside of burnt areas and on vegetation composition particularly with regard to forbs, where only tormentil is frequent throughout. Other issues relate to localised disturbance by stock, with bare ground exceeding recommended threshold

3.2 Acid grassland

This is a very minor vegetation community within the site and as such no condition assessment was undertaken.

Table 1 Summary of habitats and vegetation communities

Chykembro 3 39-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Acid grassland	U4a	n/a	1.71	n/a	Lowland acid grassland 1.71
Humid heath	H4b	n/a	2.73	UFNC	Lowland heathland 7.71
	H4b (burnt)	n/a	4.98	UFNC	
Total Area Mapped		n/a	9.42		

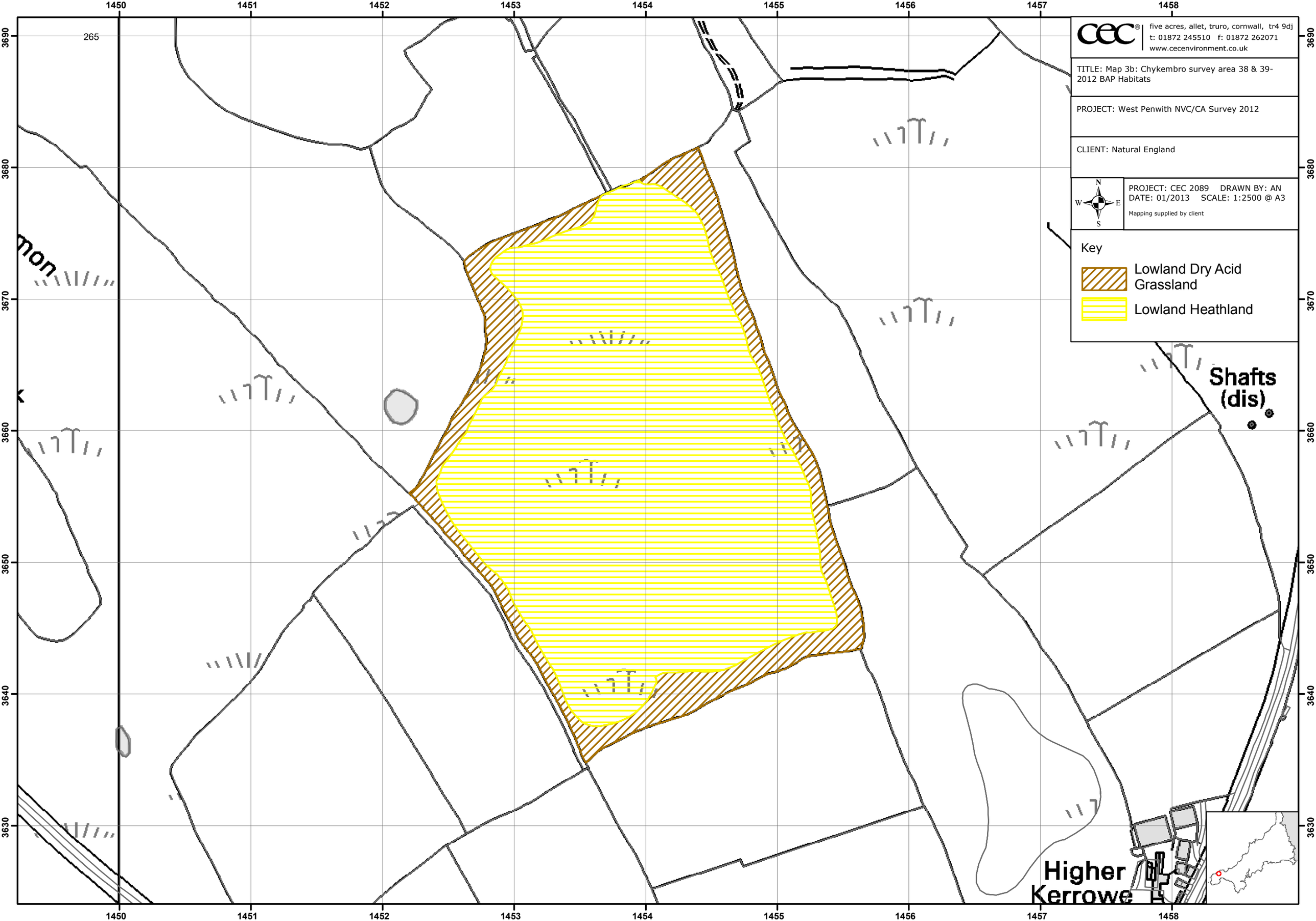
Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD)

Appendix 1

Maps (1: Location, 2: NVC, 3: BAP habitat)

See separate Maps Folder on CD

Target Notes


1450
1451
1452
1453
1454
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1456
1457
1458
3690
3680
3670
3660
3650
3640
3630
265
Shafts (dis)
Higher Kerrowe
cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3b: Chykembro survey area 38 & 39- 2012 BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
N
W
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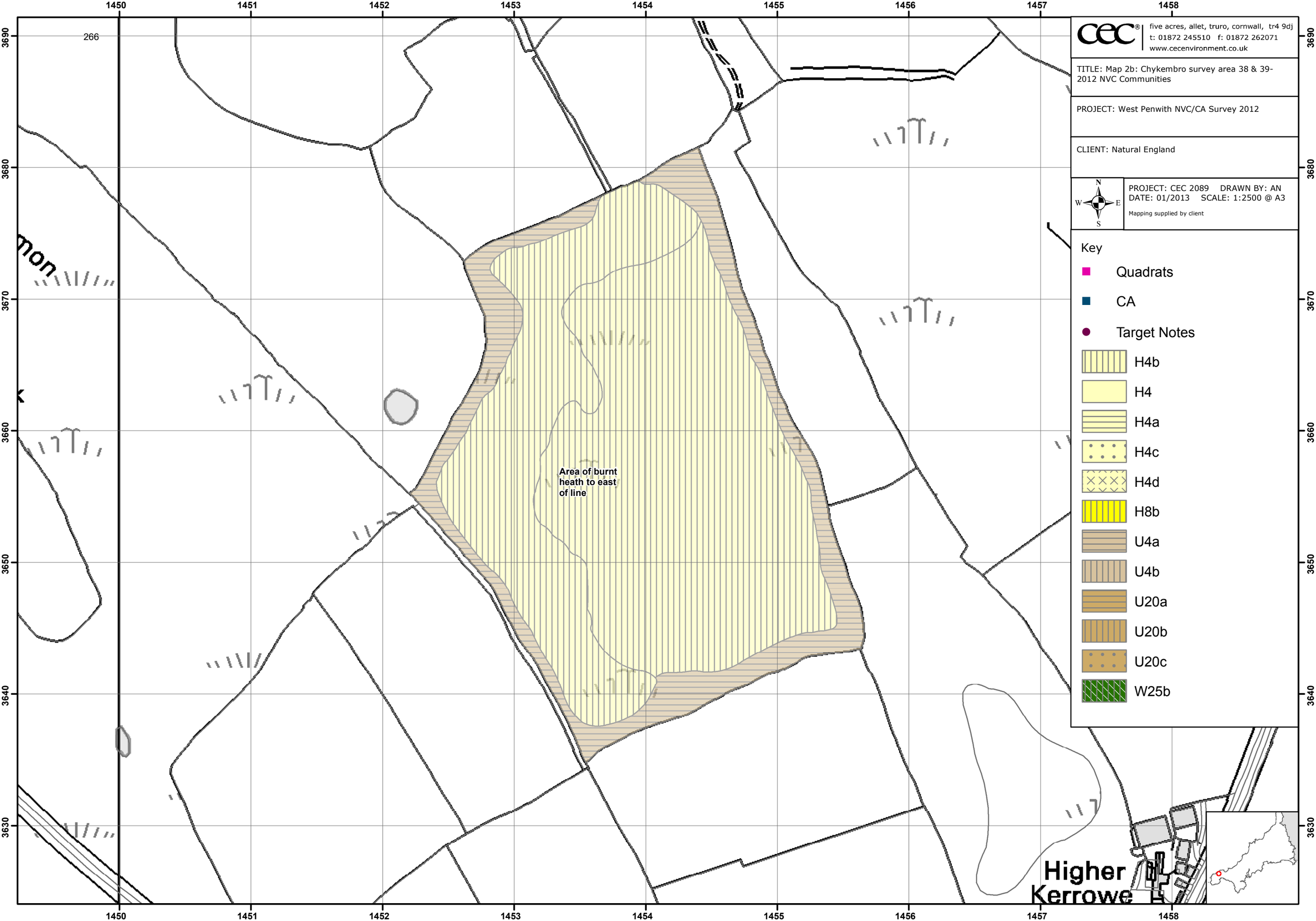
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Dry Acid Grassland
Lowland Heathland


1450
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1458
3690
3680
3670
3660
3650
3640
3630
266
Area of burnt heath to east of line
Higher Kerrowe
cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2b: Chykembro survey area 38 & 39- 2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
N
W
E
S
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
H4b
H4
H4a
H4c
H4d
H8b
U4a
U4b
U20a
U20b
U20c
W25b

Map 2 Target Notes Chykembro 3 (Survey Area 39 - 2012)

TN. No.	Grid Ref.	Text
1	SW45293659	Mature grass heath vegetation comprising hummocks of dwarf heath shrubs within shorter, grassy matrix. Heath element is dominated by *Ulex gallii*, but *Erica cinerea*, *Calluna* and *Erica tetralix* are constant and can be locally abundant. *Molinia* and *Agrostis curtisii* are both prominent in a grazed grassy sward that otherwise shows similar floristic character to U4a grassland, with *Carices*, *Carex pilulifera* and *C. binervis* preferential constants. Area is cattle grazed and there is localised light poaching in places along grassy runnels.
2	SW45443656	Grassy heath here has been recently burnt though it is now regenerating. Burning has resulted in an increase locally in cover of *A curtisii* and apparent loss of dwarf shrubs. Closer inspection shows all ericoids to be present and curtisii to be localised in cover with most of the grass species seen at TN1 also present at TN 2. Initially assigned to H4a on the basis of *A curtisii* cover and no tetralix, this vegetation was subsequently re-assigned to H4b (burnt) see CA sample points C26 – C30.

Appendix 2 Species list – Vascular and non-vascular plants

Latin	Common Name	Scrub	Humid Heath	Acid grassland	Hedges
Agrostis canina	Velvet bent		O/LF	O	
Agrostis capillaris	Common bent-grass	O (e)		A	F/LA
Agrostis curtisii	Bristle bent-grass		LF		O
Agrostis stolonifera	Creeping bent		O/LF		O
Anthoxanthum odoratum	Sweet vernal grass			F/LA	F
Athyrium filix-femina	Lady fern	O			O
Bellis perennis	Daisy			R	R
Blechnum spicant	Hard fern	R			O
Calluna vulgaris	Heather/ ling		A	O/LF	LF
Carex binervis	Green ribbed sedge		F	O	
Carex panicea	Carnation sedge		O		
Carex pilulifera	Pill sedge		F	O/LF	
Centaurea nigra	Common knapweed				O
Cerastium fontanum	Common mouse-ear			R	
Cirsium palustre	Spear thistle			O	
Cirsium vulgare	Creeping thistle			R	
Cirsium arvense	Marsh thistle	O			
Crataegus monogyna	Hawthorn				O
Cynosurus cristatus	Crested dog's-tail			R	O
Dactylis glomerata	Cock's-foot	O			O
Digitalis purpurea	Foxglove	O			O/LF
Dryopteris dilatata	Broad buckler fern	O	R		O
Dryopteris filix mas	Male fern	O			O
Erica cinerea	Bell-heather		F		O
Erica tetralix	Cross-leaved heath		F/LA		O
Festuca ovina	Sheep's fescue			O	
Festuca rubra	Red fescue	O	F	F	F
Galium aparine	Cleavers	O			O
Galium mollugo	Hedge bedstraw				O
Galium saxatile	Heath bedstraw		O	O/LF	O/LF
Geranium dissectum	cut-leaved crane's-bill				O
Geranium robertianum	Herb-Robert	R			O
Glechoma hederacea	Ground ivy	O			
Hedera hibernica	Atlantic ivy	O			O
Holcus lanatus	Yorkshire fog	O/LF		O/LF	O
Holcus mollis	Creeping soft-grass	O			O
Hypochaeris radicata	Common cat's ear		R	O/LF	O
Ilex aquifolium	Holly				R
Jasione montana	Sheep's-bit				O
Juncus effusus	Soft rush	O		O/LF	
Lolium perenne	Perennial rye grass			R	
Lonicera periclymenum	Honeysuckle	O			O
Lotus pedunculatus	Greater bird's-foot-trefoil			O	O
Luzula campestris	Field woodrush			LF	O
Luzula multiflora	heath woodrush			LF	
Molinia caerulea	Purple moor-grass		F	O	O
Pedicularis sylvatica	Lousewort			O	

Latin	Common Name	Scrub	Humid Heath	Acid grassland	Hedges
Phyllitis scolopendrium	Hart's tongue	O			LF
Plantago lanceolata	Ribwort plantain	O		R	O
Poa annua	Annual meadow grass			R	
Polypodium vulgare	Polypody				O
Potentilla erecta	Common tormentil		F	F	LF
Prunella vulgaris	Selfheal				O
Prunus spinosa	Blackthorn				O
Pteridium aquilinum	Bracken	R	R	R	O/LF
Ranunculus acris	Meadow buttercup				O
Ranunculus repens	Creeping buttercup	O		O	
Rubus fruticosus agg.	Blackberry/bramble	A/LD	R	O	LF
Rumex acetosa	Common sorrel	O		F	LF
Rumex obtusifolius	Broad-leaved dock			R	O
Salix cinerea ssp oleifolia	Grey willow				O
Scrophularia auriculata	Water figwort				O
Sedum anglicum	English stonecrop				LF
Senecio jacobaea	Ragwort		O	O	O
Silene dioica	Red campion	O			LF
Stachys officinale	Betony				O
Stachys sylvatica	Hedge woundwort				O
Stellaria holostea	Greater stitchwort				O
Succisa pratensis	Devil's-bit scabious				0
Taraxacum officinale	Dandelion			R	
Teucrium scorodonia	Wood sage	O		O	LF
Ulex europaeus	European gorse	R/LF			O/LF
Ulex gallii	Western gorse	R/LF	A/LD	O	LF
Umbilicus rupestris	Navelwort				O/LF
Urtica dioica	Common nettle	O			O
Veronica chamaedrys	Germander speedwell			O/LF	
Viola riviniana	Common dog-violet				O/LF
Brachythecium rutabulum	A moss	O			LF
Campylopus flexuosus	A Moss		O	O	
Dicranum scoparium	A moss		O	O	O
Eurhynchium praelongum	A moss	O			LF
Hypnum cupressiforme	A moss		O	LF	LF
Hypnum jutlandicum	A moss				O
Polytrichum juniperinum	A moss				LF
Rhytidiadelphus squarrosus	A moss		LF	LF	LF
Scapania gracilis	Liverwort				O

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally, E = Edge

Appendix 3 NVC quadrat data and photos

See Chykembro 3 subfolder on West Penwith CD for quadrat data, quadrat photos and other site photos.

Survey	Chykembro 3					Recorder	MD		Date	16/10/2012	
Vegetation type	H4b Humid heath										
Species	Q10	Q11	Q12	Q13	Q15	Species					
Ulex gallii	8	8	8	8	5						
Calluna vulgaris	5	4	4	5	4						
Erica cinerea	4	5	4	5	3						
Erica tetralix	3	3	3	4	2						
Potentilla erecta	3	3	3	3	3						
Molinia caerulea	4	5	4	4	5						
Agrostis curtisii	3	3	2	2	6						
Carex binervis	3	3	4	3	4						
Anthoxanthum odoratum	3	3	3	4	3						
Agrostis capillaris	4	4	4	4	4						
Carex pilulifera	3	3	3	3	4						
Holcus lanatus	2	3	2	2	2						
Rubus fruticosus	0	0	0	2	2						
Hypnum cuprssiforme	2	3	2	3	3						
Festuca rubra	0	2	0	2	3						
Dicranum scoparium	2	0	0	0	0						
Carex panicea	0	0	3	1	0						
Bare ground											

Grid. ref.	
Photo. No.	
Survey method	
Slope	
Aspect	
Soil type	
Quadrat area	
Vegetation height (mm)	
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

Quadrats

Q10	Q11	Q12	Q13	Q15
SW4534 3647	SW4532 3651	SW4528 3653	SW4530 3659	Sw4536 3642
P10	P11	P12	P13	P15
			Slight	
			NW	
4 m sq	4 m sq	4 m sq	4 m sq	4 m sq
300 (750)	300 (600)	250 (750)	300 (750)	300 (750)
Dwraf shrub islands within a matrix of Mc Ac grassy runnels. E tet frequent but rarely abundant. Cattle grazed but not burnt recently.	Grassy heath, with ericild islands within U4a matrix.	As for Q10	As for Q12	Grassy runnels are U4a , with addition of Mc , Acurt and Carex pil.

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

Survey	**Chykembro 3**					**Recorder**	**MD**		**Date**	**16/10**
Vegetation type	**H4b (burnt)**									
Species	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Species**				
Ulex gallii	5	5	5	5	4					
Erica cinerea	2	2	2	0	0					
Calluna vulgaris	3	2	2	0	0					
Agrostis curtisii	8	5	6	5	7					
Molinia caerulea	5	5	5	5	6					
Carex panicea	3	2	0	3	0					
Anthoxanthum odoratum	4	5	4	4	0					
Potentilla erecta	3	3	3	4	3					
Carex binervis	3	2	4	4	4					
Holcus lanatus	0	3	3	2	2					
Carex pilulifera	2	3	3	2	0					
Juncus effusus	0	0	0	1	0					
Agrostis capillaris	3	3	3	4	2					
Erica tetralix	2	0	1	0	0					
Bare ground										

/2012

	Quadrats			
	Q4	**Q5**	**Q6**	**Q7**
Grid. ref.	SW4549 3646	SW4548 3652	SW4544 3653	SW4537 3658
Photo. No.	P4	P5	P6	P7
Survey method				
Slope	V Slight	Slight	V Slight	
Aspect	E	E	E	
Soil type				
Quadrat area	4 m sq	4 m sq	4 m sq	4 m sq
Vegetation height (mm)	300	300	300	300
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Area of burnt heath with dwarf shrubs regenerating, but grasses particularly A curt dominant.	As for Q4	As for Q4. evidence of cattle grazing throughout field	Localised disturbnace allowing increase in cover of Poa annua and holcus lanatus.

Q8
SW4537 3665
P8
4 m sq
300
More rank and grassy, with no ericoids and Ug slow to regenerate.

Survey	**Chykembro 3 Site no 39**					**Recorder**	**MD**		**Date**	**16/10**
Vegetation type	**U4a acid grassland**									
Species	**Q1**	**Q2**	**Q3**	**Q9**	**Q14**	**Species**				
Agrostis capillaris	7	6	7	8	8					
Anthoxanthum odoratum	5	5	5	4	4					
Festuca rubra	4	4	4	4	4					
Holcus lanatus	3	3	4	4	3					
Molinia caerulea	3	0	0	0	0					
Carex binervis	3	0	0	2	5					
Potentilla erecta	4	4	4	3	4					
Hypochaeris radicata	1	2	0	2	2					
Scleropodium parum	4	0	4	4	0					
Rhytidiadelphus squarrosus	5	7	4	4	0					
Rumex acetosa	0	2	3	0	0					
Danthonia decumbens	0	2	0	0	0					
Hypnum cupressiforme	0	1	0	0	0					
Cirsium palustre	0	1	0	0	0					
Galium saxatile	0	3	3	3	0					
Ulex gallii	0	0	0	1	1					
Lotus pedunculatus	0	0	0	0	2					
Cynosuros cristatus	0	0	0	0	3					
Juncus effusus	0	0	0	0	1					
Ranunculus repens	0	0	0	0	1					
Trifolium repens	0	0	0	0	1					
Agrostis canina	0	0	0	0	3					
Bare ground										

)/2012

	Quadrats		
	Q1	**Q2**	**Q3**
Grid. ref.	SW4547 3669	SW4555 3645	SW4550 3643
Photo. No.	P1	P2	P3
Survey method			
Slope	Slight	Slight	
Aspect	N	N	
Soil type			
Quadrat area	2 m sq	2 m sq	2 m sq
Vegetation height (mm)	200	200	200
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	5-10 m wide grassy field track around edge of most of field. Occasional Ug and Ue shrubs. Kept open by grazing and use of track for access.	As for Q1	As for Q1

Q9	Q14
SW4543 3640	SW4528 3670
P9	P14
	Slight
	W
2 m sq	2 m sq
200	150
As for Q1-3	Je locally frequent and appaerance of trifolium and Ran rep suggestes transition to U4b.

LOGAN STONE (Survey Area 43 - 2012)

Condition Assessment surveyor	Colin French	Dates surveyed	27th October 2012
NVC surveyor	Colin French	Date surveyed	27th October 2012
Report compiled by	Colin French	31st October and 1st November 2012	

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Logan Stone
District	Penwith
Parishes	Zennor
Map Reference	Footpath access at approximately SW460378
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

The location of the site is shown on *Map 1*.

1.2 Summary description

Area	8.6ha
Altitude	150 – 230m AOD
Aspect	Logan Stone is located about 1km to the south east of Zennor. It has a south western aspect and forms part of the northern side of the valley which runs through Zennor itself. The top of the site is flat and the junction between the steep slope and the flat top is marked by a line of substantial granite tors.
Drainage	No flowing water was found on site, however, there is a stream below the site which is flowing away from the site suggesting it is draining the hill slope of Logan Stone.

1.3 Access

Logan Stone is accessible via two pathways, one of which is unmarked on the OS map. The first runs parallel to the lane leading from Zennor to Foage Farm, and the second, unmarked path, leads from the lane to Foage Farm up the slope onto the Logan Stone site. The top of the site is also connected to further unmarked paths that lead across the heath to Zennor Quoit. Judging by the amount of trampling on the path leading up the south eastern boundary of Logan Stone, the site is reasonably well frequented by walkers. A geo-caching bag was found in a crevice under one of the tors indicating one modern form of recreational use for the site.

1.4 Tenure

The site is owned by the National Trust and managed by a tenant farmer in partnership with the National Trust.

2 Biological Description

Plate 1 One of the granite tors which outcrop in a line at the top of the slope.

In essence, Logan Stone consists of steep, boulder strewn, bracken-covered

slopes, clad with granite tors at the apex with heathland filling the flat areas at the very top of the site. The lower slopes are more sheltered and consequently there are trees and shrubs dotted about amongst the bracken, whereas higher up trees and shrubs are rare, heavily wind-pruned, and mostly found where they can gain some shelter from rock outcrops.

Logan Stone is on the margin of a much larger area of continuous heathland and semi-natural habitat which extends to the north, east and south east, and whilst the area of heathland at Logan Stone is small, the site needs to be considered in the context of the much larger landscape of high nature conservation value, of which it is an integral part.

The whole site is cattle grazed and there were numerous cattle trackways criss-crossing the bracken slopes. There was little evidence of rabbit grazing, apart from occasional droppings encountered on rock outcrops.

2.1 Habitats

There are two main habitats present within the site: dry heath and scrub. Other, minor, habitats occur such as rock outcrops and tors, and Cornish hedges. The National Vegetation Classification (NVC) communities identified during the survey are described below and their distribution within the site is shown on *Map 2* in *Appendix 1*. A list of plant species recorded within each habitat is provided in *Appendix 2*. The NVC quadrat data is located in *Appendix 3*. The completed dry heath CSM form accompanies this report. The location and reference number of field notes made during the vegetation survey visits are annotated onto *Map 2* and appended to this report. Photographs taken during the three field visits are included in the text where these are considered useful in illustrating particular points of discussion.

2.1.1 Dry dwarf heath

There is a sizeable block of dry heath at the very top of the site, which extends slightly downslope amongst the tors. There are also smaller unmapped patches of heath amongst the rock outcrops within the W25b scrub community. The dry heath at Logan Stone is characterised by a short, dwarf shrub canopy dominated by heather (*Calluna vulgaris*) and, in a few places, bell heather (*Erica cinerea*), interspersed with common bent-grass (*Agrostis capillaris*) and bristle bent (*Agrostis*

curtisii). Very small plants of bilberry (*Vaccinium myrtillus*) and tormentil (*Potentilla erecta*) are frequent between the heather tussocks, whilst purple moor-grass (*Molinia caerulea*), bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticosus*) occur in small amounts.

Plate 2 The Dry Heath H10 community at the top of the Logan Stone, looking north eastwards towards Eagle's Nest.

Analysis of the quantitative sample data for this heath vegetation showed a generally close match with descriptions for **H10 *Calluna vulgaris – Erica cinerea* heath**.

Plate 3 looking northwards across the top of the site. The junction between the heath and bracken can clearly be seen in this photograph.

Plate 4 a close-up of the H10 dry heath.

2.1.2 Continuous scrub

Bracken forms the most extensive habitat on the site, filling the steeper slopes upon closer inspection however bramble tends to be co-dominant more or less through out. These areas were therefore mapped as **W25b *Pteridium aquilinum - Rubus fruticosus underscrub,* scrub** the ***Teucrium scorodonium sub-community.***

Although bracken and bramble are often co-dominants, bramble is at times subordinate to bracken in coverage and wood sage (*Teucrium scorodonia*) is frequently encountered. Few associates are found beneath the areas with the densest bracken and bramble canopy, however, in the more open areas the ground cover is much richer.

Plate 5 A view down the W25b bracken slope, looking towards Zennor village.

The amount of grass beneath the bracken is generally much reduced. Instead there is a proportion of plants typical of a woodland ground flora, such as ivy (*Hedera helix* subsp*. hibernica*), wood sage (*Teucrium scorodonia*), common sorrel (*Rumex acetosa*) and herb Robert (*Geranium robertianum*).

There were also places with a high proportion of heathers and bilberry (*Vaccinium myrtillus*) beneath the bracken, and small areas of open heath within the overall expanse of the bracken. The lower bracken slopes were punctuated by willow trees – both grey willow (*Salix cinerea* subsp. *oleifolia*) and eared willow (*Salix aurita*) and large granite boulders were common on the steep slopes further breaking up the uniformity of the bracken.

Plate 6 Close up of the W25b vegetation.

There were two further areas of continuous scrub which consisted of dense blackthorn (*Prunus spinosa*). These areas are spreading up the slope as seedlings/suckers were found in the adjoining bracken.

Plate 7 A view looking down across the W25b bracken slope towards Foage Farm. The two small blackthorn copses hug the contours in the centre of the photograph.

The following plant species were found beneath the blackthorn; lady fern (*Athyrium filix-femina),* hard fern (*Blechnum spicant*), foxglove (*Digitalis purpurea*), scaly male-fern *(Dryopteris affinis),* broad buckler-fern *(Dryopteris dilatata),* herb Robert (*Geranium robertianum*), soft rush (*Juncus effusus*), polypody *(Polypodium* agg*.),* bracken *(Pteridium aquilinum),* red campion (*Silene dioica*), common violet (*Viola riviniana)* and surprisingly tutsan (*Hypericum androsaemum*). This area of scrub belongs in the NVC community **W22 Prunus spinosa-Pteridium aquilinum scrub**. It was too small an area to be sampled.

Elsewhere on the bracken slopes there were isolated trees and shrubs, mostly nestling behind rock outcrops for shelter, except at the lower end of the site where there was much more shelter. Invasion by scrub would appear to be the main threat to the site and although this threat is minor at the moment, further spread, particularly of the blackthorn, should be prevented.

2.1.3 Rock outcrops and tors

A significant percentage of the hill slope is strewn with large granite

boulders which provide additional habitat for fern species and species that are typical of rock outcrops like early hair-grass (*Aira praecox*) and English stonecrop (*Sedum anglicum*). The granite boulders also enable small pockets of heath to persist amidst the bracken. A number of the tors had significant quantities of Nationally Scarce and RDB Near Threatened plant hay-scented buckler-fern (*Dryopteris aemula*) within rock crevices.

Plate 6 the boulder strewn slope.

2.1.4 Earth and stone banks

The majority of earth and stone banks were Cornish hedges and mark the boundaries of the Logan Stone site. The hedges that are still in use to contain cattle are generally in good repair. None of the boundaries were assessed as part of the NVC survey, with communities in most cases likely to reflect those of adjacent habitats.

2.2 Species

2.2.1 Vascular plants

Two alien species were discovered at Logan Stone. There was a single *Cotoneaster simonsii* bush at SW46373800 and several small prickly heath plants (*Gaultheria mucronata*) at SW46363824, within the heath.

Plate 7 prickly heath (*Gaultheria mucronata*)

3 Condition Assessment

3.1 Dry heath (H10)

Fifteen samples were taken distributed throughout areas of dry heath within the site.

The samples fail the mandatory attribute for vegetation structure there being an over-representation of building/mature heathers and insufficient physiognomic diversity within the sward. On this basis, although the community generally was observed to be in relatively good condition (perhaps due to exposure and a relatively harsh micro-climate) it must be assessed overall as **unfavourable no change**.

Table 1 Summary of habitats and vegetation communities

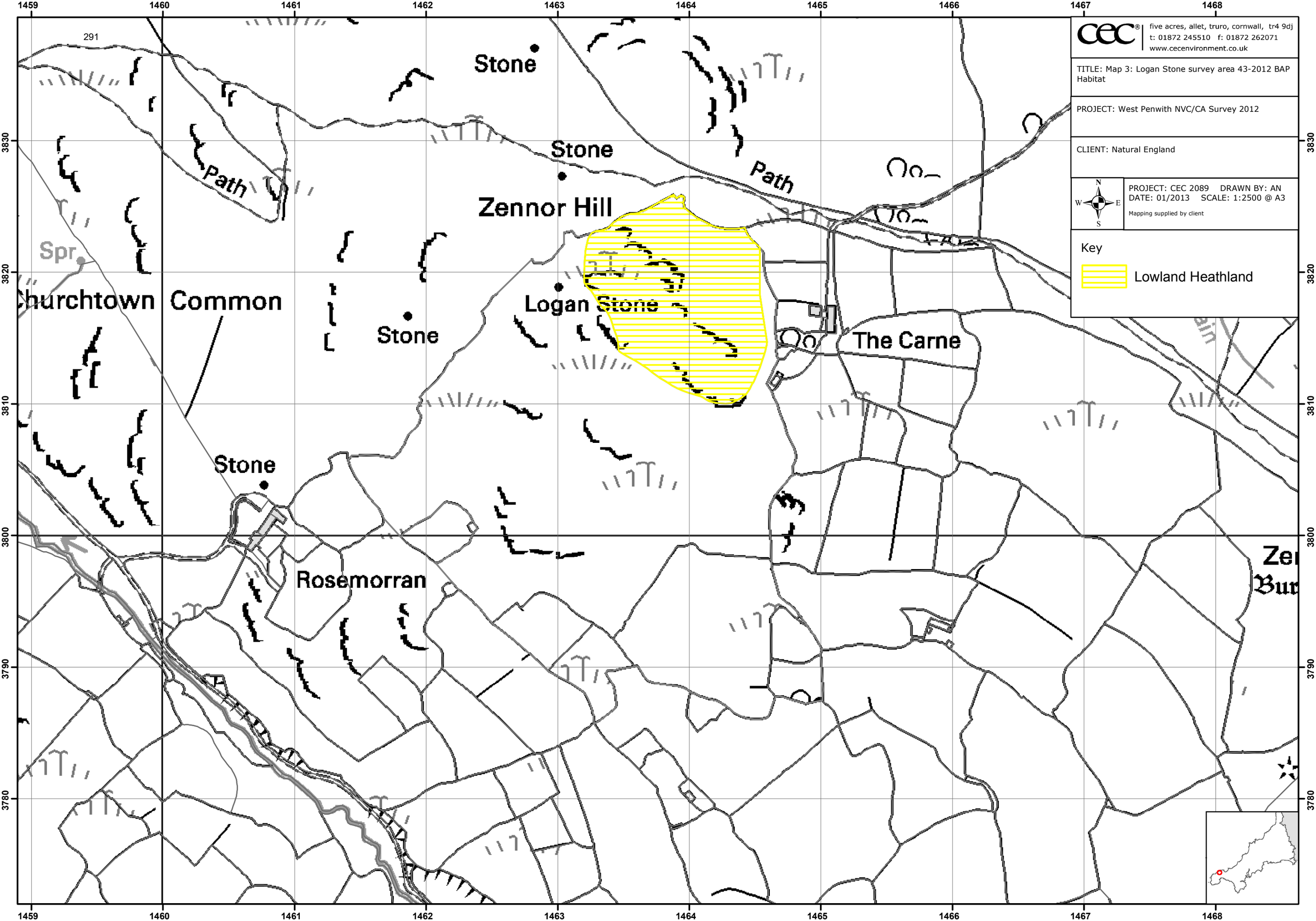
Logan Stone 43-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W25b	N/A	7.14	N/A	N/A
Dry heath	H10c	N/A	1.53	UFNC	Lowland heathland 1.53
Total Area Mapped		N/A	8.67		

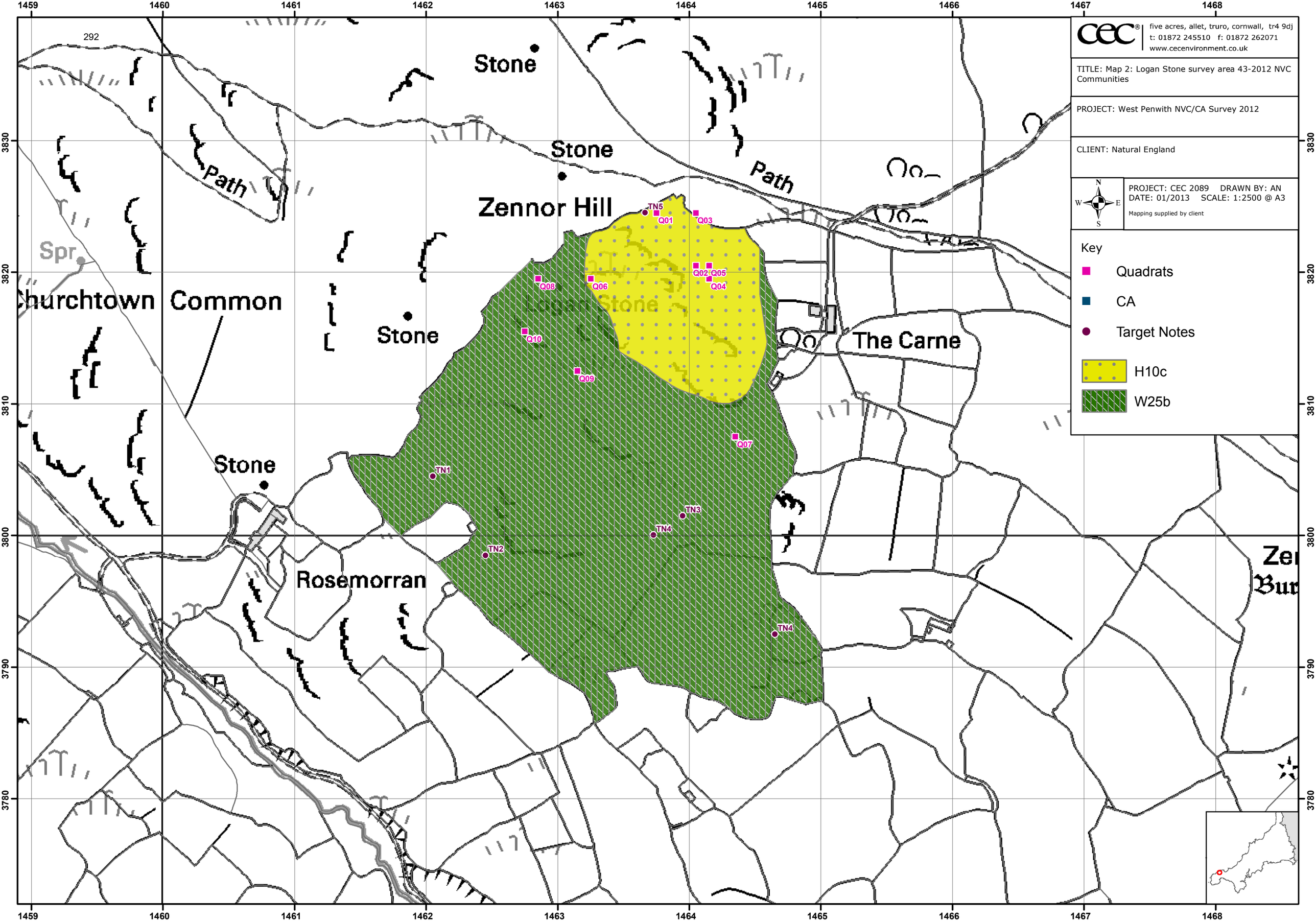
Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD)

Appendix 1

Maps (1: Location, 2: NVC, 3:BAP habitat)

See separate folder on CD


five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3: Logan Stone survey area 43-2012 BAP Habitat
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Heathland
Zennor Hill
Logan Stone
The Carne
Churchtown Common
Rosemorran
Path
Path
Stone
Stone
Stone
Stone
Spr
291
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468
3830
3820
3810
3800
3790
3780


five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2: Logan Stone survey area 43-2012 NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
H10c
W25b
Stone
Stone
Path
Path
Zennor Hill
Spr
Churchtown Common
Stone
Logan Stone
The Carne
Stone
Rosemorran
TN5
Q01
Q03
Q02
Q05
Q04
Q08
Q06
Q10
Q09
Q07
TN1
TN3
TN4
TN2
TN4
292
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468
3830
3820
3810
3800
3790
3780

Map 2 Target Notes Logan Stone (Survey Area 43 – 2012)

TN. No.	Grid Ref.	Text
1	SW46213804	The lower slopes had willow trees dotted about amongst the bracken – both *Salix cinerea* subsp. *oleifolia* and *Salix aurita*.
2	SW46243799	There were two small blocks of *Prunus spinosa* here, which area spreading up slope. Further spread should be prevented.
3	SW46393801	*Ulex europaeus* was confined to the lower parts of Logan Stone, especially the south eastern end.
4	SW46373800	*Cotoneaster simonsii*
5	SW46363824	*Gaultheria mucronata*

Appendix 2 Plant species recorded during survey

Species name	Common name	Dry Heath	Bracken	Scrub	Earth Stone Bank	Rock outcrops
Agrostis capillaris	Common Bent-grass	O	O		A	
Agrostis curtisii	Bristle Bent	A	R		LF	
Aira praecox	Early Hair-grass					O
Anagallis arvensis subsp. arvensis	Scarlet Pimpernel		X			
Asplenium obovatum subsp. *lanceolatum*	Lanceolate Spleenwort					O
Athyrium filix-femina	Lady-fern			F	F	O
Blechnum spicant	Hard-fern			O	O	R
Calluna vulgaris	Ling	D			LF	LF
Carex binervis	Green-ribbed Sedge	R				
Cerastium fontanum subsp. *vulgare*	Common Mouse-ear Chickweed		R			
Cirsium arvense	Creeping Thistle		R			
Cirsium palustre	Marsh Thistle		R			
Cotoneaster simonsii	Himalayan Cotoneaster		R			
Crataegus monogyna	Hawthorn		R		R	
Crepis capillaris	Smooth Hawk's-beard		R		R	
Dactylis glomerata	Cock's-foot		LF			
Digitalis purpurea	Foxglove		O	O	R	

Species name	Common name	Dry Heath	Bracken	Scrub	Earth Stone Bank	Rock outcrops
Dryopteris aemula	Hay-scented Buckler-fern					R
Dryopteris affinis	Scaly Male-fern			O	O	O
Dryopteris dilatata	Broad Buckler-fern		R	O	O	R
Dryopteris filix-mas	Male-fern					O
Erica cinerea	Bell Heather	LD	R		LF	
Eupatorium cannabinum	Hemp-agrimony		R			
Festuca ovina	Sheep's-fescue					O
Galium saxatile	Heath Bedstraw				F	
Gaultheria mucronata	Prickly Heath	R				
Geranium robertianum	Herb-Robert		R	O		R
Hedera helix subsp. *hibernica*	Atlantic Ivy	O	A		LF	LF
Hieracium umbellatum	Narrow-leaved Hawkweed	R			R	
Holcus lanatus	Yorkshire-fog		O		O	
Holcus mollis	Creeping Soft-grass		R		R	
Hypericum androsaemum	Tutsan			R		
Hypochaeris radicata	Cat's-ear	R			R	
Juncus effusus	Soft-rush			LF		
Lonicera periclymenum	Honeysuckle		O			
Lotus corniculatus	Common Bird's-foot-trefoil	R				
Lotus pedunculatus	Large Bird's-foot-trefoil	R				

Species name	Common name	Dry Heath	Bracken	Scrub	Earth Stone Bank	Rock outcrops
Luzula campestris	Sweep's Brush	R				R
Molinia caerulea	Purple Moor-grass	R			O	
Oxalis acetosella	Wood-sorrel		O		O	
Pedicularis sylvatica	Lousewort	R				
Polypodium sp.	Polypody Unidentified			O	F	LF
Potentilla erecta	Common Tormentil	F	O		F	
Prunus spinosa	Blackthorn		R	LF		
Pteridium aquilinum	Bracken	O	D	LA	LA	LF
Ranunculus repens	Creeping Buttercup	R				
Rubus fruticosus agg.	Blackberry		D		LA	F
Rumex acetosa	Common Sorrel		F		F	
Rumex acetosella	Sheep's Sorrel				F	LF
Salix aurita	Eared Willow		O			
Salix cinerea subsp. *oleifolia*	Grey Willow		R			
Sambucus nigra	Elder		R			
Sedum anglicum	English Stonecrop				LA	LA
Silene dioica	Red Campion		O	F		
Solidago virgaurea	Goldenrod	R	R		R	
Stellaria holostea	Greater Stitchwort	R	F			
Teucrium scorodonia	Wood Sage	O	A		F	

Species name	Common name	Dry Heath	Bracken	Scrub	Earth Stone Bank	Rock outcrops
Ulex gallii	Western Gorse	R			LA	
Umbilicus rupestris	Pennywort				O	O
Vaccinium myrtillus	Bilberry	O	R		O	O
Veronica chamaedrys	Germander Speedwell		R		R	
Veronica officinalis	Heath Speedwell		O			R
Veronica persica	Common Field-Speedwell		X			
Viola riviniana	Common Violet		R	R	R	

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, LF = Locally Frequent

Appendix 3 NVC quadrat data and Photos

See separate folder on CD

Survey	Logan Stone					Recorder	CF		Date	27/09/2012	
Vegetation type	W25b										
Species	Q6	Q7	Q8	Q9	Q10	Species	1	2	3	4	5
Pteridium aquilinum	7	8	9	9	8						
Rubus fruticosus agg.	6	5	5	4	7						
Teucrium scorodonia	4	4	2	3	3						
Agrostis capillaris	7	2	7								
Stellaria holostea		1	2		1						
Dryopteris dilatata				1	2						
Hedera helix subsp. hibernica				5	4						
Holcus lanatus		3	3								
Rumex acetosa	3	1									
Solidago virgaurea	1				1						
Viola riviniana	1	1									
Digitalis purpurea	1										
Holcus mollis					3						
Hyacinthoides non-scripta		1									
Lonicera periclymenum				1							
Lotus pedunculatus			1								
Oxalis articulata					3						
Potentilla erecta					1						
Ulex europaeus				1							
Bare ground											

	Quadrats				
	Q6	Q7	Q8	Q9	Q10
Grid. ref.	SW46323819	SW46433807	SW46283819	SW46313812	SW46273815
Photo. No.					
NVC method					
Slope	Moderate to steep	oderate to stee	oderate to stee	oderate to stee	oderate to steep
Aspect	SW	SW	SW	SW	SW
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	0.75m -1.2m	0.75m -1.2m	0.75m -1.2m	0.75m -1.2m	0.75m -1.2m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

Survey	Logan Stone					Recorder	CF		Date	27/09/2012	
Vegetation type	H10c										
Species	Q1	Q2	Q3	Q4	Q5	Species	Q3	Q5	Q7	Q9	Q14
Calluna vulgaris	9	9	9	9	9						
Erica cinerea	1	1	1	1	1						
Potentilla erecta	1	1	1	1	2						
Agrostis capillaris		3	4	5	5						
Agrostis curtisii	3	2	4	3							
Lotus corniculatus	2		1		1						
Vaccinium myrtillus	3	1	1								
Pteridium aquilinum	1				2						
Carex binervis		1									
Galium saxatile			1								
Holcus mollis					1						
Juncus effusus				1							
Teucrium scorodonia			1								
Bare ground											

	Quadrats				
	Q1	Q2	Q3	Q4	Q5
Grid. ref.	SW46373824	SW46403820	SW46403824	SW46413819	SW46413820
Photo. No.					
Survey method					
Slope	Flat	Flat	Flat	Flat	Flat
Aspect					
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	10-20cm	10-20cm	10-20cm	10-20cm	10-20cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

ZENNOR QUOIT (Survey Area 44 – 2012)

Condition Assessment surveyor	Colin French	Dates surveyed	24th & 25th October 2012
NVC surveyor	Colin French	Date surveyed	24th & 25th October 2012
Report compiled by	Colin French	29th and 30th October 2012	

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Zennor Quoit
County	Cornwall
District	Penwith
Parishes	Zennor
Map Reference	Access at Foage Farm SW46483756
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

The location of the site is shown on *Map 1*.

1.2 Summary description

Area	20.19ha
Altitude	190 – 220m AOD
Aspect	The Zennor Quoit survey site is named after the prehistoric burial chamber which is found outside the survey site boundary near SW468379. For the remainder of this report Zennor Quoit refers to the survey site. Zennor Quoit is located about 1.5km to the south east of Zennor. It has a south western aspect and forms part of the northern side of the valley which runs through Zennor itself. The north western end of the site is flat-topped.

Drainage	There is one small stream running along the south western edge of the site, and a drainage ditch beside the road leading up to Foage Farm. The flat-topped north western end of the site is poorly drained and was waterlogged during the site visits.

1.3 Access

Zennor Quoit is a remote area of species-poor moorland, which is little used for recreational purposes. There is a footpath through the site, which does not appear to lead anywhere. There is also a track which runs past the eastern edge of the site northwards to the Zennor Quoit monument and Zennor Hill.

1.4 Tenure

The site is owned by the National Trust and managed by a tenant farmer in partnership with the National Trust.

2 Biological Description

Zennor Quoit is part of a much larger area of continuous heathland and should be considered in the context of its surroundings. This heathland extends to the east over Amalveor Downs, to the north east to Zennor Hill and to the north towards Sperris Quoit and beyond. The whole site is cattle grazed and there were numerous cattle trackways criss-crossing the bracken slopes in particular. There was little evidence of rabbit grazing, however, a rabbit was seen and a few droppings encountered on rock outcrops.

2.1 Habitats

There are five main habitats present within the site: bracken, dry heath, humid heath, scrub and acid grassland. Minor habitats include running water and Cornish hedges. There were very few trees and shrubs present (almost all on boundary hedges and all stunted).

The National Vegetation Classification (NVC) communities identified during the survey are described below their distribution is shown on *Map 2* in *Appendix 1.* Completed condition assessment forms accompany this report. A list of plant species recorded within each habitat is provided in *Appendix 2*.

The location and reference number of field notes made during the vegetation survey visits are annotated onto *Map 2.* Target notes are appended to this report. Photographs taken during the field visits are included in the text where these are considered useful in illustrating particular points of discussion.

2.1.1 Bracken

Bracken forms the most extensive habitat in the site, occupying most of the steeper slopes, and filling a significant proportion of the surrounding pasture fields. All vegetation stands in which bracken is dominant were mapped as bracken habitat; stands were bramble is co-dominant are assigned to **W25** and treated as scrub (see below). The greater area of bracken occupying gentle slopes around the centre of the site does not readily correspond to any NVC community and is shown as **Mol/Pta** (*Molinia caerulea/Pteridium aquilinum* – purple moor-grass/bracken). Steeper lower slopes support **U20 *Pteridium aquilinum- Galium saxatile* calcifugous grassland.** The extent of both purple moor-grass and bristle bent (*Agrostis curtisii*) in both of these communities would seem to be at least partially attributable to the mild climate of the region[1].

Plate 1 Looking across the bracken/*Molinia* community.

The **Mol/Pta community** is dominated by purple moor-grass and bracken, rarely there is some bramble. Yorkshire fog (*Holcus lanatus*) and common bent (*Agrostis capillaris*) are locally frequent, in places

[1] Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D., & Yeo, M., (2004) *An Illustrated Guide to British Upland Vegetation* & Rodwell, J.S., Dring, J.C., Averis, A.B.G., Proctor, M.C.F., Malloch, A.J.C., Schaminée, J.N.J., & Dargie T.C.D., (2000) Review of coverage of the National Vegetation Classification

exceeding the cover of purple moor-grass. Bristle bent is occasional to locally frequent throughout. There is a limited suite of broadleaved herbs including tormentil (*Potentilla erecta*), heath bedstraw (*Galium saxatile*), goldenrod (*Solidago virgaurea*), common sorrel (*Rumex acetosa*) and wood-sorrel (*Oxalis acetosella*). Western gorse (*Ulex gallii*) is occasional. Although the origin of this community is uncertain in common with other sites where it has been mapped within the West Penwith area (e.g. Carn Galver) it seems likely to be an artefact of past management of humid heath (namely burning).

Plate 2 Close up of the Mol/Pta community.

U20b *Pteridium aquilinum- Galium saxatile* calcifugous grassland, *Vaccinium myrtillus – Dicranum scoparium* sub-community.

Stands with an increased cover of sub-shrubs, in particular Western gorse but also, on close inspection, scattered sprigs of any of heather (*Calluna vulgaris*), bell heather (*Erica cinerea*) and in places locally abundant bilberry (*Vaccinium myrtillus*) have been mapped as **U20b.** This community is noted within the NVC as commonly intervening in the absence of further management following the burning of heathland and it is likely to share similar origins to the **Mol/Pta** community described above.

2.1.2 Dry heath

There are three blocks of dry dwarf heath habitat across the north-western half of Zennor Quoit. Typically, dry dwarf heath is characterised by a tall, closed, dwarf shrub canopy dominated by Western gorse (*Ulex gallii*), within which ling (*Calluna vulgaris*) and bell heather (*Erica cinerea*) can both be abundant. Purple moor-grass (*Molinia caerulea*), bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticosus*) occur in trace amounts.

Plate 3 The Dry Heath H8a community near the top of the slope of Zennor Quoit.

The dry dwarf heath habitat at Zennor Quoit is the least cattle-grazed community due to the impenetrable nature of the tall Western gorse. It is also the most species-poor community because the dense gorse and heather cover crowds out most other species apart from small amounts of grass, bracken and bramble. Due to the inaccessible nature of this community the sample points were all around the fringes and were, in consequence, more species-rich than the interior of the stand.

Analysis of the quantitative sample data for this heath vegetation showed a generally close match with descriptions for **H8a species-**

poor sub-community of *Calluna vulgaris – Ulex gallii* heath.

2.1.3 Humid heath

Humid heath occupies the higher, generally flat-topped, parts of Zennor Quoit. This heath community has a high grass coverage, dominated either by purple moor-grass (*Molinia caerulea*) or bristle bent (*Agrostis curtisii*) with ericoids of variable frequency whilst ling (*Calluna vulgaris*) is the most common. Between the hummocks of Western gorse (*Ulex gallii*) and heathers the number of species increases with the addition of sedges, bryophytes and plants such as lousewort (*Pedicularis sylvatica*).

Humid heath is the dominant heathland habitat. It all consists of the H4, Ulex gallii – Agrostis curtisii heath and can be sub-divided into two distinct sub-communities: **H4a, *Agrostis curtisii-Erica cinerea* sub-community** and **H4c, *Erica tetralix* sub-community**.

H4a, *Agrostis curtisii-Erica cinerea* sub-community of *Ulex gallii – Agrostis curtisii* heath.

The H4a habitat all occurs at the north eastern end of Zennor Quoit sandwiched between the two tumuli in a slightly sloping area. It is a cattle-grazed community and is in very good condition. This sub-community is characterised by a high coverage of bristle bent (Agrostis curtisii) with purple moor-grass (Molinia caerulea) and common bent-grass (Agrostis capillaris) frequent. At Zennor Quoit the coverage of heathers and Western gorse (Ulex gallii), was less than half the total area.

Plate 4 The H4a habitat showing the dominance of grasses especially purple moor-grass (*Molinia caerulea*) and bristle bent (*Agrostis curtisii*).

H4c, *Erica tetralix* sub-community of *Ulex gallii – Agrostis curtisii* heath.

This is the most varied humid heath at Zennor Quoit and occupies the flat areas at the top of the site. The terrain was hummocky with the heathers and Western gorse (*Ulex gallii*) dominating the hummocks and a more diverse flora filling in the interstices. Purple moor-grass (*Molinia caerulea*) frequently protrudes through the woody plants in abundance and bristle bent (*Agrostis curtisii*) was more frequent in between the hummocks. There were no signs of fire and the amount of cattle grazing appeared to diminish in the north easterly direction, however, this community was in very good condition. H4c is characterised by a high coverage of Western gorse (*Ulex gallii*), ling (*Calluna vulgaris*), and an abundance of purple moor-grass (*Molinia caerulea*) and frequent cross-leaved heath (*Erica tetralix*). Bristle bent (*Agrostis curtisii*) was much reduced and deergrass (*Trichophorum cespitosum* subsp. *germanicum*) was only found in trace amounts in the wetter areas. Bell heather (*Erica cinerea*) was much less frequent than in the H4a community.

Plate 5 Looking across the H4a stand towards Zennor.H4c, *Erica tetralix* sub-community of *Ulex gallii – Agrostis curtisii* heath.

Plate 6 Looking north-eastwards across the H4c stand.

2.1.4 Dry Acid Grassland

Grassland within the survey area is predominantly found within a series of grazed and/ or cut fields around the perimeter of the site. Most are small and irregularly shaped and would appear to be of ancient origin. Swards, ultimately won from the surrounding heath, are of a type characteristic of poorer quality grazing land over acid soils peripheral to moorland areas in the South West. Although not quantitatively sampled common bent dominates, often with sweet vernal grass and generally with varying amounts of Yorkshire fog. Frequent associates are few but tormentil and common sorrel are typical. The occasional occurrence of more competitive dicot herbs, such as creeping buttercup (*Ranunculus repens*) and white clover (*Trifolium repens*) is suggestive of **U4b *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland the *Holcus lanatus – Trifolium repens* sub-community.**

Accurate assessment of grassland at this time of year can be difficult; in particular crested dog's-tail (*Cynosurus cristatus*) a species key to separating **U4b** from **MG6** is hard to spot, even more so where swards

are cut and/ or grazed. Nonetheless, limited quantitative assessment of these swards supports their assignment to U4b grassland. Unfortunately, these data that were collected from the pastures at Zennor Quoit were lost.

2.1.5 Continuous scrub

Three types of scrub have been mapped around the western fringes of the site where they occur at times in coarse mosaic with one another over disturbed ground.

The **W25b *Pteridium aquilinum - Rubus fruticosus underscrub, Teucrium scorodonium* sub-community** consisted of stands of ostensible bracken habitat but in which upon inspection bramble was frequent to co-dominant with wood sage (*Teucrium scorodonia*) often present. Few associates are found beneath the areas with the densest bracken and bramble canopy, however, in the more open areas the ground cover is much richer, and at this site was considerably more species-rich than the **Mol/Pta** community, probably because many of the sample points were in more heavily grazed areas.

Plate 7 A view across a stand of W25b vegetation; looking towards Zennor Hill.

Common bent-grass (*Agrostis capillaris*) was frequently found beneath the bracken, often accompanied by Yorkshire fog (*Holcus lanatus*) and

creeping soft-grass (*Holcus mollis*) in the more open areas. Purple moor-grass (*Molinia caerulea*) was a rarity. The broadleaved herbs (forbs) included foxglove (*Digitalis purpurea*), honeysuckle (*Lonicera periclymenum*), tormentil (*Potentilla erecta*), greater stitchwort (*Stellaria holostea*) and common sorrel (*Rumex acetosa*). Scaly male-fern (*Dryopteris dilatata*) was occasionally seen. Red campion (*Silene dioica*) and goldenrod (*Solidago virgaurea*) were found more locally.

Plate 8 Close up of W25b vegetation.

Where European gorse comes to the fore stands are assigned as **W23c *Ulex europaeus – Rubus fruticosus* scrub, *Teucrium scorodonia* sub-community.** Here European gorse dominates, the height and density of the canopy limits the number of associate species. Bramble is generally the only other constant; bracken can be locally abundant, Atlantic ivy and wood sage are frequent, the last of which is preferential for this sub-community.

There was one further area of continuous scrub which consisted of a dense, stunted and gnarled blackthorn (*Prunus spinosa*) copse at the south western end of the site. A stream runs through the copse and at the eastern end of the track, beneath the blackthorn, there was, what

looked like, a badger sett. Very little grew under the very dense canopy, whilst the blackthorn itself carried a very profuse lichen flora. The following plant species were found beneath the blackthorn; lady fern (*Athyrium filix-femina),* scaly male-fern *(Dryopteris affinis),* broad buckler-fern *(Dryopteris dilatata),* ground-ivy *(Glechoma hederacea),* wood-sorrel *(Oxalis acetosella),* polypody *(Polypodium* agg.*),* bracken *(Pteridium aquilinum),* bramble *(Rubus fruticosus* agg.*),* sorrel *(Rumex acetosa),* chickweed *(Stellaria media),* pennywort *(Umbilicus rupestris)* and common violet (*Viola riviniana)*. This area of scrub belongs in the NVC community **W22a Prunus spinosa-Pteridium aquilinum scrub the *Hedera helix – Silene dioica* sub-community**. It was too small an area to be sampled.

Plate 9 The heavily lichen-encrusted blackthorn scrub.

2.1.6 Running water

Running water is an insignificant feature of the site. There is one stream running down from Trewey Common which passes through the blackthorn copse, and there is a drainage ditch beside the road leading up to Foage Farm. There were also two places above the farm where the National Trust had engineered granite structures to divert runoff

across the footpath.

2.1.7 Earth and stone banks

The majority of Earth and stone banks were Cornish hedges. A few were merely earth banks. They divide up the site into (pre)historic fields and mark the boundaries of the Zennor Quoit site. The hedges that are still in use to contain cattle are generally in good repair and many of these were supplemented by post and wire fencing. There were quite a few remnant hedges, which once must have divided up the site into much smaller enclosures. None of the boundaries were assessed as part of the NVC survey, with communities in most cases likely to reflect those of adjacent habitats.

2.2 Species

2.2.1 Vascular plants

The Habitat survey in October 2012 recorded a total of 90 vascular plant species. No plant species carrying a rarity designation (i.e. RDB, BAP or NS) were found. However, notable plant species within the 1km squares (SW4637 and SW4737) that encompass Zennor Quoit include ivy-leaved bellflower (*Wahlenbergia hederacea*) and lanceolate spleenwort (*Asplenium obovatum* subsp. *lanceolatum*). Whilst not seen, both these species could be present on site; the former in the wetter marshy heath and the latter on Cornish hedges.

3 Condition Assessment

3.1 Dry Heath (H8a)

Twenty samples were taken form within areas of dry heath across the site.

This community was condition assessed as unfavourable as it fails mandatory attributes for vegetation structure and composition. The canopy lacks pioneers and appears over-mature. Shrubs in general are over-represented and there is more than the prescribed maximum 50% of gorse cover. The closed canopy provides little opportunity for associated species to become established and in consequence there is also a lack of desirable forbs and graminoids.

As with other sites these are presumably facets associated with a lack of management. Controlled burning and extensive grazing would be expected to introduce more variety into the sward.

3.2 Humid heath (H4)

Twenty samples were taken form within areas of humid heath across the site.

The community was observed to be generally in good condition during the survey. Cattle grazing seems to be creating a good range of sub-communities and micro-habitats with variation in age structure and height across the site.

Despite this, on the basis of CSM samples the community must be assessed as unfavourable there being a lack of desirable forbs and the compulsory attribute for vegetation composition consequently being failed. It is considered to be recovering nevertheless.

3.3 Acid grassland

No condition assessment of acid grassland areas at Zennor Quoit was carried out, though based on the extent of these habitats this would

appear to be required. A condition assessment of areas of acid grassland at Zennor Quoit will be carried out at the earliest opportunity in 2013 with the findings provided as an addendum to this report.

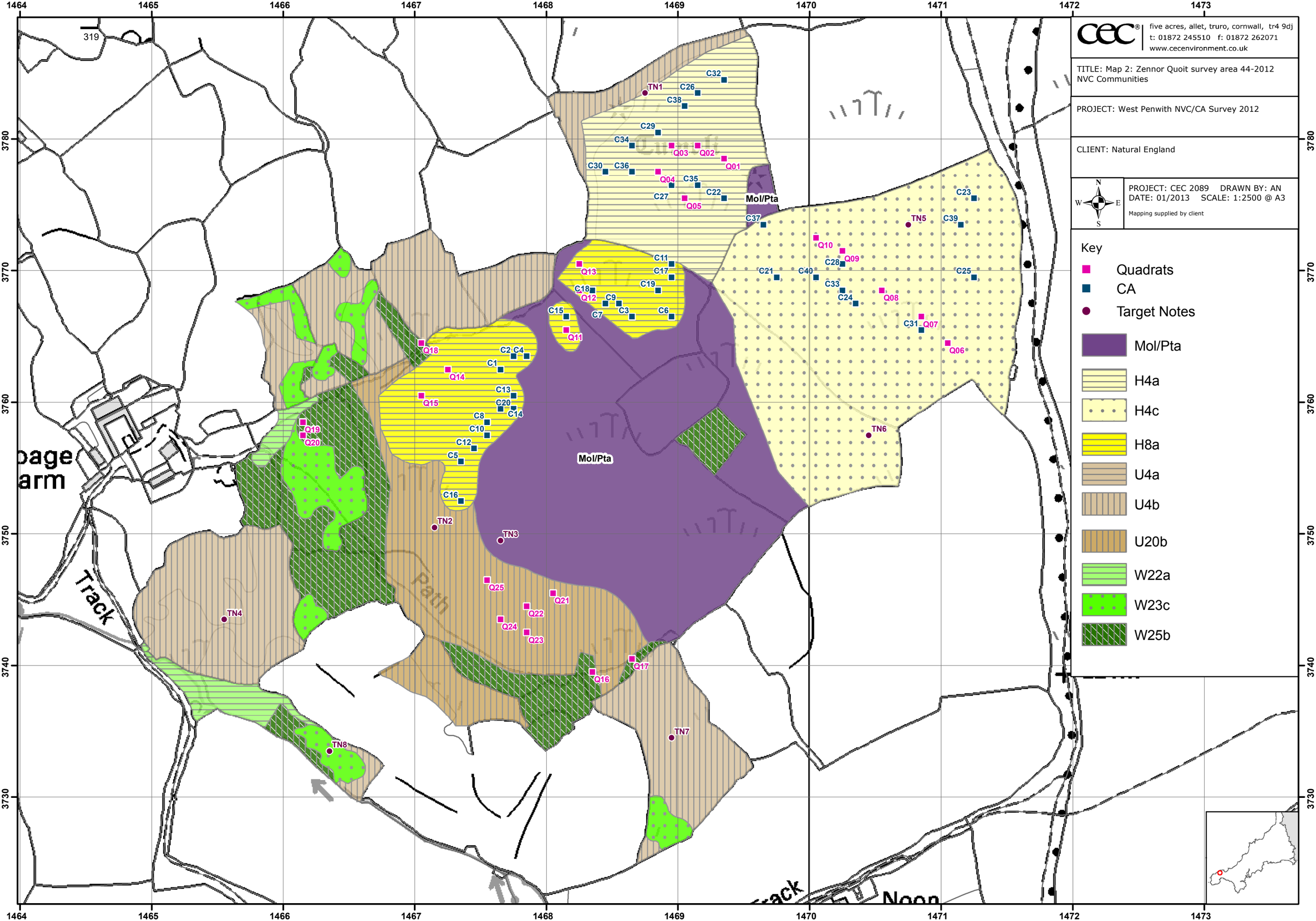
Table 1 Summary of habitats and vegetation communities

Zennor Quoit 44-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W22a	N/A	0.32	N/A	N/A
	W23c	N/A	0.83		
	W25b	N/A	1.74		
Acid grassland	U4b	N/A	3.51	TBD	Lowland dry acid grassland 3.51
Bracken	U20b	N/A	2.07	N/A	N/A
Dry heath	H8a	N/A	1.56	UFNC?	Lowland heathland 7.44
	H4a	N/A	1.74	UFNC?	
Humid heath	H4c	N/A	4.14	UFR	
Mire	Mol/Pta	N/A	4.28	N/A	N/A
Total Area Mapped		N/A	20.19		

Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD), To be done (TBD)

Appendix 1

Maps (1: Location, 2: NVC, 3: BAP habitat) See separate sub-folder on CD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3730
319
Mol/Pta
Mol/Pta
Track
Path
TN1
TN2
TN3
TN4
TN5
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TN7
TN8
Q01
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five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2: Zennor Quoit survey area 44-2012
NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
N
W
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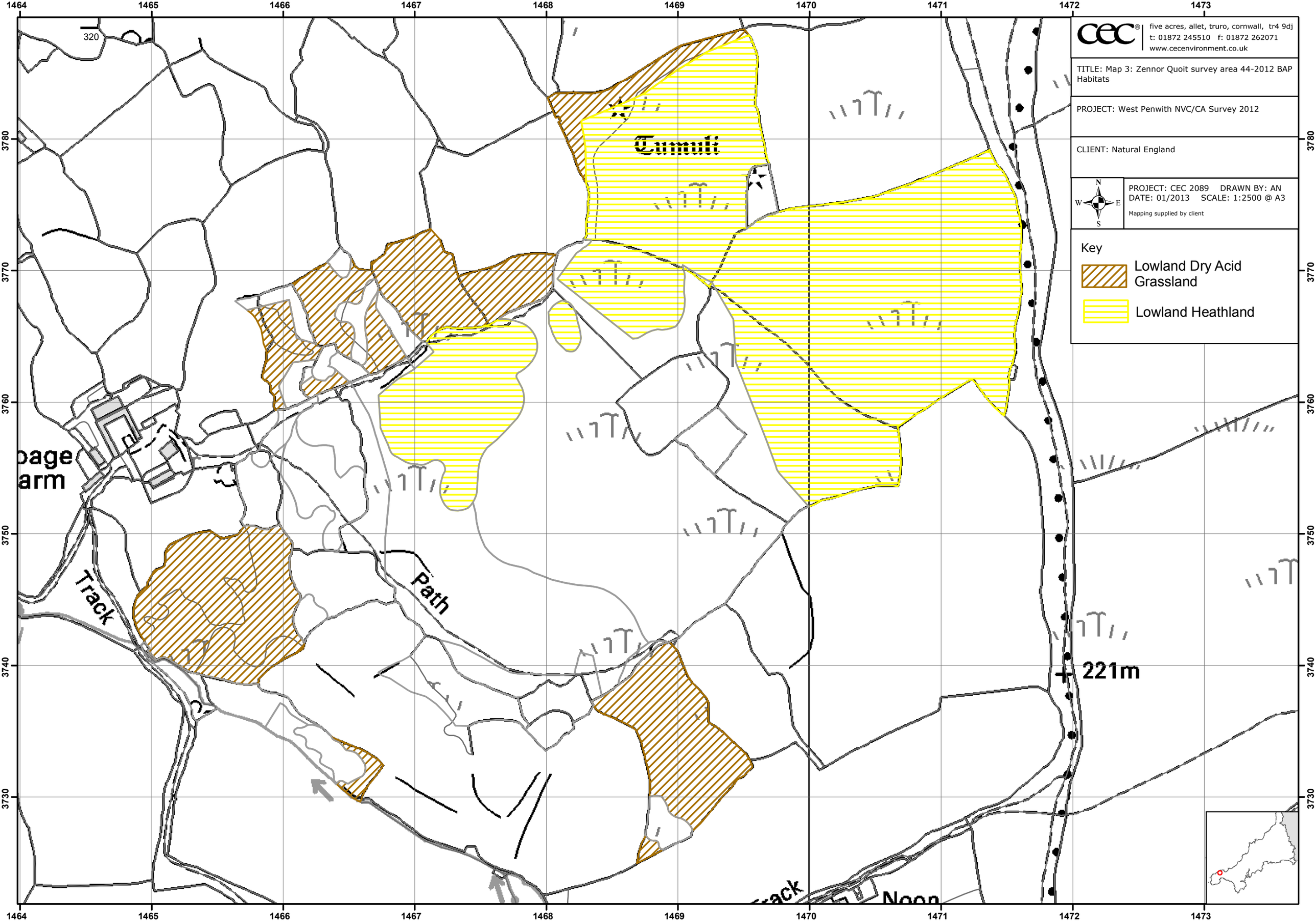
S
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mol/Pta
H4a
H4c
H8a
U4a
U4b
U20b
W22a
W23c
W25b



cec®
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk

TITLE: Map 3: Zennor Quoit survey area 44-2012 BAP Habitats

PROJECT: West Penwith NVC/CA Survey 2012

CLIENT: Natural England

PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3

Mapping supplied by client

Key

- Lowland Dry Acid Grassland
- Lowland Heathland

Map 2 Target Notes Zennor Quoit (Survey Area 44 – 2012)

TN. No.	Grid Ref.	Text
1	SW46883784	A heathy area of species-rich grassland with several large patches dominated by devil's bit scabious (*Succisa pratensis*).
2	SW467253650	This was an area dominated by European gorse (*Ulex europaeus*), which was too small to map. European gorse was confined to the lower parts of Zennor Quoit.
3	SW46763749	There were patches of W25b *Pteridium aquilinum* - *Rubus fruticosus* underscrub, *Teucrium scorodonium* sub-community within the Bracken/*Molinia* community as well as isolated Western gorse (*Ulex gallii*) bushes.
4	SW46553744	A pasture field which is dominated by grass with much bracken dotted about.
5	SW47083774	The humid heath gets increasingly wet in the direction of the arrow and small amounts of deergrass (*Trichophorum cespitosum subsp. germanicum*) start appearing.
6	SW47053757	The humid heath gets increasingly taller and drier in the direction of the arrow.
7	SW44903735	This field comprises about 60% grass and 40% bracken/bramble with small occasional Western gorse bushes dotted about.
8	SW46643734	This area is a mixture of European gorse (*Ulex europeaus*) and grass.

Appendix 2 Species List - vascular and non-vascular plants

Species name	Common name	Wet Heath	Dry Heath	Bracken	Earth Stone Bank	Pasture
Agrostis capillaris	Common Bent-grass	O		LA	F	F/LA
Agrostis curtisii	Bristle Bent	F		O	O/LF	
Arrhenatherum elatius	False Oat-grass				LF	O
Athyrium filix-femina	Lady-fern				O	R
Blechnum spicant	Hard-fern				F	
Calluna vulgaris	Ling	LA	LF	R	LF	
Carex binervis	Green-ribbed Sedge	F				O
Carex panicea	Carnation Sedge	F				
Centaurea nigra	Common Knapweed			R	O	O
Cerastium fontanum subsp. *vulgare*	Common Mouse-ear Chickweed					O/LF
Cerastium glomeratum	Sticky Mouse-ear					O
Cirsium arvense	Creeping Thistle					O/LF
Cirsium palustre	Marsh Thistle					O
Cirsium vulgare	Spear Thistle					O
Crataegus monogyna	Hawthorn				R	
Crepis capillaris	Smooth Hawk's-beard				O	O
Cynosurus cristatus	Crested Dog's-tail					O

Species name	Common name	Wet Heath	Dry Heath	Bracken	Earth Stone Bank	Pasture
Dactylis glomerata	Cock's-foot			R		O
Dactylorhiza maculata subsp. *ericetorum*	Heath Spotted-orchid	R				
Digitalis purpurea	Foxglove			O	O/LF	R
Dryopteris aemula	Hay-scented Buckler-fern				O	R
Dryopteris affinis	Scaly Male-fern				O	R
Dryopteris dilatata	Broad Buckler-fern		R	O	O	R
Erica cinerea	Bell Heather	F	LF		LF	
Erica tetralix	Cross-leaved Heath	LF				
Festuca rubra agg.	Red Fescue				F/LA	
Galium saxatile	Heath Bedstraw	R		O	O/LF	O/LF
Geranium dissectum	Cut-leaved Crane's-bill					O
Geranium robertianum	Herb-Robert					R
Glechoma hederacea	Ground-ivy					LF
Hedera helix subsp. *hibernica*	Atlantic Ivy			LF	O/LF	R
Heracleum sphondylium	Cow Parsnip			R		O
Hieracium umbellatum	Narrow-leaved Hawkweed			R	LF	
Holcus lanatus	Yorkshire-fog			LA	LF	LF
Holcus mollis	Creeping Soft-grass			LF	F/LA	O/LF
Hypericum pulchrum	Slender St John's-wort				O	
Hypochaeris radicata	Cat's-ear	O			O	O

Species name	Common name	Wet Heath	Dry Heath	Bracken	Earth Stone Bank	Pasture
Ilex aquifolium	Holly			R		
Jasione montana	Sheep's-bit				O/LF	R
Juncus bufonius	Toad Rush					LF
Juncus effusus	Soft-rush					LF
Lolium perenne	Perennial Rye-grass					O
Lonicera periclymenum	Honeysuckle			O	O	R
Lotus pedunculatus	Greater bird's-foot-trefoil				O	O
Malus domestica	Eating Apple				R	
Molinia caerulea	Purple Moor-grass	A	R	LA	O/LF	
Oxalis acetosella	Wood-sorrel			O	O/LF	
Pedicularis sylvatica	Lousewort	O				
Persicaria hydropiper	Water-pepper					LF
Plantago lanceolata	Ribwort Plantain					O/LF
Plantago major	Greater Plantain					LF
Poa annua	Annual Meadow-grass					O
Polygala vulgaris	Common Milkwort	R				
Polypodium sp.	Polypody Unidentified				O	
Potentilla anserina	Silverweed					LF
Potentilla erecta	Common Tormentil	F		O	R	
Prunella vulgaris	Selfheal					O

Species name	Common name	Wet Heath	Dry Heath	Bracken	Earth Stone Bank	Pasture
Prunus spinosa	Blackthorn				O/LA	
Pteridium aquilinum	Bracken	R	R	LD	LF	O/LF
Ranunculus repens	Creeping Buttercup	R				F
Rubus fruticosus agg.	Blackberry	R	R	LD	LF	O
Rumex acetosa	Common Sorrel			O	F	O/LF
Rumex acetosella	Sheep's Sorrel				O	O
Rumex crispus	Curled Dock					O
Rumex obtusifolius	Broad-leaved Dock					O
Salix cinerea subsp. *oleifolia*	Grey Willow				O/LF	
Sambucus nigra	Elder				O	
Sedum anglicum	English Stonecrop				O	
Senecio jacobaea	Common Ragwort					O
Silene dioica	Red Campion			R	O	R
Solidago virgaurea	Goldenrod			R		
Sonchus asper	Prickly Sow-thistle					O
Stachys officinalis	Betony				LF	
Stachys sylvatica	Hedge Woundwort				O	
Stellaria holostea	Greater Stitchwort			O	LF	
Stellaria media	Common Chickweed					O
Succisa pratensis	Devil's-bit Scabious	R			O	O

Species name	Common name	Wet Heath	Dry Heath	Bracken	Earth Stone Bank	Pasture
Taraxacum officinale agg.	Common Dandelion					O
Teucrium scorodonia	Wood Sage			O	LF	
Trichophorum cespitosum subsp. *germanicum*	Deergrass	R				
Trifolium pratense	Red Clover					O
Trifolium repens	White Clover					LF
Ulex europaeus	Gorse				LF	
Ulex gallii	Western Gorse	F	D	R	LF	
Umbilicus rupestris	Pennywort				O	
Urtica dioica	Common Nettle					O/LF
Vaccinium myrtillus	Bilberry			O	O/LF	
Veronica chamaedrys	Germander Speedwell					LF
Veronica serpyllifolia	Thyme-leaved Speedwell					O
Viola riviniana	Common Violet			R	LF	

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, LF = Locally Frequent

Appendix 3 NVC quadrat data and Photos

See Zennor Quoit subfolder on West Penwith CD for quadrat data, quadrat photos and other site photos.

Survey	Zennor Quoit					Recorder	CF		Date	24&25/10/12	
Vegetation type			U20b			Vegetation Type	H4d				
Species	**Q21**	**Q22**	**Q23**	**Q24**	**Q25**	**Species**					
Agrostis capillaris	3	3	3	5	4						
Molinia caerulea	9	9	9	8	9						
Pteridium aquilinum	4	6	7	7	7						
Teucrium scorodonia	1	1	1	2	1						
Rubus fruticosus agg.		1	1		1						
Rumex acetosa			1	1	1						
Stellaria holostea		1	1		1						
Hedera helix subsp. hibernica	1	1									
Oxalis acetosella		2		3							
Agrostis curtisii	3										
Lonicera periclymenum					2						
Potentilla erecta	1										
Bare ground											

Quadrats

	Q21	Q22	Q23	Q24	Q25
Grid. ref.	SW46803745	SW46783744	SW46783742	SW46763743	SW46753746
Photo. No.					
NVC method					
Slope	Moderate	Moderate	Moderate	Moderate	Moderate
Aspect	SW	SW	SW	SW	SW
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	30cm - 1m	30cm - 1m	30cm - 1m	30cm - 1m	30cm - 1m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

Survey	Zennor Quoit					Recorder		CF		Date	24&25/10/12
Vegetation type			W25b								
Species	Q16	Q17	Q18	Q19	Q20	Species	1	2	3	4	5
Pteridium aquilinum	7	6	7	6	6						
Rubus fruticosus agg.	8	9	9	9	9						
Agrostis capillaris		2	3	3							
Holcus lanatus	2				3						
Holcus mollis	3	3									
Lonicera periclymenum			3		1						
Oxalis acetosella	1				1						
Rumex acetosa	2				2						
Silene dioica				2	1						
Stellaria holostea			2	1							
Dryopteris dilatata					1						
Heracleum sphondylium				1							
Teucrium scorodonia			2								
Ulex gallii			2								
Bare ground											

	Quadrats				
	Q16	Q17	Q18	Q19	Q20
Grid. ref.	SW46833739	SW46863740	SW46703764	SW46613758	SW46613757
Photo. No.					
NVC method					
Slope	Slight - Moderate	Slight - Moderate	Slight - Moderate	Slight - Moderate	Slight - Moderate
Aspect	SW	SW	SW	SW	SW
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	60cm - 1.2m	60cm - 1.2m	60cm - 1.2m	60cm - 1.2m	60cm - 1.2m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

Survey	Zennor Quoit					Recorder	CF		Date	24&25/10/12	
Vegetation type	H4a										
Species	Q1	Q2	Q3	Q4	Q5	Species	1	2	3	4	5
Agrostis curtisii	8	5	3	6	4						
Erica cinerea	5	1	4	5	4						
Molinia caerulea	6	7	4	7	4						
Ulex gallii	5	7	8	7	8						
Potentilla erecta	2	2	1	1							
Calluna vulgaris	3	5		3							
Pedicularis sylvatica				1							
Polygala vulgaris	1										
Pteridium aquilinum	2										
Bare ground											

	Quadrats				
	Q1	Q2	Q3	Q4	Q5
Grid. ref.	SW46933778	SW46913779	SW46893779	SW46883777	SW46903775
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	SW	SW	SW	SW	SW
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	15cm - 45cm	15cm - 45cm	15cm - 45cm	15cm - 45cm	15cm - 45cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

Survey	Zennor Quoit					Recorder	CF		Date	24&25/10/12	
Vegetation type	H4c										
Species	Q6	Q7	Q8	Q9	Q10	Species	Q3	Q5	Q7	Q9	Q14
Agrostis curtisii	4	3	4	5	5						
Calluna vulgaris	8	8	7	7	8						
Carex panicea	3	3	2	3	3						
Molinia caerulea	7	7	7	6	4						
Pedicularis sylvatica	1	1	1	1	1						
Potentilla erecta	1	2	3	2	1						
Ulex gallii	1	4	5	6	1						
Carex binervis	2	1	2	2							
Erica tetralix		3	2	3	4						
Hypochaeris radicata			1	1	1						
Agrostis capillaris	1			1							
Erica cinerea		1	1								
Succisa pratensis	1										
Bare ground											

	Quadrats				
	Q6	Q7	Q8	Q9	Q10
Grid. ref.	SW47103764	SW47083766	SW47053768	SW47023771	SW47003772
Photo. No.					
Survey method					
Slope	Flat	Flat	Flat	Flat	Flat
Aspect					
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	10cm - 45cm	10cm - 45cm	10cm - 45cm	10cm - 45cm	10cm - 45cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

Survey	Zennor Quoit					Recorder	CF		Date	15,16&17/10	
Vegetation type	H8a										
Species	Q11	Q12	Q13	Q14	Q15	Species	1	2	3	4	5
Ulex gallii	9	10	9	9	8						
Calluna vulgaris	3	3		5	5						
Pteridium aquilinum	2		1	2	2						
Rubus fruticosus agg.	1			1	2						
Erica cinerea	4		5								
Molinia caerulea		1		1							
Teucrium scorodonia					2						
Bare ground											

	Quadrats				
	Q11	Q12	Q13	Q14	Q15
Grid. ref.	SW46813765	SW46823768	SW46823770	SW46723762	SW46703760
Photo. No.					
NVC method					
Slope	Slight - Moderate	Slight - Moderate	Slight - Moderate	Slight - Moderate	Slight - Moderate
Aspect	SW	SW	SW	SW	SW
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	1.2m - 1.5m	1.2m - 1.5m	1.2m - 1.5m	1.2m - 1.5m	1.2m - 1.5m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

TREWEY COMMON (Survey Area 47 – 2012)

Condition Assessment surveyor	Colin French	Dates surveyed	15th, 16th & 17th October 2012
NVC surveyor	Colin French	Date surveyed	15th, 16th & 17th October 2012
Report compiled by	Colin French	18th and 19th October 2012	

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Trewey Common
County	Cornwall
District	Penwith
Parishes	Zennor
Map Reference	Access at SW46833666
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

The location of the site is shown on *Map 1*.

1.2 Summary description

Area	30.19ha
Altitude	190 – 220m AOD
Aspect	Trewey Common is located about 2km to the south east of Zennor at the head of the valley which runs through Zennor itself. The highest point is in the south. From that flat topped point it slopes in a northerly to north-easterly direction down to the Zennor valley which bisects the eastern third of the site and fans out in north-westerly direction. Slopes throughout the site are generally gentle becoming moderately steep on the valley sides.

Drainage	There are a number of very small streams running in the ditches which occur alongside the Cornish hedges that extend down slope. The largest of these small streams exits the site at SW46783701.

1.3 Recreational Use

Trewey Common is a remote area of species-poor heathland, which is rarely used for recreational purposes. There is a footpath along the southern boundary of the site, which is used by local dog-walkers and intrepid hikers. The nearest safe place to park a car to that footpath is over a kilometre away near Higher Kerrowe, consequently Trewey Common is likely to remain little visited.

1.4 Tenure

The site is owned by the National Trust and managed by a tenant farmer in partnership with the National Trust.

2 Biological Description

Plate 1 Looking westwards across Trewey Common from the eastern end of the site.

Trewey Common is part of a much larger area of continuous heathland and should be considered in the context of its surroundings. Immediately to the west there is another block of heathland, which leads down towards the conspicuous remains of Trewey Downs Mine - an area of rough pasture of conservation interest. At the other end of the site the heathland extends in a south-easterly direction towards Lady Downs and in a north-easterly direction onto Amalveor Downs. There are also pockets of heathland outside the site boundary to the south. The whole site is cattle grazed and there are several large fire-breaks/tracks cutting through blocks of heath or running around their outer edge.

2.1 Habitats

There are four main habitats present within the site: bracken, dry heath, humid heath and scrub. Other, minor, habitats occur such as dry acid grassland, running water, pasture mosaic and Cornish hedges. There were very few trees and shrubs present (mostly on boundary hedges) and only one alien plant was found (a single *Cotoneaster simonsii* bush). The National Vegetation Classification (NVC) communities are described in more detail below and their distribution within the site is shown on *Map 2* in *Appendix 1*. A list of plant species recorded within each habitat is provided in *Appendix 2*. The NVC quadrat data is located in *Appendix 3*; completed CSM forms also accompany this report.

The location and reference number of field notes made during the vegetation survey visits are annotated onto *Map 2* and are appended to this report. Photographs taken during the three field visits are included in the text where these are considered useful in illustrating particular points of discussion.

2.1.1 Bracken

Vegetation stands in which bracken is dominant were mapped as bracken habitat. Areas where bracken is co-dominant with bramble (*Rubus fruticosus*) are treated as scrub (see below).

Areas of bracken have been assigned to **U20 *Pteridium aquilinum-Galium saxatile* calcifugous grassland.** The most extensive areas are found to the west of the site over moderate sloping ground giving way to dry heath to the east, further stands are found along the northern site perimeter. Typically the covering of bracken appears super-imposed over an acid grassland ground flora, this type of habitat is best placed within **U20a** the ***Anthoxanthum odoratum* sub-community.** Within this community both common bent-grass (*Agrostis capillaris*) and sweet vernal grass (*Anthoxanthum odoratum*) can be locally abundant, Yorkshire fog (*Holcus lanatus*) and bristle bent (*Agrostis curtisii*) are occasional/ locally frequent. There is a limited suite of accompanying broadleaved herbs including tormentil (*Potentilla erecta*), heath bedstraw (*Galium saxatile*), goldenrod (*Solidago virgaurea*), common sorrel (*Rumex acetosa*), and more locally wood-sorrel (*Oxalis acetosella*) and common violet (*Viola riviniana*).

Plate 2 Close up of U20a community.

2.1.2 Dry heath

There are four blocks of dry heath habitat across the northern half of Trewey Common. Typically, dry heath is characterised by a tall, closed, dwarf shrub canopy dominated by Western gorse (*Ulex gallii*), within which ling (*Calluna vulgaris*) and bell heather (*Erica cinerea*) can both be abundant. Purple moor-grass (*Molinia caerulea*) and cross-leaved heath (*Erica tetralix*) occur in trace amounts. The dry heath habitat at Trewey Common is the least cattle grazed community due to the impenetrable nature of the tall Western gorse. It is also the most species-poor community because the dense gorse and heather cover crowds out most other species apart from small amounts of grass, bracken and bramble. Due to the inaccessible nature of this community the sample points were all around the fringes and were, in consequence, more species-rich than the interior of the stand.

Analysis of the quantitative sample data for this heath vegetation showed a generally close match with descriptions for **H8a species-poor sub-community of *Calluna vulgaris – Ulex gallii* heath**.

Plate 3 The Dry Heath H8a community at the western end of Trewey Common.

2.1.3 Humid heath

Humid heath is the dominant heathland habitat within the site. It consists of the **H4, *Ulex gallii – Agrostis curtisii* heath** NVC community and can be further sub-divided into three distinct NVC sub-communities: **H4a *Agrostis curtisii-Erica cinerea* sub-community, H4c, *Erica tetralix* sub-community** and **H4d, *Scirpus cespitosus* sub-community**.

H4a, *Agrostis curtisii-Erica cinerea* sub-community of *Ulex gallii – Agrostis curtisii* heath.

This sub-community is characterised by a high coverage of bristle bent (*Agrostis curtisii*) with purple moor-grass (*Molinia caerulea*) and common bent-grass (*Agrostis capillaris*) frequent. At Trewey Common the coverage of heathers and Western gorse (*Ulex gallii*), was low, but they were present throughout.

The H4a habitat all occurs at the eastern end of Trewey Common. Much of this community has been subject to fire in the past as many charred remains of western gorse twigs were found. This community is probably still recovering from the fire hence the relatively low amounts of heathers found. It is a cattle-grazed community and appeared to be in very good condition

Plate 4 The H4a habitat showing the dominance of bristle bent (*Agrostis curtisii*) with only a trace of heathers and Western gorse (*Ulex gallii*).

H4c, *Erica tetralix* sub-community of *Ulex gallii – Agrostis curtisii* heath.

H4c is characterised by a high coverage of Western gorse (*Ulex gallii*), ling (*Calluna vulgaris*), and an abundance of purple moor-grass (*Molinia caerulea*) and cross-leaved heath (*Erica tetralix*). Bristle bent (*Agrostis curtisii*) was virtually absent, as was deergrass (*Trichophorum cespitosum* subsp. *germanicum*). Bell heather (*Erica cinerea*) was of frequent occurrence.

This is the most species-poor humid heath at Trewey Common with a typically closed cover of heathers and western gorse (*Ulex gallii*) with purple moor-grass (*Molinia caerulea*) frequently protruding through the woody plants in abundance. Little sign of cattle grazing was found in this community, although there was easy access for the cattle. It may well be the case that, having free range over the whole site, the cattle favour the areas with more palatable grasses and so have little impact on the H4c stands. To improve the condition of this community further, perhaps there should be times when the cattle are forced to graze the H4c areas by judicious use of electric fencing.

Plate 5 Looking across an H4c stand towards Zennor.

H4d, *Scirpus cespitosus* (*Trichophorum cespitosum* subsp. *germanicum*) sub-community of *Ulex gallii – Agrostis curtisii* heath.

H4d occurs in the wetter areas and had more of a hummocky terrain, with the hummocks characterised by a high coverage of purple moor-grass (*Molinia caerulea*) and cross-leaved heath (*Erica tetralix*), Western gorse (*Ulex gallii*), ling (*Calluna vulgaris*) and bristle bent (*Agrostis curtisii*). Bell heather (*Erica cinerea*) was very rare. Between the hummocks deergrass (*Trichophorum cespitosum* subsp. *germanicum*) and carnation sedge (*Carex panicea*) were locally abundant, and were accompanied by various mosses, a *Sphagnum* species and further ling and cross-leaved heath.

The H4d community is the wettest of the three H4 communities at Trewey Common with hummocks of purple moor-grass (*Molinia caerulea)*, ling (*Calluna vulgaris)*, Western gorse (*Ulex gallii*) and cross-leaved heath (*Erica tetralix*) separated by low lying wet areas with much deergrass (*Trichophorum cespitosum* subsp. *germanicum*), carnation sedge (*Carex panicea*), some mosses and *Sphagnum* in patches. It is the most species rich of the H4 communities at Trewey Common, reflecting the range of microhabitats. Little sign of cattle grazing was found in this community, despite being adjacent to the much cattle-grazed H4a habitat. The greater part of this community was found at the far eastern end of the site at the top of the valley slope above the drier H4a habitat.

Plate 6 H4d stand along the eastern edge of Trewey Common. The visible standing water appeared to be a temporary feature.

2.1.4 Dry acid grassland

Grassland within the survey area is restricted to a single small field surrounded by heath towards the eastern end of the site. Although not sampled the swards was dominated by common bent (*Agrostis capillaries*) with sweet vernal grass (*Anthoxanthum odoratum*) and some Yorkshire fog (*Holcus lanatus*). It is typical of poorer quality grassland won from rough moorland on the upland fringes and treated as **U4a *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland the typical sub-community.**

2.1.5 Scrub

The **W25 *Pteridium aquilinum – Rubus fruticosus* underscrub** consisted of the stands of bracken habitat in which bramble was frequent to co-dominant. The species which differentiate sub-communities of W25, such as wood sage (*Teucrium scorodonia*) and bluebell (*Hyacinthoides non-scripta*) were only very rarely encountered.

In the W25 community bracken and bramble are often co-dominants, although bramble is often subordinate in cover. Few associates are found beneath the areas with the densest bracken and bramble

canopy, however, in the more open areas the ground cover is much richer.

Plate 7 A view across the W25 vegetation from the north eastern-most part of Trewey Common.

Purple moor-grass (*Molinia caerulea*) was frequently found beneath the bracken, often accompanied by Yorkshire fog (*Holcus lanatus*) and common bent-grass (*Agrostis capillaris*) in the more open areas. Bristle bent (*Agrostis curtisii*) was a rarity. The broadleaved herbs (forbs) included foxglove (*Digitalis purpurea*), tormentil (*Potentilla erecta*), and common sorrel (*Rumex acetosa*). Scaly male-fern (*Dryopteris dilatata*) was occasionally seen. Red campion (*Silene dioica*) and goldenrod (*Solidago virgaurea*) were found more locally.

Plate 8 Close up of W25 vegetation.

2.1.6 Running water

Running water is an insignificant feature of the site. There are a few very small streams found within ditches alongside Cornish hedges that are oriented in a down-slope direction, as drainage channels. No aquatic, or typical stream, species were present, although soft rush (*Juncus effusus*) was most commonly associated with these streams.

2.1.7 Earth and stone banks

The majority of earth and stone banks were Cornish hedges. A few were merely earth banks. They divide up the site into (pre)historic fields and mark most of the boundaries of the Trewey Common site. The hedges that are still in use to contain cattle are generally in good repair and many of these were supplemented by post and wire fencing. Some of the hedges, that remain functional, have not been maintained in many years (see plate 9). There were quite a few remnant hedges, particularly at the eastern end of the site, which once must have been divided up into much smaller enclosures.

Plate 9 One of the little maintained Cornish hedges at Trewey Common.

None of the boundaries were assessed as part of the NVC survey, with communities in most cases likely to reflect those of adjacent habitats.

2.1.8 Mosaic

There are two mosaic areas. The first near the track at Mill Downs is a weedy mixture of grassland pasture plants and soft rush (*Juncus effusus*), and the second, in the valley below Noon Veor, is a wet sedge pasture dominated by common bent-grass (*Agrostis capillaris*) with purple moor-grass (*Molinia caerulea*) dotted throughout.

2.2 Species

2.2.1 Vascular plants

The Habitat survey in October 2012 recorded a total of 77 vascular plant species. No species carrying a rarity designation (i.e. RDB, BAP or NS) were found. However, there are recent records for four notable plant species within the 1km grid squares that include Trewey Common, namely: dodder (*Cuscuta epithymum*), ivy-leaved bellflower (*Wahlenbergia hederacea*), chamomile (*Chamaemelum nobile*) and lanceolate spleenwort (*Asplenium obovatum* subsp. *lanceolatum*).

3 Condition Assessment

3.1 Dry Heath (H8)

Twenty samples were condition assessed within areas of this habitat across the site.

The samples fail compulsory attributes for vegetation structure and composition. There is an over-representation of shrubs within the sward and a general absence of Ericoids in the pioneer growth phase and well as an excess of gorse. Purple moor-grass is the only graminoid to be at least occasional and there are insufficient desirable forbs.

Dry heath at Trewey Common is therefore classed as in unfavourable no change and would be expected to benefit from an enhanced programme of management.

3.2 Humid Heath (H4)

Twenty samples were condition assessed within areas of this habitat across the site.

There is one failure among mandatory attributes due to a lack of desirable forbs within the sward. On this basis the community must be considered to be in unfavourable condition. Nevertheless it is actively managed and cattle grazing as well as controlled burning have produced a good range of sub-communities and micro-habitats. On this basis it is assessed as recovering.

3.3 Acid grassland

Though qualifying as a BAP habitat, acid grassland represents a very minor component of the vegetation communities at Trewey Common and as such, no condition assessment was carried out

Table 1 Summary of habitats and vegetation communities

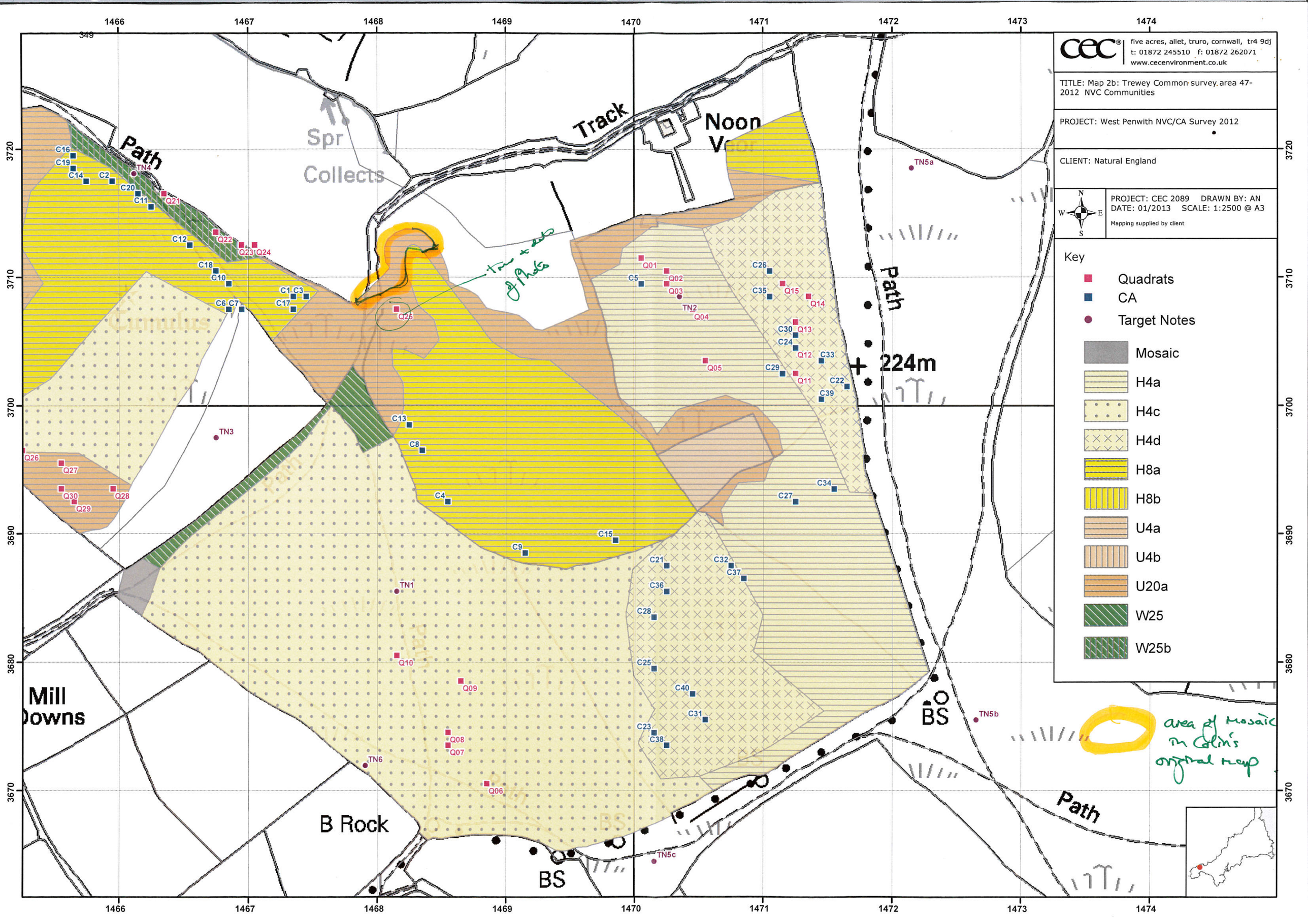
Trewey Common 47-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W25	N/A	0.84	N/A	N/A
	W25b	N/A	0.23	N/A	
Acid grassland	U4a	N/A	0.34	N/A	Lowland dry acid grassland 0.34
Bracken	U20a	N/A	6.27	N/A	N/A
Dry heath	H8a	N/A	5.97	UFNC	Lowland heathland 22.42
	H4a	N/A	4.01	UFNC	
Humid heath	H4c	N/A	9.29	UFR	
	H4d	N/A	3.15	UFR	
Mosaic	Mosaic	N/A	0.09	N/A	N/A
Total Area Mapped			30.19		

Condition Assessment reporting categories: Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC), Unfavourable declining (UFD)

Appendix 1

Maps (1: Location, 2: NVC, 3: BAP habitat)

See separate maps folder on CD.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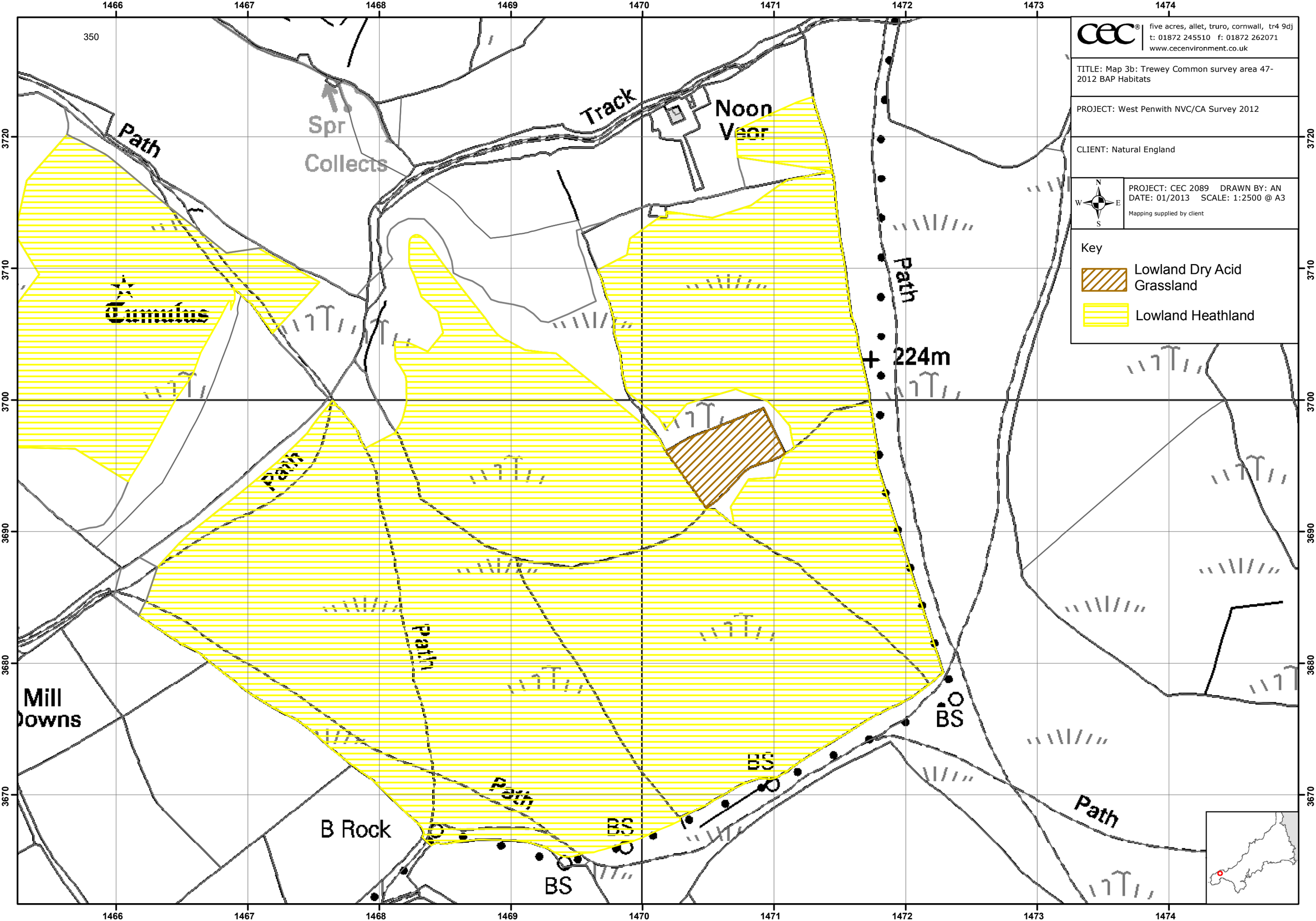
Quadrats
CA
Target Notes
Mosaic
H4a
H4c
H4d
H8a
H8b
U4a
U4b
U20a
W25
W25b
Path
Track
Spr
Collects
Noon
224m
Path
Mill
Downs
B Rock
BS
BS
Path
area of Mosaic in Colin's original map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CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
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Key
Lowland Dry Acid Grassland
Lowland Heathland
Track
Noon Veor
Spr
Collects
Path
Cumulus
224m
Mill Downs
B Rock
BS
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1470
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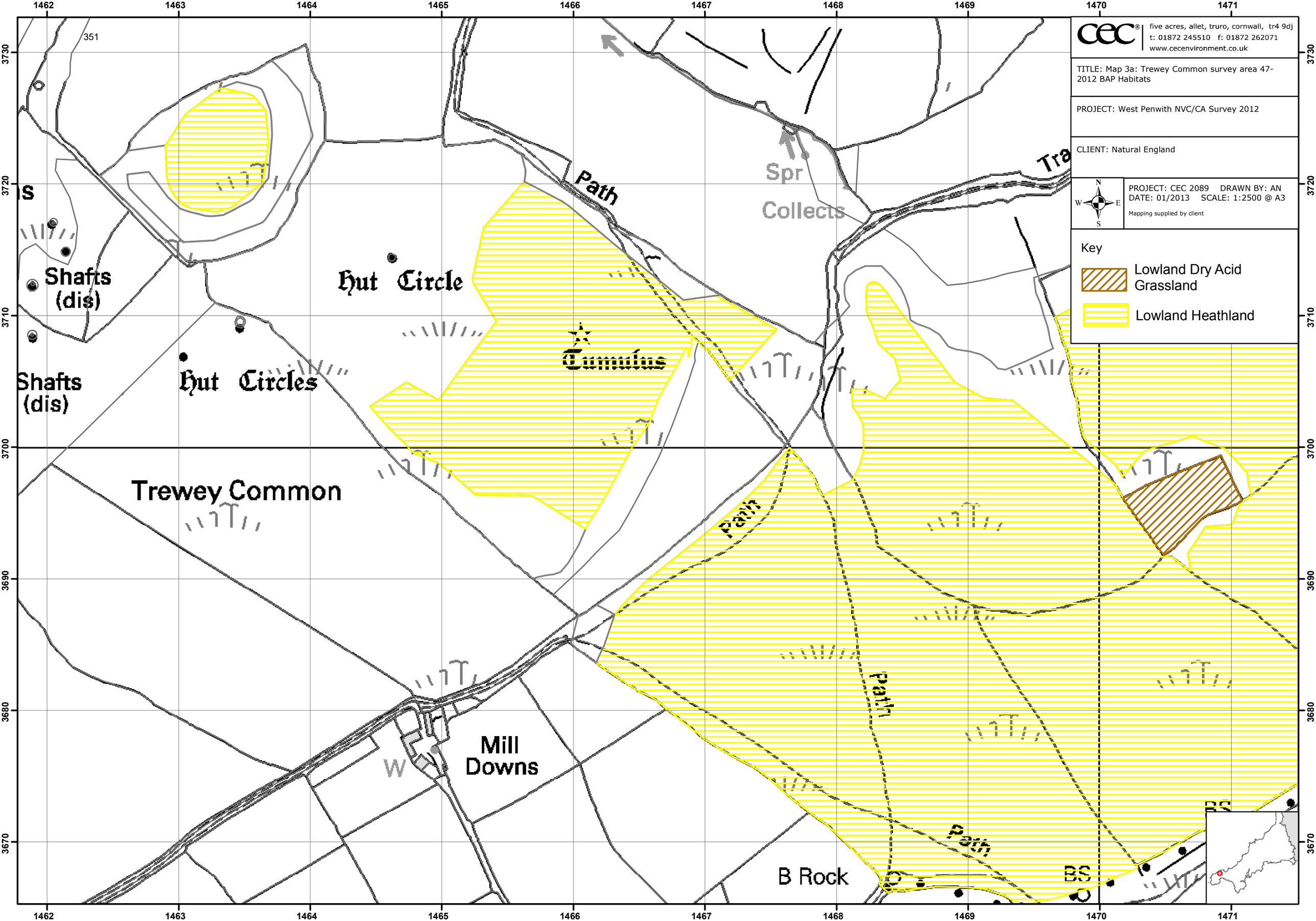
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3670
351
Shafts (dis)
Shafts (dis)
Hut Circle
Hut Circles
Tumulus
Path
Spr
Collects
Trewey Common
Mill Downs
W
Path
Path
Path
B Rock
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BS
N
S
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W
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five acres, allet, truro, cornwall, tr4 9dj
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www.cecenvironment.co.uk
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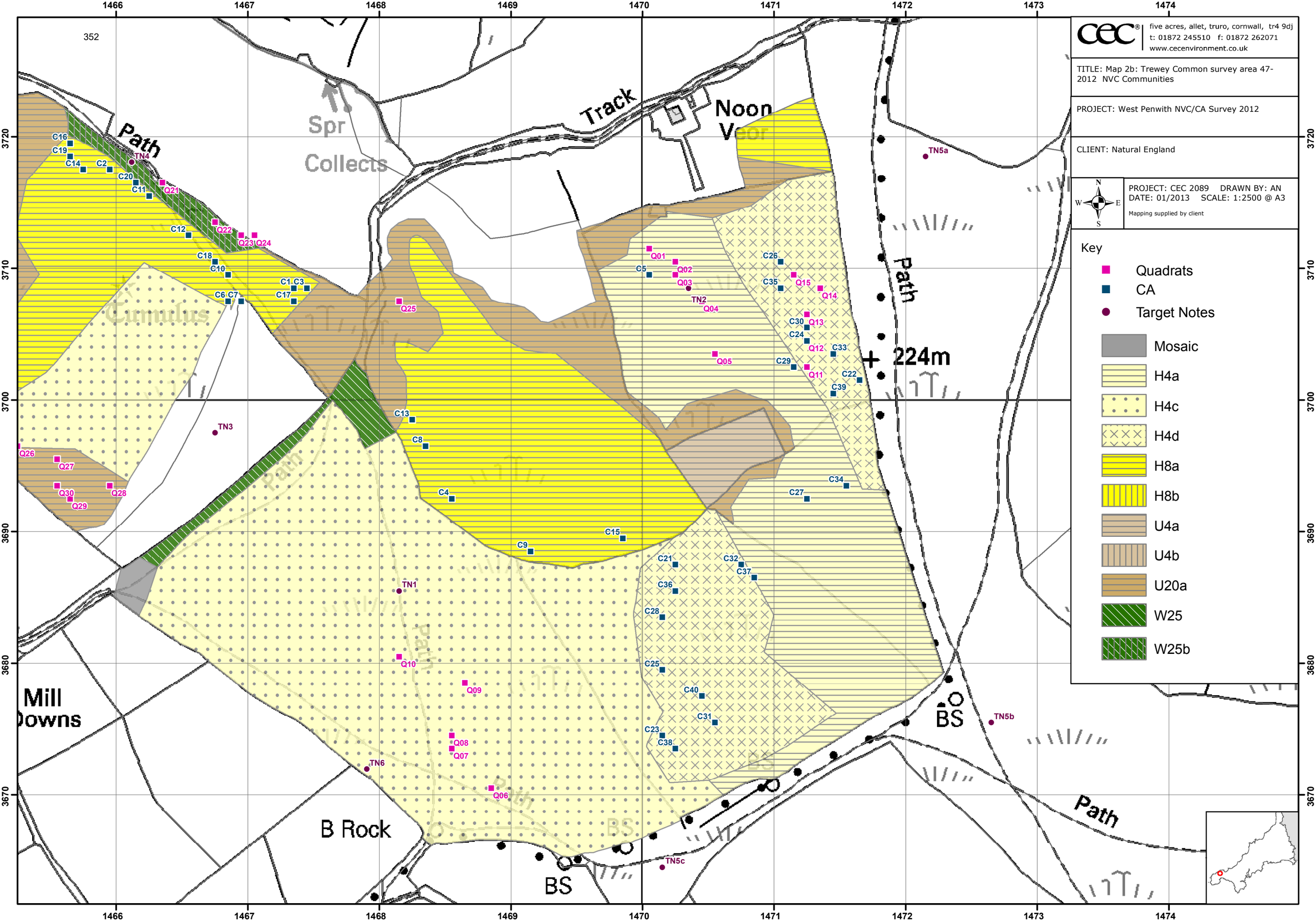
Lowland Heathland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TN5a
TN5b
TN5c
TN6
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Q30
C1
C2
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C4
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C32
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C34
C35
C36
C37
C38
C39
C40
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1470
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3710
3700
3690
3680
3670
cec
five acres, allet, truro, cornwall, tr4 9dj
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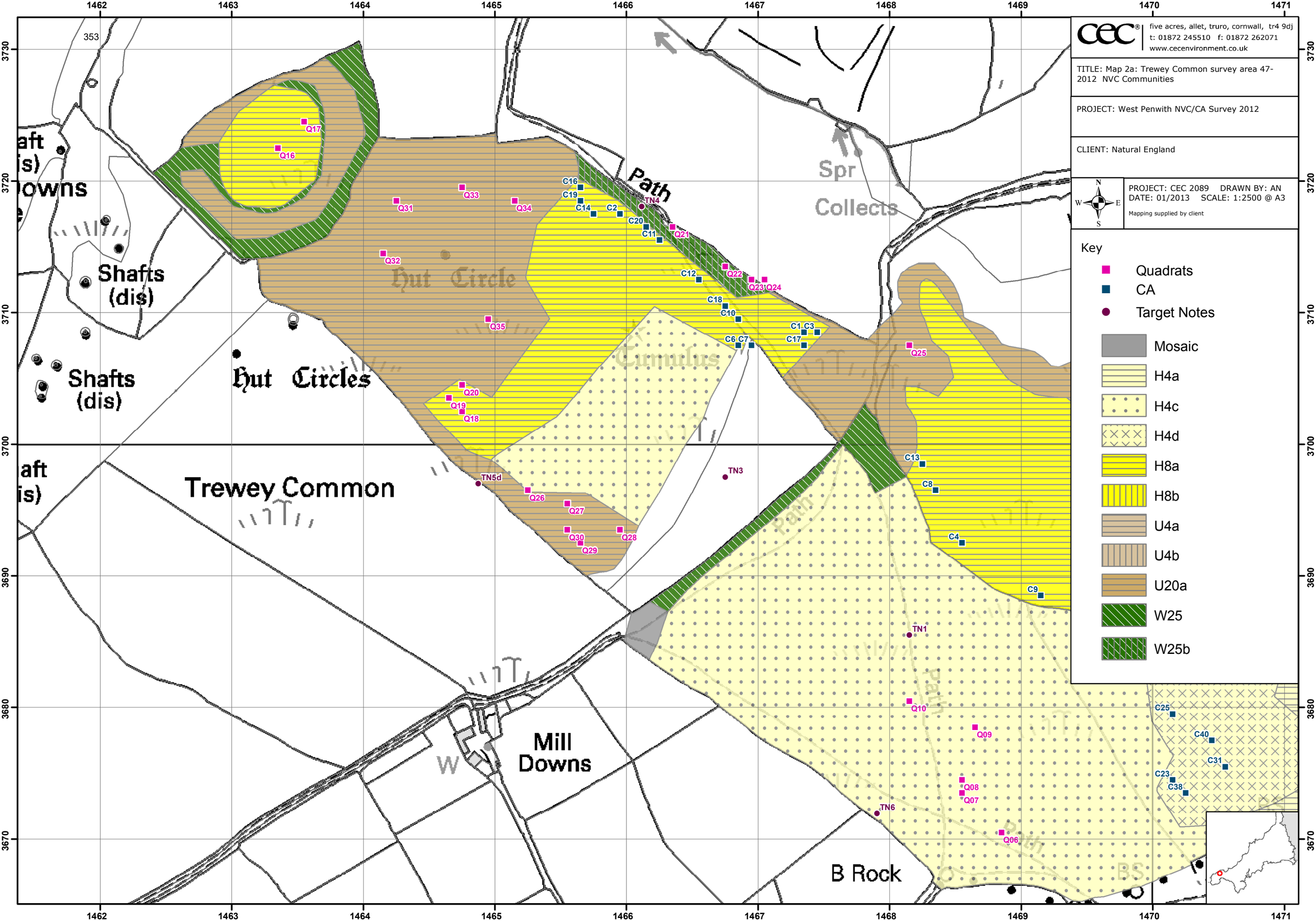
Key
Quadrats
CA
Target Notes
Mosaic
H4a
H4c
H4d
H8a
H8b
U4a
U4b
U20a
W25
W25b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Mapping supplied by client
Key
Quadrats
CA
Target Notes
Mosaic
H4a
H4c
H4d
H8a
H8b
U4a
U4b
U20a
W25
W25b
Trewey Common
Mill Downs
B Rock
Shafts (dis)
Shafts (dis)
Hut Circles
Hut Circle
Cumulus
Path
Spr
Collects
Q17
Q16
Q33
Q31
Q34
Q32
Q35
Q20
Q19
Q18
TN5d
Q26
Q27
Q30
Q29
Q28
TN3
C16
C19
C14
C2
TN4
C20
C11
Q21
C12
Q22
Q23
Q24
C18
C10
C1
C3
C17
C6
C7
Q25
C13
C8
C4
C9
TN1
Q10
Q09
Q08
Q07
TN6
Q06
C25
C40
C31
C23
C38
1462
1463
1464
1465
1466
1467
1468
1469
1470
1471
3730
3720
3710
3700
3690
3680
3670

Map 2 Target Notes Trewey Common (Survey Area 47 – 2012)

TN. No.	Grid Ref.	Text
1	SW46813686	A number of the fire breaks/trackways that have been cut through the heath (see plate 10) had a dominant coverage of bristle bent (*Agrostis curtisii*) along with much *Carex binervis*, *Carex panicea* and *Carex viridula* subsp. *oedocarpa*. The latter was rarely seen elsewhere on site.
2	SW47033708	The area of H4a that has been subject to fire most recently.
3	SW46683698	Although not part of the survey area this permanent pasture field is a very species rich mixture of grassland and heathland plants including a number of species not seen elsewhere on Trewey Common, such as *Luzula campestris, Prunella vulgaris* and *Lotus corniculatus*.
4	SW46623718	The Cornish hedges lining the sunken path are rich in fern species including substantial amounts of *Dryopteris aemula*. West Penwith remains a stronghold for *Dryopteris aemula,* where it was first discovered.
5a	SW47223719	(5a-d) Heathland adjacent to the Trewey Common site. Trewey Common should not be considered in isolation, as it is part of a much larger landscape of high Nature Conservation value.
5b	SW47263676	
5c	SW47023665	
5d	SW46793672	
6	SW46793672	One of the few areas of trees or shrubs. There was a line of blackthorn *Prunus spinosa* along this hedge. The lack of trees and shrubs is one of the excellent features of this heathland site because there are no management problems caused by their spread.

Appendix 2 Species List - vascular and non-vascular plants

Species name	Common name	Wet Heath	Dry Heath	Bracken	Earth Stone Bank	Mosaic
Achillea millefolium	Yarrow				O	
Agrostis capillaris	Common Bent-grass	O		F	F	
Agrostis curtisii	Bristle Bent	F		R	O	
Anthoxanthum odoratum	Sweet Vernal-grass				LF	
Athyrium filix-femina	Lady-fern				R	
Blechnum spicant	Hard-fern		R		O	
Calluna vulgaris	Ling	LA	F	R	LF	
Carex binervis	Green-ribbed Sedge	LF				R
Carex panicea	Carnation Sedge	LF				LF
Carex viridula subsp. *oedocarpa*	Yellow Sedge	R				O/LF
Centaurea nigra	Common Knapweed				O	
Cerastium fontanum subsp. *vulgare*	Common Mouse-ear Chickweed			R		O
Cirsium palustre	Marsh Thistle					LF
Cirsium vulgare	Spear Thistle					O
Cotoneaster simonsii	Himalayan Cotoneaster				R	
Crepis capillaris	Smooth Hawk's-beard				LF	
Cynosurus cristatus	Crested Dog's-tail					O
Dactylis glomerata	Cock's-foot					F
Danthonia decumbens	Heath-grass	R				
Digitalis purpurea	Foxglove			O	F	
Dryopteris aemula	Hay-scented Buckler-fern				R	
Dryopteris affinis	Scaly Male-fern				O	
Dryopteris dilatata	Broad Buckler-fern		R	O	O	
Dryopteris filix-mas	Male-fern				O	

Species name	Common name	Wet Heath	Dry Heath	Bracken	Earth Stone Bank	Mosaic
Eleocharis multicaulis	Many-stemmed Spike-rush	R				
Erica cinerea	Bell Heather	O	F		O	
Erica tetralix	Cross-leaved Heath	F	R			
Festuca rubra agg.	Red Fescue				F	
Galium aparine	Goosegrass				O	
Galium saxatile	Heath Bedstraw	R		O	LF	
Geranium molle	Dove's-foot Crane's-bill					O
Heracleum sphondylium	Cow Parsnip					O
Hieracium umbellatum	Narrow-leaved Hawkweed				LF	
Holcus lanatus	Yorkshire-fog			LA	O/LA	
Holcus mollis	Creeping Soft-grass			O	LF	
Hyacinthoides non-scripta	Bluebell			R		
Hypericum pulchrum	Slender St John's-wort	R				
Hypochaeris radicata	Cat's-ear	R		R	LF	
Ilex aquifolium	Holly				O	
Jasione montana	Sheep's-bit				LF	
Juncus bufonius	Toad Rush					LF
Juncus bulbosus	Bulbous Rush					LF
Juncus effusus	Soft-rush	R				LA
Lotus pedunculatus	Large Bird's-foot-trefoil					LF
Molinia caerulea	Purple Moor-grass	A	R	F	O	
Oxalis acetosella	Wood-sorrel			R	O	
Pedicularis sylvatica	Lousewort	R				
Persicaria maculosa	Willow Weed					LF
Phyllitis scolopendrium	Hart's-tongue Fern				F	
Plantago lanceolata	Ribwort Plantain					O
Poa trivialis	Rough Meadow-grass					O

Species name	Common name	Wet Heath	Dry Heath	Bracken	Earth Stone Bank	Mosaic
Polygala serpyllifolia	Heath Milkwort	R				
Polygala vulgaris	Common Milkwort	R				
Polypodium sp.	Polypody Unidentified				O	
Potentilla erecta	Common Tormentil	F	R	O	O	
Prunus spinosa	Blackthorn				O	
Pteridium aquilinum	Bracken		R	LD	LF	
Ranunculus repens	Creeping Buttercup					LF
Rubus fruticosus agg.	Blackberry		R	LD	O	
Rumex acetosa	Common Sorrel			O	O	O
Rumex acetosella	Sheep's Sorrel				O	
Rumex crispus	Curled Dock					O
Rumex obtusifolius	Broad-leaved Dock					O
Salix cinerea subsp. *oleifolia*	Grey Willow					O
Sedum anglicum	English Stonecrop				O	
Silene dioica	Red Campion			R		LF
Solidago virgaurea	Goldenrod			O		
Succisa pratensis	Devil's-bit Scabious				LF	
Taraxacum officinale agg.	Common Dandelion					O
Teucrium scorodonia	Wood Sage			R	LF	
Trichophorum cespitosum subsp. germanicum	Deergrass	LA				
Ulex europaeus	Gorse				LF	
Ulex gallii	Western Gorse	A	D	R	LF	
Urtica dioica	Common Nettle					O
Vaccinium myrtillus	Bilberry				LF	
Viola riviniana	Common Violet			R	LF	

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, LF = Locally Frequent

Appendix 3 NVC quadrat data and Photos

See Trewey Common subfolder on West Penwith CD for quadrat data, quadrat photos and other site photos.

Survey	Trewey Common					Recorder		CF	Date	15,16&17/10	
Vegetation type			H4d								
Species	Q11	Q12	Q13	Q14	Q15	Species					
Agrostis curtisii	6	6	7	4	5						
Calluna vulgaris	3	4	3	3	3						
Carex panicea	3	3	2	1	3						
Erica tetralix	3	4	4	4	4						
Molinia caerulea	7	7	7	7	7						
Trichophorum cespitosum	3	4	4	3	2						
Ulex gallii	3	3	4	4	3						
Carex binervis	2				1						
Pedicularis sylvatica			1		1						
Sphagnum sp.	2										
Bare ground											

Quadrats

	Q11	Q12	Q13	Q14	Q15
Grid. ref.	SW47123702	SW47123704	SW47123706	SW47133708	SW47113709
Photo. No.					
NVC method					
Slope	Moderate	Moderate	Moderate	Moderate	Moderate
Aspect	SW	SW	SW	SW	SW
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	10cm - 30cm	10cm - 30cm	10cm - 30cm	10cm - 30cm	10cm - 30cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

Survey	Trewey Common					Recorder		CF	Date	15,16&17/10	
Vegetation type	Bracken/Molinia										
Species	Q26	Q27	Q28	Q29	Q30	Species	1	2	3	4	5
Agrostis curtisii	4	3	5	3	3						
Galium saxatile	2	1	2	2	2						
Molinia caerulea	9	9	9	9	9						
Potentilla erecta	2	2	2	2	2						
Pteridium aquilinum	4	5	4	5	5						
Rumex acetosa	1		2	2							
Agrostis capillaris				3	3						
Calluna vulgaris					1						
Holcus mollis				2							
Bare ground											

	Quadrats				
	Q26	Q27	Q28	Q29	Q30
Grid. ref.	SW46523696	SW46553695	SW46593693	SW46563692	SW46553693
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	N	N	N	N	N
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	30cm - 60cm	30cm - 60cm	30cm - 60cm	30cm - 60cm	30cm - 60cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

Survey	Trewey Common					Recorder	CF		Date	15,16&17/10	
Vegetation type	W25										
Species	Q21	Q22	Q23	Q24	Q25	Species	1	2	3	4	5
Dryopteris dilatata	1	1	1	2	3						
Pteridium aquilinum	10	9	8	9	8						
Rubus fruticosus agg.	4	4	7	7	7						
Molinia caerulea		3	4	3	3						
Rumex acetosa	2	1	3		2						
Digitalis purpurea		2		2							
Agrostis capillaris			2								
Athyrium filix-femina			1								
Silene dioica	1										
Bare ground											

	Quadrats				
	Q21	Q22	Q23	Q24	Q25
Grid. ref.	SW46633716	SW46673713	SW46693712	SW46703712	SW46813707
Photo. No.					
NVC method					
Slope	Slight - Moderate	Slight - Moderate	Slight - Moderate	Slight - Moderate	Slight - Moderate
Aspect	N	N	N	N	N
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	60cm - 1m	60cm - 1m	60cm - 1m	60cm - 1m	60cm - 1m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

Survey	Trewey Common					Recorder	CF		Date	15,16&17/10/12	
Vegetation type	H4a										
Species	Q1	Q2	Q3	Q4	Q5	Species	1	2	3	4	5
Agrostis curtisii	9	9	9	9	7						
Calluna vulgaris	3	2	3	3	2						
Molinia caerulea	3	3	4	5	7						
Potentilla erecta	2	3	2	2	1						
Ulex gallii	4	4	2	2	4						
Carex binervis	2		2		2						
Erica cinerea				3	1						
Agrostis capillaris	3										
Erica tetralix					1						
Bare ground											

Quadrats

	Q1	Q2	Q3	Q4	Q5
Grid. ref.	SW47003711	SW47023710	SW47023709	SW47043707	SW47053703
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	SW	SW	SW	SW	SW
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	15cm - 45cm	15cm - 45cm	15cm - 45cm	15cm - 45cm	15cm - 45cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

Survey	Trewey Common					Recorder	CF		Date	15,16&17/10	
Vegetation type	H4c										
Species	Q6	Q7	Q8	Q9	Q10	Species	Q3	Q5	Q7	Q9	Q14
Calluna vulgaris	8	7	7	7	7						
Erica tetralix	3	3	6	3	3						
Molinia caerulea	3	4	7	8	7						
Ulex gallii	7	7	8	3	7						
Erica cinerea		4			2						
Carex binervis				4							
Carex panicea				2							
Potentilla erecta					1						
Bare ground											

Quadrats

	Q6	Q7	Q8	Q9	Q10
Grid. ref.	SW46883670	SW46853673	SW46853674	SW46863678	SW46813680
Photo. No.					
Survey method					
Slope	Flat	Flat	Flat	Flat	Flat
Aspect					
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	10cm - 30cm	10cm - 30cm	10cm - 30cm	10cm - 30cm	10cm - 30cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

Survey	Trewey Common					Recorder		CF		Date	15,16&17/10
Vegetation type			H8a								
Species	Q16	Q17	Q18	Q19	Q20	Species	1	2	3	4	5
Calluna vulgaris	5	3	3	3	2						
Erica cinerea	4	5	4	2	3						
Molinia caerulea	1	1	2	1	1						
Ulex gallii	9	9	9	10	10						
Pteridium aquilinum			2	1	1						
Erica tetralix	2	2									
Dryopteris dilatata		1									
Rubus fruticosus agg.		1									
Bare ground											

	Quadrats				
	Q16	Q17	Q18	Q19	Q20
Grid. ref.	SW46333722	SW46353724	SW46473702	SW46463703	SW46473704
Photo. No.					
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect	N	N	N	N	N
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	60cm - 1m	60cm - 1m	60cm - 1m	60cm - 1m	60cm - 1m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

NOON DIGERY (Survey Area 51 – 2012)

Condition Assessment surveyor	Colin French	Dates surveyed	4th, 6th and 7th October 2012
NVC surveyor	Colin French	Date surveyed	4th, 6th and 7th October 2012
Report compiled by	Colin French	8th and 9th October 2012	

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Noon Digery
County	Cornwall
District	Penwith
Parishes	Ludgvan
Map Reference	Access at SW48253590
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

The location of the site is shown on *Map 1*.

1.2 Summary description

Area	26.15ha
Altitude	170 – 220m AOD
Aspect	The survey site comprises the south-eastern two-thirds of the Baker's Pit Nature Reserve. The site is two tiered with the highest point in the south west. From that flat topped point it slopes in a northerly / north-easterly direction down to a shallow valley which bisects the site and fans out in WNW direction. Slopes in the central portion of the site are gentle. Finally, the north-eastern end of Noon Digery has a moderately steep slope in a north-easterly direction.
Drainage	There is one small stream draining the shallow valley in the centre of the site. This drains through a pond, which may have been originally dug to supply the engine house

with water as that steam engine would have required a small reservoir. Three very small springs were also encountered during the survey, one of which feeds a straight runnel which runs in a northerly direction towards the most northerly point of the site.

1.3 Access

Cornwall Wildlife Trust has a leaflet which marks out self-guided trails throughout the Baker's Pit Nature Reserve. These leaflets are available at the entrance gate. The trails use the existing public rights of way, plus paths specially created to join the various points of interest (natural history, archaeology and industrial archaeology).

1.4 Tenure

Noon Digery is owned by the Cornwall Wildlife Trust and is managed by tenant farmers.

2 Biological Description

2.1 Habitats

There are three main Phase 1 habitats present within the site: scrub, dry dwarf heath and wet dwarf heath. Other, minor, habitats occurring within the site are: standing water, running water and Cornish hedges. The National Vegetation Classification (NVC) communities are described in more detail below and their distribution within the site is shown on *Map 2* in *Appendix* 1. A list of plant species recorded within each habitat is provided in *Appendix 2*. The NVC quadrat data is provided in *Appendix 3*. Completed CSM forms accompany this report.

The location and reference number of field notes made during the vegetation survey visits are annotated onto *Map 2* and appended to this report. Photographs taken during the three field visits in October are included in the text where these are considered useful in illustrating particular points of discussion.

2.1.1 Scrub

Vegetation stands in which bracken is co-dominant with bramble were mapped as the **W25b sub-community of *Pteridium aquilinum – Rubus fruticosus* underscrub** NVC community. Along with dry and humid heath, bracken-bramble scrub is one of the principal habitats of the site, with one extensive stand at the south-western end of the site, and another fringing an area of H4 to the northwest.

The main bracken stand has many cattle tracks meandering through it and these greatly increase the diversity of the stand. In this community bracken and bramble are co-dominants, although bramble is usually subordinate in coverage. Few associates are found beneath the areas with the densest canopy, however, closer to the tracks (where most of the quadrats were sampled) the ground cover is much richer. Rosebay willowherb (*Chamerion angustifolium*), Yorkshire fog (*Holcus lanatus*) and creeping soft-grass (*Holcus mollis*) were more common along the western edge of this stand, whereas purple moor-grass (*Molinia caerulea*) was an important constituent elsewhere, sometimes becoming locally dominant. Bristle bent (*Agrostis curtisii*) was encountered in the heathier parts on the eastern side, where ling (*Calluna vulgaris)*, bell heather (*Erica cinerea*) and bilberry (*Vaccinium myrtillus*) grew.

Present was a limited suite of broadleaved herbs (forbs) including wood-sorrel (*Oxalis acetosella*), goldenrod (*Solidago virgaurea*), common sorrel (*Rumex acetosa*), foxglove (*Digitalis purpurea*) and more locally red campion (*Silene dioica*) and tormentil (*Potentilla erecta*). Wood sage (*Teucrium scorodonia*) was recorded throughout and Atlantic ivy (*Hedera helix* ssp. *hibernica*) was found beneath the more shaded stands. Scaly male-fern (*Dryopteris dilatata*) was frequently encountered

There is a small amount of *Rhododendron ponticum* scattered throughout the bracken which should be eradicated. Bracken habitat also tends to occur along field hedges, the largest stand of which was found at the northern western end of the site.

Plate 1 Close up of W25b vegetation from the main bracken stand in the south-western part of the site

A small amount of wet woodland, dominated by grey willow (*Salix cinerea* ssp *oleifolia*) and eared willow (*Salix aurita*) has been mapped around part other western perimeter of the site. It is assigned to the NVC community **W1 *Salix cinerea – Gallium palustre* woodland** but was too small to sample at the scale of the present survey.

The canopy is quite open making the understorey relatively rich. Several species of *Sphagna* were found beneath the willow canopy along with frequent common sorrel (*Rumex acetosa*), bracken (*Pteridium aquilinum*) and soft rush (*Juncus effuses*) and occasional bramble (*Rubus fruticosus* agg). , blackthorn (*Prunus spinosa*) and Yorkshire fog (*Holcus lanatus*). Species such as marsh violet (*Viola palustris* subsp. *juressi*), tormetil (*Potentilla erecta*) and pink purslane (*Claytonia sibirica*) are more rarely encountered.

Grey and eared willow were also found in small patches scattered across the bracken, either side of the pond. It is important that these areas of willow are kept in check and are not allowed to encroach further into the heathland. Such encroachment appears to be occurring

along the northern edge of the site.

2.1.2 Dry heath

Small stands of dry heath occur at Noon Digery. Typically stands are characterised by a tall, closed sub-shrub canopy dominated by Western gorse (*Ulex gallii*), but within which ling (*Calluna vulgaris*) and bell heather (*Erica cinerea*) can both be abundant.

The largest of these dry heath communities is located at the north-eastern end, and lowest point, of the site. This stand forms part of a much larger cattle-grazed pasture field. It is much more species-rich than would normally be expected of dry heath and this is probably due to the amount of cattle grazing and the age of the heath which is approaching a senescent stage. This stand has been broken up by the many cattle tracks that crisscross it and by some scrub clearance where a number of large stumps were found. Rhododendron continues to be a problem in this stand and further periodic clearance work is needed.

Other stands of dry heath were more typical of this type of habitat being much more species poor with a closed canopy of heathers and Western gorse and virtually nothing else present.

Plate 2 The Dry Heath H8a community at the south-western end of Noon Digery.

Analysis of the quantitative sample data for this heath vegetation showed a generally close match with descriptions for **H8a** (**species-poor sub-community of *Calluna vulgaris – Ulex gallii* heath**.

2.1.3 Humid heath

Humid heath is the dominant heathland habitat within the site. It is characterised by a high coverage of Western gorse (*Ulex gallii*), ling (*Calluna vulgaris*), and an abundance of purple moor grass (*Molinia caerulea*) and cross-leaved heath (*Erica tetralix*). Bell heather (*Erica cinerea*) was of frequent occurrence in some stands. The humid heath in general is very species poor and the number of species present, in the field, noticeably decreases with the age of the community as the *Ulex gallii* and the heathers crowd out other species.

Plate 3 H4c stand below the tumulus at the south-western end of Noon Digery.

All the stands of humid heath at Noon Digery have been assigned to **H4c, *Erica tetralix* sub-community of *Ulex gallii – Agrostis curtisii* heath**. It is considered to be this sub-community based on the relative abundance of cross-leaved heath compared to bristle bent and bell heather. Although floristically similar with regard to the constants:

purple moor-grass, bristle bent, heather, bell heather and Western gorse, the relative abundance of these five species within stands of H4c varies hugely as too does their height and general structure and this is reflected in the samples.

Evidence of cattle grazing within this habitat is most prominent around Q1-Q4, probably the most species rich area of H4 at Noon Digery. Over a more or less flat area the vegetation is mostly very short (less than 6 inches tall) and the sub-shrubs are small in size and stature. To the west are a series of small pools, mostly filled by *Sphagna*. One was surrounded by soft rush (*Juncus effusus*). Deergrass (*Trichophorum cespitosum* subsp. *germanicum*) and carnation sedge (*Carex panicea*) were locally frequent in the wetter areas with the shortest vegetation. There are small amounts of rhododendron (*Rhododendron ponticum*) here too.

To the south of here (around Q5) the heath appears more mature with a closed canopy reaching 2-3ft in height and very few species other than ericoids and Western gorse. This area is also cattle grazed and there are a number of cattle tracks crossing it which, in places, allow plants such as carnation sedge (*Carex panicea*) and deergrass (*Trichophorum cespitosum* subsp. *germanicum*) to grow. There are large clumps of lichen scattered throughout, suggesting it has not been subject to fire for many years.

To the north, the area around Q6-Q10 looks very different (see plate 4). It is overwhelmingly dominated by purple moor-grass (*Molinia caerulea*), which in places forms substantial tussocks. H4 species are present in small amounts supporting a somewhat uneasy assignment to this community. Some gorse stumps show signs of burning, so it seems likely that this area represents an H4 community recovering after fire (since which is appears to have gone ungrazed). To the south of this area, bristle bent (*Agrostis curtisii*) becomes locally dominant and scrub including rhododendron, pampas grass (*Cortaderia selloana*), grey willow and butterfly-bush (*Buddleja davidii*) is invading. European gorse (*Ulex europaeus*) was also found scattered across this area although it is more or less absent across the rest of the site.

Plate 4 typical H4c stand from the northern part of the site

The area to the north east (where the majority of the CSM samples were taken – C16-C35) though still species poor, is again sub-shrub dominated and though species poor displays more structural variation. Species such as green-ribbed sedge (*Carex binervis*) and lousewort (*Pedicularis sylvatica*) are occasional alongside paths. The most interesting find within this area was Dorset heath (*Erica ciliaris*) see *Section 2.2*.

2.1.4 Standing water

There is one pond which is completely filled with soft rush (*Juncus effusus*) at SW48253546. Immediately, to the west of this pond is another rectangular depression (evidently man made), which looks like it was once a pond too. There are also a series of small pools, mostly filled by *Sphagnum* spp., to the west of the northernmost area of H4 (see above)..

2.1.5 Running water

Running water is an insignificant feature of the site. There is a small runnel running diagonally down the slope in a northerly direction across the northernmost part of the site and a small stream which starts just to the east of the pond and runs in a westerly direction along the

boundary of the site before turning in a north-westerly direction and ending up in the flooded china clay pit. The stream flows through W1 woodland at its lower end, and has no aquatic, or typical stream, species present.

A substantial but short drainage ditch occurs at the northern edge of Noon Digery above the Clay Dries. Presumably occasional flooding problems are alleviated by this ditch.

2.1.6 Earth and stone banks

The Earth and stone banks are all Cornish hedges. They divide up the site into (pre)historic fields and mark most of the boundaries of the Noon Digery site. They are in very good repair and where they are needed to manage stock they are supplemented by post and wire fencing. One long section of Cornish Hedge looks to be of recent construction (the granite is very clean and there are a number of species present that are not normally found on long-established Cornish hedges away from built-up areas, such as ivy-leaved toadflax (*Cymbalaria muralis*), teasel (*Dipsacus fullonum*) and mind-your-own-business (*Soleirolia soleirolii*). None of the boundaries were assessed as part of the NVC survey, with communities in most cases likely to reflect those of adjacent habitats.

2.2 Species

The location of important species and features is shown as target notes to Map 2.

2.2.1 Vascular plants

The Habitat survey in October 2012 recorded a total of 122 vascular plant species, including two of particular importance (dodder and Dorset heath).

Dodder (*Cuscuta epithymum*) is classified as Vulnerable (RDB 2005). In Cornwall it has disappeared from many inland sites but maintains a very healthy population at most of its coastal haunts. It Noon Digery it was found in low concentrations, at a few places, parasitizing mature *Ulex gallii* (see Map 2).

Dorset heath (*Erica ciliaris*), a Red Data Book species, was found in one small area of H4 (see Map 2). There were several small patches of it covering, in total, an area of about 2ft square. It has only twice before been recorded, as a native plant, in Penwith. Once in 1889 from a Croft near Ding Dong mine and secondly from an 1849 herbarium specimen in Liverpool Museum labelled St. Just (which could be from anywhere in Penwith). It also still occurs at Chyenhal Moor where it was originally planted.

Plate 5 Dorset heath (*Erica ciliaris*) at Noon Digery.

3 Condition Assessment

3.1 Dry Heath

Twenty condition assessment samples were taken in areas of dry heath across the site.

Analysis of the samples shows failures against mandatory attributes for structure and composition of this vegetation type. Dry heath at Noon Digery is consequently assessed as in **unfavourable no change.** Overall there is an absence of pioneers and an over-representation of shrubs in general and an associated lack of desirable forbs and grasses. Floristic paucity in many respects would seem to be an inevitable outcome of over maturity within this type of habitat (generally inherently species poor to start with).

3.2 Humid Heath

Twenty condition assessment samples were taken across the site.

Wet heath at Noon Digery is very species poor and the samples fail when assessed against the composition attribute due to the lack of desirable forbs.

Despite this the site is in active management with cattle grazing, signs of controlled burning and brush-cutting. The heath is managed in compartments of even aged blocks of heath. Each unit is a different age thus ensuring a very good mix of wet heath H4c throughout the site. On this basis the community has been assessed as **unfavourable recovering.**

3.3 Acid Grassland and Mire

Though qualifying as a BAP habitat, acid grassland and mire represent a very minor component of the vegetation communities at Noon Digery and as such, no condition assessment was carried out for these habitats.

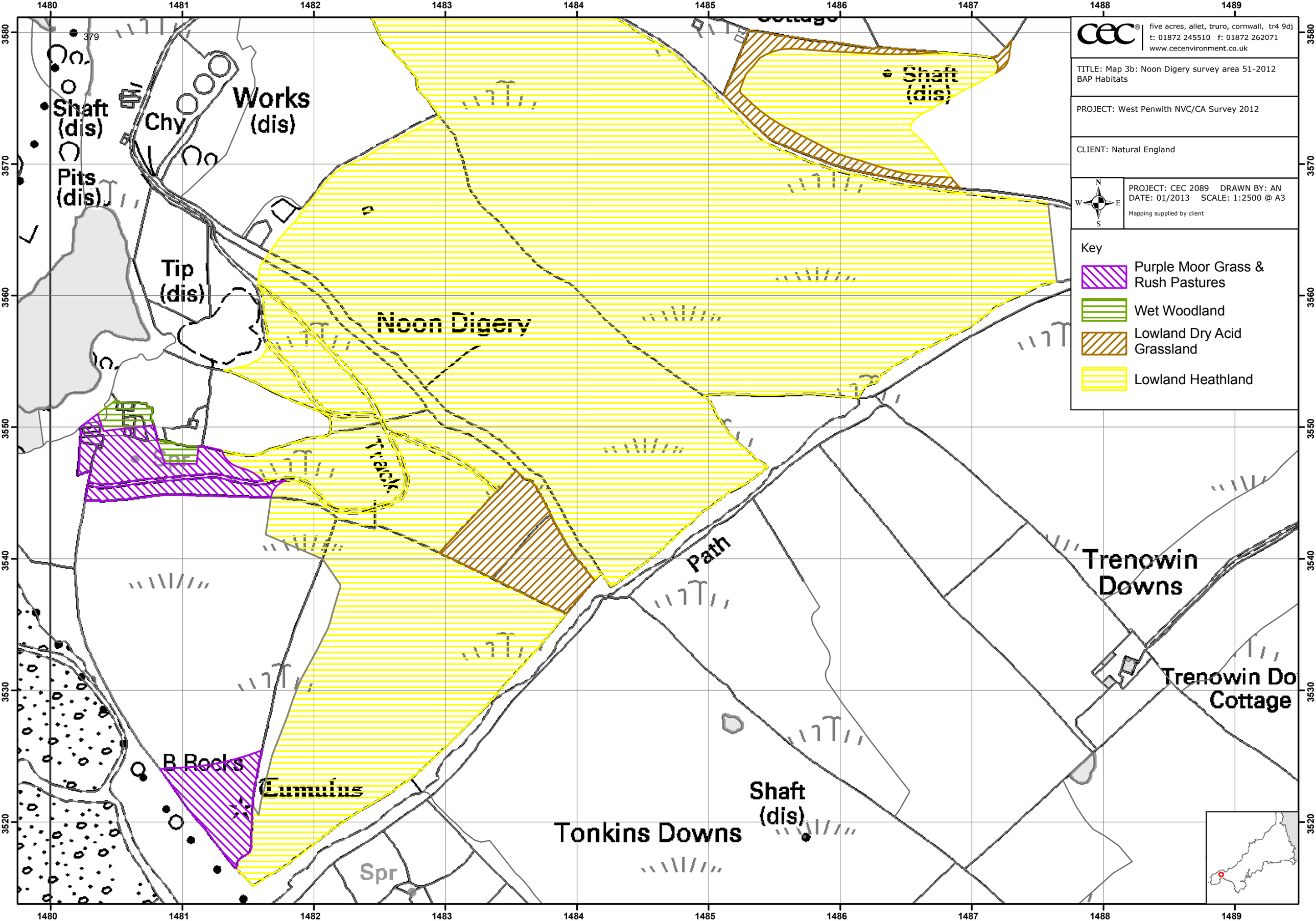
Table 1 Summary of habitats and vegetation communities

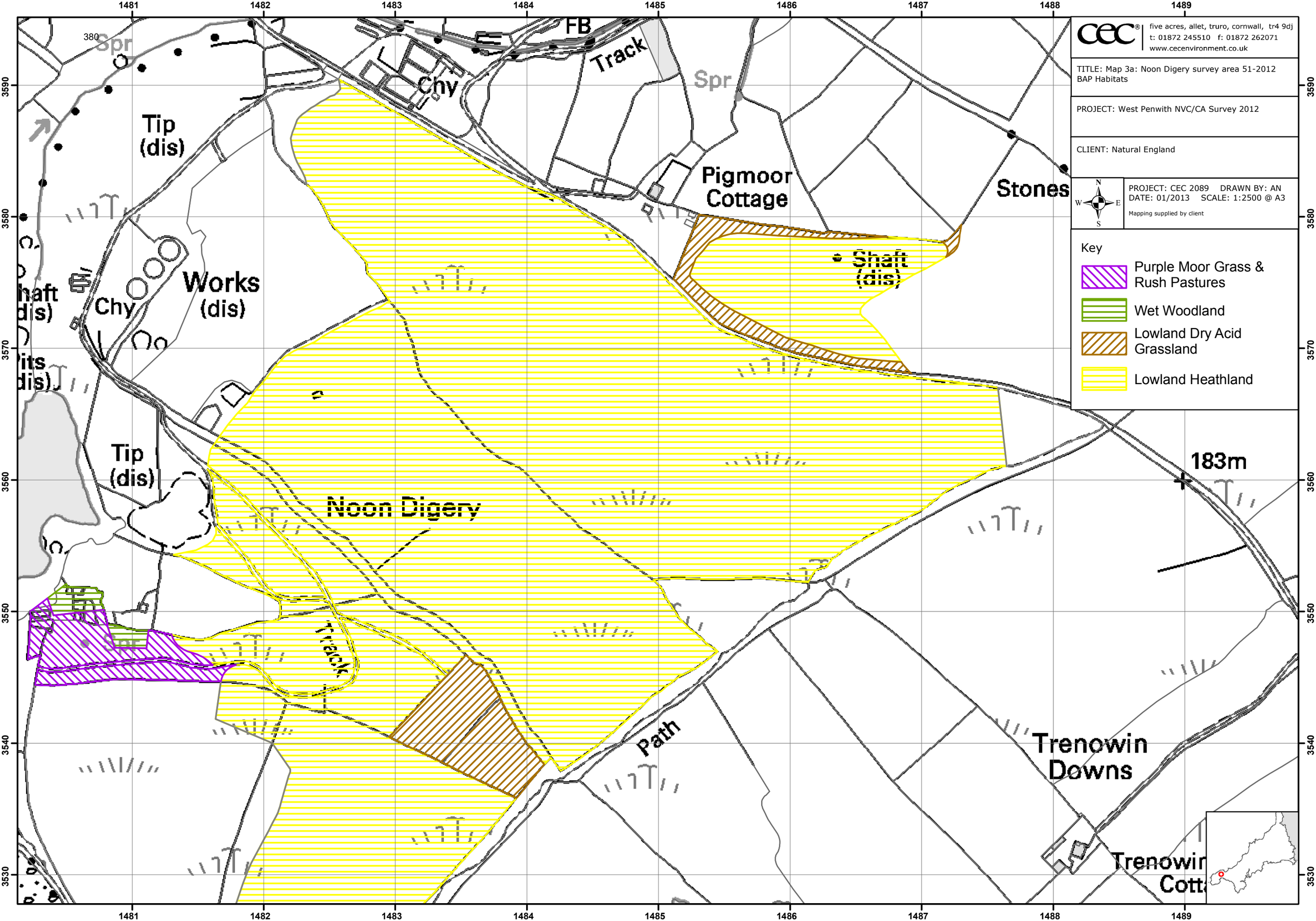
Noon Digery 51-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W1	6.28	0.11	N/A	Wet woodland 0.11
	W22	0.31			
	W25b	0.67	3.59	N/A	N/A
Acid grassland	U4b		0.95	N/A	Lowland dry acid grassland 0.95
	U20c	0.15	N/A	N/A	N/A
Semi-improved grassland	MG6	9.03	N/A	N/A	N/A
Dry heath	H8a		1.94	UFNC	Lowland heathland 20.64
Humid heath	H4c	24.1	18.70	UFR	
Mire	M23b	0.71	0.51	N/A	Purple moor grass and rush pastures 0.86
	M25	0.72	0.35	N/A	
Total Area Mapped		43.51	26.15		

Appendix 1

Maps (1: Location, 2: NVC, 3: BAP habitat)

See separate Maps Folder on CD


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3b: Noon Digery survey area 51-2012
BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Purple Moor Grass & Rush Pastures
Wet Woodland
Lowland Dry Acid Grassland
Lowland Heathland
Shaft (dis)
Chy
Works (dis)
Pits (dis)
Tip (dis)
Noon Digery
Tracks
Spr
Path
Trenowin Downs
Trenowin Do Cottage
B Rocks
Tumulus
Tonkins Downs
Shaft (dis)
Shaft (dis)
379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five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 3a: Noon Digery survey area 51-2012
BAP Habitats
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Purple Moor Grass & Rush Pastures
Wet Woodland
Lowland Dry Acid Grassland
Lowland Heathland
Spr
FB
Track
Chy
Tip (dis)
Pigmoor Cottage
Stones
Shaft (dis)
Works (dis)
Chy
Tip (dis)
Noon Digery
183m
Track
Path
Trenowin Downs
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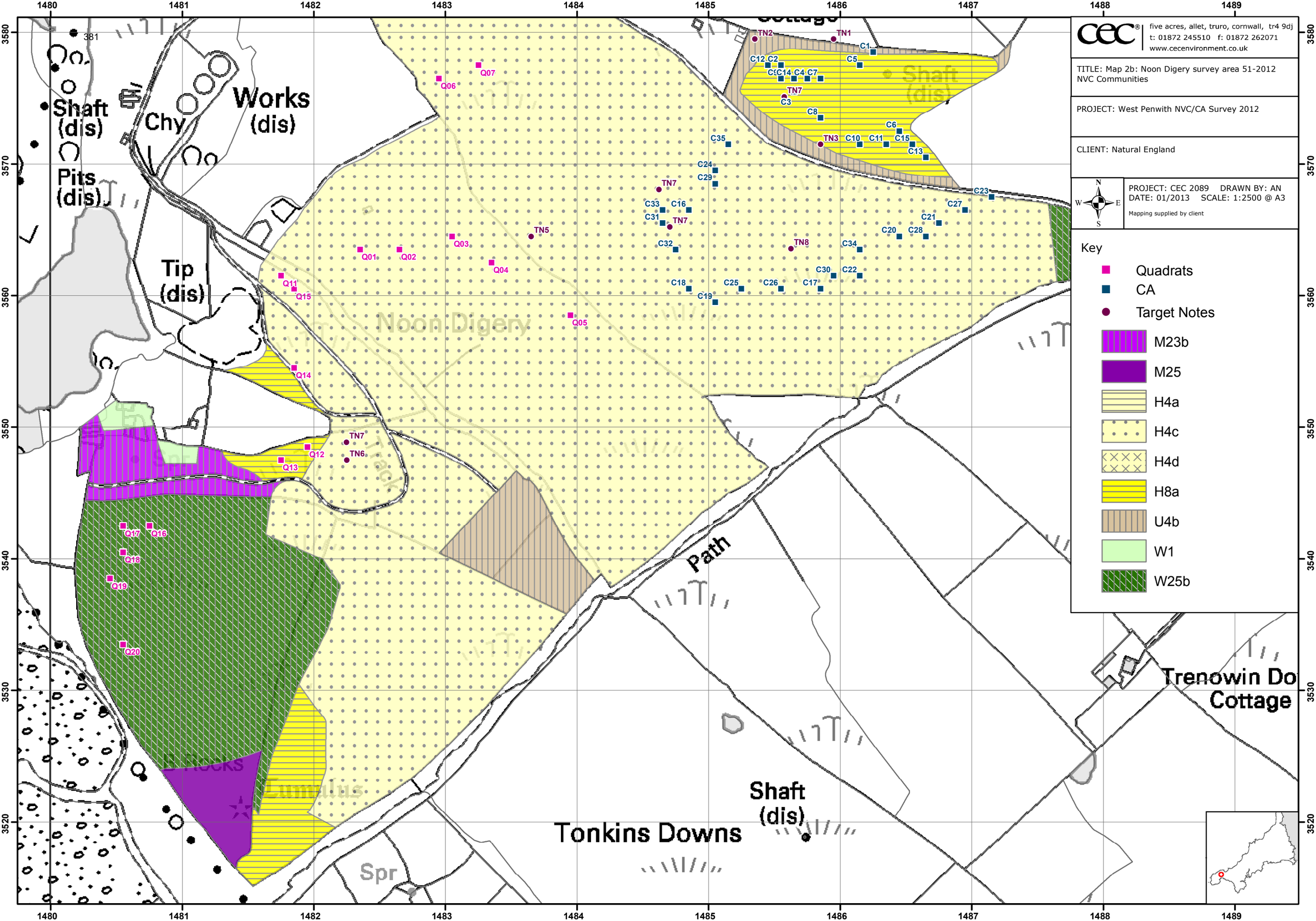
1483
1484
1485
1486
1487
1488
1489
3590
3580
3570
3560
3550
3540
3530


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2b: Noon Digery survey area 51-2012
NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
M23b
M25
H4a
H4c
H4d
H8a
U4b
W1
W25b
Shaft (dis)
Chy
Works (dis)
Pits (dis)
Tip (dis)
Noon Digery
Shaft (dis)
Path
Trenowin Do
Cottage
Tonkins Downs
Shaft (dis)
Spr
Q01
Q02
Q03
Q04
Q05
Q06
Q07
Q11
Q12
Q13
Q14
Q15
Q16
Q17
Q18
Q19
Q20
TN1
TN2
TN3
TN5
TN6
TN7
TN8
C1
C2
C3
C4
C5
C6
C7
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C10
C11
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C16
C17
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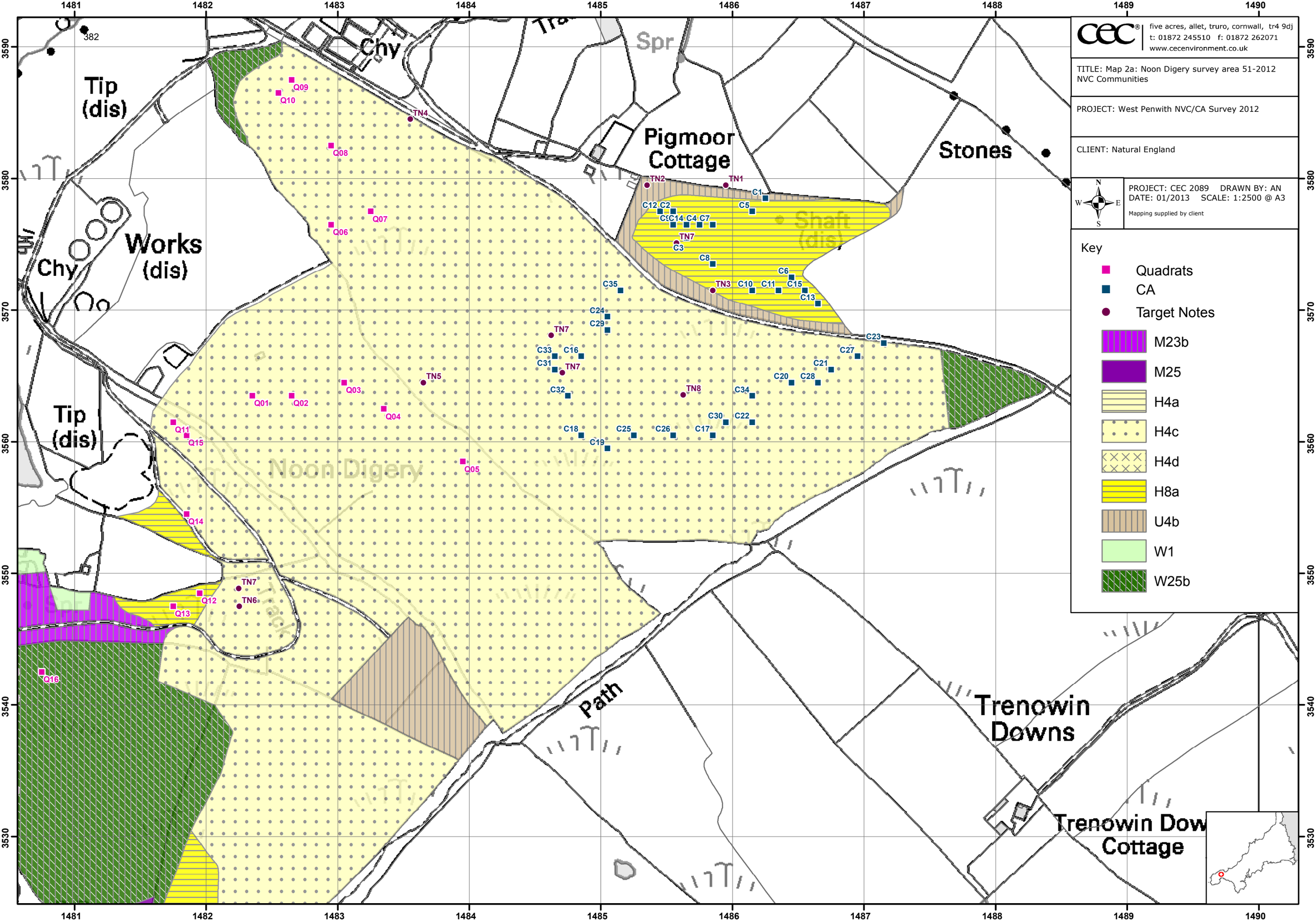
C31
C32
C33
C34
C35


cec
five acres, allet, truro, cornwall, tr4 9dj
t: 01872 245510 f: 01872 262071
www.cecenvironment.co.uk
TITLE: Map 2a: Noon Digery survey area 51-2012
NVC Communities
PROJECT: West Penwith NVC/CA Survey 2012
CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Quadrats
CA
Target Notes
M23b
M25
H4a
H4c
H4d
H8a
U4b
W1
W25b
Tip (dis)
Chy
Works (dis)
Chy
Tip (dis)
Noon Digery
Pigmoor Cottage
Stones
Shaft (dis)
Path
Trenowin Downs
Trenowin Dow Cottage
Q01
Q02
Q03
Q04
Q05
Q06
Q07
Q08
Q09
Q10
Q11
Q12
Q13
Q14
Q15
Q16
TN1
TN2
TN3
TN4
TN5
TN6
TN7
TN8
C1
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C3
C4
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1489
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3530

Target Notes to Map 2 (Survey Area 51 – 2012)

TN. No.	Grid Ref.	Text
1	SW48593579	A small area dominated by soft rush (*Juncus effusus*) where the ground is more marshy. Immediately below it is a marshy ditch running alongside the boundary Cornish hedge.
2	SW48533579	A large patch of black, much cattle-trodden, bare earth.
3	SW48593571	Around the dry heath, particularly at the top of the slope is a margin of pasture grassland.
4	SW48363584	Scrub encroachment is an issue along this hedge.
5	SW48373564	A firebreak following the length of this hedge would be welcome to allow cattle access to the north-western part of this field, which is currently ungrazed.
6	SW48373564	Site of the pond.
7	SW48553575 SW48473568 SW35654847 SW48223549	*Cuscuta epithymum*
8	SW48573563	*Erica ciliaris*

Appendix 2 Species List - vascular and non-vascular plants

Species name	Common name	Wet Heath	Dry Heath	Bracken	Wet Woodland	Standing Water	Earth Stone Bank
Achillea millefolium	Yarrow						R
Agrostis canina	Velvet Bent						
Agrostis capillaris	Common Bent-grass		O				LA
Agrostis curtisii	Bristle Bent	R	R	R			R
Agrostis stolonifera	Fiorin		R				
Agrostis vinealis	Brown Bent		R				
Aira caryophyllea	Silver Hair-grass						R
Angelica sylvestris	Wild Angelica			R			
Anthoxanthum odoratum	Sweet Vernal-grass						LF
Arctium minus	Lesser Burdock						
Artemisia vulgaris	Mugwort						R
Athyrium filix-femina	Lady-fern			R	R		R
Bellis perennis	Daisy						
Blechnum spicant	Hard-fern	R	O	R			O
Brassica nigra	Black Mustard						R
Buddleja davidii	Butterfly-bush	R					R
Calluna vulgaris	Ling	D		O			O
Calystegia sepium	Hedge Bindweed						R
Cardamine flexuosa	Wavy Bitter-cress						
Carex binervis	Green-ribbed Sedge	O		R			
Carex panicea	Carnation Sedge	R					
Centaurea nigra	Common Knapweed						R
Cerastium fontanum subsp. vulgare	Common Mouse-ear Chickweed				R		
Cerastium glomeratum	Sticky Mouse-ear						
Chamerion angustifolium	Rosebay Willowherb			R			
Chelidonium majus	Greater Celandine						
Cirsium arvense	Creeping Thistle						R
Cirsium palustre	Marsh Thistle			R			
Cirsium vulgare	Spear Thistle						
Claytonia sibirica	Pink Purslane				R		
Clinopodium ascendens	Common Calamint						R

Species name	Common name	Wet Heath	Dry Heath	Bracken	Wet Woodland	Standing Water	Earth Stone Bank
Cortaderia selloana	Pampas-grass	R					
Crataegus monogyna	Hawthorn			R			R
Crepis capillaris	Smooth Hawk's-beard						R
Crocosmia x crocosmiiflora	Montbretia						
Cuscuta epithymum	Common Dodder	R					
Cymbalaria muralis	Ivy-leaved Toadflax						R
Cynosurus cristatus	Crested Dog's-tail						
Dactylis glomerata	Cock's-foot						O
Daucus carota	Wild Carrot						R
Digitalis purpurea	Foxglove	R		O	O		R
Dipsacus fullonum	Teasel						R
Dryopteris affinis	Scaly Male-fern	R	R	R			O
Dryopteris dilatata	Broad Buckler-fern	R	D	F			O
Dryopteris filix-mas	Male-fern						R
Erica ciliaris	Dorset Heath	R					
Erica cinerea	Bell Heather	A	O	R			LF
Erica tetralix	Cross-leaved Heath	D	R				R
Festuca ovina	Sheep's-fescue						R
Festuca rubra agg.	Red Fescue						LA
Fraxinus excelsior	Ash						
Galium mollugo	Great Hedge Bedstraw						O
Galium saxatile	Heath Bedstraw			R			F
Geranium robertianum	Herb-Robert						R
Hedera helix subsp. hibernica	Atlantic Ivy			R			O
Heracleum sphondylium	Cow Parsnip						R
Hieracium umbellatum	Narrow-leaved Hawkweed						R
Holcus lanatus	Yorkshire-fog		R	R	O		LA
Holcus mollis	Creeping Soft-grass			R			R
Hypericum pulchrum	Slender St John's-wort						R
Hypochaeris radicata	Cat's-ear						O
Ilex aquifolium	Holly			R			R
Iris pseudacorus	Yellow Iris						
Juncus acutiflorus	Sharp-flowered Rush						

Species name	Common name	Wet Heath	Dry Heath	Bracken	Wet Woodland	Standing Water	Earth Stone Bank
Juncus bufonius	Toad Rush						
Juncus effusus	Soft-rush	R	R		F	D	
Lolium perenne	Perennial Rye-grass						
Lotus corniculatus	Common Bird's-foot-trefoil						O
Lotus pedunculatus	Large Bird's-foot-trefoil						O
Molinia caerulea	Purple Moor-grass		A	F			LF
Osmunda regalis	Royal Fern						
Oxalis acetosella	Wood-sorrel			R	O		
Pedicularis sylvatica	Lousewort	R					
Phyllitis scolopendrium	Hart's-tongue Fern		R	R			O
Picris echioides	Bristly Oxtongue						R
Plantago lanceolata	Ribwort Plantain						
Plantago major	Greater Plantain						
Poa annua	Annual Meadow-grass						
Polypodium sp.	Polypody Unidentified				R		R
Potentilla anserina	Silverweed						
Potentilla erecta	Common Tormentil	R	R	O	R		O
Potentilla reptans	Creeping Cinquefoil						R
Prunella vulgaris	Selfheal						
Prunus spinosa	Blackthorn				O		O
Pteridium aquilinum	Bracken		O	D	F		LF
Ranunculus repens	Creeping Buttercup						
Rhododendron ponticum subsp. ponticum	Rhododendron	R	F	R			R
Rubus fruticosus agg.	Blackberry	R	D				LA
Rumex acetosa	Common Sorrel		R	A			F
Rumex acetosella	Sheep's Sorrel						O
Rumex conglomeratus	Clustered Dock						O
Rumex crispus	Curled Dock						
Rumex obtusifolius	Broad-leaved Dock						O
Rumex sanguineus	Wood Dock						R
Salix aurita	Eared Willow			R	F		
Salix cinerea subsp. oleifolia	Grey Willow			LF	F		
Sambucus nigra	Elder		R				

Species name	Common name	Wet Heath	Dry Heath	Bracken	Wet Woodland	Standing Water	Earth Stone Bank
Scrophularia auriculata	Water Figwort		R				
Sedum anglicum	English Stonecrop						R
Senecio jacobaea	Common Ragwort						R
Silene dioica	Red Campion		O	R			R
Soleirolia soleirolii	Mind-your-own-business						R
Solidago virgaurea	Goldenrod			A			R
Sonchus asper	Prickly Sow-thistle						R
Sorbus aucuparia	Rowan		R				
Stachys sylvatica	Hedge Woundwort						R
Stellaria uliginosa	Bog Stitchwort						
Taraxacum officinale agg.	Common Dandelion						R
Teucrium scorodonia	Wood Sage		R	O			O
Trichophorum cespitosum subsp. germanicum	Deergrass	R					
Trifolium repens	White Clover						0
Ulex europaeus	Gorse		R	R			LF
Ulex gallii	Western Gorse	D	D	O			LF
Ulmus aggregate	Elm						R
Umbilicus rupestris	Pennywort						O
Urtica dioica	Common Nettle		R				
Vaccinium myrtillus	Bilberry			O			
Veronica officinalis	Heath Speedwell				R		
Veronica persica	Common Field-Speedwell						R
Veronica serpyllifolia	Thyme-leaved Speedwell						R
Viola palustris subsp. juressi	Marsh Violet				R		
Viola riviniana	Common Violet						O

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally, E = Edge

Appendix 3 NVC quadrat data and Photos

See separate folder on CD

Survey	Noon Digery					Recorder	CF		Date	4/6/7 10/201	
Vegetation type	W25a										
Species	**Q16**	**Q17**	**Q18**	**Q19**	**Q20**	**Species**	**1**	**2**	**3**	**4**	**5**
Pteridium aquilinum	8	8	7	9	8						
Rubus fruticosus agg.	7	7	8	7	7						
Dryopteris dilatata	1	2		1	2						
Molinia caerulea	4	6		4	3						
Solidago virgaurea	2		1	1	1						
Vaccinium myrtillus	2	2	4	3							
Rumex acetosa	2		2		3						
Teucrium scorodonia		1	2	1							
Hedera helix subsp. hibernica			2	1							
Holcus mollis			3	2							
Potentilla erecta	2			1							
Agrostis curtisii	2										
Chamerion angustifolium					1						
Digitalis purpurea		1									
Dryopteris affinis		1									
Silene dioica					1						
Ulex gallii		1									
Bare ground											

	Quadrats				
	Q11	**Q12**	**Q13**	**Q14**	**Q15**
Grid. ref.	SW48073542	SW48053542	SW48053540	SW48043538	SW48053533
NVC method					
Slope	Moderate	Moderate	Moderate	Moderate	Moderate
Aspect	N	N	N	N	N
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	1m	1m	1m	1m	1m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

Survey	Noon Digery					Recorder	CF		Date	4/6/7 10/201	
Vegetation type			H8a								
Species	**Q11**	**Q12**	**Q13**	**Q14**	**Q15**	**Species**	**1**	**2**	**3**	**4**	**5**
Calluna vulgaris	7	4	7	7	7						
Erica cinerea	3	3	7	2	3						
Erica tetralix	1	2	1	1	1						
Ulex gallii	8	8	3	7	9						
Molinia caerulea	4	3		1	4						
Cuscuta epithymum		2									
Dryopteris dilatata					1						
Bare ground											

	Quadrats				
	Q11	**Q12**	**Q13**	**Q14**	**Q15**
Grid. ref.	SW4817356	SW48193548	SW48173547	SW48183554	SW4818356
NVC method					
Slope	Slight	Slight	Slight	Slight	Slight
Aspect					
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	0.75m - 1m	0.75m - 1m	0.75m - 1m	0.75m - 1m	0.75m - 1m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)					

10 = 91 - 100 9 = 76 - 90 8 = 51 - 75 7 = 34 - 50 6 = 26 - 33
5 = 11 - 25 4 = 4 - 10 3 < 4 several 2 < 4 several 1 < 4 few

Survey	Noon Digery										Recorder	CF
Vegetation type			H4c									
Species	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**		
Erica tetralix	4	4	6	5	3		3	2	4	2		
Molinia caerulea	9	9	6	9	9	10	10	9	10	10		
Ulex gallii	4	4	7	4	6	1	1	3	3			
Calluna vulgaris		4	6	4	6	2	3	4	3	3		
Agrostis curtisii	3	3		2		3		4				
Carex binervis		1		1								
Erica cinerea	1		4									
Potentilla erecta	2											
Rumex acetosa		1										
Trichophorum cespitosum				2								
Ulex europaeus						1	1		1	2		
Digitalis purpurea						1						
Erica cinerea								3				
Rubus fruticosus agg.						2						
Bare ground												

Date **4/6/7 10/2012**

	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**
Grid. ref.	SW48233563	SW48263563	SW48303564	SW48333562	SW48393558	SW48293576	SW48323577	SW48293582	SW48263587	SW48253586
Photo. No.										
NVC method										
Slope	Slight	Slight	Slight	Slight	Slight	Moderate	Moderate	Moderate	Moderate	Moderate
Aspect	N	N	N	N	N	NE	NE	NE	NE	NE
Soil type										
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	15cm	15cm	15cm	15cm	15cm	0.75m - 1m	0.75m - 1m	0.75m - 1m	0.75m - 1m	0.75m - 1m
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)										

ROSEWALL HILL (Survey Area 53 – 2012)
TREVALGAN HILL (Survey Area 52 – 2012)

NVC surveyor	Steve Adams	Date surveyed	24, 30 & 31/10/12
CSM surveyor	Steve Adams	Date surveyed	31/10 & 7/11/12
Report compiled by	Steve Adams		

1 General Information

This section places the site in a geographical context, provides a brief description of the site including access information.

1.1 Location

Site Name	Rosewall Hill & Trevalgan Hill
County	Cornwall
District	Penwith
Parishes	St. Ives, small part of Trevalgan Hill is in Towednack
Map Reference	Access at SW 4877 3946
Nat. Eng. Region	Cornwall and Isles of Scilly
National Character Area	West Penwith (No. 156)

The site comprises much of the western, north-facing slope of Rosewall Hill, and Trevalgan Hill, the two hills are separated by the B3306 St.Ives to Zennor road. There is much evidence of past mining activity within the site, with several capped mineshafts, hummocky areas of spoil and pits (now well obscured by vegetation), and areas of quarried granite boulders. There are also large areas of exposed granite rocks, either natural outcrops (tors) or half-buried boulders *in situ*.

Rosewall Hill and Trevalgan Hill were previously surveyed in December 2008. The survey area for the 2012 survey of Rosewall Hill is unchanged from 2008, however the Trevalgan Hill survey area has increased significantly, with the addition of the three fields on the western side of the hill.

1.2 Summary description

Area	c. 34 ha
Altitude	Rosewall 140m – 227m Trevalgan Hill 177m – 190m
Aspect	The slopes of Rosewall Hill are moderate to gentle and face north. The highest points are in the southeast and southwest corners of the site between which there is an almost level hill top plateau.

Plate 1 Looking northwest to Trevalgan Hill from Rosewall Hill SW49133924 (2008)

	Trevalgan Hill slopes through all points of the compass from a summit of 190m. The northwest side of the hill is steeply sloping whilst others are moderate to gentle, see *Plate 1*.
Drainage	There are no streams on the site, though on Rosewall Hill a covered concrete reservoir at SW48983935 (TN4), apparently receiving water piped from an old mine adit at SW48943934, emits a small amount of water, which dissipates into scrub with no discernible course. At SW49103923 (TN5) at 200m, small pools (remains of past

mining activity) were full of water during the site surveys in 2008 and 2012.
There are no watercourses or areas of standing water, etc., on Trevalgan Hill.

1.3 Recreational Use

The site is well used especially by dog-walkers and numerous dogs and owners were seen on both Rosewall Hill and Trevalgan Hill on all days of the survey.

1.4 Land Tenure

Both Rosewall Hill and Trevalgan Hill are owned by the National Trust and managed by a tenant farmer in partnership with the National Trust. However, the maps provided to the surveyor by Natural England, showing the site boundaries, do not appear to reflect the boundaries on the ground.
The western boundary on Rosewall Hill is shown as a straight line on the map and is marked by a new fence on the ground. A Cornish hedge is immediately to the west of the fence, the distance between the fence and hedge varies between 2-3m and 10m, which along a 300m boundary is a significant area. The area surveyed includes the land between the fence and the hedge.

There are also two large discrepancies along the southern boundary of Rosewall Hill at SW 490392 and SW492390 where the boundaries shown on the map are not marked on the ground by any visible feature. In both cases, the surveyor mapped to the obvious boundaries on the ground which is a larger area.

The roadside boundary of Rosewall Hill has been mapped to the road edge rather than the roadside Cornish hedge, so that the verge is included within the site.

In the north-east corner of Rosewall Hill are three small fields. These all appear to be farmed by one farmer as livestock are able to move between all three fields. The boundary map provided to the surveyor gives the western field as part of the survey site. The management of the fields would suggest that either all the fields should be included or none of the fields. In the 2008

survey these fields were not included within the survey.

The southern boundary of Trevalgan Hill is mapped to the roadside hedge and therefore does not include the road verge. However the south-western boundary of Trevalgan Hill does not follow a consistent physical boundary zigzagging between the Cornish hedge and the edge of the road.

2 Biological Description

2.1 Habitats

The main habitats present within the site are scrub, neutral grassland, acid grassland, bracken, dry dwarf shrub heath, humid dwarf shrub heath, basic flush and standing water. A list of plant species recorded within each habitat is provided in *Appendix 2*.

The National Vegetation Classification (NVC) communities identified during the survey are described below under the broad habitat in which they occur, and their distribution shown on *Map 2* in *Appendix 1.*

Field notes made during the vegetation survey visits are annotated onto *Map 2* and appended as Target Notes in *Appendix 1.* Photographs taken during field visits are included in the text to illustrate particular points of discussion. Photographs relating to each quadrat and CSM sampling point (as annotated onto *Map 2*) are appended (with quadrat data) to this report as a named subfolder on CD.

2.1.1 Scrub – continuous

The main areas of scrub within the site are on the northern and western slopes of Trevalgan Hill and on the lower slopes of Rosewall Hill. Most of the scrub is dominated by bramble (*Rubus fruticosus* agg.) but there are also small areas of European gorse (*Ulex europaeus*) scrub on Trevalgan Hill.

The scrub is assigned to three NVC communities, the European gorse scrub was assigned to **W23c** while the vast majority of the bramble scrub was assigned to **W25b**, with a single small area of **W24** scrub in the north-east corner of Rosewall Hill.

W23c *Ulex europaeus – Rubus fruticosus* scrub*, Teucrium scorodonia* sub-community

European gorse scrub is found as small areas on the northern and western slopes of Trevalgan Hill. A complication on this site is the presence of western gorse (*Ulex gallii*) with a growth form similar to that of European gorse. Where western gorse is abundant (more than 50% of the vegetation) these areas have been mapped as **H8** heathland.

European gorse is dominant; growing up to 2m high, but there can also be abundant bramble and bracken within this community. Other smaller herbs such as foxglove (*Digitalis purpurea*), red campion (*Silene dioica*) and Atlantic ivy (*Hedera hibernica*) occur as occasionals where there is a break in the gorse canopy.

There has been a considerable reduction in the area of European gorse scrub since the 2008 survey. With no gorse scrub mapped on Rosewall Hill in 2012 and a greatly reduced area on Trevalgan Hill. The 2008 survey did note that “European Gorse is not at all abundant (indeed in most of this area it appears moribund with only a few individuals regenerating)”. Most of the areas no longer mapped as a **W23** community has been now mapped as the bramble/bracken scrub **W25b**. Within these areas there are still the dead stems of European gorse bushes.

Plate 2 52-2012-Q25 Gorse scrub in the northern corner of Trevalgan Hill (SW4876039834)

W24 *Rubus fruticosus – Holcus lanatus* underscrub*,*

There is a small area of scrub that is heavily dominated by bramble in the north-east corner of Rosewall Hill, immediately beside the B3306. This is possibly an old quarry as the bramble scrub is contained within a small hollow.

W25b *Pteridium aquilinum* - *Rubus fruticosus* –underscrub, *Teucrium scorodonia* sub-community.

This is the main scrub community on site and the main community on Trevalgan Hill. All stands of bracken habitat within the site in which bramble was frequent to co-dominant are mapped as **W25b** underscrub. If heath sub-shrubs were present, even at low frequencies, the vegetation was mapped as a heathland, normally a H8b, albeit a degraded form.

Bramble and bracken are co-dominant, while species such as wood sage (*Teucrium scorodonia*), foxglove, European gorse and false brome only occur as occasionals.

2.1.2 Acid grassland – unimproved

U4a *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland, typical sub-community

In the centre of Rosewall Hill there is a narrow band of short grazed grassland running from the crest of the ridge down the slope. This is closest to the **U4a** typical sub-community. This type of grassland is dominated by the grasses common bent (*Agrostis capillaris*), red fescue (*Festuca rubra*) and sweet vernal grass (*Anthoxanthum odoratum*). The moss *Rhytidiadelphus squarrosus* is also abundant within the sward while common tormentil (*Potentilla erecta*) and heath bedstraw (*Galium saxatile*) are frequent.

However, close to the top of the ridge, the sward includes species such as white clover (*Trifolium repens*) smooth meadow grass (*Poa pratensis*) and yarrow (*Achillea millefolium*), which suggests a more neutral soil and possible the more mesotrophic *Holcus lanatus – Trifolium repens* sub-community. This may be due to the gentler slope reducing the removal of nutrients in run-off or this may have been the area where stock were fed causing a concentration of nutrient increase from dunging. There is no current evidence that stock gather in this area.

2.1.3 Neutral grassland - semi-improved

MG6a – *Lolium perenne – Cynosurus cristatus* grassland, typical sub-community

A very small area of grazed, heavily trodden grassland found immediately south of the car park hedge at SW487394, fits fairly well with **MG6a**. Being immediately adjacent to the car park of a popular dog-walking site, there is a large amount of dog fouling that occurs in this area. It is possibly this nutrient enrichment that has modified the grassland into a semi-improved, neutral grassland. Grasses found include frequent common bent, red fescue and Yorkshire-fog, with white clover (*Trifolium repens*), ribwort plantain (*Plantago lanceolata*), creeping buttercup (*Ranunculus repens*) and self-heal (*Prunella vulgaris*) frequent to occasional. However perennial rye-grass (*Lolium perenne*), a species usually a major component to this community, was not seen, perhaps overlooked at the time of survey, though it occurs on a nearby pathway.

Plate 3 53-2012 MG6a grassland grazed by Exmoor ponies

2.1.4 Bracken

There are two bracken communities on site; with abundant bramble in the **W25b** community and in the grassy **U20a** community. **W25b** has been described above in the scrub section.

U20a – *Pteridium aquilinum - Galium saxatile*, *Anthoxanthum odoratum* sub-community

Where bracken was found without (or with very little) bramble in a more or less low grassy sward, this vegetation was identified as U20a, the grassy sub-community of a normally bracken dominated vegetation. Yorkshire-fog, sweet vernal-grass and common bent are the commonest grasses. Though no sheep's-fescue (*Festuca ovina*), a species usually in this community was recorded. Other species characteristic of this community seen include heath bedstraw (*Galium saxatile*), tormentil (*Potentilla erecta* and some common violet and wood-sage. In some stands wood-sorrel (*Oxalis acetosella*) was found and the mosses *Pseudoscleropodium purum* and *Rhytidiadelphus squarrosus*, give the sward a spongy feel in places when walked upon. At the time of survey the bracken was present as dead fronds but it

was generally frequent and in the summer must form a fairly closed canopy.

Plate 4 53-2012-C20 U20a at the eastern end of Rosewall Hill, SW49233917

2.1.5 Heathland - dry dwarf shrub heath

Dry heath covers large areas within the site and has developed from past and continuing management with grazing appearing to influence the sub-communities present.

Two dry heath communities have been identified: **H8a *Calluna vulgaris* - *Ulex gallii* heath, species-poor sub-community** and **H8b *Calluna vulgaris* - *Ulex gallii* heath, *Danthonia decumbens* sub-community**.

H8a *Calluna vulgaris* - *Ulex gallii* heath, species-poor sub-community

In the absence or near absence of purple moor-grass, cross-leaved heath and bristle bent, much of the dry dwarf heath on Rosewall Hill in the eastern part of the site, has been identified as **H8a**. This vegetation forms a dense, closed canopy of Western gorse, with lesser amounts of bell heather and heather. The canopy is so dense that not much

else can grow between these three species, though a few shoots of purple moor-grass and bramble make a contribution to the vegetation. The vegetation is generally tall – to about 70-80cm on average, with some gorse bushes slightly higher.

Plate 5 52-2012-Q14 H8a heathland on Rosewall Hill, SW4926739340 showing dense canopy

H8b *Calluna vulgaris* - *Ulex gallii* heath, *Danthonia decumbens* sub-community

Much of the **H8** vegetation on the western part of Rosewall Hill and on Trevalgan Hill is more open. Here, previous cutting and or grazing, has created more open vegetation. Western gorse is common and abundant, with constant bell heather and heather though the abundance of these species varies considerably from stand to stand cross-leaved heath is more or less absent. Bristle bent can be frequent, though not a species typically associated with this community this species is at its edaphic optimum in the extreme southwest of the British Isles and can be over represented within a number of communities as compared to published descriptions.

This community is more open than **H8a**, and grasses found include

common bent, Yorkshire-fog and sweet vernal-grass: purple moor-grass is rare. Other species found in this sub-community included broad buckler-fern, tormentil and heath bedstraw.

Plate 6 52-2012-Q18 on Rosewall Hill, SW 48788 39345 showing typical H8b with grassy runnels.

The structure of the community varied, with some vegetation around 40cm tall towards the higher part of Rosewall Hill and some where the western gorse had become leggy and tall to 120cm giving if the initial appearance of a European gorse scrub rather than a heathland. Those areas with the taller western gorse also tended to abundant to frequent bracken and bramble.

Plate 7 53-2012-Q20 SW 48860 39463 showing H8b heath with frequent bramble and bracken.

2.1.6 Humid dwarf shrub heath

H4c *Ulex gallii – Agrostis curtisii* heath*, Erica tetralix* sub-community

This community was found on the lower slopes and higher eastern part of Rosewall Hill. In contrast to adjacent dense continuous stands of **H8a** these areas are somewhat more open with vegetation to 60cm and have constant and frequent purple moor-grass (*Molinia caerulea*) and cross-leaved heath. Western gorse is the most abundant species, with frequent bell heather and heather.

H4c appears to have developed on poorly-drained, north-facing slopes of Rosewall Hill, hence the presence of cross-leaved heath and purple-moor grass, (species that need moisture but not too much water-logging).

Plate 8 53-2012 H4c area immediately alongside the B3306 on the lower slopes of Rosewall Hill.

In some areas, hard grazing has created hummocks of Western gorse, with associated ericoids, separated by grass dominated, compacted 'paths.' Here the vegetation is about 10cm high, bristle bent is frequent and *Cladonia portentosa* is locally frequent. More rarely *Sphagnum* occurs in small patches where there is run-off between the gorse hummocks. Carnation sedge (*Carex panacea*) and lousewort (*Pedicularis sylvatica*) are also occasionally present.

Plate 9 53-2012-C5 H4c on Rosewall Hill, SW4937939237, showing more open structure associated with heavier grazing

2.1.7 Basic flush

A covered concrete reservoir at SW48983935 (TN4), apparently receiving water piped from an old mine adit at SW4894393, discharges a small amount of water which drains into surrounding areas of scrub. This was assigned to **M23b *Juncus effusus/acutiflorus – Galium palustre* rush-pasture vegetation *Juncus effusus* sub-community** in the 2008 survey but the low frequency of rush suggests that it is probably best described as a basic flush or rill. Around localised wet patches, are clumps of soft rush (*Juncus effuses*), with Yorkshire-fog (*Holcus lanatus*), common bent, marsh thistle (*Cirsium palustre*) and greater bird's-foot trefoil (*Lotus pedunculatus*). Water-purslane (*Lythrum portula*), and round-leaved crowfoot (*Ranunculus omiophyllus*) are also present within small pools and poached areas.

Plate 10 53-2012-TN4 Basic flush on Rosewall Hill, SW48943935

There are abundant bryophytes within this flush but no *Sphagna*. The moss *Calliergonella cuspidata* and the thallose liverwort *Pellia endiviifolia* are both frequent, with the *Pellia* being a base-rich indicator.

2.1.8 Open water

There are two small pools at SW49103923 (TN5) at 200m, presumably associated with past mining activity. The only plants that could be identified were common float-grass and bog pondweed (*Potamogeton polygonifolius*). The 2008 survey suggested that these ponds were temporary, however the 2012 surveyor has visited the site a number of times over the previous ten years and these ponds have always held water.

Plate 11 53-2012-TN5 Pond in old mine workings, Rosewall Hill, SW49103923

2.1.9 Rock exposure and waste – other exposure

Granite rock outcrops are a feature of the site, with substantial natural *in situ* outcrops in the western and southernmost parts of Rosewall Hill and at the summit of Trevalgan Hill. Granite boulders are also scattered throughout the site, sometimes hidden by the heath or scrub vegetation. The vegetation that has developed on the exposed rock outcrops tends to be dominated by bryophytes and lichens.

2.1.10 Artificial exposures and waste tips – quarry, spoil, mine

Rosewall Hill has had a long history of mining activity and several features associated with mining are present. There are mine shafts, at least one old granite quarry, extractive pits and spoil tips: these features are now thoroughly vegetated and form part of the natural landscape. They have been mapped with the vegetation that now grows on these features or are target-noted where appropriate.

There are several large piles of granite rocks and boulders, presumably associated with mining or quarrying activity, on the north side of Rosewall Hill. The most substantial area of these rocks lies within an area of **W25b** vegetation forming the steep back edge of an old quarry.

Both bryophytes and lichens are abundant on these boulders but identification of these species groups is beyond the remit of this survey. During the 2008 survey the near threatened Wilson's filmy-fern (*Hymenophyllum wilsonii*) was found in a shaded crevice at SW49143944.

2.2 Species

2.2.1 Vascular plants

The 2012 NVC survey recorded 81 plant species and 25 bryophytes. Phase 1 Habitat survey in December 2008 recorded a total of 121 plant species, including 6 non-vascular species.

No species of nature conservation concern were recorded during the 2012 survey. However during the 2008 survey one species of nature conservation concern was recorded and a desk study for botanical species was also undertaken.

Important species recorded during the 2008 survey were assessed using the *Conservation designations for UK Taxa* (JNCC, 2009). For rarity at a more local level, the Cornwall Rare Plant Register (Botanical Cornwall Group, 2009) has identified species found in twenty or fewer sites in Cornwall. The only important species found during the 2008 survey was the near threatened (and Cornwall scarce) Wilson's filmy-fern (*Hymenophyllum wilsonii*), a small patch found between granite boulders at SW49143944 on the lower part of the northern side of Rosewall Hill. From a desk study of rare or threatened vascular plants found close to Rosewall and Trevalgan Hills this species has been recorded for Rosewall Hill in 1996 for SW487396 (though this grid reference puts it on Trevalgan Hill) and for SW487394 in 2000 (on Rosewall Hill). Suitable habitats were searched in these grid references during surveying but no further specimens were found.

Other species identified from a desk study include: the vulnerable common dodder *Cuscuta epithymum*, recorded for both Rosewall Hill (at SW487396 in 2000) and Trevalgan Hill (at SW490394 in 2000), and though not recorded in December 2008 it is likely to still be present (seen in summer months).

3 Condition Assessment

There are three communities at Rosewall Hill that require condition assessment, Cornish humid lowland heathland (H4c), dry lowland heathland (H8a and H8b) and lowland acid grassland (U4a and U20a). These were assessed using the appropriate NE CSM forms for these habitats.

3.2 The lowland acid grassland (U4/U20), which only occurs on Rosewall Hill, has been assessed as being in Unfavourable declining condition. This is because it has failed on several of the mandatory attributes. One of these failures was its sward composition, frequency of positive indicator species. However if the site was resurveyed in the summer it is possible it would pass this attribute as additional species may be identified.

It also fails on frequency of negative indicator species, especially thistles. While they still account for less than 5% of cover, marsh thistle (*Cirsium palustre*) is frequent.

The most concerning failure is the frequency and cover of bramble. While is does not occur in the U4 short grassland areas, in the U20 community if was recorded in all the CSM stops and in 3 of the 5 NVC quadrats, During the 2008 NVC survey bramble was not recorded in any of the U20 quadrats, suggesting that bramble has increased significantly over the last 4 years.

3.1 The Cornish humid lowland heath (H4c), which only occurs on Rosewall Hill is assessed as being in Favourable maintained condition. This is because it meets all the mandatory attributes except one. The gorse cover in this community ranges from 45-95%, averaging at 75%. However, all the gorse is western gorse (*Ulex gallii*) and in Cornwall, this species is known to occur at much higher cover than national descriptions such as NVC, would suggest. This is recognised by Natural England, with the CSM guidance for lowland heath stating; “However, the relative abundance of *Ulex gallii* in certain areas of the country (Cornwall and the Isles of Scilly……..) is not

necessarily an indication that the site is badly managed. Targets should be set which take into account its natural abundance in otherwise good quality stands in the above mentioned areas…....". The assessor has, therefore, decided that the high levels of western gorse in this community are not a concern or cause to fail the site.

The main area of this type of humid heath is found in the south-east corner of the site, running from the ridge top to roughly half way down the slope. It has a good variety of structure which has probably been maintained by grazing from cattle and ponies. The small area of heath at the base of the slope, alongside the road is more uniform in structure without any pioneer stage heath. This area did not show any evidence of being grazed.

3.3 Dry lowland heathland (H8a and H8b) occurs on both Rosewall Hill and Trevalgan Hill and has been assessed as Unfavourable no change. It failed on a number of mandatory attributes. There is over 50% cover of western gorse, however as stated above in the humid heath section this should not be a reason for failing on Cornish sites.

The age structure has been assessed for ericiods as a whole rather than just ling (*Calluna vulgaris*). There is limited structural diversity with the over 90% being in the building/mature stage and only 1% being at the pioneer stage.

There is limited diversity of graminiods with two species, bristle bent and sedges being abundant, but only one other, purple moor-grass recorded as rare. However the NVC quadrats for the H8b heath do give a higher diversity of graminiods.

It also fails on the frequency and cover of bramble. While CSM has not been carried out on this site before, the 2008 NVC recorded bramble in 10 of the 11 H8 quadrats with a domin score ranging between 1-6. All 9 of the H8b quadrats contained bramble while only 1 of 2 H8a quadrats did. The 2012 survey recorded bramble in 6 of 10 quadrats with scores between 3-6. The H8a heath appears healthier than the H8b heath from this respect with only 1 of 5 quadrats containing bramble compared to the 5 of 5 quadrats for H8b. This suggests that

the cover and frequency of bramble in this heath is, at worst, probably stable.

However the tenant farmer believes there has been an increase in the bramble cover and that this is due to him no longer being able to graze sheep on the site. The site is currently being grazed by cattle or Exmoor ponies. In 2008 sheep were also grazed on Rosewall Hill. However the tenant farmer can no longer graze sheep on this site due to the number of dogs that are walked on the site which have caused problems in the past.

Dog fouling is also probably the main cause for the presence or continued presence of MG6 close to the entrance to the site, rather than U4 grassland.

Table 1 Summary of habitats and vegetation communities

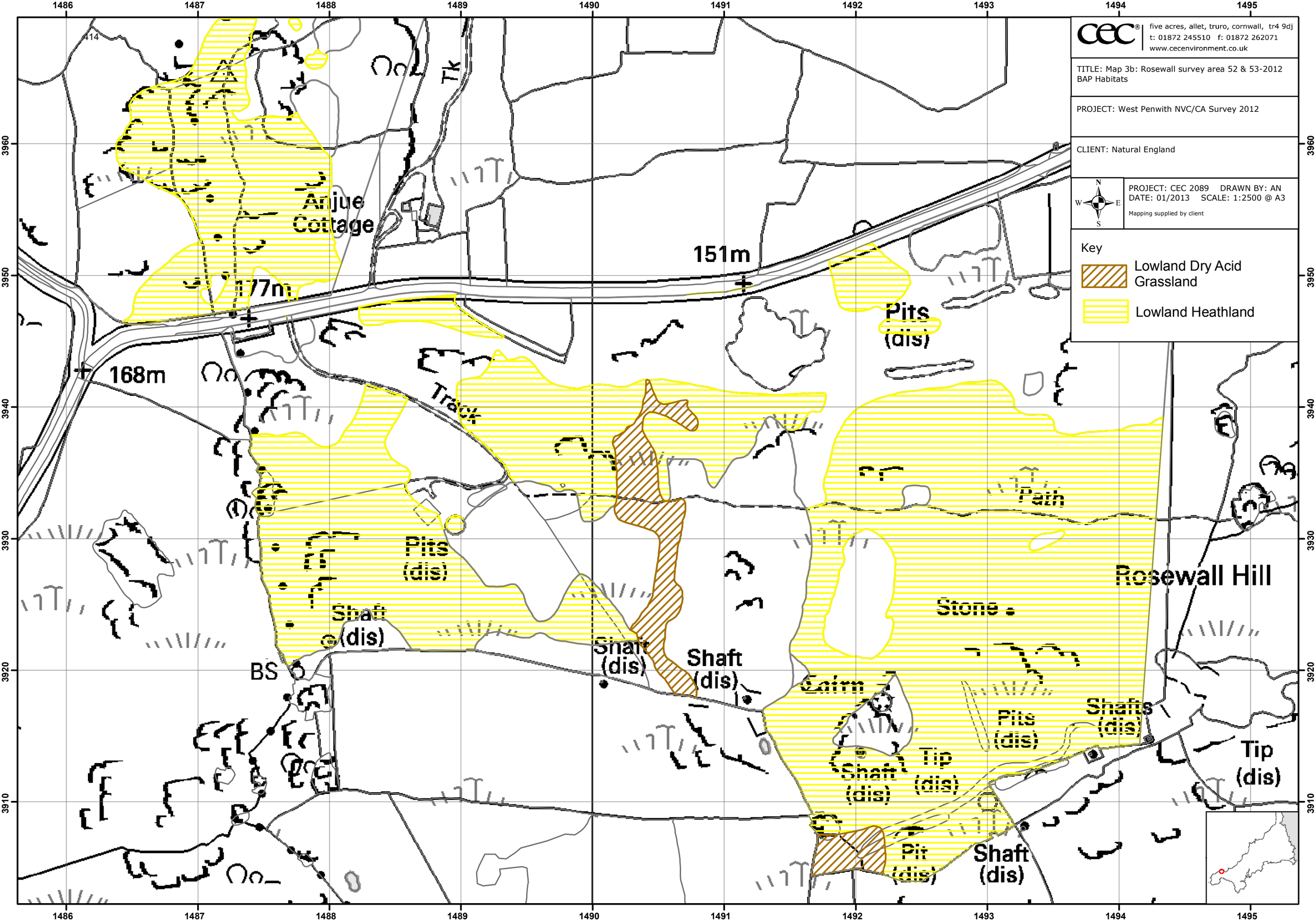
Rosewall Hill 53 and Trevalgan Hill 52-2012					
Habitats	**NVC communities**	**Area (Ha) 2008 data**	**Area (Ha) 2012 data**	**CA category**	**BAP Type/area (Ha)**
Scrub	W23a	0.18	0	N/A	N/A
	W23c	3.07	0.92	N/A	
	W24	0	0.22	N/A	
	W25b	6.92	13.74	N/A	
Acid grassland	U4a	0	0.73	UFD	Lowland dry acid grassland 0.73
Bracken	U20a	4.47	3.56	UFD	N/A
Dry heath	H8a	3.01	3.25	UFNC	Lowland heathland 14.38
	H8b	7.48	7.39	UFNC	
Humid heath	H4c	3.97	3.74	F	
Mesotrophic grasslands	MG6a	0.1	0.12	N/A	N/A
Total Area Mapped		**29.2**	**33.67**		

Condition Assessment reporting categories:
Favourable (F), Unfavourable recovering (UFR), Unfavourable no change (UFNC)**,** Unfavourable declining (UFD)

The area surveyed in 2012 is larger then that surveyed in 2008. The Rosewall Hill site has the same boundaries, but Trevalgan Hill has three additional fields on the western side. These are mainly **W25b** scrub with two areas of the **W23c** gorse scrub and an area of **H8** heath near the top of the hill.

Appendix 1

Maps (1: Location, 2: NVC, 3: BAP habitat) See separate Maps Folder on CD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five acres, allet, truro, cornwall, tr4 9dj
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www.cecenvironment.co.uk
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CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
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Lowland Dry Acid Grassland
Lowland Heathland
Anjue Cottage
177m
151m
168m
Pits (dis)
Track
Path
Rosewall Hill
Stone
Shaft (dis)
BS
Cairn
Shafts (dis)
Tip (dis)
Pit (dis)
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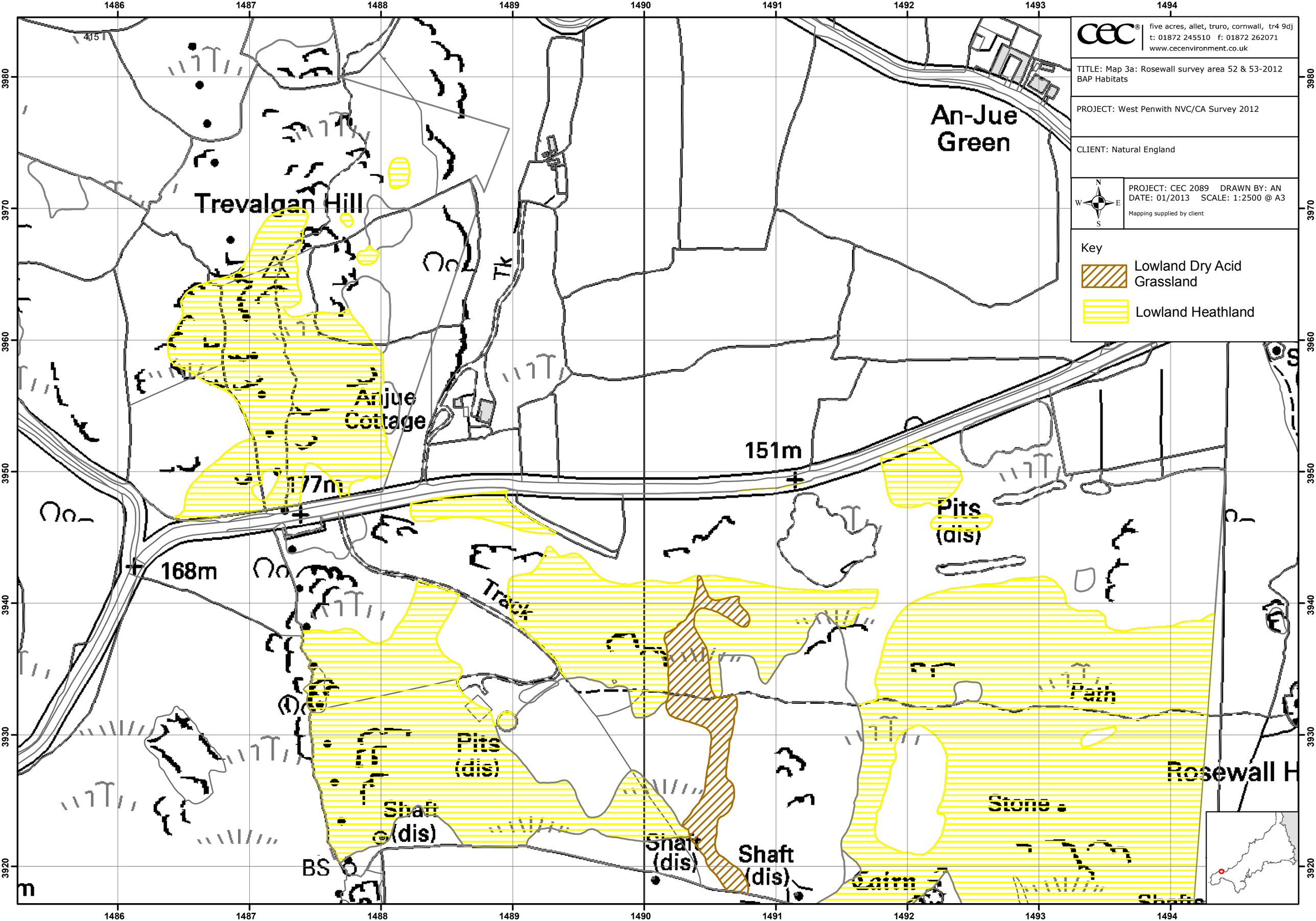
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five acres, allet, truro, cornwall, tr4 9dj
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CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
DATE: 01/2013 SCALE: 1:2500 @ A3
Mapping supplied by client
Key
Lowland Dry Acid Grassland
Lowland Heathland
Trevalgan Hill
An-Jue Green
Anjue Cottage
151m
77m
168m
Pits (dis)
Track
Path
Rosewall H
Stone
Shaft (dis)
Cairn
BS
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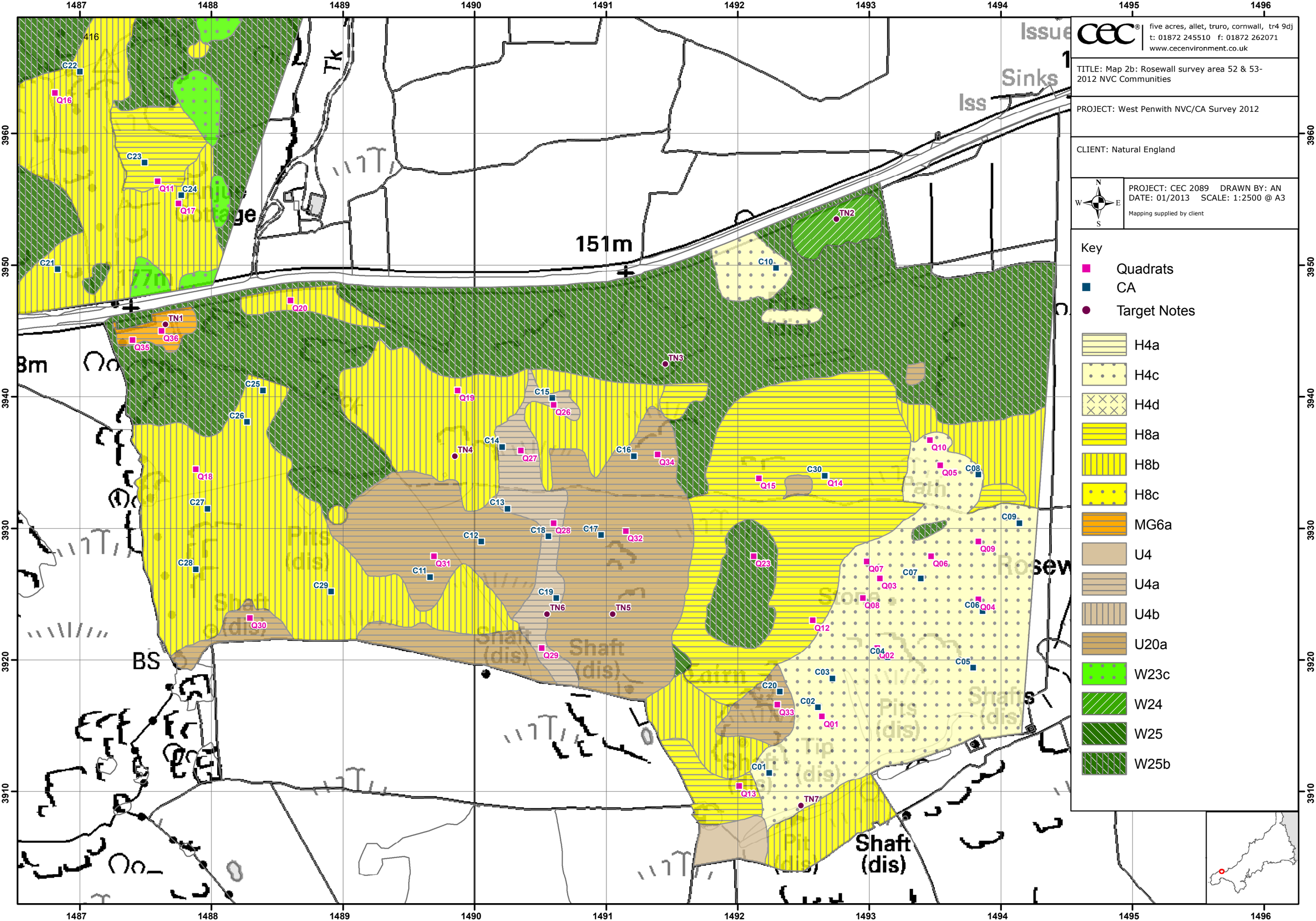
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CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
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Quadrats
CA
Target Notes
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H4c
H4d
H8a
H8b
H8c
MG6a
U4
U4a
U4b
U20a
W23c
W24
W25
W25b
151m
Shaft (dis)
Pits (dis)
Cairn
Tip (dis)
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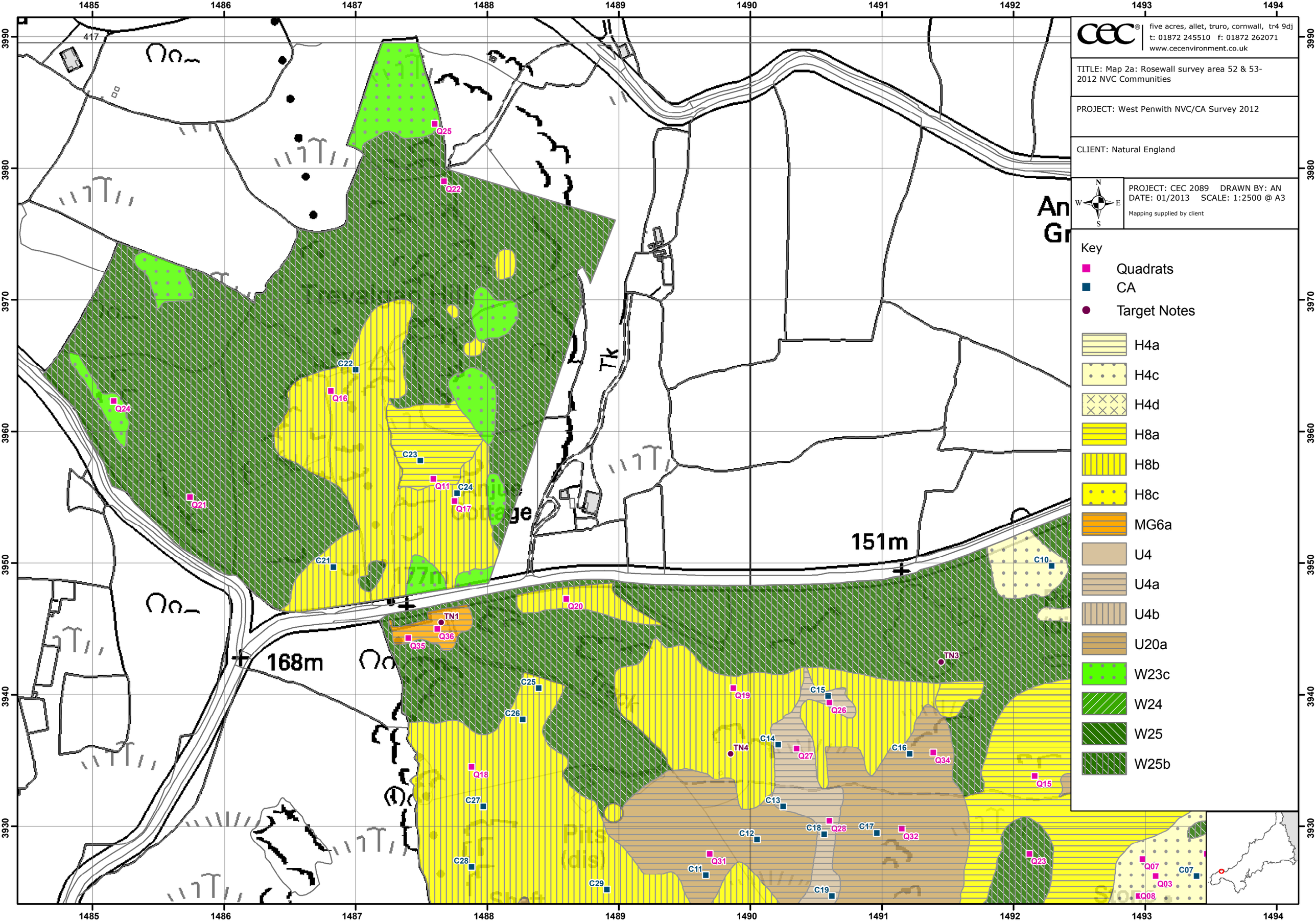
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CLIENT: Natural England
PROJECT: CEC 2089 DRAWN BY: AN
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H4c
H4d
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H8c
MG6a
U4
U4a
U4b
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151m
168m
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Q22
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C11
C19
Q23
C10
Q07
Q03
Q08
C07

Target Notes for Rosewall Hill (Survey Area 53 – 2012)

TN. No.	Grid Ref.	Text
1	SW48763945	MG6a, short grazed turf, enriched by dog excrement, possible congregation place for ponies (dung here) and also rabbit droppings. Q1, 2.
2	SW49273953	Area of dense bramble scrub without bramble (W24). No quadrats taken.
3	SW49143942	Area of boulders – possible old spoil site from an abandoned quarry?
4	SW48983935	There is a water tank with overflow which causes a flush running downhill for approximately 30m.
5	SW49103923	Two ponds – possible old settling tanks from mining activities
6	SW49053923	This is the location of the provided site boundary but does not match the physical boundaries on the ground. Area surveyed was to the physical boundary to the south.
7	SW49243908	This is the location of the provided site boundary but does not match the physical boundaries on the ground. Area surveyed was to the physical boundary to the south.

Appendix 2 Species list

Vascular Plants

Species Name		Scrub	SI grassland	Acid grassland	Bracken	Heath	Standing water	Basic flush
Achillea millefolium	Yarrow			R				
Agrostis canina	Velvet Bent					R		
Agrostis capillaris	Common Bent		A	A	A	R		
Agrostis curtisii	Bristle Bent				R	O		
Agrostis stolonifera	Creeping Bent							F
Anthoxanthum odoratum	Sweet Vernal-grass	R		A	F	R		
Athyrium filix-femina	Lady-fern				R	R		
Bellis perennis	Daisy		O	R				
Blechnum spicant	Hard Fern					R		
Brachypodium sylvaticum	False brome	O				R		
Calluna vulgaris	Ling			O		A		
Carex binervis	Green-ribbed Sedge			O		O		
Carex panecea	Carnation sedge							
Carex pilulifera	Pill Sedge			R		R		
Carex viridula ssp. *oedocarpa*	Yellow sedge							O
Cerastium fontanum	Common Mouse-ear Chickweed		O	R				
Chamerion angustifolium	Rosebay Willowherb	O						
Cirsium arvense	Creeping Thistle		R	R				
Cirsium palustre	Marsh Thistle			O				O
Cotoneaster sp.	Cotoneaster (unidentified)					R		
Crataegus monogyna	Hawthorn					R		
Cuscuta epithymum	Common dodder					R		
Dactylis glomerata	Cock's-foot	R						
Danthonia decumbens	Heath-grass					R		
Digitalis purpurea	Foxglove	O				R		
Dryopteris dilatata	Broad Buckler-fern	O			R	R		
Epilobium sp.	Willowherb (unidentified)							O
Erica cinerea	Bell Heather					F		
Erica tetralix	Cross-leaved Heath					O		
Festuca rubra	Red Fescue		A	A	R	R		
Galium saxatile	Heath Bedstraw			F	F	R		
Geranium dissectum	Cut-leaved Crane's-bill		R					
Geranium robertianum	Herb-Robert	R						
Glechoma hederacea	Ground-ivy	R						
Glyceria fluitans	Common float-grass						O	
Hedera helix subsp. *hibernica*	Atlantic Ivy	R				R		
Heracleum sphondylium	Hogweed	R						
Holcus lanatus	Yorkshire-fog		F	F	F	R		F
Hypochaeris radicata	Cat's-ear			R		R		
Ilex aquifolium	Holly					R		

Species Name		Scrub	SI grassland	Acid grassland	Bracken	Heath	Standing water	Basic flush
Juncus bufonius	Toad Rush							O
Juncus effusus	Soft-rush					R		O
Lolium perenne	Perennial Rye-grass		F					
Lonicera periclymenum	Honeysuckle					R		
Lotus corniculatus	Bird's-foot-trefoil			R	R	R		O
Lotus pedenculatus	Greater bird's-foot-trefoil							O
Luzula multiflora	Heath wood-rush		O	O	R			
Lythrum portula	Water-purslane							O
Molinia caerulea	Purple Moor-grass					LF		
Osmunda regalis	Royal fern	R						
Oxalis acetosella	Wood-sorrel				O			
Pedicularis sylvatica	Lousewort			R		O		
Petasites fragrans	Winter Heliotrope	R						
Plantago lanceolata	Ribwort Plantain		F					
Poa annua	Annual Meadow-grass		R	R				
Poa pratensis	Smooth meadow-grass		R	R				
Polygala serpyllifolia	Heath Milkwort					R		
Potamogeton polygonifolius	Bog pondweed						O	
Potentilla erecta	Common Tormentil		O	F	F			
Potentilla reptans	Creeping Cinquefoil	R						
Potentilla sterilis	Barren Strawberry			R				
Prunella vulgaris	Selfheal		F	O				
Pteridium aquilinum	Bracken	A			A	O		
Ranunculus repens	Creeping Buttercup		F	R				
Rubus fruticosus agg.	Bramble	A			A	O		
Rumex acetosa	Common Sorrel	R			O			
Rumex acetosella	Sheep's Sorrel			R				
Sagina procumbens	Procumbent Pearlwort		R					
Salix cinerea	Grey Willow	R						
Sedum anglicum	English Stonecrop					R		
Silene dioica	Red Campion	R						
Solidago virgaurea	Goldenrod	R						
Taraxacum officinale agg.	Common Dandelion			R				
Teucrium scorodonia	Wood Sage	R	F		R	R		
Trifolium repens	White Clover		A	O				
Ulex europaeus	Gorse	LD						
Ulex gallii	Western Gorse	R				A		
Umbilicus rupestris	Pennywort					R		
Vaccinium myrtillus	Bilberry				R	R		
Veronica chamaedrys	Germander Speedwell				R			
Veronica officinalis	Heath speedwell			R				
Veronica serpyllifolia	Thyme-leaved speedwell		R	R				
Viola riviniana	Common Violet			F		O		

Non-vascular Plants

Species Name		Scrub	SI grassland	Acid grassland	Bracken	Heath	Standing water	Basic flush
Calliergonella cuspidata	Pointed Spear-moss							F
Campylopus brevipilus	Compact Swan-neck Moss					R		
Campylopus flexuosus	Rusty Swan-neck Moss					R		
Campylopus introflexus	Heath Star Moss					R		
Campylopus pyriformis	Dwarf Swan-neck Moss					R		
Dicranoweisia cirrata	Common Pincushion					R		
Dicranum scoparium	Broom Fork-moss	R						
Hypnum cupressiforme	Cypress-leaved Plait-moss					R		
Hypnum jutlandicum	Heath Plait-moss					O		
Isothecium myosuroides	Mouse-tail moss	R				R		
Kindbergia praelonga	Common feather-moss	O	O					
Pellia endiviifolia	Endive Pellia							O
Philonotis fontana	Fountain apple-moss							O
Plagiomnium undulatum	Hart's-tongue Thyme-moss	R						
Pleurozium schreberi	Red-stemmed feather-moss				R			
Polytrichum juniperinum	Juniper Haircap					R		
Pseudoscleropodium purum	Neat Feather-moss	R		F	F	R		
Rhytidiadelphus loreus	Little Shaggy-moss				R			
Rhytidiadelphus squarrosus	Springy Turf-moss	R		A	F			
Scapania gracilis	Western Earwort			O				
Sphagnum cuspidatum	Feathery Bog-moss					R		
Sphagnum denticulatum	Cow-horn Bog-moss					R		
Sphagnum subnitens	Lustrous Bog-moss					R		
Sphagnum tenellum	Soft Bog-moss					R		
Thuidium tamariscinum	Common Tamarisk-moss			O				
Cladonia portentosa	*A cladonia lichen*					R		
Usnea rubicunda	A lichen					R		
Parmelia sp	A lichen					R		

DAFOR is a nominative scale for measuring frequency of plants: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare, L = Locally, E = Edge

Appendix 3 NVC quadrat data and Photos

See Rosewall subfolder on West Penwith CD for quadrat data and photos.

Survey	Rosewall Hill					Recorder	SA		Date 30/10/2012		
Vegetation type	H4c										
Species	Q1	Q2	Q3	Q4	Q5	Species	1	2	3	4	5
Ulex gallii	8	8	8	8	7						
Erica cinerea	7	7	5	8	8						
Erica tetralix	4	7	8	7	7						
Agrostis curtisii	4	3	4	8	5						
Molinia caerulea	7	7	7	7	7						
Potentilla erecta	3	3	3	3	2						
Danthonia decumbens	3	0	0	0	0						
Hypnum cupressiforme	4	0	0	3	0						
Calluna vulgaris	7	7	7	7	7						
Veronica serpyllifolia	0	2	0	2	0						
Carex binervis	0	3	0	4	4						
Cladonia sp.	0	1	0	4	0						
Sphagnum sp.	0	0	3	0	0						
Bare ground											

Quadrats

	Q1	Q2	Q3	Q4	Q5
Site	**53**	**53**	**53**	**53**	**53**
Grid. ref.	SW 49264 39157	SW 49306 39209	SW 49308 39262	SW 49383 39246	SW 49354 39348
Photo. Bearing	5	190	194	90	200
Slope	Flat	Very gentle	Gentle	Very gentle	Gentle
Aspect	na	32	0	352	343
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation Height	5-50cm	10-30cm	30cm	10-30cm	10-30cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	A relatively open heath with grassy runnels. Grazed by cattle and ponies.	A low growing heath with some grassy runnels. Grazed by cattle and ponies.	A low growing heath with some grassy runnels. Grazed by cattle and ponies.	A low growing open heath with areas of pioneer heath and lichens. Grazed by cattle and ponies	A low growing open heath with areas of pioneer heath and lichens. Grazed by cattle and ponies

Survey	Rosewall Hill					Recorder		SA		Date	30/10/2012
Vegetation type	H4c										
Species	Q6	Q7	Q8	Q9	Q10	Species	1	2	3	4	5
Ulex gallii	10	9	9	9	9						
Erica tetralix	7	7	6	7	6						
Calluna vulgaris	6	5	6	7	7						
Erica cinerea	4	7	7	6	8						
Molinia caerulea	3	3	0	7	0						
Agrostis curtisii	3	0	0	0	0						
Bare ground	1		2								

	Quadrats				
	Q6	Q7	Q8	Q9	Q10
Site	**53**	**53**	**53**	**53**	**53**
Grid. ref.	SW 49347 39279	SW 49298 39275	SW 49295 39247	SW 49383 39290	SW 49346 39367
Photo. Bearing	80	340	350	332	180
Slope	Gentle	Gentle	Gentle	Gentle	Moderate
Aspect	350	340	350	350	0
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	60cm	60cm	50cm	60cm	80cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	A tall, closed canopy of sub-shrubs. Stock do not appear to graze this tall heath.	A tall, closed canopy of sub-shrubs. Stock do not appear to graze this tall heath.	A tall, closed canopy of sub-shrubs. Stock do not appear to graze this tall heath.	A tall canopy of sub-shrubs, however Molinia is present and there are several U.gallii bushes that are dying back, which has opened the canopy slightly.	A tall, closed canopy of sub-shrubs. Stock do not appear to graze this tall heath.

Survey	Rosewall & Trevalgan Hills					Recorder		SA		Date 30/10/2012	
Vegetation type			H8a								
Species	Q11	Q12	Q13	Q14	Q15	Species	1	2	3	4	5
Ulex gallii	9	9	9	9	10						
Erica cinerea	8	8	6	7	8						
Rubus fruticosus agg.	4	0	0	0	0						
Teucrium scordium	3	0	0	0	0						
Agrostis canina	3	0	0	0	0						
Athyrium filix-femina	2	0	0	0	0						
Calluna vulgaris	8	7	5	7	5						
Cuscuta epithymum	0	3	0	0	0						
Agrostis curtisii	0	0	3	0	0						
Digitalis purpurea	0	0	0	1	0						
Dryopteris dilatata	0	0	0	0	1						
Hypnum cupressiforme	0	0	5	0	3						
Pteridium aquilinum	0	0	4	0	0						
Molinea caerulea	0	0	0	1	0						
Bare ground											

Quadrats

	Q11	Q12	Q13	Q14	Q15
Site	**52**	**53**	**53**	**53**	**53**
Grid. ref.	SW 48759 39564	SW 49257 39230	SW 49201 39104	SW 49267 39340	SW 49216 39338
Photo. No.					
Photo. Bearing	5	190	194	90	200
Slope	Flat	Very gentle	Gentle	Very gentle	Gentle
Aspect	na	32	0	352	343
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation Height	5-50cm	10-30cm	30cm	10-30cm	10-30cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	A tall, almost closed canopy of sub-shrubs with some bramble. Stock do not appear to graze this tall heath.	A tall, almost closed canopy of sub-shrubs. Stock do not appear to graze this tall heath.	A tall canopy of sub-shrubs with some bracken. Stock do not appear to graze this tall heath.	A tall canopy of sub-shrubs. Stock do not appear to graze this heath.	A tall, almost closed canopy of sub-shrubs. Stock do not appear to graze this tall heath.

Survey	Rosewall & Trevalgan Hills					Recorder	SA		Date	31/10/2012	
Vegetation type	H8b										
Species	Q16	Q17	Q18	Q19	Q20	Species	1	2	3	4	5
Ulex gallii	5	6	6	8	5						
Erica cinerea	7	8	7	8	7						
Rubus fruticosus	4	3	3	5	4						
Pteridium aquilinum	6	0	3	6	4						
Teucrium scorodonia	4	0	2	0	0						
Brachypodium sylvaticum	4	0	2	0	0						
Anthoxanthum odoratum	5	3	3	0	0						
Agrostis curtisii	4	5	5	3	5						
Digitalis purpurea	1	0	0	0	0						
Hedera atlantica	3	0	0	0	0						
Galium saxatile	3	0	3	3	0						
Agrostis capillaris	6	0	3	0	0						
Calluna vulgaris	0	7	8	0	7						
Lonicera periclymenum	0	0	2	0	0						
Veronica serpyllifolia	0	0	1	0	0						
Dryopteris dilatata	0	0	1	2	0						
Pseudoscleropodium purum	0	0	3	0	0						
Holcus lanatus	0	0	3	0	0						
Carex binervis	0	0	0	0	4						
Hypnum cupressiforme	0	0	0	0	4						
Molinia caerulea	0	0	0	0	2						
Rock	0	0	4	0	0						
Bare ground											

Quadrats

	Q16	Q17	Q18	Q19	Q20
Site	**52**	**52**	**53**	**53**	**53**
Grid. ref.	SW 48681 39631	SW 48775 39547	SW 48788 39345	SW48987 39405	SW 48860 39473
Photo. No.					
Photo. Bearing	118	205	177	249	102
Slope	Steep	Flat	Moderate	Moderate	Gentle
Aspect	244	na	2	0	17
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	30cm	40cm	45cm	100cm	40cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	A very scrubby open version of H8b. U.gallii often having the growth form of U. europaeus. Cattle were grazing this site at the time of the visit but they did not appear to push into this type of vegetation.	Open heath with grassy runnels and bramble. Grazed by cattle.	Open heath with grassy runnels and bramble. Grazed by cattle and ponies.	Closed heath with bracken and bramble. Stock do not appear to push into this type of vegetation.	Open heath with grassy runnels, bracken and bramble. Grazed by cattle and ponies

Survey	Rosewall & Trevalgan Hills					Recorder	SA		Date	24/10/2012	
Vegetation type	W25b										
Species	Q21	Q22	Q23			Species	1	2	3	4	5
Pteridium aquilinum	9	8	9								
Rubus fruticosus	9	8	8								
Brachypodium sylvaticum	5	4	0								
Rumex acetosa	4	0	2								
Digitalis purpurea	4	4	4								
Teucrium scorodonia	3	0	0								
Kindbergia praelonga	3	3	0								
Dryopteris dilatata	0	3	0								
Dicranum scoparium	0	2	0								
Anthoxanthum odoraum	0	4	0								
Rhytidiadelphus squarrosus	0	0	3								
Pseudoscleropodium purum	0	0	7								
Bare ground											

Quadrats

	Q21	Q22	Q23		
Site	**52**	**52**	**53**		
Grid. ref.	SW 48574 39550	SW 48767 39790	SW 49212 39279		
Photo. No.					
Photo. Bearing	342	24	315		
Slope			Gentle		
Aspect			0		
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m		
Vegetation height (mm)	80cm	60cm	100cm		
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Dense growth of bramble with bracken. Stock have not pushed into this type of vegetation.	Bramble with bracken with some small areas of short grass, however stock do not appear to have pushed into this vegetation.	Dense growth of bramble with bracken. Stock have not pushed into this type of vegetation.		

Survey	Trevalgan Hill					Recorder	SA		Date	24/10/2012	
Vegetation type	W23										
Species	Q24	Q25				Species					
Ulex europaeus	8	8									
Rubus fruticosus	8	8									
Pteridium aquilinum	6	7									
Silene dioica	4	0									
Hedera atlantica	4	0									
Kindbergia praelonga	4	0									
Dryopteris dilatata	2	4									
Digitalis purpurea	3	3									
Solidago virgaurea	0	3									
Bare ground											

Quadrats

	Q24	Q25			
Site	**52**	**52**			
Grid. ref.	SW 48516 39623	SW 48760 39834			
Photo. No.					
Photo. Bearing	250	10			
Slope	Flat	Moderate			
Aspect	na	335			
Soil type					
Quadrat area	4m x 4m	4m x 4m			
Vegetation height (mm)	150-200cm	180cm			
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Tall gorse with bramble. Stock have not pushed into this scrub.	Tall gorse with bramble. Stock have not pushed into this scrub.			

Survey	Rosewall Hill					Recorder	SA		Date	30/10/2012	
Vegetation type	**U4a**										
Species	**Q26**	**Q27**	**Q28**	**Q29**		**Species**					
Carex binervis	4	0	2	0							
Rhytidiadelphous squarrosus	7	9	8	6							
Pseudoscleropodium purum	4	2	0	0							
Galium saxatile	4	3	4	0							
Potentilla erecta	3	3	3	0							
Agrostis capillaris	8	9	10	8							
Festuca rubra	7	5	5	7							
Anthoxanthum odoratum	8	7	5	5							
Holcus lanatus	4	0	4	0							
Viola riviniana	0	3	3	4							
Cerastium fontanum	0	0	2	0							
Calluna vulgaris	0	3	0	0							
Luzula multiflora	0	3	1	3							
Cirsium palustre	0	0	3	3							
Trifolium repens	0	0	4	4							
Prunella vulgaris	0	0	4	3							
Taraxacum officinale	0	0	2	3							
Lotus corniculatus	0	0	0	4							
Ranunculus repens	0	0	0	3							
Poa pratensis	0	0	0	2							
Veronica serpyllifolia	0	0	0	1							
Bellis perennis	0	0	0	1							
Achillea millefolium	0	0	0	1							
Bare ground											

Quadrats

	Q26	**Q27**	**Q28**	**Q29**	
Site	**53**	**53**	**53**	**53**	
Grid. ref.	SW 49060 39394	SW 49035 39359	SW 49060 39304	SW 49051 39209	
Photo. Bearing	130	130	212	175	
Slope	Moderate	Moderate	Moderate	Gentle	
Aspect	50	17	0	345	
Soil type					
Quadrat area	1m x 1m	1m x 1m	1m x 1m	1m x 1m	
Vegetation height (mm)	6cm	5cm	2cm	2cm	
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Short grazed by cattle, ponies and rabbits.	Short grazed by cattle, ponies and rabbits.	Short grazed by cattle, ponies and rabbits.	Short grazed by cattle, ponies and rabbits. This area shows some grading towards an MG grassland	

Survey	Rosewall Hill					Recorder	SA		Date	30/10/2012	
Vegetation type	**U20a**										
Species	**Q30**	**Q31**	**Q32**	**Q33**	**Q34**	**Species**					
Pteridium aquilinum	7	8	7	9	9						
Rubus fruticosus	2	5	0	0	2						
Potentiall erecta	4	3	0	3	3						
Galium saxatile	5	0	0	4	2						
Rhytidiadelphus squarrosus	5	6	4	0	0						
Anthoxanthum odoratum	8	8	4	6	0						
Holcus lanatus	5	6	6	0	3						
Agrostis capillaris	9	8	8	6	8						
Pseudoscleropodium purum	4	5	5	5	4						
Teucrium scorodonia	3	0	0	0	0						
Rumex acetosa	0	0	4	4	5						
Veronica chamaedrys	0	0	2	0	0						
Oxalis acetosella	0	0	2	3	3						
Viola riviniana	0	0	3	4	0						
Juncus effusus	0	0	2	0	0						
Lotus corniculatus	0	0	3	0	0						
Festuca rubra	0	0	4	0	0						
Athyrium filix-femina	0	0	0	1	0						
Agrostis curtisii	0	0	0	3	0						
Vaccinium myrtillus	0	0	0	3	2						
Pleurozium schreberi	0	0	0	4	0						
Rhytidiadelphous loreus	0	0	0	0	3						
Dryopteris dilatata	0	0	0	0	2						
Luzula multiflora	0	0	0	0	1						
Bare ground											

1

Quadrats

	Q30	**Q31**	**Q32**	**Q33**	**Q34**
Site	**53**	**53**	**53**	**53**	**53**
Grid. ref.	SW 48829 39232	SW 48969 39279	SW 49115 39298	SW 49230 39166	SW 49139 39356
Photo bearing	214	278	112	277	180
Slope	Gentle	Moderate	Moderate	Very gentle	Gentle
Aspect	14	35	8	15	8
Soil type					
Quadrat area	2m x 2m	2m x 2m	2m x 2m	2m x 2m	2m x 2m
Vegetation height (mm)	10cm	10cm	25cm	50cm	40cm
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Cattle & pony grazed	Cattle & pony grazed	Cattle & pony grazed	Cattle & pony grazed	Cattle & pony grazed

Survey	Rosewall Hill					Recorder	SA		Date	24/10/2012	
Vegetation type	**MG6a**										
Species	**Q35**	**Q36**				**Species**	**1**	**2**	**3**	**4**	**5**
Trifolium repens	7	7									
Taraxacum officinale	4	3									
Prunella vulgaris	5	4									
Holcus lanatus	4	3									
Plantago lanceolata	4	5									
Ranunculus repens	4	4									
Agrostis capillaris	5	6									
Luzula multiflora	3	3									
Veronica serpyllifolia	2	0									
Cerastium fontanum	2	2									
Festuca rubra	6	6									
Sagina procumbens	3	0									
Poa pratensis	3	0									
Potentilla erecta	2	2									
Bellis perennis	0	3									
Geranium dissectum	0	1									
Kindbergia praelonga	3	3									
Bare ground											

Quadrats

	Q35	Q36			
Site	**53**	**53**			
Grid. ref.	SW 48740 39443	SW 48762 39450			
Photo bearing	222	192			
Slope	Flat	Flat			
Aspect	na	na			
Soil type					
Quadrat area	1m x 1m	1m x 1m			
Vegetation height (mm)	3cm	2cm			
Site descption (inc. vegetation layers height & cover) & Management details (grazing, erosion, poaching etc.)	Grazed by rabbits, ponies and cattle. Significant enrichment from dog fouling.	Grazed by rabbits, ponies and cattle. Significant enrichment from dog fouling.			