

**Ecological Appraisal Report  
For  
Kilkhampton Common,  
Cornwall**

June 2012

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**For**  
WGP Exploration Ltd.

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<b>Background &amp; Methodology</b>	
<b>Name of Site</b>	Kilkhampston Common
<b>Grid Reference</b>	SS245118
<b>Date of Survey</b>	21st July 2012
<b>Surveyor</b>	John Sproull, MSc, MIEEM
<b>Site Location</b>	<p>The c.8ha site occupies part of a steep, south-facing valley-side 0.5km to the west of Kilkhampston near Bude and is known as Kilkhampston Common. Access is gained from West Street at SS248114. The surrounding landscape is agricultural, predominantly dairy pasture with some arable sub-divided by a network of Cornish hedges. Steep-sided, wooded valleys run down to the sea, which lies c.4km to the west of the site at Duckpool.</p>  <p><b>Photo 1 General view of the main part of the site taken from the eastern boundary looking west.</b></p> <p>The location of the site is shown on <i>Map 1</i>.</p>
<b>Background</b>	<p>Cornwall Environmental Consultants (CEC) Ltd was commissioned by WGP Exploration Ltd. in May 2012 to undertake an ecological assessment of Kilkhampston Common. WGP took control of Kilkhampston Common approximately 4 months ago and intend to manage it for wildlife and as a community resource. To this end, substantial improvements have recently been made to the site infrastructure; a series of new access tracks and permissive footpaths have been created, three small ponds have been excavated and the pasture has been re-fenced, with a view to introducing</p>

	<p>rare-breed sheep.</p> <p>Brief management / enhancement recommendations are provided in this report, along with sources of further information.</p>
<b>Methodology and Limitations</b>	<p>This assessment has been carried out in accordance with the 'Guidelines for Ecological Appraisal' produced by the Institute of Ecology and Environmental Management (IEEM, 2011). It comprises three elements: a desk study, a site survey and a report. The desk study consisted of a search of all existing ecological records within a 1km radius of the site using the information held by the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS, to 2011). A walkover site survey was undertaken to identify plant species and map habitats present according to standard 'Phase 1' categories (JNCC, 2010). Signs of faunal species were also searched for; including tracks, prints, droppings, hairs, feeding remains, nests and burrows.</p> <p>June is an appropriate time of year to undertake this form of survey. Although it remains possible that certain early (or particularly late) flowering species may have been missed, it is possible to assess habitats and assign them within the Phase 1 methodology at this time. There was free access to all areas of the site; although it remains possible that dense scrub vegetation in some areas could have hidden features such as badger setts.</p> <p>Weather conditions during the survey were overcast at first with persistent light rain later with a light westerly wind and with temperatures below seasonal norms.</p>
<b>Site description</b>	<p>The site is part of a south-facing valley-side, the bulk is comprised of a steep open slope sub-divided by a number of tracks. This is separated from the smaller western end of the site by a band of scrub; here the steep slope divides roughly level ground at the top and bottom of the valley-side. Across the site, more tractable areas support semi-improved pasture whilst over steeper ground bracken and bramble scrub dominates, with fragments of secondary woodland and willow scrub along a stream in the valley-bottom. In areas, bracken, bramble-scrub and grassland forming mosaics and rather than map these at the scale of the current survey, communities have been assigned to Phase 1 Habitat types according to the dominant species as described below and shown on <i>Map 2</i>.</p>
<b>Features of Conservation Importance: description, evaluation and impacts</b>	
<b>Designated Sites</b>	
<b>Designated sites</b>	<p>There is one designated site of nature conservation importance within a 1km radius of the site as shown on <i>Map 1</i>. The prosaically named Woodland Wood CWS (NC24) lies c.200m to the north of the site. It has been designated for supporting the BAP Priority Habitats: Upland Mixed Ashwoods, Upland Oakwood and Wet Woodland as well as the BAP species otter.</p>
<b>Local conservation projects</b>	<p>The Cornwall Biodiversity Initiative (CBI) has recently produced a Biodiversity Action Plan (BAP) Volume 4: Priority Projects (CBI, 2010). The site lies within the Culm Grassland project area.</p> <p>Culm grassland refers to an internationally important habitat which</p>

	<p>includes elements of purple moor grass and rush pasture, damp meadows and associated wetlands as well as woodland and watercourses. Through the Working Wetlands project, Cornwall and Devon Wildlife Trusts seek to take a landscape scale approach to restoration of this fragmented and threatened habitat. (See below for further sources of information).</p>
<p><b>Habitats</b></p>	
<p><b>Semi-improved grassland</b></p>	<p>There are three areas of pasture mapped as semi-improved grassland.</p> <p>Along the northern edge of the site at the top of the main slope is a narrow rectangular parcel of grassland dominated by common bent, with locally abundant rough meadow grass and creeping soft-grass. There is a moderately diverse range of associated wildflower species including locally abundant sheep's sorrel, frequent bird's-foot trefoil and locally frequent creeping buttercup, self-heal and pignut. Coarser grasses such as cock's-foot form occasional tussocks to the west and perennial rye-grass, suggesting former agricultural improvement, is locally frequent. Bracken and bramble become frequent to the south, with patches of European gorse (separately mapped where they coalesce). Around the transition there are signs of localised enrichment around old brash burning sites which support ragwort, foxglove, marsh thistle and red campion.</p>  <p><b>Photo 2 showing more free-draining semi-improved grassland with encroaching bracken/ scrub down-slope</b></p> <p>Farther west a roughly square field sloping more gently to the south supports a less rich assemblage dominated by Yorkshire fog and common bent with frequent perennial rye-grass and more typical agricultural wildflower species such as creeping buttercup, broad-leaved dock and white clover. The north-eastern corner is noticeably wetter where species such as marsh foxtail, creeping bent and flote grass are locally frequent</p>

	<p>around a small pond (see below).</p> <p>Finally, in the valley bottom directly below the parcel just described (and connected to it by a recently cut break through gorse scrub) there is an area of damp semi-improved grassland. Here, perennial rye-grass attains about 30% cover but there is still an array of other grasses including common bent, crested dog's-tail and Yorkshire fog. Broadleaved herbs are reasonably frequent and include self-heal, both common and greater bird's-foot trefoil, ribwort plantain and marsh thistle.</p>  <p><b>Photo 3 damp semi-improved grassland in the valley-bottom.</b></p> <p>In general, although not especially species-rich, the semi-improved grassland is reasonably diverse and shows some potential for enhancement with appropriate management. It is likely to provide a good nectar source for invertebrates and therefore potential foraging for other faunal species such as birds and bats.</p>
<p><b>Bracken</b></p>	<p>The middle section of the main slope and part of a steep slope at the western end of the site are dominated by bracken that forms a canopy over a rank and, in places, somewhat scrubby, grass-dominated ground flora. Common bent persists with sweet vernal grass; Yorkshire fog increases in prominence under heavier shade where creeping soft-grass too can be locally abundant. Wildflower species include tormentil, heath bedstraw, wood-sage, sheep's sorrel and common dog's-violet, bluebell is occasional. Scrubby elements such as European gorse and bramble become increasingly prominent downslope, sometimes with an accompanying ruderal element that includes rosebay willowherb, foxglove and red campion.</p> <p>This type of community is typical of moderately deep, well aerated and moist soils. It is often found on marginal and abandoned land in the southwest on hill-sides or within valleys subject to downwash from slopes above. If left unmanaged bracken can dominate at the expense of other</p>

	<p>species sometimes as the progenitor of scrub development. Nevertheless more open stands can be of value to invertebrate species including some species of butterfly and birds and there is potential for enhancement.</p>
<b>Hedge</b>	<p>Cornish hedges surround the site; they are of typical construction being stone-faced and earthen-cored and supporting woody growth (often trees) along their tops. More exposed hedges (such as H2 see <i>Map 2</i>) tend to be dominated by blackthorn with occasional hawthorn and sycamore, with a sparse understorey including Atlantic ivy, bramble, red campion and occasional hart's tongue fern. Elsewhere, in particular alongside the access track and the stream sessile oak, ash, sycamore and beech can form frequent hedgerow trees up in places to c.15m high with frequent hazel and holly in the understory and a woodland ground flora including male, scaly male, hard, broad –buckler and soft shield fern, dog's mercury and herb Robert.</p> <p>Hedges are listed as a priority habitat for conservation on the UK BAP and can provide valuable habitat for wildlife including birds, reptiles, invertebrates and mammals. They can also provide corridors via which wildlife can travel through agricultural landscapes, linking larger areas of semi-natural habitat.</p> <p>Although not individually assessed several of the hedges are likely to qualify as 'ecologically and/ or historically important' according to the criteria in the Hedgerows Regulations 1997. Removal of 'important' hedges generally requires planning consent.</p>
<b>Scrub</b>	<p>Scrub across the site takes several forms. Downslope of the main bracken dominated area, although bracken remains abundant, bramble dominates to the extent that the community is hard to walk through. Associate species observed here are few but include cleavers and common nettle, there are also extensive patches of rosebay willowherb and the invasive Himalayan balsam (see also below). European gorse is patchily distributed, locally abundant but always sub-ordinate to bracken and bramble except in the areas mapped, where it forms dense homogeneous stands over steeply sloping and disturbed ground. Blackthorn dominates small patches to the east presumably having encroached into the site from H1 where it is prominent.</p> <p>A roughly linear band dominated by grey willow follows a small stream/ flush separating the main open part of the common from the western part. For the most part, the canopy here is open to about 7m high and there is a poorly developed ground flora. However, to the north of a recently enlarged pond (<i>TN1</i>) within an open area there is a small fragment of species-rich marshy grassland (described with ponds below). Further areas dominated by willow, as mapped along the valley-bottom further to the east, support a reasonable number of typical wet woodland/ poor fen associates such as water mint, marsh bedstraw, spearwort, creeping forget-me-not and wavy St. John's-wort. Under Phase 1 notation (JNCC, 1993) vegetation dominated by grey willow is categorised as scrub. However under the BAP definition this habitat is best described as wet woodland. Wet woodlands are listed as a priority habitat for conservation in the UK and county BAPs. As a wetland habitat, although well represented in Cornwall it is one of the most threatened habitats in the UK</p>

	<p>and is important for many species, in particular invertebrates.</p> <p>Other types of scrub are also of value in their own right but, as with bracken, if unmanaged can dominate at the expense of other species and become problematic. These areas are likely to be of value to nesting birds and invertebrates and show potential for enhancement with appropriate management (see below).</p> <p>In general, it is likely that much of the area now occupied by scrub was formerly open (and grazed). The present distribution of scrub communities and variation shown in their stages of development probably reflects not only changing soil characteristics across the site (increasing fertility moving down-slope) but also time since abandonment.</p>
<b>Woodland</b>	<p>Woodland occupies a thin linear strip along the valley bottom. The assemblage is variable and shows strong affinities to the type of wet willow woodland discussed above in some places where grey willow and sometimes downy birch are prominent. In general, however, sessile oak, ash and hazel are present within the canopy and there is a richer ground flora including several species considered to be 'ancient woodland indicators' (AWI – Rose, 2006). These include sanicle, wood speedwell, wood sorrel, yellow pimpernel, ramsons, bluebell, dog's mercury, opposite-leaved golden saxifrage and, at the western end of the main stand, several plants of the orchid broad-leaved helleborine.</p> <p>The trees are of mixed age and form a canopy to approximately 14m. A newly created footpath runs alongside the stream, crossing the watercourse in a number of places – other than this there are no signs of recent management. Lowland mixed deciduous woodland, to which this community best approximates, is listed as a priority habitat for conservation in the UK and county BAPs. This habitat type can be among the richest for wildlife in the lowlands.</p> <p>In addition to this the woodland has potential to support notable plants as well as for faunal species including dormouse, bats, birds and invertebrates.</p>
<b>Ponds</b>	<p>There are three ponds within the site, two have been recently created and the third recently enlarged as wildlife habitat and to assist with drainage. In the northern-most semi-improved field a shallow 'dew pond' c.10m in diameter supports (presumably planted) yellow flag with other wetland species around the margin such as water foxtail, creeping bent, flote grass, marsh cudweed, soft rush, toad rush and some planted osier.</p>



**Photo 4 'dew pond' in northern-most corner of the site.**

Along the southern boundary there is a slightly smaller pond surrounded by regenerating grassland with no aquatic flora visible at the time of the survey. This pond is fed by water piped from upslope and outfalls to the stream below.

Finally, within an opening in the willow flush area (*TN1*) there is a recently enlarged circular pond surrounded by a bare, excavated area. The pond is about 1m deep with shelved sides fed by a pipe with an outfall leading down to the stream. It contains a good array of native species including water plantain, fools water-cress, watercress, kingcup, floating club-rush and flote grass as well as the introduced Nuttall's pondweed. Around the margins species including bulbous rush, carnation, star and common yellow sedge are colonising the bare soil.



**Photo 5 recently enlarged pond at TN1 (note relict marshy grassland in background and regenerating bare excavated area).**

Immediately to the north there is a relict marshy grassland area dominated by sharp-flowered rush and purple moor-grass with common heath grass and the sedges listed above. Associated species include greater bird's-foot trefoil, purple loosestrife, bog pimpernel, ragged robin, watermint, fleabane, wild angelica, lesser skullcap, tormentil and southern marsh orchid. Although only a small fragment of habitat, this area is species-rich and qualifies as the BAP habitat-type purple moor-grass and rush pasture. There may potentially be other similar areas upslope along the line of the flush not observed during the survey. This habitat has potential for notable plant species as well as faunal species including amphibians and invertebrates and also has potential for enhancement through appropriate management.

Ponds too are listed as a priority habitat for conservation in the UK BAP but those within the site are, as yet, unlikely to be of sufficient quality to qualify. In general, however, this habitat, with appropriate management is likely to develop over time and shows potential for enhancement. It is hoped that the marshy grassland will spread over the area of bare ground surrounding the third pond.

### Species

#### Flora

#### Vascular Plants

A total of 115 vascular plant species were recorded during the June 2012 site visit. This is a relatively high number of species and the site contains species-rich habitats. One species of conservation importance was recorded during the survey, wavy St. John's-wort within the wet willow scrub/ woodland in the valley bottom. This species is Nationally Scarce (occurring in 16-100, 10km grid-squares within the UK national grid) and confined to Cornwall, Devon and Wales within Britain. It is classically

associated with culm grassland. Although not rare, broad-leaved helleborine has a markedly eastern distribution in Cornwall and is largely absent from the rest of the county.



**Photo 6 broad-leaved helleborine recorded within woodland below flushed area.**

The ERCCIS desk study revealed records for several arable weed species for which there is no suitable habitat within the site and a historic record (1886) for small water-pepper which has not been confirmed as part of the Cornish flora.

Overall the site contains examples of species-rich habitat, in particular the woodland and marshy grassland fragment. It has the potential to support further notable species which might be found by follow up targeted botanical survey work.

#### Invasive Plants

Himalayan balsam is present within the site, in particular within the area of bramble scrub as indicated on *Map 2*. This annual species spreads readily via explosive seed pods and can dominate over extensive areas at the expense of native species. It has recently been listed on Schedule 9 of the Wildlife and Countryside Act 1981 making it an offence to 'cause it to spread in the wild'.

Nuttall's pondweed is present within one of the ponds (*TNX*). This species is also listed in Schedule 9. It is common in eutrophic water and although it is a good oxygenator can out-compete native flora resulting in thick mats at the water's surface.

#### Lower Plants

A specialised survey for non-vascular plants, bryophytes and lichens, was outside the scope of this study. The desk study revealed one record for a liverwort of conservation importance *Lophozia capitata*, recorded from Woodford in 1990 (although the grid reference given, SS240116, places

	<p>this record considerably nearer the site c.500m south west of the site boundary). This species is associated with bare, damp acidic soils such as hollows in heathland, quarries and spoil heaps. More rarely, it can grow on tree bases and rocks. It is listed as a priority species of conservation concern on the UK BAP and could potentially be present within the site.</p> <p>Otherwise the range of habitats within the site in particular the hedges, woodland and flush area are likely to support a suite of common bryophyte species but the site is not expected to be of particular importance for this group.</p>
<b>Amphibians</b>	<p>The desk study revealed many records for common frog from within a 1km radius of the site. All British amphibian species require standing water to reproduce. The site supports three ponds and a stream as well as several drainage ditches. The ponds have potential to support breeding populations of the more common species of amphibian including common frog, common toad and palmate newt. Their value for this group is likely to increase over time; in addition, Cornish hedges may provide potential hibernation and foraging sites for amphibian species.</p> <p>Common toad is a UK and Cornwall BAP Priority species. The common amphibian species are protected from sale only under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).</p>
<b>Badgers</b>	<p>The desk study revealed a number of records for badger from within a 1km radius of the site. An assessment of the habitats' potential to support badgers was also made during the survey. No badger setts or evidence of badger activity was observed on-site. However, arable fields and hedgerows/ woodland within and immediately adjacent to the site provide suitable foraging habitat and sites for badger setts respectively. Badger is assumed to be present within the area and is at least likely to on occasion pass through or forage within the site.</p> <p>Although widespread and common in Cornwall, badgers and their setts are legally protected under the Protection of Badgers Act 1992 (HM Government, 1992) (see <i>Appendix 2</i>).</p>
<b>Bats</b>	<p>The ERCCIS desk study revealed several records for bats from within a 1km radius of the site including several not determined to species and two for pipistrelle. In general the site has good potential for bats the mixture of habitats including woodland, standing and running water, pasture and strong linear landscape features (hedges) provide excellent foraging opportunities. More mature trees within and adjacent to the site (as well as buildings nearby) may also support bat roosts</p> <p>All UK bat species and their roosts are legally protected under the Conservation Regulations 2010 (HM Government, 2010) (see <i>3</i>).</p> <p>Dedicated bat survey work would enable a fuller assessment to be made of how bats are using the site.</p>
<b>Birds</b>	<p>The desk study revealed that several bird species of conservation value have been recorded near the site. Those with potential to occur on-site are presented in a table in <i>Appendix 1</i>.</p> <p>Of the birds listed the BAP species yellowhammer, song thrush, linnet, house sparrow, bullfinch, dunnock and grasshopper warbler may make</p>

	<p>use of the mosaics of scrub, woodland-edge, hedges and semi-improved grassland for foraging and/ or breeding. Barn owl could also forage over more tussocky areas of semi-improved grassland.</p> <p>Species observed (or heard) during the site visit include long-tailed tit, great-tit, blue –tit, common buzzard, wren, blackbird, chiffchaff, dunnock and linnet. This is not a comprehensive list for the site as a bird survey was not carried out, and merely provides an indication of the conspicuous species present on the day of survey.</p> <p>All birds are legally protected whilst nesting under the Wildlife &amp; Countryside Act 1981, as amended.</p>
<b>Brown Hare</b>	<p>The desk study revealed a 1994 record for brown hare from c500m to the west of the site at SS237117. This species lives in scrapes in the ground mainly in arable fields with hedgerows and at the edges of woodland. Cornwall's brown hare population is now small and probably consists of a few, fairly isolated, sub-populations. Although hare could be present within the area<sup>1</sup> the habitats within the site are considered sub-optimal for this species.</p> <p>Brown hare is a UK and Cornwall BAP Priority Species.</p>
<b>Dormice</b>	<p>The ERCCIS desk study revealed records for dormouse from the surrounding area, most recently (2008) from north of Kilkhampton at SS254121 but also from Kilkhampton Castle (2001) 100m to the south of the site.</p> <p>Dormice are usually associated with ancient species-rich hedgerows and woodland, especially where hazel is common. They are a largely arboreal species and generally reluctant to descend to the ground to cross open spaces. They also require habitats that will provide a variety of food sources throughout the spring and summer months. Hazel, honeysuckle, bramble, hawthorn, and blackthorn are important food sources. The site supports these species and is well connected to the surrounding area via a network of species-rich hedges and scrub within the valley-bottom. On this basis the site should be considered as having good potential for this species. Further survey work would be required to confirm the presence of dormouse within the site.</p> <p>Dormouse is listed as a priority species for conservation on the UK and county BAPs and is a European protected species included on Annex IV(a) of the EC Habitats Directive (CEC, 1992). They are legally protected by national law under the Conservation Regulations 1994 and the Wildlife and Countryside Act 1981.</p>
<b>Hedgehog</b>	<p>There are a number of recent desk study records for hedgehog from within a 1km radius of the site. This species is thought to have undergone a dramatic decline in recent years and has now been added to the UK BAP as a priority species for conservation. It nests and hibernates in log / leaf / rubble piles, at the base of Cornish hedges and under tree roots and could make use of these habitats within the site. Hedgehog is given partial protection by the Wildlife &amp; Countryside Act 1981.</p>

<sup>1</sup> A hare was seen by the author c3km south of the site on 22<sup>nd</sup> June 2012.

<b>Invertebrates</b>	<p>The desk study revealed records for notable invertebrates including the water beetle <i>Gyrinus natator</i> associated with the stream from 1988. This species is now considered extinct. Although the ponds may be of some importance to invertebrates (and their value is likely to increase over time) the stream is understood to be subject to periodic pollution from a nearby sewage treatment works and is now unlikely to be of particular value to aquatic invertebrates.</p> <p>There are also records for wall butterfly, a near threatened<sup>2</sup> BAP species which breeds in short, open grassland and disturbed coastal habitats. It's food plants include cock's-foot, bent grasses and Yorkshire-fog; this species could make use of the grassland within the site.</p> <p>A number of BAP moth species have been recorded from nearby. The majority of these were added to the BAP list 'for research purposes only' and are not therefore necessarily of conservation concern. Having said this, the variety of habitats within the site show good potential for a range of moth species and notable species may well be present.</p> <p>Finally, on the basis of some the habitats present, the site is considered to have potential for further butterfly species including certain types of fritillary. A search of the NBN Gateway (ref) revealed 1988/89 records for pearl-bordered fritillary (from Welcombe), small pearl-bordered fritillary (from Morwenstow) and dark green fritillary (from Coombe). These species each have specific requirements but are all associated with south-facing bracken dominated slopes with common-dog violet which is a prevalent feature of the site.</p> <p>In general the site contains a variety of habitats likely to support a rich suite of invertebrate species,</p>
<b>Otter</b>	<p>There is one (1991) record for otter relating to a 'Coombe valley tributary.' Otter need clean watercourses with well-vegetated riparian habitats. Otter 'holts' (breeding dens) are normally located within the root systems of mature riverside trees. However, dense scrub and tall bankside vegetation is also important for otters to hide unnoticed these are called hovers (temporary resting places) and couches (flattened vegetation).</p> <p>Cornwall is the stronghold for otter within lowland England; nearly all vegetated water courses support otter populations and this species should therefore be considered as likely to be present within the area.</p> <p>Otter is a European protected species included on Annex IV(a) of the EC Habitats Directive (CEC, 1992). They are legally protected by national law under Schedule 2 of the Habitats and Species Regulations 2010 and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).</p>
<b>Brief recommendations to manage and enhance the site for biodiversity</b>	
<p><b>Grassland</b> The semi-improved grassland has some existing interest and shows potential for floristic</p>	

<sup>2</sup> Near threatened species fall just below the RDB status threshold.

enhancement.

Management of conservation grassland for species richness normally seeks to emulate traditional meadow management regimes where a main summer hay cut is taken with autumn, and possibly spring, mowing or grazing. This system, by removing the bulk of the herbage produced each year (unless fertilisers are applied) tends to deplete soil fertility over time and prevent the development of coarse, tussocky species which otherwise tend to out-compete wild flowers. Traditionally, cutting or grazing is avoided from spring through to late July/August giving wild flowers a chance to flower and set seed; follow up, or aftermath, grazing then creates openings in the sward allowing wild flower seedlings to become established leading to an increase in species richness. Existing soil fertility levels are likely to be the main limiting factor on any attempts at grassland restoration at Kilkhampton Common – it is recommended that soil testing is undertaken to inform development of the most appropriate management prescriptions.

It is understood that the intention is to use the common as supplementary grazing for a small flock of rare-breed sheep (with more fertile grazing land available elsewhere). Grassland enhancement using sheep can be achieved but can be challenging because they tend to create a uniform close-cut sward and are light footed in contrast to cattle or ponies which (depending on the breed) graze and browse more selectively and would tend to create more openings in the sward and surrounding scrub/ bracken. Ideally, sheep grazing would be carried out in combination with an annual hay-cut as described above and probably at least some initial scrub/ bracken clearance (see below). The grazing regime should be extensive; with a low stocking rate and minimal inputs. If grass-cutting is impractical then a higher stocking rate may be required to maintain a sward with sheep alone, but with care it should still be possible to achieve some enhancement in sward diversity.

Ideally, treatments would be varied so that some areas of longer, tussocky grassland could be allowed to develop to increase structural diversity and the range of habitats available. New fencing is situated, in general, about 5m from surrounding hedgerows; this should allow the land in between to be managed effectively as buffer strips perhaps by following standard ELS prescriptions. These require predominantly input free maintenance of a grassy strip by infrequent cutting (annual, after mid-July, or less). If desired, buffer strips could be sown with an appropriate native seed-mix and managed accordingly for wildflowers. It might also be possible to extend this treatment to the pastures by over-seeding or spreading locally harvested green hay, CEC could provide further advice on this if required; see also [www.floralocale.com](http://www.floralocale.com). For commercially available native, grass-seed mixes see:

<http://wildseed.co.uk/>

<http://www.britishseedhouses.com/> and

<http://www.heritageseeds.co.uk/>

Whereas most of the higher ground (with the exception of the area around the 'dew pond') appears to be relatively free draining the lower pasture is damp. Elements of purple moor-grass and rush pasture/ culm grassland are present nearby (within the flush area) and it might be possible to encourage the development of a more marshy grassland flora within this lower lying field. For information on purple moor-grass and rush pasture/ culm grassland see:

<http://www.wildlifetrusts.org/wildlife/habitats/purple-moor-grass-and-rush-pasture> and

[http://www.cornwallwildlifetrust.org.uk/Resources/Cornwall%20Wildlife%20Trust/PDF%20Documents/Cornwall\\_BAP\\_Vol\\_4\\_Priority\\_Projects\\_whole\\_document.pdf](http://www.cornwallwildlifetrust.org.uk/Resources/Cornwall%20Wildlife%20Trust/PDF%20Documents/Cornwall_BAP_Vol_4_Priority_Projects_whole_document.pdf)

#### Hedges

1. Maintain hedgerows to a height and width customary to the local landscape, but not

- less than 1.5m in height (preferably more)
2. Cut as seldom as practicable no more than once every 2 calendar years
  3. Cut in winter (November to February; ideally Jan/Feb)
  4. Cut alternate sides in alternate years – do not cut all hedgerows in the same year – cut one third/ one half of hedgerows each year
  5. Cut hedge tops no more than every 3 to 5 years to a minimum of 1m. If trees are present, cut hedge top to an open-topped "A" shape, leaving a central strip of at least 0.5m untrimmed along the middle.
  6. Allow hedgerow trees to grow where possible. Coppice/ pollard/ lop as necessary but retain standing deadwood wherever possible.

For more information see: <http://www.cornishhedges.co.uk/PDF/aonb.pdf>

### **Bracken/scrub**

The overall cover of scrub and bracken within the site should be reduced. The aim should be to manage scrub cyclically to allow the development of a range of different aged stands and an increase in physiognomic diversity. The creation of open 'coops', 'rides' and scalloped edges within and around areas of scrub and bracken by cutting, burning and/or grazing would enhance structural diversity and provide potential opportunities for expansion of existing areas of semi-improved grassland.

On lower slopes where trees saplings are more frequent within the bramble scrub (*TW2*) it might be more appropriate to limit clearance and allow some successional development of more mature scrub stands/ embryonic woodland.

Detailed specifications will vary according to the species managed for. Birds for instance particularly associated with scrub include willow warbler, wren, blackbird, dunnock, yellowhammer and linnet. Use of scrub by birds tends to be determined not by the species present but by vegetation structure, species numbers tending to be highest where there is greatest physiognomic diversity. Different species of bird are adapted to different stages of growth; whitethroats and yellowhammers for instance, favour low scattered bushes whereas blackcaps and garden warblers are more associated with the later successional stages of scrub more akin to embryonic woodland. Blackbird and song thrush feed in shorter vegetation but nest in thick cover and so rely upon intimate mosaics of grassland and scrub.

Refer to the Scrub Management Handbook for more information:

<http://publications.naturalengland.org.uk/file/114022>

Fritillary butterflies require mosaics of bracken interspersed with grassy patches and canopy gaps, with abundant violets growing through the leaf litter. Bracken bruising machines can help reduce dominance where cutting is impractical. For more information on bracken management for butterflies see:

<http://www.butterfly-conservation.org/uploads/Bracken%20for%20Butterflies.pdf>

### **Woodland**

Beyond monitoring and potentially further survey work woodland management is likely to be predicated upon a policy of non-intervention. There is generally a good cover of ground flora, with some saplings and deadwood present. Path creation works have been sensitively undertaken to date and brash has been left *in situ* in habitat piles. Although Himalayan balsam is present within the site none was observed within the woodland along the riparian corridor.

If any planting is undertaken within the site to increase the area of woodland (such as within more advanced areas of scrub as at *TNX*) appropriate native species should be used and then left to develop naturally.

### **Pond**

In general, ponds should be left to develop naturally. Nuttall's pondweed should be removed from the pond at *TNX*. Mechanical removal by pulling out the plants (preferably during July-August) should be successful. Careful disposal is essential as it is an offence to cause the plants to spread. Advice on disposal must be sought from the Environment Agency (more information here: <http://publications.environment-agency.gov.uk/PDF/GEHO0410BSBR-E-E.pdf>). The Centre for Aquatic Plant Management also provides useful advice: [http://www.ceh.ac.uk/sci\\_programmes/AquaticPlantManagement.html](http://www.ceh.ac.uk/sci_programmes/AquaticPlantManagement.html).

The 'Million Ponds Project', run by Pond Conservation, also provides excellent advice: [www.pondconservation.org.uk/millionponds/pondcreationtoolkit/](http://www.pondconservation.org.uk/millionponds/pondcreationtoolkit/)

**Species-specific recommendations:**

Flora: Botanical surveys could be undertaken to inform management and monitor its success. For instance, fixed quadrats could be sampled within grassland and ponds and targeted surveys could be undertaken for notable vascular species and/ or bryophytes within areas of woodland and potential further flush areas. The incidence of selected indicator species, such as violets within bracken areas (if managed for butterflies) could also be monitored. At a bigger scale, fixed point photography could be used to monitor the extent of scrub/ bracken cover and marshy grassland regeneration around the pond within the flush area.

Dormice: As dormice have been confirmed in the area, it would be beneficial to local and national research to set up dormouse boxes in hedgerows and woodland. The 'National Dormouse Monitoring Programme' (NDMP) is a coordinated survey across the UK to collect data on dormice. Monitoring of the boxes would need to be undertaken by licensed surveyors, as dormice are legally protected. Contact the People's Trust for Endangered Species (PTES) for further information: <http://www.ptes.org/dormousemonitoring/>.

Bats: Monitoring/ surveys would be beneficial for local and national research. The Bat Conservation Trust (BCT) runs the 'National Bat Monitoring Programme' (NBMP), which contains several survey types that can be undertaken by non-licensed surveyors: <http://www.bats.org.uk/pages/nbmp.html>.

Herptiles: Monitoring of the amphibian and reptile population could be undertaken through registering with the National Amphibian and Reptile Recoding Scheme (NARRS): <http://www.narrs.org.uk/> Information on creating hibernacula for reptiles can be found on the Amphibian and Reptile Conservation website, at [www.arc-trust.org/resources/RHMH.php](http://www.arc-trust.org/resources/RHMH.php).

Butterflies: Consider contributing to the UK Butterfly Monitoring Scheme see: <http://www.ukbms.org/Default.aspx>.

Birds: The Volunteer & Farmer Alliance (V&FA) provides farmers with a survey of the birds breeding on their land, undertaken by RSPB volunteers see: <http://www.rspb.org.uk/ourwork/farming/vandfa/index.aspx>

For further information on the landscape-scale conservation project 'Working Wetlands' see <http://www.devonwildlifetrust.org/working-wetlands/>.

Further contributions could be made to the local and national BAPs for the species and habitats listed in the text; refer to BARS (2011) for individual habitat and species action plans.

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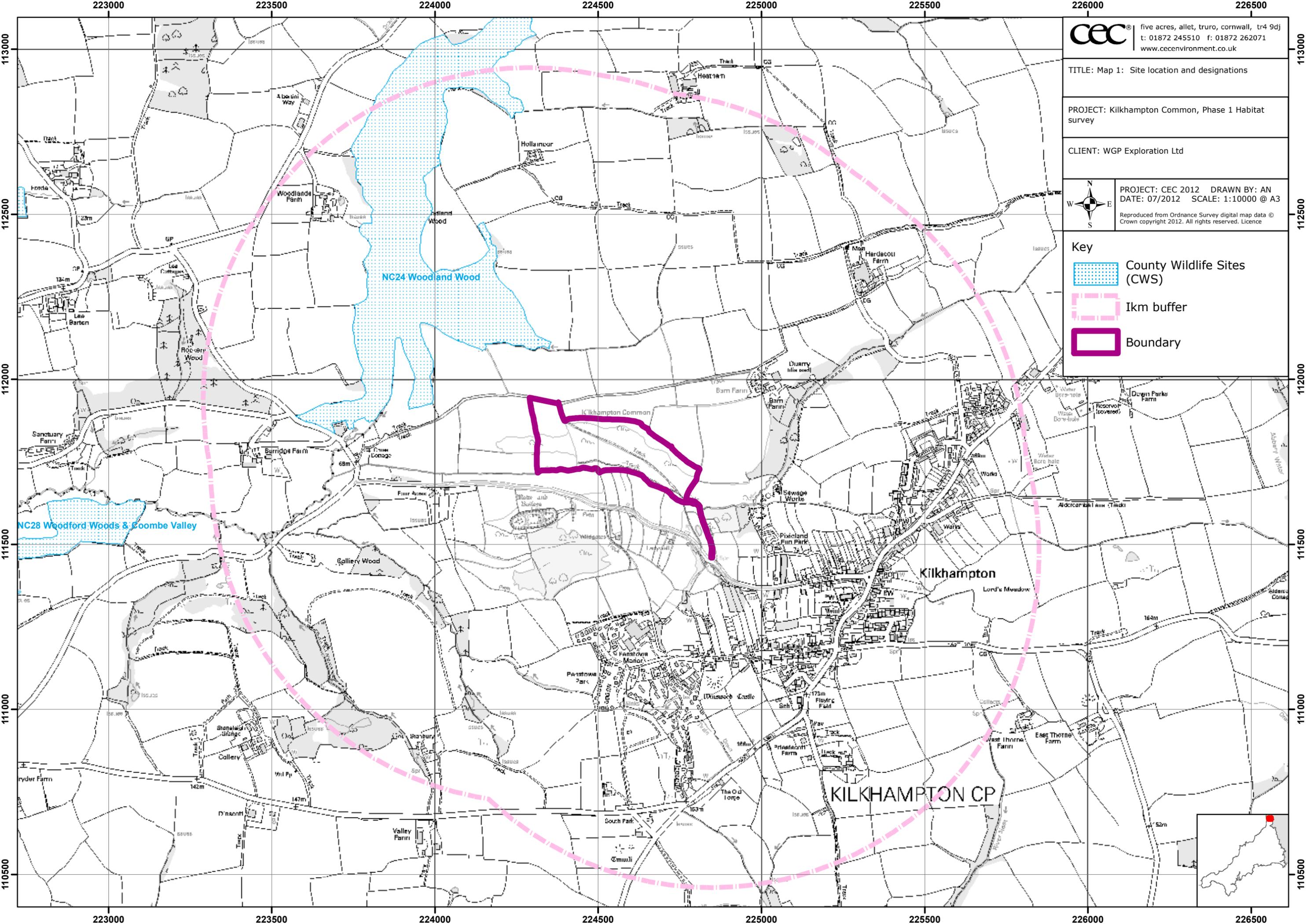
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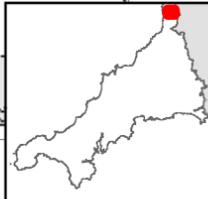
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**Key**

-  County Wildlife Sites (CWS)
-  1km buffer
-  Boundary

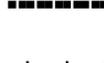
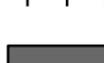
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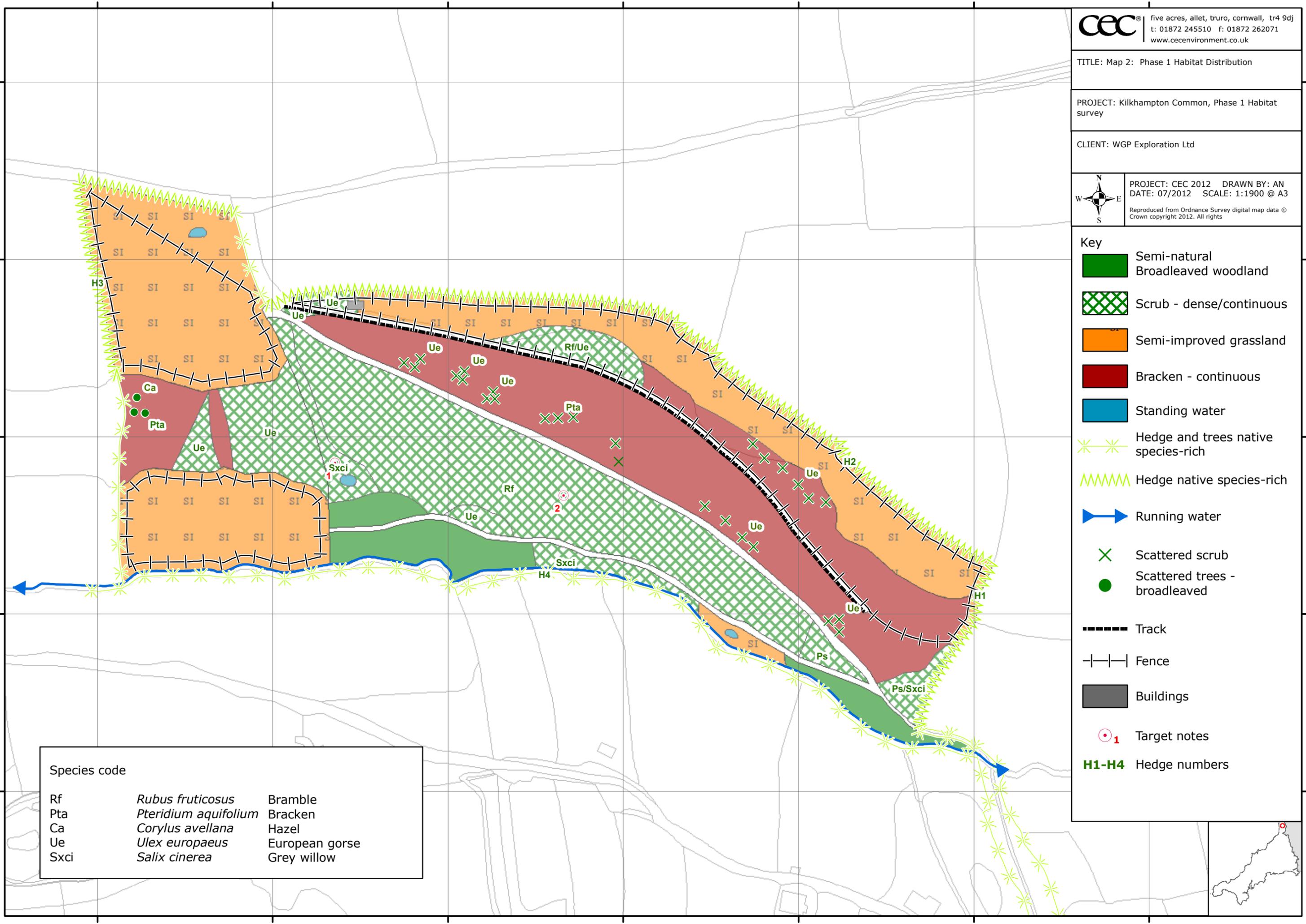
## Target Notes relating to Map 2

1. Relict marshy grassland community around wet flush
2. Tree saplings including hawthorn, hazel, oak and ash frequent within bramble scrub.

**Key**

-  Semi-natural Broadleaved woodland
-  Scrub - dense/continuous
-  Semi-improved grassland
-  Bracken - continuous
-  Standing water
-  Hedge and trees native species-rich
-  Hedge native species-rich
-  Running water
-  Scattered scrub
-  Scattered trees - broadleaved
-  Track
-  Fence
-  Buildings
-  Target notes
-  Hedge numbers

Species code		
Rf	<i>Rubus fruticosus</i>	Bramble
Pta	<i>Pteridium aquifolium</i>	Bracken
Ca	<i>Corylus avellana</i>	Hazel
Ue	<i>Ulex europaeus</i>	European gorse
Sxci	<i>Salix cinerea</i>	Grey willow



## Appendix 1 Notable bird species recorded in the desk study

Bird Species		Status in Cornwall		Legislation		
English Name	Scientific Name	Rarity	Season	International	National	County
Skylark	<i>Alauda arvensis</i>	C	r		RP	P
Little Owl	<i>Athene noctua</i>	FR	r			R
Linnet	<i>Carduelis cannabina</i>	C:FC	bs/(a)m:w		RP	P
Siskin	<i>Carduelis spinus</i>	U:FR	am:bs/w			R
Hen Harrier	<i>Circus cyaneus</i>	FR	m/w	I	R1	R
Quail	<i>Coturnix coturnix</i>	R	(b)s		R1	R
Yellowhammer	<i>Emberiza citrinella</i>	C	r		RP	
Pied Flycatcher	<i>Ficedula hypoleuca</i>	U:R	(a)m:bs			R
Brambling	<i>Fringilla montifringilla</i>	U	am/w		1	
Grasshopper Warbler	<i>Locustella naevia</i>	U	bs		RP	
Goosander	<i>Mergus merganser</i>	FR	w			R
House Sparrow	<i>Passer domesticus</i>	C	r		RP	
Willow Tit	<i>Parus montanus</i>	U	r		RP	
Dunnock	<i>Prunella modularis</i>	VC	r		AP	
Bullfinch	<i>Pyrrhula pyrrhula</i>	C	r		RP	P
Starling	<i>Sturnus vulgaris</i>	VC:C	w:r		RP	
Song Thrush	<i>Turdus philomelos</i>	C:FC	r:m/w		RP	P
Ring Ouzel	<i>Turdus torquatus</i>	FR	m		RP	
Barn Owl	<i>Tyto alba</i>	U:R	r:w		A1	(P)R
Lapwing	<i>Vanellus vanellus</i>	C:FR	w:bs		AP	(P)R

Key – Legislation:

Conservation Status	Symbol	Conservation concern list reference
<b>International</b>	I	Annex I of the EC Birds Directive (CEC, 1979)
<b>National</b>	R	Red list of birds of conservation concern (Gregory <i>et al</i> , 2002)
	A	Amber list of birds of conservation concern (Gregory <i>et al</i> 2002)
	P	UK BAP priority list of species (UKBG, 1998)
	1	Schedule 1 of the Wildlife & Countryside Act 1981 (HM Government, 1981)
<b>County</b>	P	Cornwall BAP priority species (with a SAP) (CBI, 1998, 2004)
	(P)	Cornwall BAP priority species (without a SAP) (CBI, 1997)
	R	Red Data Book for Cornwall (Spalding, 1997)

Key – Status in Cornwall (McCartney, 2006):

Status in Cornwall	Symbol	Explanation	
		Non-breeding individuals	Breeding pairs
<b>Rarity:</b> These assessments are intended for guidance only; they are not definitive statements	VC (Very common)	> 100 000	>50 000
	C (Common)	10 001 – 100 000	5001 – 50 000
	FC (Fairly common)	1001 – 10 000	501 – 5000
	U (Uncommon)	101 – 1000	51 – 500
	FR (Fairly rare)	11 – 100	6 – 50
	R (Rare)	1 – 10	0.5 – 5
	VR (Very rare)	< 1	< 0.5
<b>Season:</b> This is an <i>indication only</i> of when the bird is present	r m spm (sp)m s am (a)m w b (b)	Resident (may be assumed to breed) Migrant Spring migrant Migrant (mainly in spring) Summer visitor Autumn migrant Migrant (mainly in autumn) Winter visitor Breeds Occasionally breeds	

## Appendix 2 Legislation

### Legislation

The Wildlife and Countryside Act (HM Government, 1981, as amended) is the main piece of legislation relating to nature conservation in Great Britain. It transposes into British law the Berne<sup>3</sup>, Bonn<sup>4</sup> and RAMSAR<sup>5</sup> Conventions, and the European 'Birds Directive' (CEC, 1979). This legislation covers protection of wildlife (birds, other animals and plants), Sites of Special Scientific Interest (SSSI's) (with some SSSI's also designated as Special Protection Areas, SPA's), National Nature Reserves (NNR's) and RAMSAR sites.

The Conservation of Habitats and Species Regulations (HM Government, 2010) transposes into British law the European 'Habitats Directive' (CEC, 1992), and covers Special Areas of Conservation (SAC's) and European Protected Species (EPS) (see below). It also provides further protection for SPA's and RAMSAR sites.

The Countryside and Rights of Way (CRoW) Act (HM Government, 2000) increases protection for SSSI's and threatened species. It specifies the duty of Local Authorities to further the conservation of listed (UK BAP priority) habitats and species; see below.

The Natural Environment and Rural Communities (NERC) Act (HM Government, 2006) confers a legal duty on every public authority to conserve biodiversity under Section 40(1).

The Hedgerows Regulations 1997 protects historically / ecologically important hedgerows.

The Protection of Badgers Act 1992 provides specific protection for badgers (see below).

### Legally protected species

The main pieces of legislation relating to protection of species are listed above. This

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<sup>3</sup> The Berne Convention on the Conservation of European Wildlife and Natural Habitats, 1979

<sup>4</sup> The Bonn Convention on the Conservation of Migratory Species of Wild Animals, 1979

<sup>5</sup> The RAMSAR Convention on Wetlands of International Importance especially as Waterfowl Habitat (Iran, 1971)

section groups protected species according to their level of protection, summarising what constitutes an offence. For a full description of the legal protection afforded to different species, the specific legislation should be consulted.

#### European Protected Species (EPS) occurring in Cornwall: Bats, Dormice, Otters

Protected under both the Conservation Regulations 2010 and the Wildlife and Countryside Act 1981 (as amended), it is an offence to:

- Intentionally kill, injure or capture an EPS;
- Intentionally or recklessly disturb an EPS;
- Intentionally or recklessly damage, destroy or obstruct access to a place of shelter or breeding (for example, bat roosts, hedgerows used by dormice), and this applies regardless of whether the species is actually present at the time (for example, a bat roost used in the winter for hibernation is protected throughout the year, even during the summer when it is not occupied).
- Possess or transport a bat or any part of an EPS, unless acquired legally;
- Sell, barter or exchange bats, or parts of an EPS.
- intentionally handle a wild EPS or disturb an EPS whilst using a place of shelter/ breeding unless licensed to do so by the statutory conservation agency (Natural England).

Reptiles (all species): Adder, common lizard, slow worm and grass snake are partially protected under Schedule 5 (section 9(1) and 9(5)) of the Wildlife and Countryside Act 1981 (as amended). They are protected against killing and injuring (but not taking) and against sale and transporting for sale. The Dangerous Wild Animals Act (1976) applies to adder if taken into captivity (even temporarily). The European protected species sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*) are unlikely to occur within the site. Sand lizard was extinct in Cornwall but was reintroduced to one site in North Cornwall in 1995. Smooth snake is thought to be absent from Cornwall.

Birds: The nests (while in use or being built) and eggs of all wild birds are protected against taking, damage and destruction under the Wildlife and Countryside Act 1981 (as amended). It is also an offence to kill, injure or take any wild bird.

The birds listed under Schedule 1 of the Wildlife and Countryside Act are afforded additional protection against intentional or reckless disturbance whilst building a nest or in or near a nest containing eggs or dependant young.

Birds listed on Annex 1 of the EC Birds Directive are of European importance (although population size and viability must be taken into account). However, they are not statutorily protected unless listed on Schedule 1 of the Wildlife and Countryside Act 1981.

Badgers: It is a criminal offence under the Protection of Badgers Act 1992 to:

- Wilfully kill, injure or take a badger;
- Intentionally or recklessly damage, destroy or obstruct access to any part of a badger sett;
- Disturb a badger whilst it is occupying a sett.

#### Statutorily protected sites

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are of international nature conservation importance and provide protection for key species and habitats. Sites of Special Scientific Interest (SSSIs) are of national importance and are designated to safeguard and enhance the characteristic plants, animals and physical features of our natural heritage. Formal consent from Natural England is a statutory requirement if a proposed project is likely to have a significant effect on the features for which a SAC or SPA was designated, or if a proposed project is likely to have a significant effect on a SSSI. National Nature Reserves (NNRs) are managed for wildlife and receive the same protection as SSSIs. Local Nature Reserves (LNRs) are managed by the Local Authority as nature reserves and are protected from inappropriate use/development.

#### Non-statutory / local designations

There are a number of systems for identifying sites, habitats and species that do not qualify for legal (statutory) protection, but may be important at the regional or county level, and may be conservation priorities for the future. They also contribute towards the UK's implementation of International Conventions and European Directives. Planning policies recognise that Local Authorities must give appropriate protection to such non-statutory designations with respect to development. This section provides a brief outline of these designations.

Non-statutory sites: Sites that may be present include County Geology Sites (CGS), County Wildlife Sites (CWS), roadside verge audit biological sites and ancient woodlands<sup>6</sup>. CGS and CWS are designated by a local partnership containing representatives from Cornwall Council and Cornwall Wildlife Trust. They are sites of at least county importance for wildlife/geology in Cornwall, are shown on local plans and given greater protection through the planning process with respect to development (ERCCIS & CWT, 2010). Roadside verge audit biological sites and ancient woodlands are also given greater protection through planning.

Biodiversity Action Plans: Biodiversity Action Plans (BAPs) identify habitats and species of nature conservation priority at a national (UK) and county level.

The UK BAP is the Government's response to the Biodiversity Convention (1992). It is the duty of Local Authorities to further the conservation of UK BAP priority habitats and species under Section 74 of the Countryside and Rights of Way (CROW) Act 2000, to protect, restore, re-create and aid recovery of these habitats and species under the National Planning Policy Framework (NPPF, 2012). There are currently 65 UK BAP priority habitats and 1150 UK BAP priority species. The most up-to-date action plans (detailing actions needed to conserve the species/habitat) are available at BARS (2011) and/or JNCC (2011b); the original list and action plans are at UKBG (1998-9).

The County (Cornwall) BAP has been developed from 1997 to 2010. The most recent BAP list is available on the Cornwall Wildlife Trust website (CWT, 2011), and contains 43 priority habitats and 360 priority species (all also UK BAP priorities). There are four published volumes of the Cornwall BAP; Volume 1: Audit and Priorities (CBI, 1997); Volume 2: Action Plans (CBI, 1998), Volume 3: Action Plans 2004 (CBI, 2004) and Volume 4: Priority Projects (CBI, 2010). BAP Volume 4 details 18 'priority projects' in Cornwall, which aim to work on a landscape-scale to enhance biodiversity.

Red Data Books /Lists: These lists are updated frequently; updates to the list are available on the JNCC website; see JNCC (2011b).

The New Atlas of the British and Irish Flora (Preston *et al.*, 2002) provides the most

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<sup>6</sup> Areas of Great Landscape Value (AGLV) and Areas of Great Scientific Value (AGSV) are shown on local plans. However, these sites are beyond the scope of this report as they are a landscape rather than ecological designation.

up-to-date information on nationally rare and nationally scarce vascular plants. Nationally rare species occur in 1-15 10km squares of the National Grid; nationally scarce species occur in 16-100 10km squares.

The Vascular Plant Red Data List for Great Britain (Cheffings & Farrell, 2005) details the status of plants in relation to threat. Plants are included under the following categories: Extinct in the wild, Critically endangered, Endangered, Vulnerable, Near Threatened.

The British Red Data Books: Mosses and liverworts (Church *et al.*, 2001); Lichens (Church *et al.*, 1996); Insects (Shirt, 1987) and Invertebrates other than insects (Bratton, 1991) detail the status of these species in term of the categories above, and lists whether they are nationally rare or scarce.

Eaton, M.A. *et al.* (2009) reviews the population status of birds regularly found in the UK. Species have been assessed with respect to seven criteria: global and European conservation status, international importance, recent and historical decline, rare breeders and localised species. 52 species are on the Red List (of high conservation concern), and 126 species are on the Amber List (of medium conservation concern).

The Cornwall Red Data Book (CISFBR, 2009) provides data on nationally rare / scarce species that are found in Cornwall, and also 'locally scarce' species (those occurring in less than 5 10km squares within the region; 64 squares in Cornwall, 4 in the Isles of Scilly). Inclusion in this text does not necessarily mean the species is of conservation importance, but useful local data is provided.

The Rare Plant Register for Cornwall has been developed by the Botanical Cornwall Group, and is due for publication. 'Cornwall Rare' plants are found in 3 or less sites in Cornwall; 'Cornwall Scarce' are found in 4-10 sites, and 'Cornwall Local' in 11-20 sites. A 'site' is a discrete area within a moveable 1km square. More information about Rare Plant Registers can be found in Lockton *et al.* (2005).