

MRS H E MURRAY

C/O R E PHILLIPS AND PARTNERS

LAND AT THE GRIFFIN, BASSALEG, NEWPORT

EXTENDED PHASE 1 HABITAT SURVEY

08 FEBRUARY 2011

soltysbrewster
E C O L O G Y

4 Stangate House
Stanwell Road,
Penarth,
Vale of Glamorgan,
CF64 2AA

Telephone:- 029 2040 8476

Facsimile:- 029 2040 8482

e-mail:- enquiry@soltysbrewster.co.uk

Web Site:- www.soltysbrewster.co.uk

MRS H E MURRAY
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SUMMARY

Soltys Brewster Ecology were commissioned to undertake an ecological appraisal of an area of farmland to the south of the settlement of Bassaleg in October 2010. The land in question – The Griffin - has been proposed for residential development as a candidate site under the Newport Local Development Plan (LDP) process.

Desk based consultation confirmed that the site was not covered by any form of nature conservation designation and that no records of protected or notable flora and fauna were known within the site boundary. Court Wood, adjacent to the eastern boundary of the candidate site is listed as ancient semi-natural woodland, meeting the criteria for local designation as a Site of Importance for Nature Conservation (SINC).

An Extended Phase I Habitat survey revealed that the site consisted mainly of improved grassland enclosed by a network of native hedgerows of varying quality, with Court Wood adjacent to the eastern boundary. Hedgerows along the western, northern and southern boundaries of the site were generally intact (stock-proof) although the diversity of woody shrub species was generally limited to Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa* and Hazel *Corylus avellana*, with a similarly poor ground flora typically present over most of the hedgerow network. A low earth ridge separating the two large grazing pastures supported remnants of a former hedgerow, although large breaks in vegetation cover (20 – 50m wide) were associated with this feature.

The limited nature of the habitats within the candidate site boundary was reflected in a similarly low potential to support protected fauna, although the hedgerows are likely to provide resources to nesting birds and foraging/commuting bats. No definitive evidence of Badgers *Meles meles* was found within the candidate site although an active Outlier sett was identified off-site and the grazing pastures are likely to contribute to the foraging resource for the local social group.

The improved grassland habitat at the candidate site represents an area with good development potential, and of little or no ecological interest. As part of any future development, retention/protection of off-site broad-leaf woodland would be required with consideration also given to minimising the impacts on hedgerows as far as practicable. Opportunities to provide local enhancements for roosting bats and nesting birds could be included as part of the development, with sensitive design of site lighting also appropriate to maintain bat flight corridors along hedgerows and woodland edge.

1.0 INTRODUCTION

- 1.1. Soltys Brewster Ecology were commissioned to undertake an ecological appraisal of land at The Griffin, south of Bassaleg, Newport. The land-holding is being proposed as a candidate site for residential development as part of the Newport Local Development Plan (LDP) process.
- 1.2. The land at The Griffin occupies an area of approximately 10 hectares (ha.) and is located to the south of the settlement of Bassaleg, centred at grid reference ST 273 866. The site is mainly pastoral farmland intersected by hedgerows of varying quality/extent with woodland (Court Wood) forming the eastern boundary of the candidate site. These habitats are typical of the landscape south of Bassaleg and the area is classified as 'Countryside' as currently defined within the Newport Unitary Development Plan 1996-2011.
- 1.3. This report presents the findings of an ecological desk study and Extended Phase I Habitat survey undertaken in October 2010 to advise on the development potential and likely ecological constraints/opportunities associated with the site.

2.0 METHODOLOGY

2.1. In order to establish the baseline ecological conditions on site and in the adjoining habitats, a combination of desk-based consultation and Extended Phase I Habitat survey were undertaken in September/October 2010.

Desk study

- 2.2. This element of the work primarily involved consultation with the South East Wales Biodiversity Records Centre (SEWBRc) to identify any records of rare, protected or notable flora and fauna within the proposed candidate site boundary and surrounding 1 km area. The search criteria also included information relating to the location and citation details (where available) for any sites designated for their nature conservation interest such as Sites of Special Scientific Interest (SSSIs) or Sites of Importance for Nature Conservation (SINCs).
- 2.3. A search for relevant information available via the internet, and other sources, such as the Phase I Survey of Wales (CCW 2005), and the ecologist at Newport Council (specifically in relation to locally designated SINCs) was also undertaken.

Extended Phase I Habitat Survey

- 2.4. The fieldwork was undertaken on 05 October 2010 by an experienced ecologist¹ and followed standard Phase 1 Habitat Survey protocol (JNCC 1990) as amended by the Institute of Environmental Assessment (1995). All habitats within and immediately adjacent to the proposed candidate site were classified and mapped as accurately as possible. Target notes were used to identify features of particular ecological interest.
- 2.5. All habitats considered to have potential to support rare, protected or otherwise notable species of flora and fauna was noted, as were any direct signs of these species (e.g. Badger *Meles meles* setts and dung-pits). The survey also included a ground-based check (using binoculars as appropriate) of mature trees for their potential to support roosting bats. Of the trees checked, each was assigned a subjective potential value from No/Low up to High. This valuation was based on a combination of the presence of suitable features, tree location/context and surveyor

¹ Full Member of the Institute of Ecology and Environmental Management (IEEM)

experience and is based on best practice survey guidelines described by the Bat Conservation Trust (2007).

- 2.6. Hazel *Corylus avellana* was a frequent component of the on-site hedgerows and along the western edge of Court Wood – any fallen nuts found were examined for characteristic gnaw marks of mammals such as Grey Squirrel *Sciurus carolinensis*, Woodmouse *Apodemus sylvaticus* or Common Dormouse *Muscardinus avellanarius*.
- 2.7. Given the frequency of Japanese Knotweed in South Wales, any colonies seen during the survey were also noted. Japanese Knotweed *Fallopia japonica*, together with other invasive non-native species such as Himalayan Balsam *Impatiens glandulifera*, is listed as a pernicious weed under Schedule 9, Section 14 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to plant or otherwise cause the species to grow in the wild.

3.0 RESULTS

Desk Study

- 3.1 The data provided by SEWBRc (Appendix I) confirmed that the site did not hold any statutory nature conservation designation (i.e. SSSI), nor was it in close proximity to any such site. Court Wood, located alongside the eastern boundary of the candidate site is identified as Ancient Semi-Natural Woodland (ASNW) and e-mail correspondence received from the local authority ecologist indicated that this would meet the selection criteria as a SINC. No other designated sites were located in close proximity, so as to be ecologically relevant, to the candidate site boundary.
- 3.2 The agricultural character of much of the land south of Bassaleg, incorporating the candidate site, was reflected in the absence of any protected or notable species records associated with the site itself (see summary map in Appendix I). Records that were identified in close proximity were associated with Court Wood and included separate recordings of Bluebell *Hyacinthoides non-scripta*. This species was also recorded from woodlands at Coed y Defaid and Coed Ffynon oer, located approximately 200m south of the candidate site. Other records within the surrounding 1km area included foraging Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *P.*

pygmaeus, and Noctule *Nyctalus noctula* bats, all associated with the Gwent Bat Survey of 2005/2006.

- 3.3 The Phase I data of Wales (2005) indicated that the site consisted of semi-improved neutral grassland with broad-leaved woodland (Court Wood) to the east and existing development (School buildings) to the north. The area to the west and south comprised a mix of improved and semi-improved neutral grassland. It should be noted that while the Phase I of Wales data are a useful tool for identifying broad habitat types, it is not appropriate for site assessment in the absence of a survey to verify existing conditions.

Extended Phase 1 Habitat Survey

- 3.4 The distribution and extent of habitats within and adjacent to the site is illustrated in Figure 1 with accompanying target notes in Appendix II.
- 3.5 The site was characterised by two large fields of improved pasture that were grazed to varying extents by Cattle, although none were present at the time of the survey in October 2010. The pastures were separated by a low earth ridge supporting a defunct, gappy remnant of hedgerow with intact hedgerows forming the western boundary of the site with the minor road south of Bassaleg. Hedgerows also formed the boundary between the candidate site and the farm to the south and the school to the north. The eastern boundary of the site was defined by the edge of Court Wood.

Improved Grassland

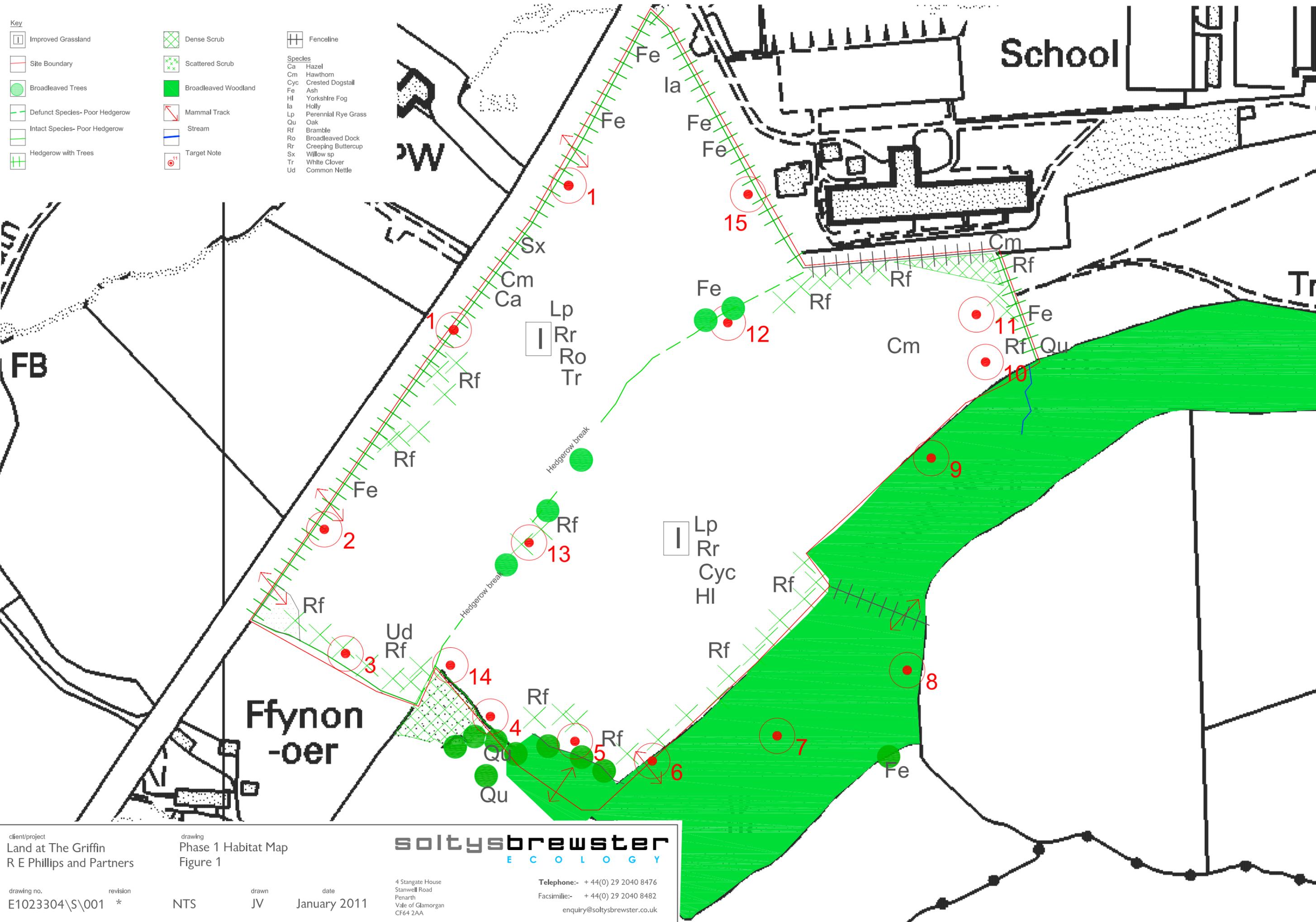
- 3.6 This was the dominant habitat type within the candidate site boundary (Figure 1) and described all the grassland present within two large pastures. No stock were present at the time of the survey although poaching of the ground, water troughs and dung indicated that the grasslands were grazed by cattle. The grassland in the lower pasture (adjacent to the road) was particularly lush (see Plate 1) and comprised of a limited range of palatable grasses and common herbs dominated by Perennial Rye grass *Lolium perenne* with Annual Meadow Grass *Poa annua*, Creeping Buttercup *Ranunculus repens*, White & Red Clover *Trifolium repens* & *T. pratense*, Ribwort Plantain *Plantago lanceolata* and Broad-leaved Dock *Rumex obtusifolius* also present.

Key

- Improved Grassland
- Site Boundary
- Broadleaved Trees
- Defunct Species- Poor Hedgerow
- Intact Species- Poor Hedgerow
- Hedgerow with Trees
- Dense Scrub
- Scattered Scrub
- Broadleaved Woodland
- Mammal Track
- Stream
- Target Note
- Fenceline

Species

- Ca Hazel
- Cm Hawthorn
- Cyc Crested Dogtail
- Fe Ash
- HI Yorkshire Fog
- la Holly
- Lp Perennial Rye Grass
- Qu Oak
- Rf Bramble
- Ro Broadleaved Dock
- Rr Creeping Buttercup
- Sx Willow sp
- Tr White Clover
- Ud Common Nettle



client/project
 Land at The Griffin
 R E Phillips and Partners

drawing no. E1023304\S\001

drawing
 Phase 1 Habitat Map
 Figure 1

revision *
 NTS

drawn
 JV

date
 January 2011

soltysbrewster
 E C O L O G Y

4 Stangate House
 Stanwell Road
 Penarth
 Vale of Glamorgan
 CF64 2AA

Telephone:- + 44(0) 29 2040 8476
 Facsimile:- + 44(0) 29 2040 8482
 enquiry@soltysbrewster.co.uk

Plate 1 Improved pasture in lower field. Viewed looking south-east from entrance gate.



- 3.7 Grassland in the upper pasture, on sloping ground, was similar in composition to the lower field although the community was generally more closely grazed (Plate 2). Grass species included Perennial Rye Grass, Crested Dog's Tail *Cynosorus cristatus* and Yorkshire Fog *Holcus lanatus* with Creeping Buttercup, Meadow Buttercup *Ranunculus acris* and White Clover. Small localised stands of Soft Rush *Juncus effusus* indicated damp or waterlogged ground.

Hedgerow with trees

- 3.8 The western and north western boundaries of the candidate site were characterised by native hedgerows incorporating several standard trees – typically Ash *Fraxinus excelsior*, Oak *Quercus* sp or Willow *Salix* sp (Figure 1 & Target Notes 1, 15). Where present, standard trees were of a relatively uniform age and size (typical diameter at chest height 20 - 30cm).
- 3.9 The western boundary hedge was tall (ca. 4m) and managed on the road-side (by cutting/flailing) although there was little evidence of similar management on the field side (Plate 3). This hedgerow mainly comprised of Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa* and Hazel *Corylus avellana* with small amounts of Elder *Sambucus nigra* and Willow shrubs towards the southern limit. Ground flora was generally poor and included species such as Common Nettle *Urtica dioica* and Ivy *Hedera helix*, with other species from the adjoining grassland. Small sections

at irregular intervals supported more characteristic hedgerow ground flora such as Dog's Mercury *Mercurialis perennis*, Red Campion *Silene dioica* and Herb Robert *Geranium robertianum*.

Plate 2 Improved grassland on sloping ground. Viewed looking north east from field corner



3.10 The north western boundary hedge, separating the candidate site from the School was regularly maintained by cutting/flailing, with a height and width of approximately 2m. This hedgerow was largely intact (i.e. stock proof) and contained a greater number of woody species than the road-side hedge (see Target Note 15). Species included Holly *Ilex aquifolium*, Elder, Hazel, Ash (as a hedgerow shrub) and Blackthorn with Bramble *Rubus fruticosus* agg and Bracken *Pteridium aquilinum* throughout along with a number of Ash standards (Figure 1).

Intact hedgerow

3.11 The southern boundary of the lower pasture was defined by an intact (stock-proof) hedge approximately 3m wide by 3 m high that was heavily overgrown with Bramble in places. Hedgerow shrub species were similar to the road-side hedge with Hawthorn predominant and small amounts of Elder, Dog Rose *Rosa canina* and Dogwood *Cornus sanguinea* present at the eastern limit (see Target Note 3, Figure 1). This hedgerow was located on top of a low earth bank with a seasonal ditch at the base (candidate site side).

Plate 3 Western boundary hedge. Viewed looking north*Defunct hedgerow*

- 3.12 The earth ridge separating the two grazed pastures supported hedgerow remnants, including several standard trees, with several large breaks in the line of hedge of 20 – 50m in extent (see front cover & Plate 1). Hedgerow vegetation was more or less continuous at the northern and southern ends of the feature, although even here the hedge was no longer stock proof and had become tall and ‘leggy’, with gaps of 1 - 2m allowing free movement of stock.
- 3.13 The northern and southern ends of the feature typically comprised of outgrown shrubs of Hazel, Hawthorn and Blackthorn (Target Notes 12 & 14, Figure 1), with ground flora typically comprised of Ivy, Bramble and grasses/herbs from the adjoining grassland. Small patches of more typical hedgerow ground flora including Wood Avens *Geum urbanum*, Herb Robert, Red Campion, Lesser Stitchwort *Stellaria graminea* and Foxglove *Digitalis purpurea* were noted. A small number of Ash standards and a single Elm *Ulmus* sp. standard were present along this feature (Figure 1).

Broad-leaved woodland

3.14 This habitat type was present as a narrow (5-10m wide) strip of vegetation along the southern boundary of the upper pasture, with Court Wood present along the length of the eastern boundary of the candidate site (Figure 1 & Plate 2). The narrow strip to the south comprised a number of Sycamore *Acer pseudoplatanus* and Oak standards with a sparse shrub layer including Hazel and Holly. Bracken and tall grasses comprised the ground flora (Target Note 4, Figure 1 & Plate 4).

Plate 4 Woodland strip alongside southern boundary of upper grazed pasture.

3.15 Court Wood comprised of two distinct areas with different vegetation types/structure (Target Notes 7 & 9). The southern half of the wood was fenced, with post & wire fencing permitting little (if any) access by cattle. In this part of the wood, Oak, Ash and Field Maple were the main canopy species with a dense shrub understorey of Hazel, Holly and Elder. In contrast, the northern part of the wood was unfenced allowing free movement of stock with the result that the understorey was very gappy with little or no ground flora (Plate 5).

Plate 5 Unfenced northern section of Court Wood.*Seasonal ditches & streams*

3.16 A seasonally wet ditch was noted at the base of the hedgerow along the southern boundary of the lower pasture (Target Note 3). The only other wetland feature at the site comprised a small stream that seemed to rise within the northern part of Court Wood, and flow into a small depression at the western edge of the woodland. The stream channel followed the western edge of the woodland towards the northern boundary hedgerow although the channel had lost any definition by this point. The depression at the woodland edge was characterised by abundant growth of Fool's Water Cress *Apium nodiflorum* (Target Note 10).

Scrub and other habitats

3.17 Scattered scrub and tall ruderal vegetation, typically comprising Bramble and Common Nettle was present along the edge of Court Wood and in the northern part of the site, close to the boundary with the School (Figure 1). Bare ground, as a result of trampling by cattle was noted within the south western corner of the candidate site.

Important or notable habitats

3.18 In the context of this report, *important or notable habitats* are considered to be those which are of a sustainable size and which meet any of the following criteria:

- Habitats which have a high intrinsic ecological value i.e. they support a diverse range of vascular plant and/or faunal species;
- Mature or semi-natural habitats in built-up areas;
- Any UK BAP Priority Habitats;
- Local BAP Habitats considered to have significant extent and/or ecological interest.

3.19 Of the habitats and site features recorded, Court Wood and, to a lesser extent, the strip of broad-leaved woodland along the southern boundary of the site would meet the criteria as 'important' habitats described above. Court Wood is listed as Ancient semi-natural woodland and as such would meet the criteria as a locally designated SINC and the description of Lowland Woodland within the UK Biodiversity Action Plan (UK BAP). A draft Habitat Action Plan for Woodland is also in preparation as part of the updating of the Newport Local BAP and Broad-leaved Woodland is cited as a habitat of 'principal importance' in Wales under Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006.

3.20 The boundary hedgerows at the site would also be considered 'important' at a local (Bassaleg) geographical scale although none were particularly diverse in terms of shrub or ground flora and would generally not meet criteria of the UK BAP *Ancient and/or Species-rich Hedgerows* Priority Habitat type (i.e. containing an average of at least five woody species per 30 metres). The central hedgerow running between the two grass pastures was defunct, with large gaps devoid of any shrub/hedgerow vegetation and would not be considered 'important' under the definition set out in paragraph 3.18.

Fauna

3.21 Over the course of the survey, a search for field signs of protected or notable species was undertaken and the potential of the habitats to support these species considered. In the context of this report, these species meet any of the following criteria:

- Species protected by British or international law;

- UK BAP Priority Species or local BAP species;
- Nationally rare or nationally scarce species;
- Species of Conservation Concern (e.g. JNCC Red List, RSPB/BTO Red or Amber Lists);

Common Dormouse

3.22 No desk study records of this species were identified by the SEWBReC data and of the fallen Hazel nuts examined within boundary hedgerows, none were found to indicate the presence of this species – all of the nuts found had been opened by Grey Squirrel (see Target Notes 1, 5 & 9, Appendix II). Court Wood was considered potentially suitable to support Dormice, based on the diversity of tree/shrub species and the dense under-storey vegetation within the fenced section of the wood. However, no evidence of Dormice was found based on an inspection of fallen nuts within the unfenced section (Target Note 9).

Bats

3.23 No buildings were present within the boundary of the candidate site and none of the hedgerow trees were of a sufficient age or size to have developed features that could be used by roosting bats. Larger trees were present in the narrow strip of woodland to the south of the upper pasture, although these were similarly devoid of features that could be used for roosting (Target Note 4, Appendix II). An assessment of trees within Court Wood was not undertaken as the woodland lies outside the boundary of the candidate site.

3.24 It is likely that the more common bat species known to occur locally – such as Pipistrelle and Noctule, would use the hedgerows and woodland edges for foraging/commuting.

Badgers

3.25 There was no evidence within the boundary of the candidate site to suggest the regular presence of Badgers, although several mammal paths were identified along the western boundary hedgerow and at the western edge of Court Wood (Target Notes 2, 5 & 6, Appendix II). However, the presence of Badgers within Court Wood was confirmed based on the presence of a latrine area and single-hole Outlier sett towards the eastern edge of the woodland (Target Note 8). The improved grazing pasture within the candidate site would represent suitable foraging habitat for the local Badger social group, although similar grassland is the predominant habitat type to the east and south.

- 3.26 Information relating to Badgers described in this report should be treated as sensitive and confidential within the client team and the local planning authority. In the event that this report were to be released into the public domain, all information relating to the location of the Outlier sett should be removed.

Birds

- 3.27 During the survey, a total of 10 different species were noted (Appendix II) including Wood Pigeon *Columba livia*, Magpie *Pica pica*, Great Tit *Parus major*, Nuthatch *Sitta europea* and House Sparrow *Passer domesticus*. The number and type of birds noted were generally consistent with the season (autumn) and the agricultural/urban edge habitats present at the candidate site and none of the species recorded would be considered particularly rare or endangered. House Sparrow is a Priority Species within the UK BAP and is included on the RSPB Amber List in Wales as of moderate conservation concern (Johnstone *et al.*, 2010).

Other Species

- 3.28 No evidence of invasive plant species such as Himalayan Balsam or Japanese Knotweed was noted over the course of the survey within or adjacent to the candidate site boundary.

4.0. POLICIES AND PLANS

- 4.1. The following local and national planning policy relating to nature conservation and biodiversity are considered of relevance to the area surveyed and to any future development proposals.

National Planning Policy

- 4.2. In terms of planning policy, a number of over-arching policies are of relevance not least of which are those described within Planning Policy Wales (PPW), which sets out land use planning policies of the Welsh Assembly Government with Chapter 5 dealing with Conserving and Improving Natural Heritage and Coast. The advice contained within PPW is supplemented for some subjects by Technical Advice Notes (TAN's), with TAN 5 addressing Nature Conservation.

Technical Advice Note 5 (2009)

4.3. TAN 5 identifies a number of key principles, which the town and country planning system in Wales should incorporate those relevant are detailed below:

- integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time (PPW 5.1.3 and 5.1.4);
- look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally (PPW 5.1).

Adopted Newport Unitary Development Plan 1996-2011

4.4. Planning policy in Newport is currently guided by the Adopted Unitary Development Plan, which will be replaced by the Local Development Plan following 2011. The Local Development Plan will contain policies that will be used in the assessment of all planning applications that come before the council to 2026. Under the UDP, the following policies are of some limited relevance to the candidate site although all of the broadleaved woodland habitat, with Court Wood representing a locally designated site, is located outside the site boundary.

- Policy CE7 - Locally Designated Sites;
- CE 10 - Species Protected by United Kingdom Legislation;
- CE 11 - Ancient Woodland

4.5. Planning policy CE13 - *Trees and Hedgerows on Development Sites* – is of more relevance where it relates to hedgerows, as any development of the site would be likely to result in breaching/partial removal of hedgerows to allow access. However, minimising loss and improving management of retained hedgerows as part of development would ensure that the policy objective could be met – namely that:

ii) 'the trees or hedgerows can be replaced within the site boundary in a manner which ensures that there is no unacceptably detrimental impact upon the character and visual amenity of the area, nor to local biodiversity.'

5.0 CONCLUSIONS AND RECOMMENDATIONS

- 5.1. The combination of desk study and field survey undertaken at the candidate site has confirmed that it is not covered by any form of nature conservation designation. Court Wood, located adjacent to the eastern boundary of the site, is designated as ancient semi-natural woodland, meeting the criteria for a local Site of Importance for Nature Conservation (SINC). The predominant habitat recorded at the site comprised agriculturally improved grassland of little or no ecological interest, and this grassland represents the most suitable area to support development, with the network of boundary hedgerows and woodland largely retained.
- 5.2. In order to allow access into the site for development, it is likely that a breach of the western boundary hedgerow would be required. Any breach should be minimised as far as practicable with subsequent management of the retained section of this hedge to ensure its longevity. A similar approach – i.e. retention and management – would also be recommended for remaining vegetation at the northern and southern ends of the defunct central hedgerow. Access for development through the central part of the site could make use of the large gaps along this feature.
- 5.3. Any subsequent development proposal at the site subject to a planning submission, should also consider the potential presence of protected species such as nesting birds, foraging/commuting bats and Badgers. As a general consideration, vegetation/hedgerow clearance should be undertaken outside the bird breeding season and ideally in the period when bats would be least likely to be using the hedgerows for foraging (i.e. between October and March inclusive). Consideration of lighting design would also be appropriate to maintain, as far as practicable, hedgerows and woodland edges as bat flight corridors. An advice note relating to bats and street lighting is included in Appendix III.
- 5.4. No definitive evidence to indicate use of the candidate site by Badgers was recorded during the survey although it is likely that the improved grazing pastures would contribute to the available foraging resource for the local Badger social group. Some retention of grassland, either as a buffer strip alongside retained woodland/hedgerows or as part of public open space, would be appropriate to maintain some of this resource. As noted in paragraph 3.24, agricultural grassland is the predominant habitat type to the south and east of the candidate site.

- 5.5. The unfenced section of Court Wood was considered potentially suitable for Common Dormouse, although no evidence of this species was identified from the *ad-hoc* nut search undertaken. Retention and protection of the woodland as part of site development, together with enhancement measures for the unfenced section and adjoining boundary features (e.g. new planting/management of hedgerows to in-fill gaps etc.) would ensure resources for this species (if present) were maintained. Given the protected status of Dormice, a survey to establish likely presence/absence within the woodland and boundary hedgerows would be appropriate as part of a planning submission. Such a survey could be undertaken using nest tubes deployed within woodland/hedgerow habitats and checked on a monthly basis from April – October/November and would aim to inform any licensing/mitigation requirements for site development.
- 5.6. Enhancement measures that could be adopted as part of any new development could include the provision of bird or bat boxes on retained boundary trees and/or as part of the building scheme. A range of products are now available (e.g. bat bricks at <http://www.ibstock.com/sustainability.asp>) that do not compromise the integrity of new building and require little, if any maintenance. Bird boxes for species such as House Sparrow, which was confirmed to be present at or adjacent to the site, are also available commercially that could be integrated into building design (for example see <http://www.alanaecology.com>).

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APPENDIX I DESK-STUDY INFORMATION RECEIVED FROM SEWBREC

Mrs H E Murray, c/o R E Phillips and Partners
Land at The Griffin, Bassaleg, Newport
[Extended Phase 1 Habitat Survey Report](#)

E1023304/R01

APPENDIX II TARGET NOTES TO ACCOMPANY PHASE 1 HABITAT MAP

Target Note	Description/comment
Birds seen/heard: Wood Pigeon, Magpie, Carrion Crow, Blue Tit, Great Tit, Robin, Jay, Pied Wagtail, Nuthatch, House Sparrow	
1	<p>Road-side boundary hedge to south of gate. Tall hedge of ca. 4m height which is largely stock-proof (for Cattle but not sheep) with a post/wire fence at the base. Hedgerow sits on a low earth bank – woody species in this southern section predominantly Hawthorn, Blackthorn and Hazel with Ivy throughout. Small amounts of Elder and Willow towards southern limit.</p> <p>Fringe of nettle on field side and hedge ground flora is generally poor – Nettle, Bracken, Ivy and Bramble – small areas support Dog’s Mercury, Red Campion and Herb Robert</p> <p>Oak and Ash standards at irregular intervals along this section of hedgerow – none of a size to have developed features of potential value to bats – no such features noted.</p> <p>Fallen hazel nuts along this section had all been opened by Grey Squirrel</p>
2	Well-worn mammal path under boundary fence/hedge. No evidence to suggest Badgers and no corresponding track on far side of road.
3	Wide Hedgerow – ca. 3m by 3m overgrown with Bramble – largely intact and stock-proof for Cattle. Main woody species as for note 1 with Hawthorn, Blackthorn and Hazel with small amounts of Elder, Dog Rose and Dogwood towards eastern limit. Hedgerow base is on low earth bank that marks the edge of the adjoining field (off-site) with seasonal ditch at base. Some Bramble and Blackthorn encroaching into field on site side.
4	Fringe of broad-leaved woodland on sloping earth bank. Site boundary is defined by the earth bank with post/wire fence – woodland is immediately adjacent to fence. Oak and Sycamore standards with Holly and Hazel in sparse understorey with Bracken and grasses (Bents, Perennial rye-grass) as the ground layer. Trees all appear in good condition and no obvious features of bat roosting potential noted.
5	<p>Line of young Ash and Oak standards with Hazel shrubs on sloping earth bank. Trees and shrubs at the top of the bank are likely to have formed part of previous field boundary/hedgerow - historical evidence of laying.</p> <p>Numerous fallen Hazel nuts on bare ground on the bank – all those examined had been opened by Grey Squirrel.</p> <p>Mammal track at top of bank with partial print (4 no toes visible) in wet mud – species could not be distinguished but larger mammal – dog, fox or badger.</p> <p>No hairs or other evidence present.</p>
6	Mammal path into Court Wood under boundary fence. Partial print as for Note 5 and size of print and nature of pathway is more suggestive of Fox.
7	<p>Court Wood. Oak and Ash are main canopy species with some Field Maple (as standard trees). Hazel, Holly and some Elder in well-developed shrub layer. Structurally, wood has potential for Dormice.</p> <p>Margins of the woodland with the improved grassland are predominantly Hazel shrubs with a ground flora comprising Ivy, Bramble, Bracken. Low earth bank that defined the boundary supports more typical woodland/hedgerow ground flora including Foxglove, Lesser Stitchwort, Common Dog Violet, and Red Campion.</p>

8	Well worn mammal path into woodland. Path leads to Badger latrine area with 1 no. dung pit with fresh dung ca. 30 m from boundary fence. Single hole sett with entrance partially used (PU) at base of large Ash tree on eastern boundary of wood – likely to be an outlier sett.
9	Unfenced part of woodland with Oak and Ash standards and ‘gappy’ understorey of Hazel and Holly. Ground flora is largely absent presumably due to free movement of stock. Lots of fallen hazel nuts in this area – search found only evidence of Grey Squirrel.
10	Area of inundated/wet ground at base of wooded slope where small stream ‘pools’ prior to continuing along the base of the slope and westwards along the boundary hedgerow. Abundant Fool’s Water Cress with some Redshank and Brooklime.
11	Intact native hedge with Ash and Oak standards. Hawthorn and Hazel are the main shrub species with small amounts of Holly. Bramble is present throughout
12	Defunct Hazel, Hawthorn and blackthorn hedgerow remnant on earth bank. Two Ash standards show some evidence of historical management by laying/plashing. Hedge ground flora is predominantly Ivy, Bramble and grasses/herbs from adjoining improved pasture. Some more typical hedgerow species present at low frequency – Wood Avens, Herb Robert, Red Campion, Lesser Stitchwort. Small number of fallen hazel nuts present – all those examined opened by Grey Squirrel
13	Ten metre long hedgerow remnant following line of earth bank. Elm, Hazel are the main species – Elm as a standard tree at northern edge of this section.
14	20m long hedgerow remnant on earth bank as previous. Hazel, and Hawthorn are the main shrub species with ground flora including Herb Robert, Red Campion, Lesser Stitchwort, Wood Avens, Nettle, Broad-leaved Dock and Foxglove.
15	Maintained boundary hedgerow with school grounds – ca. 2m wide by 1.5m high. Shrubs include Holly, Elder, Hazel, Ash, Blackthorn. Bramble and Bracken throughout.

APPENDIX III ADVICE NOTE ON BATS AND STREET LIGHTING

The following advice in relation to residential lighting where bats may be an on-site or influencing factor is based up on information contained within an article by Emery (2008) and available via Urbis lighting (<http://www.urbislighting.co.uk/>).

Firstly in terms of light source, the use of Low Pressure Sodium (SOX) is recommended, as these lamps emit light at a single wavelength with a very low amount of UV meaning that very few insects are attracted to this light source. This light also has a minimal effect on the bats. However, the use of these light sources is currently being phased out.

Next best would be High Pressure Sodium (SON) as these lamps emit light over a slightly broader wavelength spectrum attracting more insects but as these are a more intense light source they have a greater effect on bats. There are ranges of metal halide lamps available and they are classed as white light sources, these emit light at wavelengths across the colour spectrum but can also emit high levels of UV. These can attract large numbers of insects and are also a closer match daylight meaning these have an even greater impact on bats (avoid these types).

The lighting types recommended would be 8m Column heights (rather than 10m - however, see notes below) using (in order of preference) external rear louvres, or internal rear louvres, or 120mm rear shields. Either flat or curved glass protectors may be used with the former being preferred, as light spillage is marginally less than curved. However, there may be conflicts with using some louvres (plus, spacing will be reduced and so more lighting columns may be required, therefore increasing costs).

Units may be obtained from numerous suppliers, as the above-mentioned items are standard items. However, talking to Matt Emery from Urbis Lighting with regards to bats is recommended. He is a lighting engineer firstly with an interest in bats and how light influences their behaviour and this information is also recommended by the Institute of Lighting Engineers (ILE) <http://www.ile.org.uk/>.

FURTHER NOTES

Lower Mounting Height

This option is easily implemented and would generally result in a reduced column cost.

In comparison studies between 10m and 8m column heights, the overall spread of light has been reduced by lowering the column height, however due to the lower mounting height the intensity of the light on the road has been increased with the higher illuminance values spreading further. This option reduces the column spacing by 20% resulting in more columns being required thereby neutralising the benefit of the lower unit costs.

Louvres - External

External louvres are used with a flat protector so there is no spacing constraint from the optic. As with the shields mentioned below, these are externally mounted so there are increased stresses on the supporting columns and brackets from additional wind loading. As with the internal louvres (see below) an additional unit cost will incur.

In comparative studies, the external louvre almost completely blocks all the light emitted behind the units. However, this does have a greater effect on the column spacing achievable as large amounts of light are being blocked. Excellent for light sensitive species of bats (i.e. *Myotis sp.*). Urbis therefore recommends the use of its ZX2 and ZX3 product designs that have been proven to reduce light on a road scheme in the Sirhowey Valley, Caerphilly.

Louvres - Internal

Internal louvres are not available with a flat protector due to the limited space available inside the optic. Louvres are a specially designed accessory with each one requiring testing resulting in higher additional costs per unit than any of the other options described here.

In comparative studies, the internal rear louvre greatly reduces the spread of light behind the units. However it does reduce the column spacing achievable, this is because the louvre is blocking the light emitted from the optic making the luminaire less efficient.

Rear Shield

Shields are becoming more widely available on a range of luminaires but as they are an accessory they incur an extra cost per luminaire. The longer the length of the shield the more effective it is, however the increased surface area causes greater stresses on the supporting column and bracket due to wind loading.

In comparative studies, the shield has helped reduce the spread of light behind the lighting column by almost 40%. However, the column spacing is reduced by 20% resulting in the possibility of more columns being required and also there is an increased unit cost for the accessory.

Using Flat Glass Protectors

The majority of Traffic Route luminaires are available with a flat glass protector option, so this method of limiting light emitted at high angles is easily available at little or no extra cost on unit prices. However the range of protectors typically used on traffic route lighting include curved bowls due to their less restrictive light distribution.

In comparison studies results show that there is little effect on the spread of light when a flat protector is used to light roads. This is due to the decreased column spacing required to still achieve the required lighting specification on the road increasing the intensity of the light in the area. The decrease in column spacing will also mean that extra columns could be required on longer stretches of road increasing costs.

REFERENCES

Bat Conservation Trust. (2008). *Bats and Lighting in the UK; Version 2, January 2008*. <http://www.bats.org.uk/>

Emery, M. (2008). *Effect of Street Lighting on Bats*. Urbis Lighting Ltd., 2 January 2008.