Appendix 17: Monument Drive, Ashridge Estate Breeding Bird Survey Report, October 2018

Monument Drive, Ashridge Estate
Breeding Bird Survey Report – Draft

October 2018

109 Hemingford Road, Cambridge, CB1 3BY.
Tel. 07973 462948 Email: matthew@denny-ecology.com

109 Hemingford Road, Cambridge, CB1 3BY.
Tel. 07973 462948 Email: matthew@denny-ecology.com

Client	The National Trust
Job title	Ashridge BBS
Job number	0320
File reference	0320_18-10-26_BBSrep_de-nt
Date	29/10/18

	Signed	Name	Date
Author	Director	Matthew Denny	29/10/18

109 Hemingford Road, Cambridge, CB1 3BY.
Tel. 07973 462948 Email: matthew@denny-ecology.com

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1 SUMMARY

Breeding Bird Survey Results and Evaluation	The site supports 24 breeding species and five additional considered unlikely to nest on the site were recorded during the survey. Of these, one was considered to regularly occur on the site. Of the 29 species recorded, 4 are red-listed, 1 is amber-listed, and 1 (red kite) is listed on Schedule 1 of the WCA 1981, although the latter does not nest on the site.
Evaluation	The overall breeding bird assemblage is considered to be on the cusp of Local and District value. The existing value of the site is partially constrained by habitat quality, probably in part due to browsing by deer affecting the understory vegetation. Also, visitor pressure may be causing some disturbance.
Avoidance and Mitigation	Where possible, the car park should avoid areas of woodland, in particular mature trees and dense understory vegetation. To compensate for any loss of woodland, the existing woodland should be subject to increased management intervention, including control of deer and visitors.
Enhancements	The woodland could be enhanced through increased management controls, and through selective rotational coppicing where deemed appropriate. This is likely to increase the diversity and density of breeding birds on the site.

2 INTRODUCTION

2.1 Site description

The site is located approximately 3km north of Berkamstead in Hertfordshire, on the county border with Buckinghamshire, and on the Chiltern ridge. The site comprises woodland, to the north and south of Monument Drive, centred on OS grid reference SP975128. The survey area is 24.7ha in extent, and comprises ancient broad-leaved woodland, bisected by the hardstanding track of Monument Drive, and lies within the Ashridge Estate, owned and managed by the National Trust. It includes two existing car parks: a small car park approximately halfway along and to the south of Monument Drive, and a larger one at the western end. There are also several small grassy rides and paths, and two ponds in the northwest corner.

The survey area is located within the Ashridge Commons and Woods SSSI and the Chilterns Beechwoods SAC, and is also registered common land. Qualifying features for these designated sites are primarily woodland habitats, botanical and invertebrate interest. However, the SSSI designation citation, which was last revised in 1972, states the following:

The site supports an exceptionally rich breeding bird community including both county and national rarities.
A wide range of woodland bird species is known to breed, with raptors, woodpeckers, chats, warblers, tits and finches all well represented. Of particular importance within the community are species found rarely elsewhere in Hertfordshire, such as redstart, nightingale and wood warbler. The nationally rare firecrest is found here at one of its two known county localities. Other more widespread species are breeding in good numbers at this site, examples being sparrowhawk, tree pipit, lesser spotted woodpecker and hawfinch. The last species has a particularly strong population in the Ashridge woodlands.

In summary, the SSSI citation mentions the presence of a rich breeding bird community, with focal species being redstart, wood warbler, nightingale, firecrest, hawfinch, lesser spotted woodpecker, tree pipit and sparrowhawk.

A check of the Thames and Chilterns Bird Atlas (2007-12 breeding bird surveys) shows a paucity of recent breeding records for all the focal species in the Ashridge area, except for sparrowhawk, which is relatively ubiquitous locally. This may be a true reflection of their current status in the area, but could be due to lack of coverage, or some other limitation. Whilst firecrest and sparrowhawk have increased their population and range in southeast England since the SSSI citation, the other species have undergone severe declines and may have become locally extinct.

2.2 Proposed Works

Ashridge Estate's Visitor Centre lies at the top of the historic Monument Drive. Parking is currently provided near the top of the Drive, close to the Visitor Centre. Parking provision is inadequate, resulting in uncontrolled parking along the Drive, leading to damage of the historic and natural environment. The National Trust is looking at the options and feasibility of providing additional and more controlled parking in the area.

The Trust have begun ecological appraisal of the area and will be undertaking a Habitats Regulations Appraisal (HRA) in due course. They have also commissioned a Conservation Management Plan of the central part of the Estate.

2.3 Aims of study

The aim is to undertake an assessment of the breeding bird assemblage in the area; this assemblage is one of the designation features of the SSSI. Fieldwork methods and timings have been tailored to ensure breeding by any of the eight focal species mentioned above is captured,

but is also aimed at capturing the full breeding bird assemblage. The assemblage and notable single species are assessed for their nature conservation value. As details of the proposed works are not known at this time, an impact assessment could not be undertaken.

3 METHODOLOGY

The Chartered Institute of Ecology and Environmental Management (CIEEM) Ecological Impact Assessment (EcIA) guidelines will be used as a frame of reference for the evaluation and impact assessment of the result. Whilst there are no specific guidelines for breeding bird surveys (BBS) issued by CIEEM, they make particular reference to Gilbert et al. (1998), and it is common practice in the industry to use a reduced Common Bird Census (CBC) method and protocol (Marchant 1983) for breeding bird assemblage assessments.

3.1 Survey timing and number of visits

CBC surveys classically comprise ten visits across a period of March – July. However, the core woodland bird breeding season, when birds are most vocal and easily detected, is April to mid June. For species-specific surveys, Gilbert et al. (1998) recommend three April visits for lesser spotted woodpecker, two May visits for nightingale, three visits between mid-March and May for hawfinch, and three visits from mid-May to early July for firecrest. They give no species-specific methods for tree pipit, redstart or wood warbler, but these are summer migrants, most likely to be recorded during visits between late April and mid June. Sparrowhawks can be surveyed at any time over the spring/summer period.

To sample across the range of these dates, we undertook five survey visits, each separated by at least ten days. Four surveys were undertaken in the morning, and one survey was undertaken in the evening to record potential crepuscular species, such as nightingale and woodcock. In 2018, the spring was very late, with the 'Beast from the East' cold weather conditions persisting well into April. This delayed the onset of the breeding bird season, and survey dates were adjusted accordingly. Survey dates, timings and weather conditions are detailed in Table 1.

3.2 Fieldwork methods

Whole Area Search style monitoring was undertaken across the entire survey area, walking in a gridded pattern to ensure all areas were visited to within 50m, as per CBC methods. Navigation was facilitated by the use of the Google Maps app, using a GPS-enabled mobile phone. The survey area took approximately four hours to survey.

Bird records (BTO species codes and activity codes) for any species encountered were noted using a separate 1:5,000 scale paper map for each survey visit. The position and activity of all individuals present were noted. Data were pooled across the breeding season and analysed to give an estimate of the number of territorial birds (see section 3.3 below).

Days of high winds (wind above Beaufort Force 3: leaves and twigs, but not branches, in constant motion), continuous rain or fog were avoided as poor weather can inhibit bird activity and reduce detectability. Survey routes were varied between visits to ensure that different parts of the recording area did not receive systematically better coverage as a result of possible decline in song and activity later in the morning.

3.3 Territory analysis and data visualisation

Field maps were analysed to determine probable breeding bird registrations relating to different territories and to judge which birds are using the area for breeding or for other activities such as foraging. A probable or definite territory is defined as a cluster of registrations of singing or displaying individuals from more than one visit, or one or more registrations of the following breeding behaviour: disturbance displaying, interspecific aggressive interaction, repetitively alarming, carrying food, nest material or faecal sacs, or if active nests or young were found.

At the end of the fieldwork visits, all registrations were transferred to 'species maps' on which the letter of the visit (A, B, C, D, E) was substituted for the species symbol. Registrations were plotted in exactly the same locations as on the original survey maps and using the same activity codes. The information on these 'species maps' can then be used to estimate the numbers of

breeding birds. However, territory clusters may not be fully defined after five visits.

If a singing bird is recorded on just one visit or sight observations of birds are recorded in the same area on more than one visit and are not likely to be associated with any other recorded territories, these are assigned as possible territories. For birds that do not sing, such as many waterfowl, birds present at a location in suitable breeding territory on at least two visits are assigned to probable territories. Presence of such species in suitable breeding habitat on a single visit is assigned to possible territories unless the possibility of nesting is considered negligible by the observer.

This process is open to subjectivity in interpretation except where active nests are located. Therefore, these territories are classed as putative and their mapped locations indicate the 'centre' of a territory and not necessarily the nesting location. The maps were analysed to determine the number of probable and possible territories or pairs of each species present.

Territories were assigned to a category of possible, probable or confirmed, according to the number of observations across the survey visits and behaviour observed. A single record of a nest with eggs or young (or direct evidence of this) was counted as a cluster even in the event of the adults not having been seen at a level to qualify. Broods of flying juveniles, or of nidifugous species, were not be counted in the same way as a nest, as they might have moved from a territory already recorded or from one outside the survey area.

All territories falling at least partly inside the survey area have been included in the area totals. Territory totals have been tabulated and the distribution of territories digitised on a GIS map.

Table 1. Dates and weather conditions of breeding bird survey visits

Date	Time	Weather
17/04/18	07:30-12:30	Cloud 7/8, 10-12^{o}C, dry, wind: S BS force 2-3
09/05/18	06:15-10:15	Cloud 0/8, 8-12^{o}C, dry, wind: calm
23/05/18	05:50-09:40	Cloud 8/8, 11^{o}C, dry, wind: N BS force 2-3
06/06/18	17:30-21:15	Cloud 3/8, 13-16oC, dry, wind: NE BS force 2
20/06/18	06:15-10:15	Cloud 8/8, 11-15oC, dry, wind: E BS force 2

3.4 Assessment methodology

3.4.1 Nature Conservation Evaluation

Individual species and assemblages have been evaluated in accordance with the *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial and Freshwater* (CIEEM, 2016). These guidelines aim to give consistency in evaluating the importance of the ecological features within and around a site, which help inform any effects or impacts a scheme will have upon them. A value of the ecological features has been assigned according to their geographic level of importance using the following terms:

- UK
- National (England)
- Regional (Southeast)
- County (Berkshire)
- District
- Local or parish including the immediate zone of influence of the site
- Negligible

3.4.2 Bird species diversity

The number of species present is a simple and effective measure of diversity that can be used to

describe conservation value separately for breeding, passage and wintering bird assemblages. Fuller (1980) provided criteria for breeding birds where the number of species found breeding in an area can be given a value at geographic level. The application of this approach to assemblages of County importance or lower requires some care as there is no provision for assessment at the District or Parish scale. It is assumed that an assemblage comprising between 49-25 equates to District importance, and fewer than 25 species is only of importance at the Parish/Local level. Since the publication of this method, further declines have occurred in many bird populations, and for this reason it is probably legitimate to recalibrate the categories slightly downwards.

Therefore, these have been adapted according to the above frames of reference, thus:

- National = >84
- Regional & County = 50-84
- District = 25-49
- Local = 10-25
- Negligible = <10

3.4.3 Species of conservation importance

Criteria for the assessment of species of conservation importance are drawn from the lists of species from Schedule 1 of the WCA, the Biodiversity Action Plan and those of Principle Importance in the NERC Act, detailed in Appendix 1, as well as the following:

- Birds of Conservation Concern (BoCC) listings (Eaton *et al.*, 2009). The red list currently contains 52 species in need of urgent conservation action. Breeding and non-breeding species are included. Criteria for inclusion in the red list are species whose UK populations declined by more than 50% during 1984-09 or during 1969-2009, or whose UK population has experienced a historical (1800-1995) decline, or globally threatened species regularly occurring in the UK. The amber list contains 126 species. The criteria for inclusion for species in the amber list are those whose UK populations declined by 25-49% during 1984-09 or during 1969-2009, or whose UK population is restricted or small, or are present in internationally important numbers in the UK, or Species of European Conservation Concern.

- Populations of conservation importance. The generally accepted criterion is that the presence on a site of a bird species' population of over 1% of the total geographical resource is significant at the international or national scale. A similar approach has been taken in this report to assess the importance of populations at the Regional, County, District or Local scale. At the National and Regional scale evaluations have been judged using population estimates published in Baker *et al.* (2006) and information in Gibbons *et al.* (1993).

- Rare species. The generally accepted criterion is that species with fewer than 1000 pairs breeding in the UK are described as Nationally Rare. There is no formal definition for a rare non-breeding bird species or breeding birds in a regional or local context. However, if such species are present they are likely to fall within the criterion for populations of conservation importance as outlined above.

4 RESULTS

4.1 Survey limitations

The survey was tailored to detecting the focal species and, whilst an evening visit was undertaken, nocturnal species such as owls may have been overlooked. However, given the habitats present, it is considered likely that the only nocturnal species present would be tawny owl.

4.2 Bird habitats present

The site is dominated by woodland, with small amounts of grassland along paths and rides, particularly along the edge of Monument Drive. Some areas of woodland have recently fallen trees and habitats disturbed in other ways, giving rise to scrubbier patches. Examples of this habitat areas south of the smaller central car park, around the ponds in the northwest corner, the previously disturbed ground mid-way between the two car parks south of Monument Drive, and an area midway along the northern boundary. However, the majority of the woodland is dominated by high, closed-canopy woodland with a limited shrub layer. A 'browse line' characteristic of deer was evident in some of the woodland

4.3 Birds recorded

The total site has an assemblage of 29 species, which indicates it is of **District** value according to Fuller's valuation method. However, only 24 of these were considered to nest within the site (Table 2). The distribution of all putative breeding territories are mapped for each species in Appendix 2.

The following five species were considered not to nest, only using the site for foraging or other activities:
Red kite *Milvus milvus*
Buzzard *Buteo buteo,*
Kestrel *Falco tunniculus*
Mallard *Anas platyrhynchos*
Mandarin duck *Aix galericulata*

Of these, only one (buzzard) was recorded on more than one survey visit, indicating that 25 species regularly occur. Therefore, the site is on the cusp of **Local and District** value for its breeding bird assemblage.

Five notable species were recorded on the site during the survey – four red-listed species: marsh tit, mistle thrush, song thrush and willow warbler; and a single amber-listed species: stock dove. Song thrush and marsh tit are also BAP species. Willow warbler is a rapidly declining breeding species in the southeast of England, but remains common in suitable scrubby woodland. The two territories were of singing birds recorded during the April visit, and they are considered likely to have been staging at the site during migration, rather than staying to breed, and were only assigned as possible breeders. The other four notable species are relatively widespread and common breeding species in Hertfordshire and the Chiltern woodlands.

None of the species recorded are considered rare breeders, or being of higher than **Local** value. Red kite is listed on Schedule 1 of the Wildlife and Countryside Act, conferring special protection from disturbance at the nest site. However, the species was not considered to nest on the site, so disturbance issues are not relevant. In addition, since being reintroduced to the Chilterns 30 years ago, red kites have become common and widespread in the area, with over 1,000 pairs now estimated to breed in the Chilterns areas (Chilterns AONB website), and their presence on the site is not surprising.

In summary, none of the species recorded are considered uncommon or rare at any geographical scale, with all red-listed and BAP species having that status due to widespread declines across their large UK geographic range: they are still widespread in the region and the

reasons for their declines are not considered to be driven by development impacts.

4.4 Territory distribution and density

Territories were recorded generally across the site, although there was some tendency for certain species to be concentrated in certain areas. Distribution patterns generally followed subtle habitat differences, with species preferring scrubby habitats, such as blackcaps and willow warblers concentrated around scrub habitats. Species relying on more mature woodland, such as nuthatch and stock dove, were recorded in areas with more mature trees.

Species breeding densities are shown in Table 2. Looking at two typical resident woodland species, blue tit and great tit, densities appear to be similar to low-medium quality woodlands. For example, in Belgium, Dhondt (2010) found across woodlands ranging in quality that blue tits and great tits had a density range of 0.91-2.64 and 1.11-3.3 pairs per hectare, respectively, across five woodlands of increasing quality. The densities in this study were 1.6 and 1.24, respectively, indicative of a lower than average woodland quality. Blackcap density on site was 0.8 per hectare, which is approaching the 1-2 per hectare densities found in high quality habitat in northern Europe (Mason 1995). And for nuthatch (0.4 per hectare) and marsh tit (0.12 per hectare), densities were near average: 0.33-1.0 for nuthatch (Cramp & Perrins 1993), and 0.14 for marsh tit (Broughton et al. 2006). Overall, this indicates that the woodland habitats on site are not in poor condition, but are likely not to be optimal in their present condition.

4.5 Bird habitat quality

These results indicate that the breeding bird assemblage is less diverse, with fewer uncommon species, than it was when the SSSI was notified. Many of these species have declined generally across the UK, and the factors driving their local extinction may be extrinsic to the site, e.g. problems on migration or wintering grounds. However, densities of typical resident woodland bird species indicate that the woodland on the site may be in sub-optimal condition. A deer ‘browse line’ was noted across some of the wood, particularly in the less disturbed western section, and it is considered likely, in common with many woodlands in England, that the impacts of deer grazing are reducing the understorey woodland shrub layer, impacting many woodland species.

During the surveys, walking and dog-walking in particular, was noted as a common recreational activity. There were a number of paths through the woodland, with some used very regularly. However. Some areas of the woodland, particularly in the western and northern sections, remain relatively undisturbed. Whilst this recreational pressure is unlikely to be having a particularly significant impact on the general breeding bird assemblage, the presence of dogs in particular is likely to increase predation risk, and disturbance to species nesting close to or on the ground.

Table 2. Bird species recorded during the breeding bird survey, and considered likely to be breeding within the survey area, with numbers of confirmed, probable and possible breeding territories, and territory density calculated per ha.

***Note that carrion crow was considered likely to be breeding on the site, but it does not display strong territorial behaviour and the number and distribution of breeding birds was difficult to ascertain.**

Common name	Scientific name	BTO code	Total	Confirmed	Probable	Possible	Density ha^{-1}
Blackbird	*Turdus merula*	B	26	3	13	12	1.04
Blackcap	*Sylvia atricapilla*	BC	20		10	10	0.8
Blue tit	*Cyanistes caeruleus*	BT	40	3	23	14	1.6
Chiffchaff	*Phylloscopus collybita*	CC	7		4	3	0.28
Chaffinch	*Fringilla coelebs*	CH	18		10	8	0.72
Coal tit	*Periparus ater*	CT	11	1	4	6	0.44
Goldcrest	*Regulus regulus*	GC	8		4	4	0.32
Great spotted woodpecker	*Dendrocopos major*	GS	4		3	1	0.16
Great tit	*Parus major*	GT	31	2	15	14	1.24
Jackdaw	*Corvus monedula*	JD	3		2	1	0.12
Jay	*Garrulus glandarius*	J	2		1	1	0.08
Long-tailed tit	*Aegithalos caudatus*	LT	1		0	1	0.04
Magpie	*Pica pica*	MG	1		0	1	0.04
Marsh tit	*Poecile palustris*	MT	3		2	1	0.12
Mistle thrush	*Turdus viscivorus*	M	1		1	0	0.04
Nuthatch	*Sitta europaea*	NH	10		7	3	0.4
Robin	*Erithacus rubecula*	R	33	3	16	14	1.32
Stock dove	*Columba oenas*	SD	16		9	7	0.64
Song thrush	*Turdus philomelos*	ST	8	1	4	3	0.32
Treecreeper	*Certhia familiaris*	TC	8	2	3	3	0.32
Willow warbler	*Phylloscopus trochilus*	WW	2		0	2	0.08
Woodpigeon	*Columba palumbus*	WP	33		14	19	1.32
Wren	*Troglodytes troglodytes*	WR	34		21	13	1.36
Carrion crow	*Corvus corone*	C	*				

4.6 Recommended enhancements and further survey

Recommended enhancements

It is recommended that options for the management of deer, such as fencing, be investigated to attempt to reduce their grazing impacts. This should help reduce impacts on the shrub layer. In tandem with this, some rotational coppicing could be considered to open up parcels of woodland and encourage growth of the ground flora and shrub layer.

The reconfiguration of the parking on the site allows the opportunity to create a new public access strategy. As common land, the area is open access, but dog-walkers in particular could be encouraged to use the same clearly marked trails. Creation of a single large car park will allow recreational activity to be centred on one particular area. This should allow other areas of the woodland to be subject to less disturbance pressure. Without this intervention, disturbance impacts on the site are likely to increase as recreational activity and dog ownership continues to increase generally.

Further bird surveys

This survey has established an adequate baseline for the existing breeding bird status on the site, and no further breeding bird surveys are required prior to any works commencing. To assess any positive or negative impacts of the proposed car park or any management interventions, we recommended repeat breeding bird surveys of the area in years 1, 3, 5 and 10 years after work, and subsequently repeated every 10 years.

5 CONCLUSIONS

The design and location of new car parking is not known at this stage, but it is recommended that as little mature woodland as possible is lost. Enhancement measures have been recommended, and assuming these are implemented, it is highly probable that these will significantly increase the carrying capacity for bird species, and increase the breeding assemblage, such that it will more than offset any loss as a result of the development. This will result in an overall significant net gain in the breeding bird assemblage in accordance with National Planning Policy Framework (NPPF) (MHC&LG, 2018).

6 REFERENCES

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7 APPENDIX 1: LEGISLATION & PLANNING POLICY

Conservation of Habitat and Species Regulations (CHSR)
The *CHSR 2017* transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (Habitats Directive) into English law. The Regulations provide for the designation and protection of 'European sites' (including Special Protection Areas (SPAs)) and the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.

Wildlife & Countryside Act (WCA)
The *WCA 1981*, as amended by the *Countryside and Rights of Way Act (CRoW) 2000* and the *Natural Environment and Rural Communities Act (NERC) 2006*, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive), making it an offence toIntentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 to the Act, or its dependent young while it is nesting.

Natural Environment & Rural Communities (NERC) Act
The *NERC Act 2006* amends the *CRoW Act*, by further extending the requirement to have regard for biodiversity to all public authorities, which includes local authorities and local planning authorities and requires that the Secretary of State consults Natural England (NE) in the publication of the list of living organisms and habitat types deemed to be of principal importance in conserving biodiversity.

Biodiversity Action Plans
The UK Biodiversity Action Plan (UKBAP) was organised to fulfil the Rio Convention on Biological Diversity in 1992, to which the UK is a signatory. A 'UK Post-2010 Biodiversity Framework' was published in July 2012, and succeeded the UKBAP. Much of the work for the UK BAP is now focussed at a country level due to devolution and the creation of country-level biodiversity strategies.

The UKBAP lists of priority species and habitats are still valuable reference sources. Notably, they have been used to help draw up statutory lists of priority species and habitats as required under Section 41 of the NERC act.

National Planning Policy Framework (NPPF)
The NPPF sets out current government policy on biodiversity and nature conservation and places a duty on planners to make material consideration to the effect of a development on legally protected species when considering planning applications (MHC&LG, 2018). The NPPF also promotes sustainable development by ensuring that developments take account of the role and value of biodiversity and that it is conserved and enhanced within a development.

The NPFF works in conjunction with Government Circular *06/2005 'Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System*.'

8 APPENDIX 2: BREEDING BIRD DISTRIBUTION MAPS

The following maps show the distribution of putative territory centres for birds recorded breeding on the site during the 2018 survey. The red line marks the survey area boundary.

Dots mark putative territory locations, with attributed breeding certainty status according to the following colours:

Pink – breeding confirmed;
Blue – breeding probable;
Green – breeding possible.

Blackbird
Concentrated particularly in areas of more scrubby habitat, reflecting nest-site selection

Blackcap
Scattered generally across the site, although some avoidance of more disturbed ares near car parks evident

Blue tit
Scattered generally across the site

Chaffinch
Selection of woodland edge habitats evident, with concentration near to scrubby woodland paths and rides, including Monument Drive

Chiffchaff
Scattered at low density across the site

Coal tit
Concentration along Monument Drive and south of central car park, mainly in areas with occasional coniferous trees present

Goldcrest
Concentration along western section of Monument Drive and south of central car park, mainly in areas with occasional coniferous trees present

Great spotted woodpecker
Scattered across the site. With many mature trees and much dead wood, distribution probably not nest-site limited

Great tit
Scattered across the site, although an apparent propensity towards the southwest block of woodland, possibly due to a higher density of mature trees

Jackdaw
Limited to the western section, presumably where there are more mature trees with large cavities providing nesting opportunities

Jay
Territories in mature woodland

Long-tailed tit
Single possible territory in scrub on northern boundary

Magpie
Single possible territory in closed-canopy woodland near eastern boundary

Marsh tit (Red-listed; Section 41 and BAP species)
Territories centred on mature woodland with some shrubby understorey

Mistle thrush (Red-listed)
Single territory in mature woodland close to main car park

Nuthatch
Distribution follows that of the most mature woodland, a reflection of nest-site (tree cavities) and foraging habitat (mature trees) requirements

Robin
Distributed generally across site, with an apparently avoidance of a section of mature closed-canopy woodland towards the northwest, south of Monument Drive

Song thrush (Red-listed; Section 41 and BAP species)
Scattered across the site

Stock dove (Amber-listed)
Distribution follows that of the most mature woodland, a reflection of nest-site requirements (large tree cavities)

Treecreeper
Scattered across the site

Willow warbler (Red-listed)
Two possible territories involving singing birds on the first (mid-April) visit. Restricted to two areas of younger woodland with more developed understorey vegetation

Wood pigeon
Scattered across the site, although generally concentrated in areas with a good understorey shrub layer

Wren
Scattered across the site, although singing birds concentrated in small areas of better understorey vegetation and structure, reflecting nest site selection

9 APPENDIX 3: PHOTOGRAPHS

Photo 1: Main car park at western end of Monument Drive

Photo 2: Smaller car park in the centre of the site, south of Monument Drive

Photo 3: Mature beech woodland with very sparse understorey and ground flora. Typical of heavily shaded beech woodland

Photo 4: Predominantly birch and ash woodland with well developed ground flora, but very sparse shrub layer

Photo 5: Area of disturbed ground between the car parks, south of Monument Drive, with well developed surrounding shrub layer

Photo 6: Area of open grass habitat typical of the broad rides and paths crossing the site

Photo 7: Mature oak on the northern site boundary. Note the wind-thrown tree in background opening the canopy and allowing a shrub layer to grow

Photo 8: Mature oak with hole in right limb providing a potential nesting site for cavity nesting bird species such as nuthatch

Photo 9: Blackbird nest, located in typical location within the dense woodland shrub layer

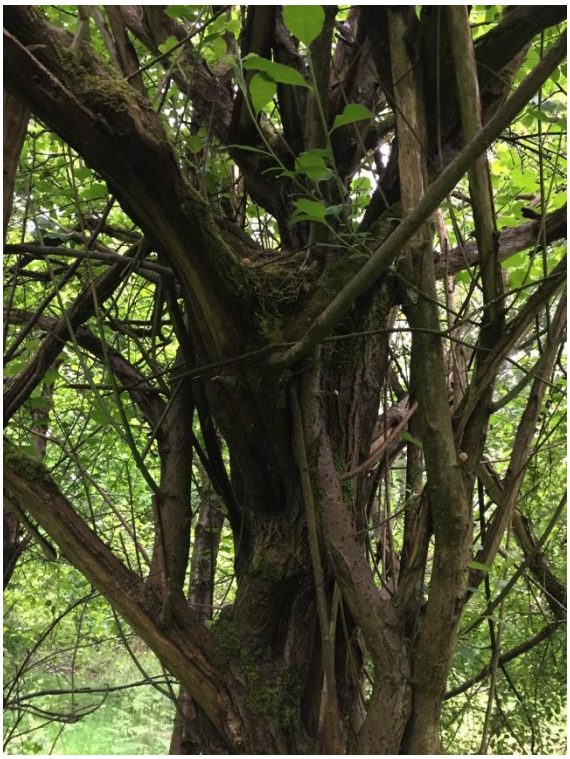

Photo 10: Wind-thrown beech, forming standing deadwood and opening the canopy allowing light to penetrate and promote bracken and shrub growth. This stump provided a treecreeper nest-site

Photo 11: Pond in northwest corner of the site with a mix of closed-canopy woodland (background right) and more open-canopy woodland (background left), with associated sparse and more dense shrub layers, respectively

Appendix 18: Preliminary Ecological appraisal for the National Trust's Proposed new car park, October 2017

Proposed New Car Park, Ashridge Estate

Hertfordshire & Buckinghamshire

Preliminary Ecological Appraisal

For **The National Trust**

20th October 2017

Issue: 1

***B*ernwood *ECS* Ltd**

Hensmans Farm

Nearton End

Swanbourne

Bucks

MK17 0SL

✆ 01296 728351 · ✉ enquiries@bernwood.net · www.bernwood.net

Limitations
Ecological assessments can only assess a site at a particular time. This evidence can be used to draw conclusions as to the likely presence or absence of species (animals and plants), population size, use of the site by animals; it is neither definitive nor complete.

Any survey is a snapshot in time and should not be regarded as a complete study. Seasonality and weather conditions may also affect survey results.

The preparation of mitigation strategies, consultation exercise and submission of any licence applications cannot be relied upon until approved [licensed] in writing by third parties. Allowance must be made for both programme and financial change to projects as a result of application failure, amendment or refusal.

Every effort has been taken to provide an accurate assessment of the situation pertaining to this site and information available at the time of the preparation of this report, but no liability can be assumed for omissions, or subsequent changes to design and development.

Surveys have been based on anticipated work resulting from instruction and information supplied at the time of request. Additional works should be anticipated as surveys and proposals for the site progress.

No responsibility will be accepted for any use of or reliance on the contents of this report by any third party.

No responsibility will be accepted for changes or alterations made to this report following submission to Bernwood ECS Ltd client.

Bernwood ECS Ltd, its employees and associates reserve the right to report on any incidents or actions [deliberate or reckless] that result in a breach of licence conditions or are in contravention of existing legislation.

Report Details	
Site	Proposed New Car Park, Ashridge Estate, Hertfordshire & Buckinghamshire
Report Title	Preliminary Ecological Appraisal
Client	The National Trust
Job number	NT 94
Issue Date	19th October 2017
Data Search	Buckinghamshire and Milton Keynes Environmental records Centre & Herts Environmental Records Centre
Surveyor(s)	C. Damant MCIEEM, E.Dickins ACIEEM & J.Salisbury
Report Author	C. Damant MCIEEM
Report Editor	C. Damant MCIEEM & E.Dickins ACIEEM
Proof Reading	E.Dickins ACIEEM

Executive Summary

Bernwood have been instructed by the National Trust to carry out a Preliminary Ecological Appraisal to inform the relocation/additional car park provision at Monuments Drive at Ashridge in Hertfordshire.

The results of the Preliminary Ecological Appraisal indicate that Special Area of Conservation qualifying features together with areas of ecological interest are present within the redline study area, some of which are already being adversely impacted by high visitor pressures.

Future demand to visit the Ashridge Estate is likely to increase with a corresponding increase in impacts on the ecological interest of the site including SAC qualifying features, that without management and planning will negatively influence how the National Trust meet their requirements to maintain the site.

Recommendations are made for;

- discussions with the Local Planning Authority and Natural England prior to submitting a screen opinion to ensure that
  - an appropriate assessment is necessary; and,
  - any focus is on those features that are likely to be subject to a significant effect
- review of existing local plans and existing Habitat Regulation Assessments
- additional data gathering and review of recreational use and visitor projections for the site and within the Chilterns
- additional data gathering on regional car park provisions at other high nature conservation sites including Special Area of Conservation and National Nature Reserves as well as local sites
- additional data gathering and review of source pollution with specific attention to recreation and transport
- further ecological surveys including Special Area of Conservation qualifying habitats; and,
- further ecological surveys species, species protected under EU and national legislation

1. Introduction

1.1. Bernwood have been instructed by the National Trust (Jennifer Smith) on 4th July 2017 to carry out a Preliminary Ecological Appraisal (PEA) for the relocation/additional car park provision at Monuments Drive, Moneybury Hill, Ringshall, Near Berkhamsted, Hertfordshire, HP4 1LT (SP 97386 12925).

1.2. The scope of the ecology works includes:

- an historical records data search
- a PEA survey of approximately 35 ha (Appendix 1)
- mapping areas which can be regarded as site fabric and provide an explanation of their characteristics
- sample indicative canopy drip line of 85 significant trees
- provide recommendations for what further, more detailed, habitat / species assessments are likely to be required, including an indicative cost for these
- Provide advice on the legal framework for mitigating or compensating potential impacts.

2. Background Information

2.1. Ashridge Estate's Visitor Centre lies at the top of the historic Monument Drive. Parking is currently provided near to the top of the Drive, close to the Visitor Centre and halfway down the drive at Barracks Square. Parking is unregulated and the public often choose to park on grass verges along the drive, which is intensified at peak visitor times. This is leading to damage of the historic and natural environment. The National Trust is looking at the options and feasibility of providing additional and more controlled parking in the area to try and prevent further damage and improve the visitor welcome.

2.2. Ashridge Estate lies within the Chilterns Area of Outstanding Natural Beauty (AONB) and is known to support a high diversity of species and habitats. Much of the site is designated as a Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). Monuments Drive and Thunderdell Cottage track are registered Historic Parks and Garden.

3. Legal Protection

3.1. The following information is a simplified summary of the legislation and the full text of the Wildlife & Countryside Act 1981 (as amended), Habitats Regulations and other legislation together with current published guidelines should be consulted.

3.2. The finding of this report represents the professional opinion of qualified ecologists and does not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this report.

European, Nationally & Locally Protected Sites

3.3. The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and wild flora and fauna) requires EU Member States to create a network of protected wildlife areas, known as Natura 2000, across the European Union. This network consists of Special Areas of Conservation (SACs) to protect habitats, plant species and fauna (other than birds) and Special Protection Areas (SPAs) for wild birds. SPAs are classified under the Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds). These sites are part of a range of measures aimed at conserving important or threatened habitats and species including the management of features of the landscape that support the Natura 2000 network but which are outside the site boundaries.

3.4. The Habitats Directive was originally transposed into UK law by the Conservation (Natural Habitats, &c.) Regulations 1994. Subsequent amendments were consolidated into the Conservation of Habitats and Species Regulations 2010. One of the key provisions is the need to undertake an appropriate assessment ("Habitats Regulations Assessment") for any plan or project likely to have a significant effect on a Natura 2000 site.

3.5. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

3.6. The SSSI series has developed since 1949 as the suite of sites providing statutory protection for the best examples of the UK's flora, fauna, or geological or physiographical features. These sites are also used to underpin other national and international nature conservation designations.

3.7. Local planning authorities for any given area may designate certain areas as being of local conservation interest – Local Wildlife Sites. The criteria for

inclusion, and the level of protection provided, if any, may vary between areas. Most individual counties have a similar scheme, although they do vary.

3.8. These sites, which may be given various titles such as 'Local Wildlife Sites' (LWS), 'Local Nature Conservation Sites' (LNCS), 'Sites of Importance for Nature Conservation' (SINCs), or ‘Sites of Nature Conservation Importance' (SNCIs), together with statutory designations, are defined in local and structure plans under the Town and Country Planning system and are a material consideration when planning applications are being determined.

Ancient Woodland & Veteran Trees

3.9. The UK is a sparsely wooded country: 11.5% of Great Britain is covered with trees. Only 1.2% of GB is ancient semi-natural woodland, a valuable and irreplaceable natural resource. Ancient semi-natural woodland, and plantations on ancient woodland sites are a priority for conservation. Planning authorities should refuse planning permission for developments that would lead to loss or deterioration of irreplaceable habitats unless the need for, and benefits of, the development in that location clearly outweigh the loss.

European Protected Species

3.10. All European Protected Species (EPS; great crested newts, bats, otter, white clawed crayfish, hazel dormice etc.) are protected under the Habitats Regulations and the Wildlife and Countryside Act 1981 (as amended) (WCA 1981). It is an offence under section 41 of the 2010 Regulations to:

- deliberately capture, injure or kill any wild animal of a EPS;
- deliberately disturb a EPS (including in particular any disturbance which is likely to impair their ability to survive, breed or reproduce, rear or nurture their young; or to hibernate or migrate; or which affects significantly the local distribution or abundance of the species);
- deliberately take or destroy the eggs of a EPS;
- damage or destroy a breeding site or resting place of a EPS; or
- possess, control, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal of a EPS, or any part of, or anything derived from a EPS.

3.11. Section 9(4) (b) and (c) of the WCA 1981 makes it an offence to:

- intentionally or recklessly disturb a EPS while it is occupying a structure or place which it uses for shelter or protection; or
- intentionally or recklessly obstruct access to any structure or place which any EPS uses for shelter or protection.

3.12. In order for otherwise illegal acts to proceed lawfully, an appropriate licence must be sought under the 2010 Regulations and WCA 1981. Licences for the purpose of development are currently determined by Natural England and must include an appropriate mitigation and monitoring scheme to secure the "favourable conservation status" of the species in the local area.

Common Species of Reptiles

3.13. Common species of reptiles (grass snakes, adder, slow worm and common lizard) are protected under the WCA 1981. These species receive partial protection under Section 9(1) and section 9(5). It is offence to:

- intentionally kill or injure a common species of reptile; or
- sell, or attempt to sell a live or dead reptile or any part of or anything derived from it.

Wild Birds

3.14. Wild birds are protected under the WCA 1981. The degree of protection depends on the species and, in some cases, the time of year. The basic principle of the Act is that all wild birds, their nests and eggs are protected by law and some rarer species are afforded special protection. Wild birds are defined as those resident in or visitors to Great Britain, in a wild state (does not include poultry or game bird). Section 1(1) of the WCA 1981 states that it is an offence to intentionally or recklessly:

- kill, injure or take any wild bird;
- take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- take or destroy an egg of any wild bird.

3.15. Section 1(2) of the WCA 1981 states that it is an offence to possess or control any live or dead wild bird or any part of or anything derived from a wild bird or an egg or part of an egg of a wild bird.

3.16. It is an offence under section 1 (5) of the WCA 1981 to intentionally or recklessly:

- disturb any wild bird included in schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young;
- disturb dependent young of such a bird.

Invasive Species

3.17. Section 14 of the WCA 1981 makes it an offense to release, or allow to escape into the wild any animal which is of a kind which is not normally

resident in the in and is not a regular visitor to Great Britain in a wild state or is included on part I of Schedule 9. Section 14 also makes it an offence to plant, or causes to grow in the wild any plant listed on part II of Schedule 9. Most commonly, these species include: Japanese knotweed *Fallopia japonica*, giant hogweed *Heracleum mantegazzianum*, Himalayan balsam *Impatiens glandulifera*, parrot's feather *Myriophyllum aquaticum* and New Zealand pygmyweed *Crassula helmsii* but this is not an exhaustive list.

Badger

3.18. Badgers are protected under the Protection of Badgers Act 1992 (PBA 1992). It is an offence (expect as permitted by or under the PBA 1992) to:

- wilfully kill, injure or take a badger or to attempt to do so;
- cruelly ill-treat a badger;
- intentionally or recklessly interfere with a badger sett by damaging or destroying a badger sett or any part of it or obstructing access to, or any entrance of, a badger sett; causing a dog to enter a badger sett; or disturbing a badger when it is occupying a badger sett;
- possess or have control of a dead badger or a part of or anything derived from a badger; or
- sell or offer for sale a live badger or to possess or have control of a live badger.

4. Planning

4.1. The local planning authority has the power to request information under Article 4 of the Town and Country (Planning Applications) Regulations 1988 (SI1988.1812) (S3) which covers general information for full applications.

4.2. The National Planning Policy Framework (NPPF) published in 2012 requires the planning system and policies to balance economic, social and environmental factors of sustainable development. Chapter 11 states: the planning system must contribute to and enhance the local environment by protecting and enhancing valued landscapes, recognising the wider benefits of ecosystem goods and services and minimise impacts on biodiversity and provide net gains where possible including establishing ecological networks that are resilient to pressures. More recently (spring 2014) habitat losses, gains and enhancement values are being assessed by some Local Planning Authorities using a Biodiversity Offsetting Matrix. Planning permission should be refused if: significant harm from a development cannot be adequately avoided, adequately mitigated, or as a last resort compensated for. The presumption in favour of development does not apply where development

requiring appropriate assessment under the Birds or Habitats Regulations is being considered, planned or determined. Planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscape and nature conservation. Please see updated Planning Practice Guidance https://www.gov.uk/government /speeches/local-planning.

4.3. Section 99 of ODPM Circular 06/2005 states: It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted. However, bearing in mind the delay and cost that may be involved, developers should not be required to undertake surveys for protected species unless there is a reasonable likelihood of the species being present and affected by development. Where this is the case, the survey should be completed and any necessary measures to protect the species should be in place, through conditions and / or planning obligations, before permission is granted.'

4.4. Local authorities have a duty to consider the three derogation 'tests' of the Habitats Regulations: no satisfactory alternative, imperative reasons of overriding public interest (including those of a social or economic nature or beneficial consequences for the environment) and that the favourable conservation status of the species will be maintained. If any of these requirements are not met, the local authority should refuse planning permission regardless of any commitment to obtain a Natural England licence.

4.5. It is essential that the presence of a protected species, the impact of the proposed development upon them and sufficient proposed mitigation and/or compensation measures are established before planning permission can be granted.

5. Methodology

Data Search

5.1. The site extends across two county boundaries, therefore a data search was requested from the Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC) and the Herts Environmental Records Centre (HERC) for historical records of protected species and sites within 1km search

radius, except for bats where a 2km search radius was applied.

5.2. Records from previous National Trust and others surveys have been consulted together with reference to more recent surveys carried out by Herts and Middlesex Bat Group and Bernwood.

5.3. Additional reference has been made to available online resources including;

- Air Pollution Information System (APIS)
- Magic – Nature on the Map (Natural England)
- NBN Atlas (NPN Atlas Partnership)
- Saproxylic Quality Index: Evaluated sites ranked by SQI

5.4. Visitor data and car parking details have been provided by property staff.

Preliminary Ecological Appraisal

5.5. A Preliminary Ecological Appraisal (PEA) of the site was undertaken C. Damant MCIEEM, E. Dickins MSc ACIEEM and J. Salisbury BSc on 7th July 2017 with a further follow up survey carried out by C. Damant MCIEEM on 10th October 2017. The habitats present on site were mapped according to the Phase I Habitat Survey methodology (JNCC, 2010). Any field signs indicating the presence of protected species were noted; otherwise the suitability to support protected species is assessed.

6. Constraints and Limitations

6.1. Environmental records can provide an indication of the likely presence of a species on, or within proximity, to the site. The absence of records for protected species and sites does not necessarily indicate absence. The use of historical environmental records is not a substitute for appropriate surveys at the correct time of year when informing land use change and development proposals.

6.2. Qualifications for historical records, e.g. if a water vole record is for an animal or field signs, may not always be known.

6.3. Data search record accuracy is variable, and will often range from 10km to 1m. Most commonly, accuracy will be within 10m. The original raw data from data searches should be consulted where the record accuracy is needed.

6.4. Every effort to ensure mapping accuracy is made; however, the exact locations of features should not be relied upon.

6.5. The PEA provides an indication of the habitats present within the study area only. Further survey may be required to assess the extent of SAC habitats and the distribution of stag beetles / suitable features for stag beetles present at Ashridge and within the Chilterns Beechwoods SAC.

7. Results and Discussion

Data Search

BMERC, HERC and MAGIC

7.1. Considerable historical ecological data is available for the site from both BMERC and HERC. A summary of the data search results are included below (Table 1). Full data search results (with the exception of species data from HERC) are included (Appendix 2).

7.2. Ashridge Estate lies within the Chilterns AONB. Much of the site is designated a Special Area of Conservation (Appendix 3) under the European Habitats Directive and Site of Special Scientific Interest (Appendix 4), and is also registered common land.

7.3. The Ashridge SSSI condition assessment indicates that the area of survey lies with two SSSI units of which Old Copse and Aldbury Common north are considered to be in favourable condition, with Aldbury Common south in unfavourable recovering due to historic damage by deer.

7.4. Monuments Drive and Thunderdell Cottage track are part of the Ashridge registered historic parkland for its special historic interest.

Landscape History in Brief

7.5. The site is comprised of areas of ancient and more recent semi-natural woodland within the Ashridge Estate that has its origins in pre-medieval or earlier landscape history of common land practices including grazing, wood pasture, and more recently parkland management including deer (see previous National Trust reports for further details) (Fig 1).

7.6. More recent history includes the expansion of the parkland landscape, felling and forestry with the significant decline in grazing practices and encroachment of secondary woodland over open common land that masks the unique history of this important historical and ecological site.

7.7. Deer and grey squirrels *Sciurus carolinensis* are present and abundant throughout the area and damage to trees and the field layer is clearly evident.

7.8. Descriptions follow the woodland compartments set out in the National Trust Biological survey (1996) for consistency with geographical names where known or apparent from maps.

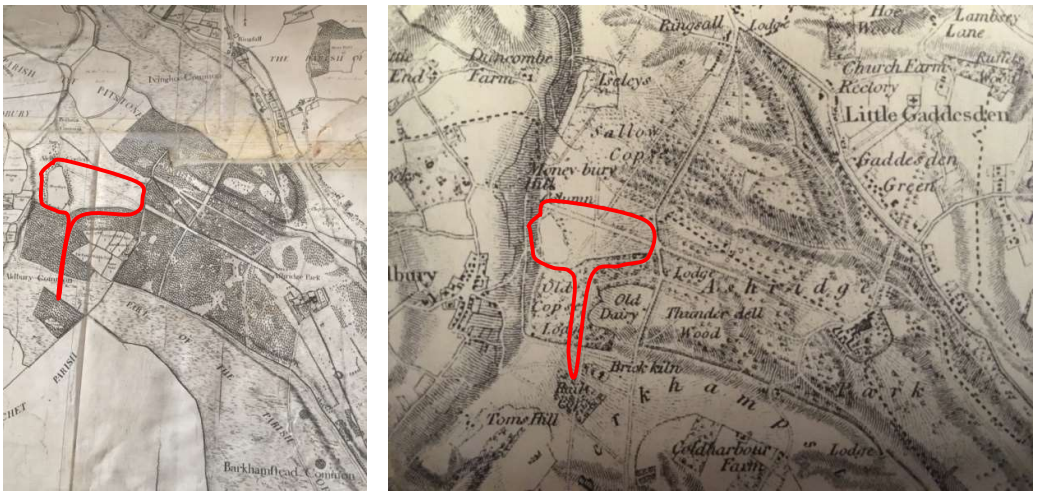

Fig 1: Ashridge Estate Plan (1828) and David and Charles ed. (1884).

Recreation and Pollution

7.9. The Monuments Drive and car parks are estimated to receive in the region of 500,000 visitors a year with a peak capacity of 350 – 450 cars during the summer holidays. During the first two weeks of August 2017 it is estimated that 10,000 visitors came to the site.

7.10. The Dacorum Core Strategy HRA (Halcrow 2011) states that the main risk to the Chilterns Beechwoods SAC is associated with air pollution and recreational disturbance. Although it noted that between 2003 – 2010 both nitrogen and sulphur deposition decreased, current air pollution data indicates that the Ashridge search area (SP9706813061) (Appendix 5) exceeded both nitrogen deposition and nitrogen oxide levels for broadleaved, mixed and yew woodland. The APIS website provides useful data on air pollution and effects on habitats and species. With respect to recreational disturbance due to the potential in-combination effects of housing development with neighbouring authorities, recommendations were made for the creation of suitable alternative natural greenspace (SANGs).

Table 1. Summary of data search results within 1 & 2km of the site. WCA Sch5: Wildlife and Countryside Act Schedule 5 species. EPS: European Protected Species. WCA Sch5(9): Wildlife and Countryside Act Schedule 5 section 9 species. PBA – Protection of badger Act 1992.

Site/Species	Highest designation	Year of latest Record	Approx distance from the site	Details
Viviparous lizard *Lacerta vivipara*	WCA Sch5	2014	650m	Prince's Riding, Ashridge (BMERC)
Slow worm *Anguis fragilis*	WCA Sch5(9)	2015	250m	Ashridge Forest (HERC)
Grass snake *Natrix natrix*	WCA Sch5(9)	2015	450m	Prince's Riding (HERC)
Great crested newts *Triturus cristatus*	EPS, WCA Sch5	2015	450m	Northchurch Common (eggs seen) (HERC)
Natterer's bat *Myotis nattereri*	EPS, WCA Sch5	2007	Vague location	In flight (HERC)
Whiskered bat *Myotis mytacinus*	EPS, WCA Sch5	2003	Vague location	In hibernation (HERC)
Daubenton's bat *Myotis daubentonii*	EPS, WCA Sch5	2008	985m	Duncombe farm House (cellar) (BMERC)
Noctule bat *Nyctalus noctule*	EPS, WCA Sch5	2015	Vague location	3 heard on bat detector (HERC)
Common pipistrelle *Pipistrellus pipistrellus*	EPS, WCA Sch5	2015	Vague location	10+ bats seen estimated (HERC)
Soprano pipistrelle *P. pygmaeus*	EPS, WCA Sch5	2015	Vague location	10+ bats seen estimated (HERC)
Serotine bat *Eptesicus serotinus*	EPS, WCA Sch5	2009	Vague location	No information (HERC)
Brown long-eared *Plecotus auritus*	EPS, WCA Sch5	2014	1.75km	Westlands Farm, Tring (roost) (HERC)
Barbastelle *Barbastella barbastellus*	EPS, WCA Sch5	1999	Vague location	1 emerged (roost) (HERC)

Table 1. Continued.

Site/Species	Highest designation	Year of latest Record	Approx distance from the site	Details
Hedgehog *Erinaceus europaeus*	Priority Species	2015	300m	Ashridge Forest (HERC)
Badger *Meles meles*	PBA	2015	300m	Ashridge Forest, dead on road (HERC)
Hazel dormouse *Muscardinus avelanarius*	EPS, WCA Sch5	1985	850m	Ashridge Park, SSSI part (HERC)

Weather

7.11. The ecological surveys were undertaken during dry conditions, with a light breeze and temperatures around 16-18°C.

Preliminary Ecological Appraisal

7.12. A habitat summary plan, ancient semi-natural woodland plan, veteran and notable tree plan and tree density plan are included (Appendix 6).

Woodland: Aldbury Common North

7.13. Former grazed common land with indications of open wood pasture and historic parkland landscape planting.

- *Compartment 66g*
  Mature beech *Fagus sylvatica* woodland with oak *Quercus robur*, ash *Fraxinus excelsior*, hawthorn *Crataegus monogyna*, birch *Betula pendula* & *B. Pubescens* with occasional holly *Ilex aquifolium*, yew *Taxus baccata* and cherry *Prunus* sp. Older veteran trees were noted including occasional pollards and a large hawthorn. The field layer is compacted nearer the car parking areas but gives way to areas of thicker scrubby understorey and pockets of bracken *Pteridium aquilnum* and bramble *Rubus sp.* with common bent *Agrostis capillaris*, tufted hair grass *Deschampsia cespitosa* and areas of bluebell *Hyacinthoides non-scripta* and wood sorrel *Oxalis acetosella*.
- *Compartments 66d, 66h, 20 and 15*
  Birch remains dominant with occasional hawthorn, holly, rowan *Sorbus aucuparia* and goat willow *Salix caprea* and is evident of scrub encroachment following the cessation of grazing from the 1920's. Areas of older oak and veteran beech give an indication of more open wood pasture common landscape. The ground flora is generally poor with bracken frequently dominant with bramble.

Woodland: Old Copse

7.14. Ancient semi-natural woodland of medieval origin although first documented in the 16th century and possibly originally more dense wood pasture that has been more recently extensively planted with sweet chestnut *Castanea sativa*. Pits and hollows may be attributed to local brick making. Areas of landscape planting including along ride edges and trackways provide an indication of the intention to extend / incorporate these areas into the parkland.

- *Compartments 14, 16 and 18*
  Sweet chestnut is dominant throughout with abundant deadwood and regeneration present. Many of the trees have large quantities of deadwood habitat (trunk rot, rot holes, peeling bark, aerial deadwood etc. present). The ground flora is generally poor although bluebell is

frequent and wood sorrel and broad buckler fern *Dryopteris dilatata* are locally abundant. A number of old pits were noted and would indicate that potential brick workings were once carried out in the area. Pockets of mature beech and oak are occasional particularly along tracks and at the edges of the compartments.

- *Compartment 13d*
  Recent beech plantation of uniform character with species poor ground flora. Small balsam *Impatiens parviflora*, an alien invasive species was noted.
- *Compartment 17 and 19*
  Compartment 19 is a recent larch plantation in need of thinning. Compartment 17 appears to be an old oak plantation with bramble and birch dominant. A small area of damper soft rush *Juncus effusus* and tufted hair grass understorey is noted in the south east corner.
- *Thunderdell Cottage Track through Old Copse*
  A linear landscape / avenue planting of Portuguese laurel *Prunus* lusitanica with associated planting including whitebeam *Sorbus* sp.

Woodland: Aldbury Common South

7.15. Former grazed common land with indications of open wood pasture and historic parkland landscape planting.

- *Compartment 67d*
  Mature beech woodland with oak, ash, hawthorn, birch with occasional holly, yew and cherry. Older veteran oak and beech trees were noted including occasional pollards and large hawthorns. The field layer is a scrubby understorey with pockets of bracken and bramble and common bent, tufted hair grass and areas of bluebell with wood sorrel.

Meadows and Pasture: Meadley's Meadow

7.16. One large field that appears to have been historically divided in two. The only remaining evidence of any division is a slightly richer colour appearance to the grassland and a single veteran hawthorn in the centre.

- *Meadley's Meadow North*
  Species poor grassland with rye grass *Lolium perenne*, smooth meadow grass *Poa pratensis*, cock's-foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus*, dandelion *Taraxacum* agg., greater plantain *Plantago major*. Some grassland waxcap fungi were present including blackening waxcap *Hygrocybe conica* and white spindles *Clavaria fragilis*. Compaction was evident.
- *Meadley's Meadow South*
  Species rich neutral grassland with smooth meadow grass, creeping bent *A. stolonifera*, Yorkshire fog, cock's-foot, red fescue *Festuca rubra*

and sweet vernal grass *Anthoxanthum odoratum*. Floristic diversity includes abundant selfheal *Prunella vulgaris*, common knapweed *Centaurea nigra*, bird's-foot trefoil *Lotus corniculatus*, meadow vetchling *Lathyrus pratensis*, sorrel *Rumex acetosa*, creeping cinquefoil *Potentilla reptans*, yarrow *Achillea millefolium*, common mouse-ear *Cerastium fontanum* red and white clover *Trifolium pratense and T. repens*. Waxcap grassland species including blackening waxcap, crimson waxcap *Hygrocybe punicea*, snowy waxcap *Cuphophyllus virgineus* and white spindles appeared more abundant in the southern section of the field.

Meadows and Pasture: The Old Dairy

7.17. Only a small section of this field was assessed adjacent to the woodbank. Species present included Timothy *Phleum pratense*, rye grass, Yorkshire fog, creeping thistle *Cirsium arvense*, white and red clover, nettle *Urtica dioica*, dock *Rumex obtusifolius* and common chickweed *Stellaria media*. The field was not visited during the autumn waxcap period.

Meadows and Pasture: Bridgewater Drive

7.18. Improved grassland compacted by heavy visitor pressure and car parking of low species diversity and dominated by rye grass.

Ponds

7.19. A total of ten ponds were noted during the site visit of which five are recorded within the redline survey area.

- A Dry pit under woodland canopy
- B Dry pit under woodland canopy
- C Dry pond under woodland canopy
- D Large pond under woodland canopy – drying out with leaf litter
- E Series of wetland ponds, possibly old brick pits
- F Woodland pond – drying out, with common water starwort *Callitriche stagnalis* and lesser spearwort *Ranunculus flammula*. Bog stitchwort *Stellaria alsine* previously reported
- G Field pond, dry dominated by nettles
- H Field pond, dry. Common cudweed *Filago vulgaris* and water pepper *Persicaria hydropiper*.
- X Woodland pond. Floating sweet grass *Glyceria fluitans*, Bog bean *Menyanthes trifoliata*, duckweed, gypsywort *Lycopus europaeus* and Water figwort *Scrophularia auriculata*.
- Y Woodland pond, dry.

Veteran and Notable Trees

7.20. The extent of veteran trees at Ashridge Estate is estimated to be in the region of 1000 trees including many notable beech and oak pollards with lime, sweet chestnut and other landscape species. They provide a valuable record of previous land management practices reflecting the cultural history of the area. A large number of these trees including many older standards that are not necessarily regarded as veteran are known to occur within the red line boundary.

7.21. Due to damage caused by deer and grey squirrel a high number of younger trees also retain features, from wood pecker and rot holes, cavities and splits, through to peeling bark and standing water that are likely to support a rich assemblage of species from saproxylic invertebrates through to bats.

7.22. Based on the initial field work samples of trees the following guide to canopy drip lines is provided as an indication only;

Species	Sample Size	Ave Radius	Max Radius
Oak	20	11	17
Beech	11	12	17
Sweet chestnut	1	10	10

Saproxylic Invertebrates

7.23. Ashridge Estate, with its extensive woodland complex and large number of notable / veteran trees, is known to support an important saproxylic invertebrate community, which, based on data up to 1996 sat within the top 100 sites in the UK. Additional surveys up to 2017 are likely to have further extended the known interest of the site.

```
Dataset ID: BF5CB84B-98F1-445D-82D5-9939B1A677C7

Site Name: Ashridge Estate (National Trust)
Vice-County: Hertfordshire
Region: England: South
Survey Period: 1992 - 1999
OS Grid Reference: SP91
SQI Value: 393.5
IEC Value: 37
SQI Type: Broadleaf
Data Source(s): Jones 1997, 1999
```

Stag Beetle

7.24. Ashridge Estate forms part of the Chilterns Beechwoods SAC with the stag beetle *Lucanus cervus* listed as an Annex II species qualifying feature, but is not a primary reason for site selection. The extent and distribution of stag beetle at Ashridge is not fully known.

Bats

7.25. Bat surveys have been carried out at the Ashridge Estate over the past twenty years and has included the following surveys carried out in 2017:

- Herts and Middlesex Bat Group Woodland Survey (trap & acoustic lure)
- Bernwood Chilterns Woodland Survey (trap & acoustic lure)
- National Trust Building Survey (Bernwood) Woodyard Cottage

7.26. A summary of the results is provided (Table 2) as they give an important indication of the bats species that are present and will be utilising the habitats present at Ashridge for roosting, movement corridors and foraging.

Table 2: Bats Species present at Ashridge.

Species	Historic	2002	2017	Notes
Daubenton's	✓	✓	✓	Tree roost Rail Copse 2002
Whiskered	✓			
Natterers	✓	✓	✓	
Leisler's	✓		✓	
Noctule	✓	✓	✓	
Common pipistrelle	✓	✓	✓	
Soprano pipistrelle	✓	✓	✓	
Nathusius pipistrelle	✓	✓		
Serotine	✓	✓		
Western barbastelle	(1908)		✓	(Fithsden beeches) Old Copse/Aldbury Common, Hardings Rookery
Brown long-eared	✓	✓	✓	

7.27. Of notable interest is confirmation in 2017 of the presence of Barbastelle bat at Ashridge, an Annex II species under the Habitats Regulations, last recorded in 1908 at Frithsden Beeches. A total of four barbastelle were caught in 2017 including both parous female and juvenile bats indicating that a maternity colony is present in the local area.

Habitats Regulations Assessment

7.28. The Conservation of Habitats and Species Regulations 2010 (as amended) ("Habitats Regulations") require a Habitats Regulations Assessment (HRA) to

be undertaken for any plan or project that may have a "likely significant effect" on a European site. The exception is where the plan or project is directly connected with or necessary to the management of the site for the purpose of conserving its features.

7.29. European sites (also referred to as *Natura 2000* sites) comprise Special Areas of Conservation (SAC)[1] and Special Protection Areas (SPA)[2] including possible and candidate sites that have yet to be formally designated. It is also Government policy that plans and projects that may affect Ramsar sites (wetlands of international importance) are also subject to HRA.

7.30. The HRA is undertaken by a "competent authority", which can be any public decision-making body that is responsible for granting consents or licences. In the case of planning applications, it is the local planning authority (LPA) that fulfils the role. The LPA is required to consult with Natural England as part of the process although it should be emphasised that it is the competent authority that is the ultimate decision-maker with respect to all stages of the HRA. For this application the LPA will be Decorum District Council.

7.31. The applicant is required to provide the necessary information for the competent authority to be able to undertake the HRA. The level of information required will vary according to the complexity of the project, nature of the impacts and the types of qualifying features that would be affected.

7.32. The HRA is focussed on the qualifying features (habitats and species) for which the site has been designated. Each European site has a list of qualifying features and associated Conservation Objectives and these will be the starting point of any assessment. The details are available from Natural England's Access to Evidence web pages[3]

7.33. There are four key stages in the HRA process, including the initial screening (Fig 2);

Stage 1: Screening for likely significant effects

7.34. The purpose of the screening stage is for the competent authority to decide whether an appropriate assessment is required. This depends on whether the activity in question:

- is a "plan or project"

[1] Designated under European Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna ("the Habitats Directive" 2009/147/EC)
[2] Classified under European Council Directive 2009/147/EC on The Conservation of Wild Birds ("the Wild Birds Directive)
[3] http://publications.naturalengland.org.uk/category/6490068894089216

- is not directly connected with or necessary to the management of the site, and,
- may have a "likely significant effect" on a European site, either alone or in combination with other plans or projects.

7.35. There are no formal, legislative requirements for a screening stage but it is always undertaken to ensure that i) an appropriate assessment is necessary and ii) it focuses only on those features that are likely to be subject to a significant effect. For larger sites and/or those with multiple features it is often the case that some features can be screened out of the need for assessment.

7.36. Screening should be a relatively quick process based on consideration of whether there are any obvious pathways for the development to impact the features either directly or indirectly. If there is any uncertainty as to whether or not there could be a likely significant effect then an appropriate assessment should be undertaken (applying the precautionary principle).

Stage 2: Appropriate assessment

7.37. A plan or project must be subject to an appropriate assessment if likely significant effects on a European site cannot be ruled out at the screening stage. The purpose of the appropriate assessment is to allow the competent authority to decide whether the plan or project may have an adverse effect on the integrity of the site, alone or in combination with other plans or projects (the "AEoI decision"). The decision will be based on whether or not the plan or project undermines the site's conservation objectives. Depending on the nature and complexity of the plan or project there may be a need to collect new data as part of the assessment process. It is possible to include mitigation measures to avoid a conclusion of AEoI but there needs to be certainty that they can be delivered and will be effective. If the conclusion is that there will be AEoI the plan or project cannot be authorised unless it passes the derogation tests (stages 3 and 4).

Stage 3: Assessment of Alternative Solutions

7.38. Examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid or have a lesser effect on European sites. If there are alternatives then the original proposal cannot be authorised. If there are no alternatives then

Stage 4: Imperative Reasons of Overriding Public Interest

7.39. This is the assessment where no alternative solution exists and where adverse impacts remain. The process to assess whether the development is necessary for Imperative Reasons of Overriding Public Interest (IROPI) and, if

so, the potential compensatory measures needed to maintain the overall coherence of the site or integrity of the European site network.

7.40. A planning application for this scheme will require screening for likely significant effect on the Chiltern Beechwoods SAC. A discussion with the Local Planning Authority is recommended to determine what information is required (including in-combination plans and projects to consider) and whether any embedded design mitigation can be included to avoid a conclusion of likely significant effect (LSE). If LSE cannot be ruled out then the scope of the stage two assessment, including the need for any surveys, will have to be agreed with the Local Planning Authority and Natural England. Advice from Natural England may have to be obtained through their Discretionary Advice Service[4]

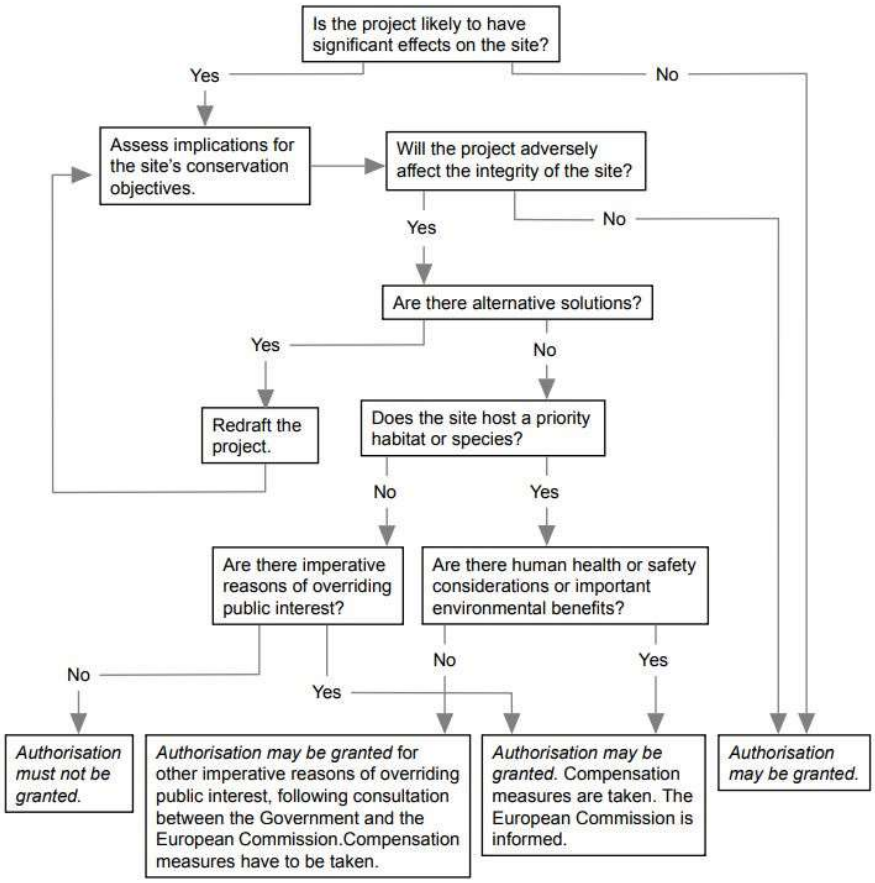

Fig 2: Simplified flow chart for projects affecting European sites (taken from Infrastructure Planning Commission advice note 10)

8. Conclusions

[4] http://publications.naturalengland.org.uk/publication/5854708291862528

8.1. The area of Ashridge Estate subject to this survey is comprised of;

- mixed beech and oak woodland on former open common land
- birch oak woodland on former common land
- ancient semi-natural woodland dominated by sweet chestnut with areas of parkland planting
- veteran and / or notable trees including beech, oak, lime, hawthorn, field maple together with non native landscape planting
- plantation on Ancient semi-natural woodland
- woodland rides
- permanent and temporary standing water (ponds)
- improved and semi improved grassland
- road, car parks and hard standing.

8.2. Based on the National Trust (1996) survey information the redline boundary includes approximately 37 ha made up of 29.3 ha of broadleaved woodland, 0.17 ha of scrub, 6.79 ha of grassland and 1.3 ha of roads, tracks and car parking. The habitat areas have been further broken down into woodland categories etc. by Bernwood within the redline boundary (Table 3).

8.3. The woodland types found at Ashridge and particularly within and around the survey area are heavily influenced by complex soils and geology and historical land management practices (or the absence of them) including the cessation of grazing on former open common land. Historical sylvicultural management practices including wood pasture and the planting of beech and sweet chestnut whether for forestry or landscape design heavily influence the vegetation types which may be broadly divided into National Vegetation Classification (NVC) W10 oak - birch woodland or W14 beech - bramble where beech and oak appear as veteran (pollards) or as historical planted. Sweet chestnut is dominant where extensively planted on ancient woodland sites that may have originated from areas of grazed beech – oak wood pasture.

8.4. Within the survey area the woodland cover is more characteristic of W10 birch – oak woodland with W14 beech - bramble only locally dominant where planted or as veteran trees and possibly only marginally falling within the 9130 *Asperulo – Fagetum* beech forest for which it is designated as an SAC. The Old Copse is dominated by mature stands of sweet chestnut masking the historical woodland cover (Table 4).

8.5. The area of beech woodland within the survey area that potentially falls within the *Asperulo – Fagetum* beech forest community is at best 8 ha, which may be extended by the additional influence of localised of veteran beech.

8.6. With the exception of southern section of Meadley's Meadow the grasslands are generally species poor. Meadley's Meadow South forms part of a smaller enclosure within the Boundary of Aldbury Common this area has greatest grassland species diversity of the survey area and is characteristic of MG5 neutral grassland. This is neither an SSSI or SAC feature.

8.7. The habitats within and around the survey area are subject to external pressures arising from high visitor pressure, whether through the direct impacts of compaction from vehicles and walkers through to indirect consequences of disturbance, eutrophication (dog excrement) and pollution.

8.8. Less tangible indirect impacts from the current pressure from high visitor numbers, without more carefully planned visitor management include;

- Health and safety include increased tree management
- Vandalism and anti-social behaviour
- Litter and fly-tipping
- Pollution
- Spread of alien species
- Disease threat through transporting pathogens and disease
- Negative influence on proactive habitat management practices including forestry, pest control and the reintroduction of grazing

8.9. It remains unlikely that these issues will be resolved without strong long term planning to manage visitor numbers across the property as a whole including the interests of ecology, archaeology and landscape, the very reason why visitors come to the site.

Table 3. Habitats by area (approx).

Habitat	Area
Hard standing	2.10 ha
Woodland (sweet chestnut)	1.37 ha
Woodland (larch plantation)	0.27 ha
Woodland (beech and oak)	8.00 ha
Woodland (oak and birch)	17.50 ha
Semi-natural improved grassland	3.75 ha
Improved grassland	4.60 ha
Portuguese laurel	0.08 ha

Table 4: Survey Area as a % of SAC Designated Area. * % based on total designated area and not specific habitat type

Habitat / Designation	Area	UK SAC %area *
UK *Asperulo fagetum* beech forest SAC	26,508 ha	
Chilterns Beechwoods SAC	1,285 ha	10%
Ashridge SSSI	627 ha	5%
Study Area	37 ha	2.5%

9. Recommendations

9.1. The proposals for new car parking at Ashridge need to be considered against the legal and planning framework including any requirements HRA, European Protected Species and overall habitat management, together with the broader biodiversity, archaeological, landscape and environmental considerations, including best practice.

9.2. Additional information and further ecological surveys will be required to inform the design process and potential requirements for HRA including;

Ecology

- mapping habitats across the SAC/SSSI area with specific regard to qualifying SAC habitat and habitat used by stag beetles, including areas where habitat enhancement may be carried
- Saproxylic (deadwood) invertebrates with specific reference to stag beetle
- bats
- great crested newts (HSI of ponds within 500m and population assessments where required)
- reptiles
- badger

Recreation and Pollution

- car park and visitor numbers
- user trends including local and regional growth targets
- local plan policies including a review of HRA's carried out
- review effectiveness of local plan HRA's avoidance and mitigation measure in controlling impacts on Ashridge as part of the Chilterns Beechwoods SAC.

9.3. The general design principles for the car park will need to follow the mitigation hierarchy to avoidance, minimise, mitigate, enhance, and compensate together with appropriate monitoring and reporting against predicted targets for no net loss of biodiversity and biodiversity enhancement.

9.4. Avoid and retain trees, regardless of age, where
- stands of high forest and veteran beech are present
- ancient semi-natural woodland
- features likely to support bats or provide habitat for saproxylic invertebrates

9.5. Avoid and retain areas of semi-natural grassland.

9.6. Avoid and retain ponds and seasonal water bodies.

9.7. Within the framework of the property Conservation Management Plan
- Restore areas of open common land to grazed wood pasture
- halo thinning around veteran tree should be considered where these will enhance habitat for saproxylic invertebrates
- Control visitor numbers and retain areas of undisturbed old growth woodland

9.8. Explore additional options for enhanced sustainability and habitat improvement including;
- sustainable urban drainage to secure permanent and temporary ponds
- renewable energy including car battery recharging, solar energy use, etc.
- minimal use of artificial lighting
- secure by design to prevent theft, damage and antisocial behaviour including night time disturbance
- traffic calming including public and animal safety

10. References and Further Reading

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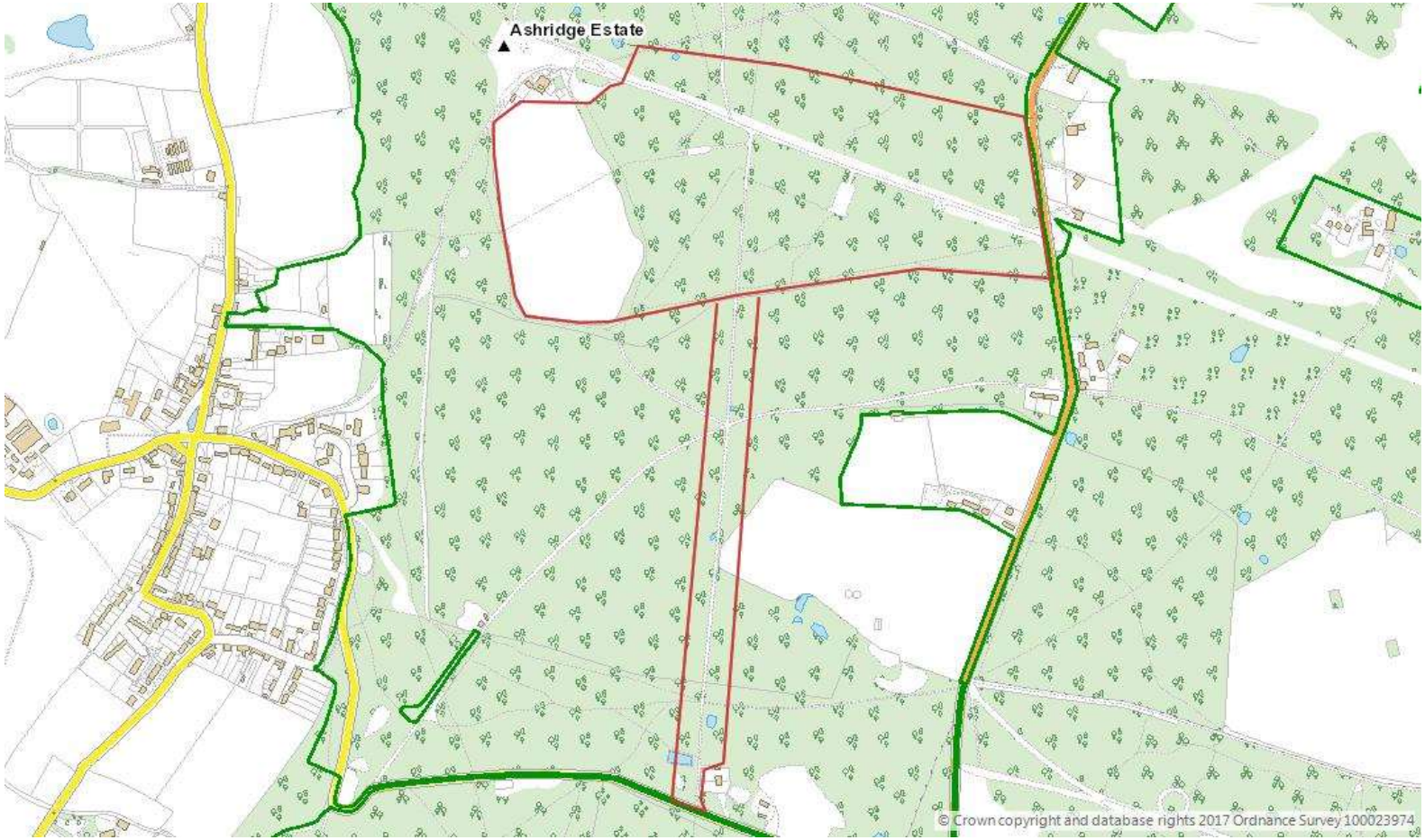
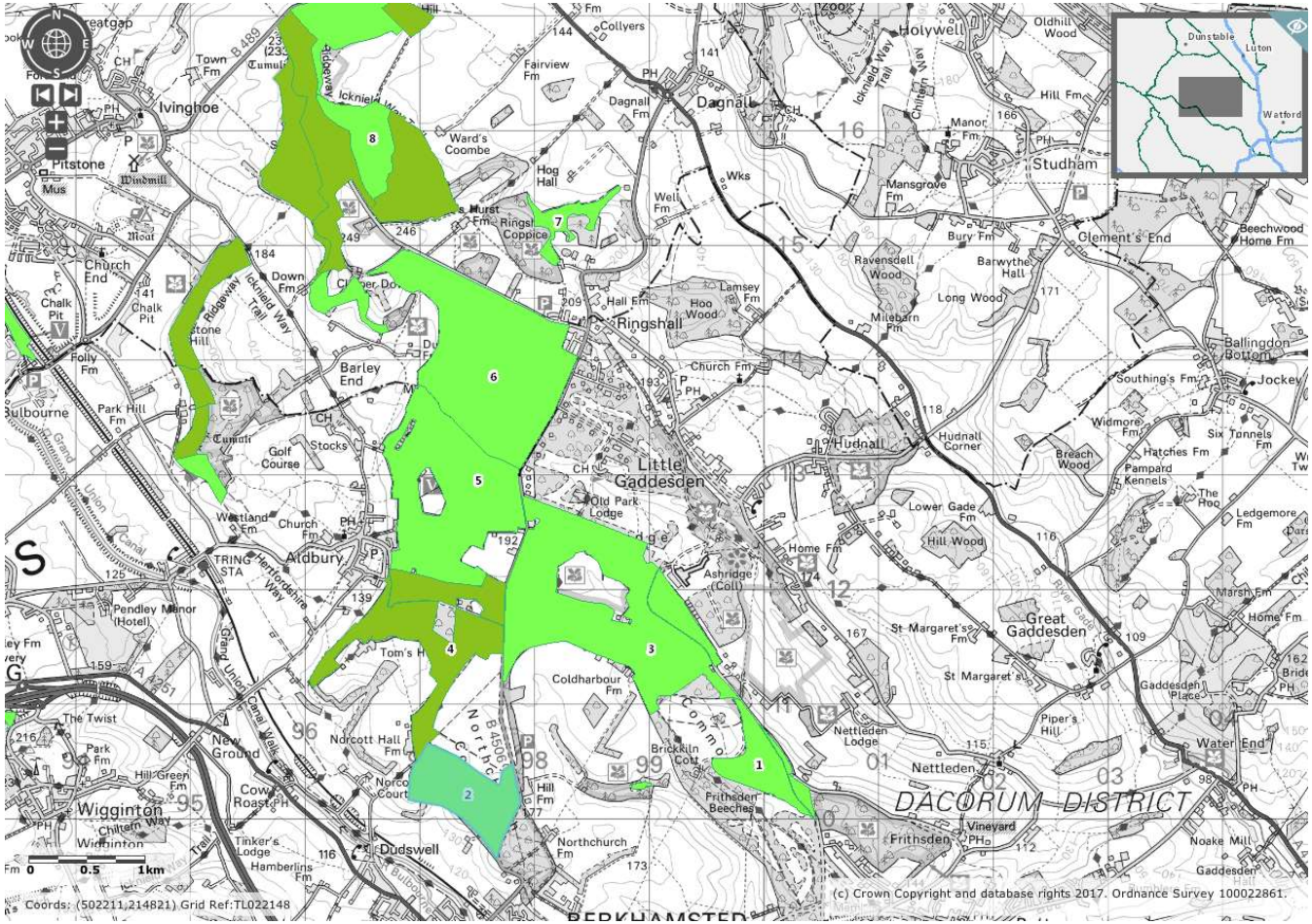
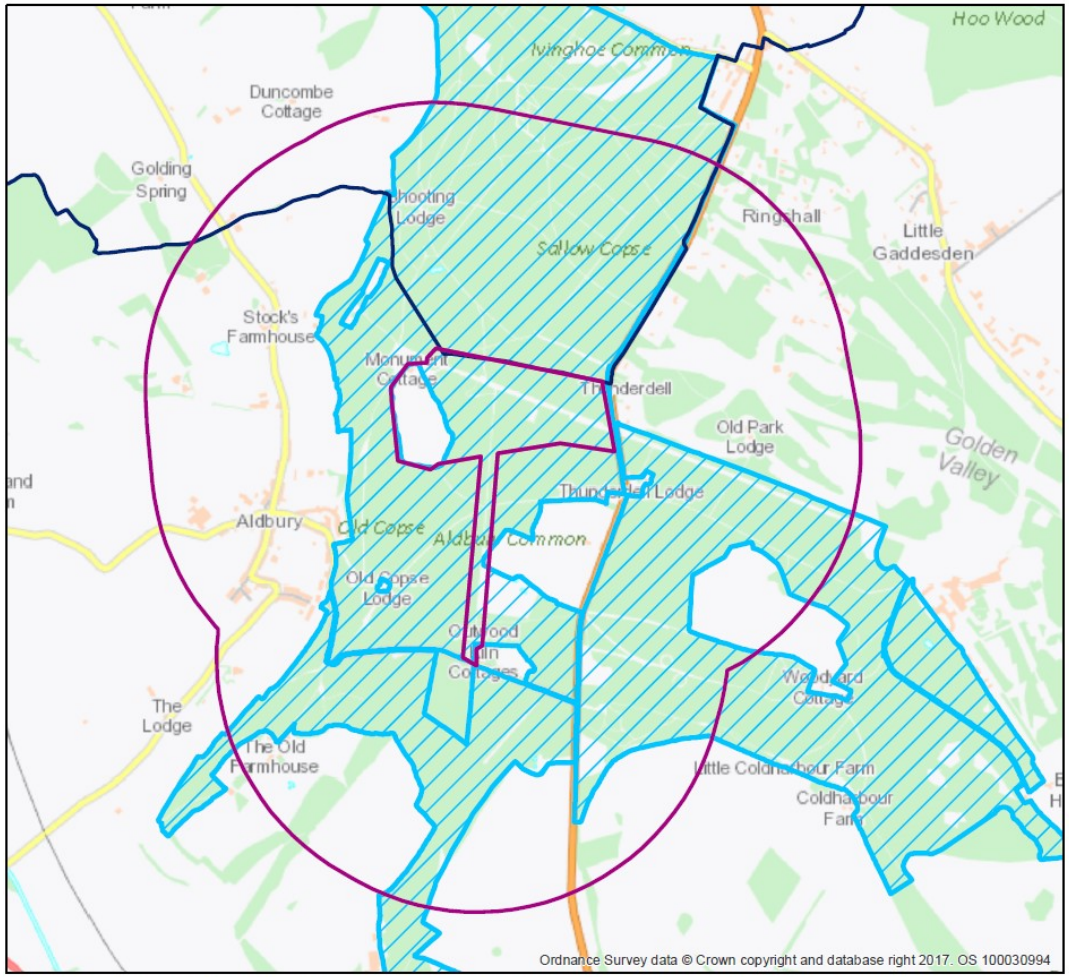
Appendix 1. Red line survey area.



Appendix 2. Data Search Results.

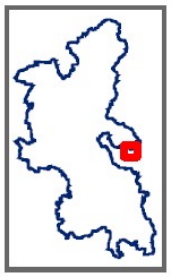




Please note that the layers held by the Environmental Records Centre are compiled from data that has been received from a variety of sources, including volunteers and professionals.

Environmental Records Centre

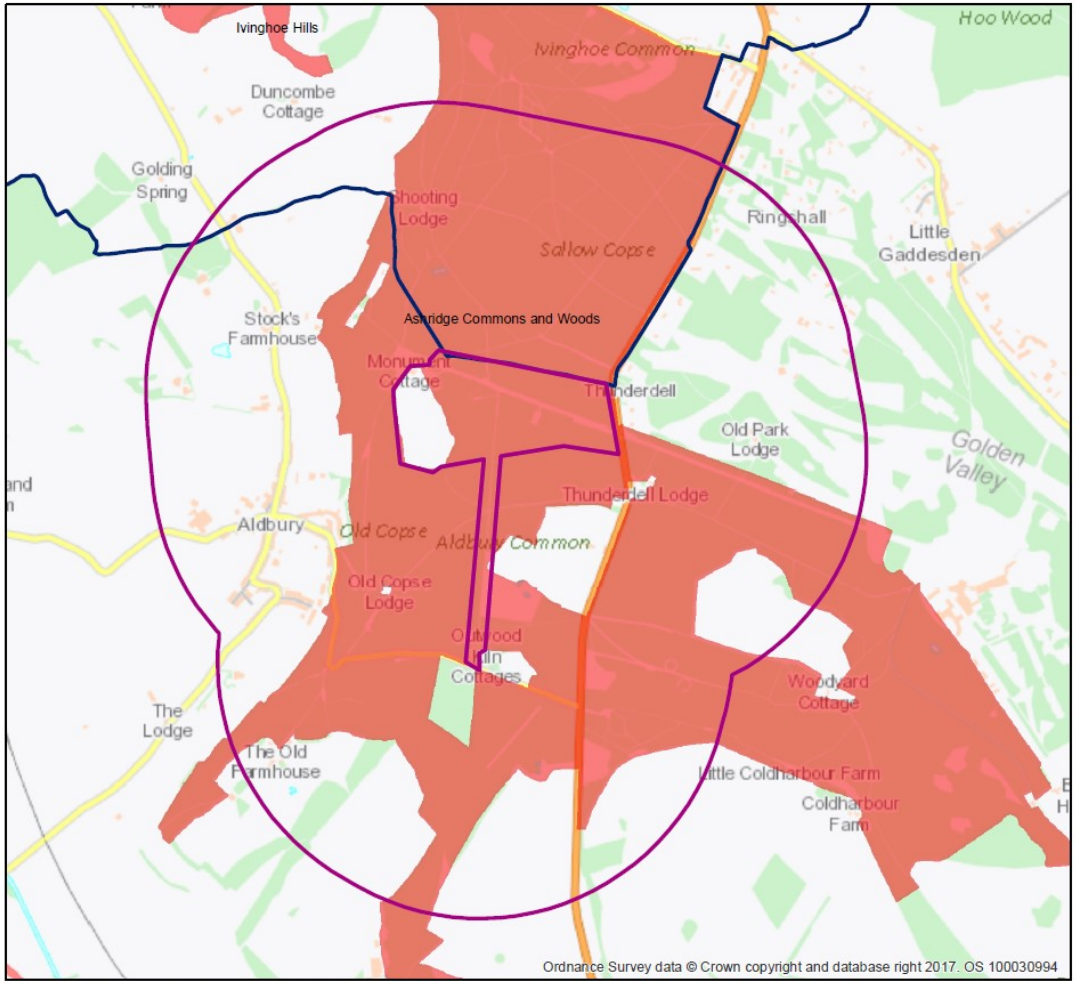
Enquiry 17-149
Special Areas of Conservation (SAC) within 1km of Ashridge Estate



Search Area
Buckinghamshire Boundary
SACs

N

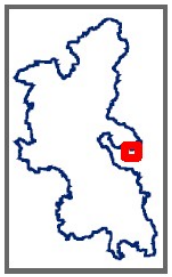
Date created 23/02/2017 1:20,000



Please note that the layers held by the Environmental Records Centre are compiled from data that has been received from a variety of sources, including volunteers and professionals.

Buckinghamshire & Milton Keynes Environmental Records Centre

Enquiry 17-149
Sites of Special Scientific Interest (SSSI) within 1km of Ashridge Estate



Search Area
Buckinghamshire Boundary
SSSI

N

Date created 23/02/2017 1:20,000

Protected species records

Taxon column:
** = species recorded as not native (e.g. introduced plants or escaped birds)*
 # (against badger Meles meles) = record of sett
Table sorted by group and taxon
Only includes records since 1990; contact BMERC if you need records from before this
Some records may have further details (e.g. information on quantity, sex and stage), contact BMERC if you need this additional detail

Data supplied by BMERC may include data from the following organisations: Botanical Society of Britain and Ireland; Bucks Amphibian and Reptile Group; Bucks Bird Club; some National Recording Schemes; plus many individual recorders

group	species	English name	European legislation	UK legislation	Species of Principal Importance	Red List (GB unless stated)	Rare / Scarce	local status	site	grid ref	precision	latest record
Amphibians and reptiles	Lacerta vivipara	Viviparous Lizard		WACA-Sch5_sect9.1,WACA-	England_NERC_S.41 & UKBAP-2007				Prince's Riding, Ashridge	SP981127	100	2014
Amphibians and reptiles	Rana temporaria	Common Frog	HabDir-A5	WACA-Sch5_sect9.5a					Ashridge Estate: Pitstone Common	SP972132	100	2013
Birds	Falco subbuteo	Hobby		WACA-Sch1_part1					Ashridge	SP979139	100	2007
Birds	Numenius phaeopus	Whimbrel		WACA-Sch1_part1		Bird-Red			Ashridge	SP979139	100	2002
Birds	Regulus ignicapilla	Firecrest		WACA-Sch1_part1					Ashridge	SP979139	100	2015
Birds	Turdus iliacus	Redwing		WACA-Sch1_part1		Bird-Red			Ashridge	SP979139	100	2015
Insects: Lepidoptera:	Apatura iris	Purple Emperor		WACA-Sch5_sect9.5a		RedList_GB_post2001-NT		High Priority butterflies	Ashridge	SP971135	100	2007
Insects: Lepidoptera:	Apatura iris	Purple Emperor		WACA-Sch5_sect9.5a		RedList_GB_post2001-NT		High Priority butterflies	Ashridge Park	SP972131	100	2008
Mammals	Pipistrellus pipistrellus	Common Pipistrelle	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-					Church Farm, Aldbury, HERTS	SP96161244	10	2012
Mammals	Pipistrellus pygmaeus	Soprano Pipistrelle	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-	England_NERC_S.41 & UKBAP-2007				Church Farm, Aldbury, HERTS	SP96161244	10	2012
Mammals	Plecotus auritus	Brown Long-eared Bat	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-	England_NERC_S.41 & UKBAP-2007				Church Farm, Aldbury, HERTS	SP96161244	10	2012
Plants	Hyacinthoides non-scripta	Bluebell		WACA-Sch8					Pitstone Common (SP91R)	SP91R	2000	1995
Plants: mosses and liverworts	Leucobryum glaucum	Large White-moss	HabDir-A5						Ashridge NT, Sallow Copse	SP9713	1000	2006

Data provided by BMERC (01296 382431) on: 19 July 2017 species table: page 1 of 1

Protected and notable bat records

Taxon column:
** = species recorded as not native (e.g. introduced plants or escaped birds)*
 # (against badger Meles meles) = record of sett
Table sorted by group and taxon
Only includes records since 1990; contact BMERC if you need records from before this
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Data supplied by BMERC may include data from the following organisations: Botanical Society of Britain and Ireland; Bucks Amphibian and Reptile Group; Bucks Bird Club; some National Recording Schemes; plus many individual recorders

group	species	English name	European legislation	UK legislation	Species of Principal Importance	Red List (GB unless stated)	Rare / Scarce	local status	site	grid ref	precision	latest record
Mammals	Myotis daubentonii	Daubenton's Bat	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-					Duncombe Farm House (cellar)	SP962140	100	2008
Mammals	Myotis nattereri	Natterer's Bat	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-					Duncombe Farm House (cellar)	SP962140	100	2006
Mammals	Myotis sp.	Myotis bat sp.	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-					Westlands Farm, Tring	SP9537312540	1	2014
Mammals	Pipistrellus pipistrellus	Common Pipistrelle	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-					Church Farm, Aldbury, HERTS	SP96161244	10	2012
Mammals	Pipistrellus pipistrellus	Common Pipistrelle	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-					Westlands Farm, Tring	SP9537312540	1	2014
Mammals	Pipistrellus pygmaeus	Soprano Pipistrelle	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-	England_NERC_S.41 & UKBAP-2007				Church Farm, Aldbury, HERTS	SP96161244	10	2012
Mammals	Pipistrellus pygmaeus	Soprano Pipistrelle	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-	England_NERC_S.41 & UKBAP-2007				Westlands Farm, Tring	SP9537312540	1	2014
Mammals	Plecotus auritus	Brown Long-eared Bat	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-	England_NERC_S.41 & UKBAP-2007				Church Farm, Aldbury, HERTS	SP96161244	10	2012
Mammals	Plecotus auritus	Brown Long-eared Bat	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-	England_NERC_S.41 & UKBAP-2007				Hall Farm, Ringshall	SP985144	100	2011
Mammals	Plecotus auritus	Brown Long-eared Bat	EPS-HabReg-Sch2 & HabDir-A4	WACA-Sch5_sect9.4b,WACA-	England_NERC_S.41 & UKBAP-2007				Westlands Farm, Tring	SP9537312540	1	2014

Data provided by BMERC (01296 382431) on: 19 July 2017 species table: page 1 of 1

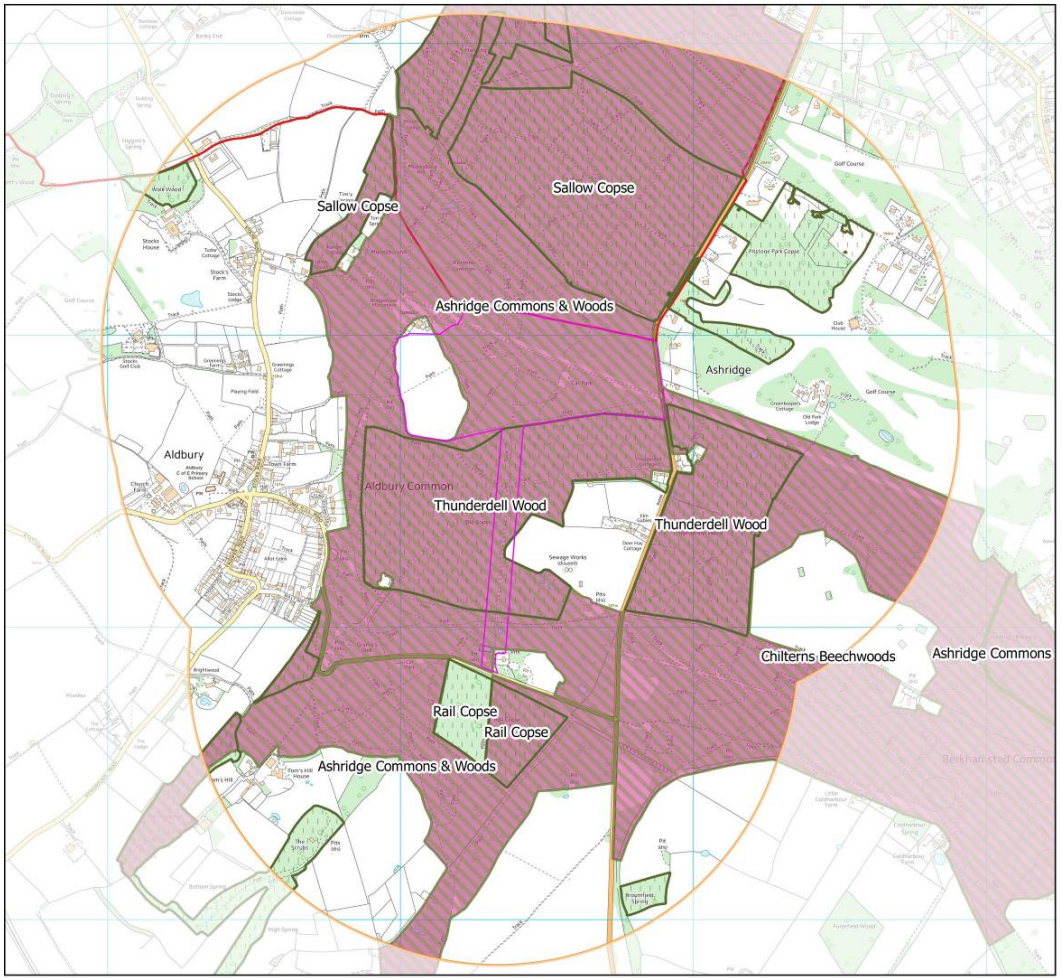
Local Sites Map 1

Search Information
- Search area
- Search boundary

Local Sites
- Local Wildlife Sites

Administrative Area
- Herts County Boundary

HERC
Herts Environmental Records Centre
05/07/2017



National Sites Map 1

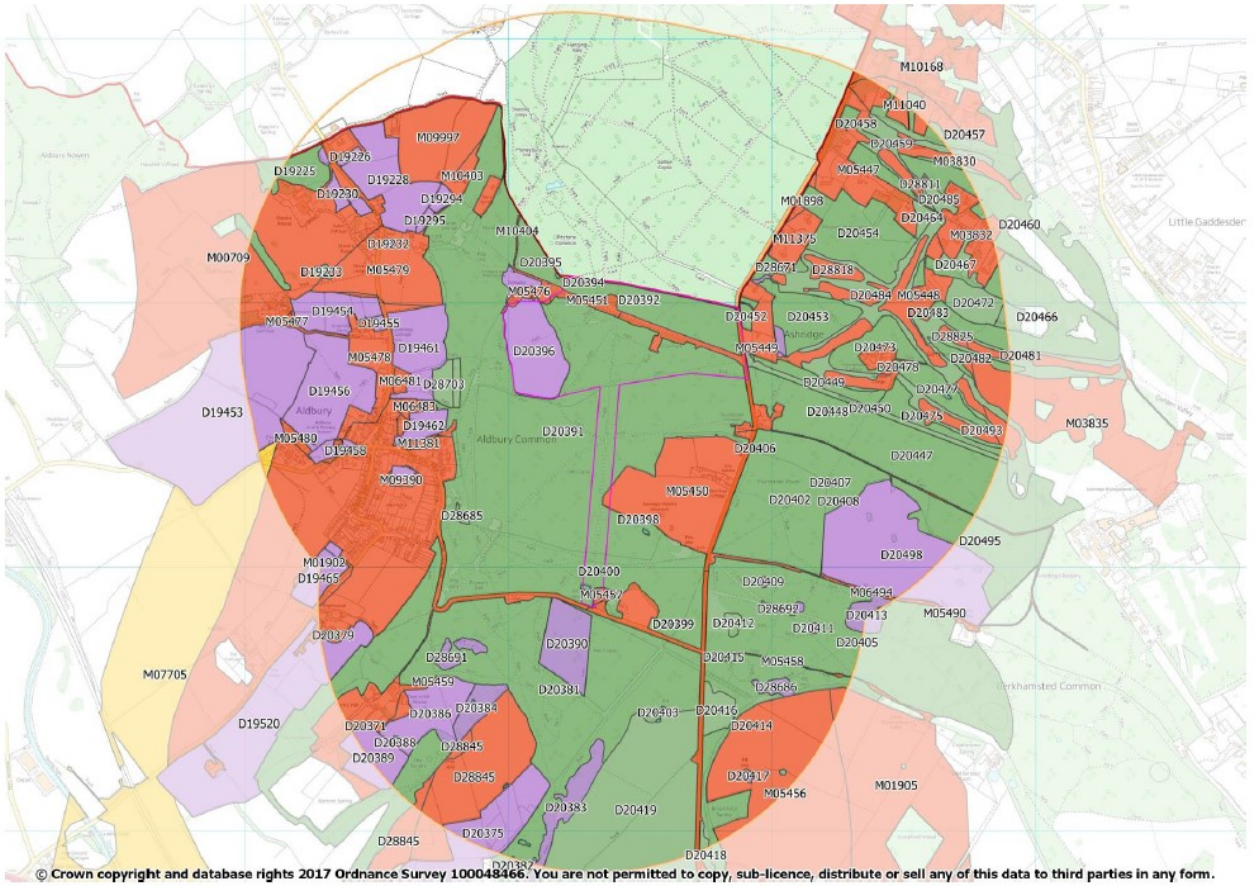
Search Information
- Search area
- Search boundary

National Sites
- Ancient Woodland Inventory

Statutory Sites
- SSSI
- SAC

Administrative Area
- Herts County Boundary

HERC
Herts Environmental Records Centre
05/07/2017



HERC Herts Environmental Records Centre

Map 1

05/07/2017

Appendix 3: Chiltern Beechwoods SAC

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Chilterns Beechwoods
Unitary Authority/County:	Buckinghamshire, Hertfordshire, Oxfordshire, Windsor and Maidenhead
SAC status:	Designated on 1 April 2005
Grid reference:	SP975134
SAC EU code:	UK0012724
Area (ha):	1276.48
Component SSSI:	Ashridge Commons and Woods SSSI, Aston Rowant Woods SSSI, Bisham Woods SSSI, Bradenham Woods, Park Wood and The Coppice SSSI, Ellesborough and Kimble Warrens SSSI, Hollowhill and Pullingshill Woods SSSI, Naphill Common SSSI, Tring Woodlands SSSI, Windsor Hill SSSI

Site description:
The Chilterns Beechwoods represent a very extensive tract of ancient semi-natural beech *Fagus sylvatica* forests in the centre of the habitat's UK range. The woodland is an important part of a mosaic with species-rich chalk grassland and scrub. A distinctive feature in the woodland flora is the occurrence of the rare coralroot *Cardamine bulbifera*. Standing and fallen dead timber provide habitat for dead-wood (saproxylic) invertebrates, including stag beetle *Lucanus cervus*.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- *Asperulo-Fagetum* beech forests. (Beech forests on neutral to rich soils)
- Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*). (Dry grasslands and scrublands on chalk or limestone)

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Stag beetle *Lucanus cervus*

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0012724
Date of registration: 14 June 2005
Signed:
On behalf of the Secretary of State for Environment, Food and Rural Affairs

European Site Conservation Objectives for Chilterns Beechwoods Special Area of Conservation Site Code: UK0012724

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- **The extent and distribution of qualifying natural habitats and habitats of qualifying species**
- **The structure and function (including typical species) of qualifying natural habitats**
- **The structure and function of the habitats of qualifying species**
- **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely**
- **The populations of qualifying species, and,**
- **The distribution of qualifying species within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone

H9130. *Asperulo-Fagetum* beech forests; Beech forests on neutral to rich soils

S1083. *Lucanus cervus*; Stag beetle

www.naturalengland.org.uk

Appendix 4: Ashridge SSSI citation

COUNTY: HERTFORDSHIRE/BUCKINGHAMSHIRE **SITE NAME:** ASHRIDGE COMMONS AND WOODS

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authorities: Dacorum Borough Council, Aylesbury Vale District Council
Hertfordshire County Council, Buckinghamshire County Council

National Grid Reference: SP975135, SP980120

Ordnance Survey Sheet 1:50,000: 165/166 **1:10,000:** SP90 NE, SP91 SE/NE, TL01 SW

Date Notified (Under 1949 Act): 1952 **Date of Last Revision:** 1972

Date Notified (Under 1981 Act): 1987 **Date of Last Revision:**

Area: 640.1 ha 1581.7 ac

Other information: This site is National Trust property within the Chilterns Area of Outstanding Natural Beauty

Description and Reasons for Notification

Ashridge Commons and Woods is an extensive area of mainly semi-natural vegetation on the Hertfordshire/Buckinghamshire border. Situated towards the northern end of the Chiltern escarpment on wet, acidic Clay-with-Flints plateau soils and more base rich flinty chalks of the scarp slopes, the site comprises a mosaic of different habitats: a mixture of ancient semi-natural and secondary woodland, plantation, scrub, a more open
component dominated by bracken, and grassland. The site supports an exceptionally rich breeding bird community including both county and national rarities.

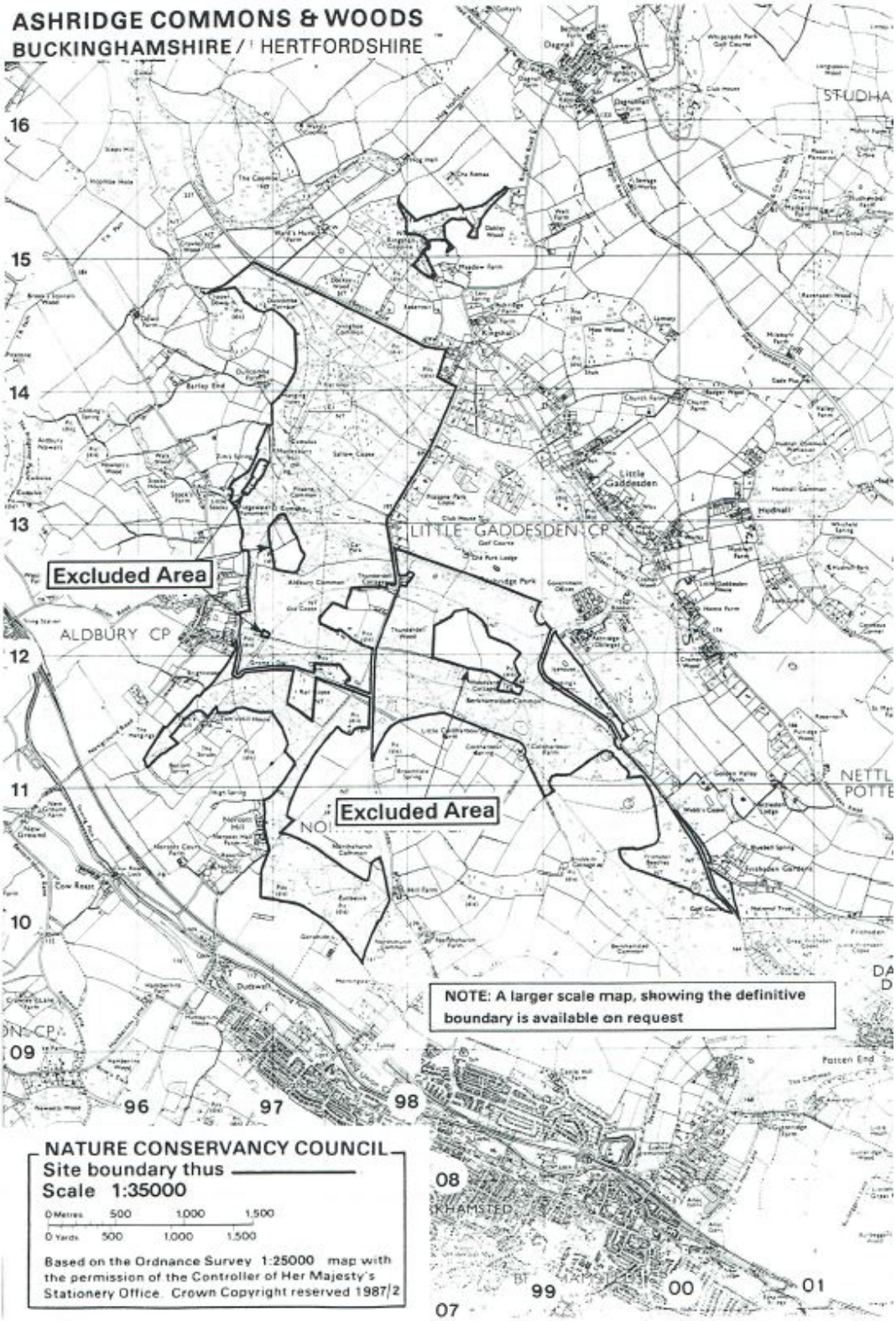
A wide range of woodland bird species is known to breed, with raptors, woodpeckers, chats, warblers, tits and finches all well represented. Of particular importance within the community are species found rarely elsewhere in Hertfordshire, such as redstart, nightingale and wood warbler. The nationally rare firecrest is found here at one of its two known county localities. Other more widespread species are breeding in good numbers at this site, examples being sparrowhawk, tree pipit, lesser spotted woodpecker and hawfinch. The last species has a particularly strong population in the Ashridge woodlands.

The site is able to support the rich breeding bird community because of varied woodland stand types, an extensive range of trees giving structural variety and the diversity of shrub and plant communities. The ancient semi-natural stands on the scarp slopes are usually of beech and in places there is vigorous regeneration. Ancient large pollards are important nesting sites for redstart. The secondary woodland has developed over common land and is mainly self-sown birch interspersed with pedunculate oak and beech. Elsewhere, broadleaved woodland diversity is enhanced by storied hornbeam-sweet chestnut coppice and an area of ash-maple-hazel coppice with a varied shrub understorey. The tall ash poles are frequently the site for singing wood warbler. Mixed conifer-broadleaved plantations add structural diversity and provide necessary sites for goldcrest, firecrest and coal tit.

On the acidic plateau soils the woodland ground flora is generally sparse. Where a more basic influence is found the plant community is correspondingly richer with wood melick *Melica uniflora*, woodruff *Galium odoratum* and sanicle *Sanicula europaea* all abundant. Less frequent are fly orchid *Ophrys insectifera*, violet helleborine *Epipactis purpurata* and yellow bird's-nest *Monotropa hypopitys*, all of which are locally uncommon, while nationally rare are narrow-lipped helleborine *Epipactis leptochila*, green flowered helleborine *E. phyllanthes* and stinking helleborine *Helleborus foetidus*.

Other habitats which are important for the bird community, especially for warblers, tree pipit and nightingale, include scrub, adjacent open areas dominated by bracken and with scattered trees, and small areas of unimproved calcareous and acidic grassland. The calcareous grassland is characterised by locally uncommon yellow-wort *Blackstonia perfoliata* and autumn gentian *Gentianella amarella*, whilst of county important in the acidic grassland is the presence of heath-grass *Danthonia decumbens* and trailing St John's wort *Hypericum humifusum*.

Additional interest is provided by small ponds scattered throughout the site which support amphibians and various invertebrates.


ASHRIDGE COMMONS & WOODS
BUCKINGHAMSHIRE / HERTFORDSHIRE
Excluded Area
Excluded Area
LITTLE GADDESDEN CP
ALDBURY CP
NOTE: A larger scale map, showing the definitive boundary is available on request
NATURE CONSERVANCY COUNCIL
Site boundary thus
Scale 1:35000
0 Metres 500 1,000 1,500
0 Yards 500 1,000 1,500
Based on the Ordnance Survey 1:25000 map with the permission of the Controller of Her Majesty's Stationery Office. Crown Copyright reserved 1987/2

Appendix 5: AIPS Data Sheet

Query by Location - Results

Habitat: Broadleaved, Mixed and Yew Woodland

Grid Reference: SP9706813061

Grid Easting: 497500 to the 5km mid point (metres)

Grid Northing: 267500 to the 5km mid point (metres)

Grid Easting: 497500 to the 1km mid point (metres)

Grid Easting: 268500 to the 1km mid point (metres)

Pollutant: Ammonia

Critical Level: 1.0 - 3 µg m-3

Concentration: 1.86 µg m-3

Data Year: 2013 - 2015

Exceedance: [1.0] to [-1.14] µg m-3

Pollutant: N Deposition

Critical Load Range:
Broadleaved deciduous woodland: 10 - 20 Kg N/ha/year
Fagus woodland: 10 - 20 Kg N/ha/year
Acidophilous Quercus-dominated woodland: 10 - 15 Kg N/ha/year
Meso- and eutrophic Quercus woodland: 15 - 20 Kg N/ha/year

For applying the best indicative critical load values for use in impact assessments please visit the following page (http://www.apis.ac.uk/indicative-critical-load-values)

Deposition: 33.04 Kg N/ha/year (Find out about method changes to CBED model 2013)

Data Year: 2013 - 2015

Exceedance Ranges:
Broadleaved deciduous woodland [23.04] to [13.04] Kg N/ha/year
Fagus woodland [23.04] to [13.04] Kg N/ha/year

Acidophilous Quercus-dominated woodland [23.04] to [18.04] Kg N/ha/year
Meso- and eutrophic Quercus woodland [18.04] to [13.04] Kg N/ha/year

---

Pollutant: Nitrogen Oxides

Critical Level: 30 µg NOx (as NO2) m-3

Concentration: 17.23 µg NOx (as NO2) m-3

Data Year: 2013 - 2015

Exceedance: -12.77 µg NOx (as NO2) m-3

Pollutant: Ozone

Critical Level: 5000 ppb hours (6 months growing season April to September)

Exposure: 4453.03 ppb hours

Data Year: 2007 - 2012

Exceedance: -546.97 ppb hours

Pollutant: Sulphur Dioxide

Critical Level: 20 µg m-3

Concentration: 0.39 µg m-3

Data Year: 2013 - 2015

Exceedance: -19.61 µg m-3

Pollutant: Acid Deposition

Critical Load Class & Values:
Class: Broadleafed/Coniferous unmanaged woodland
CLmaxS: 10.633 CLminN: 0.142 CLmaxN: 10.775 (keq/ha/yr)

Deposition: 2.23 (N: 2.36 | S: 0.23) (keq/ha/yr) (Find out about method changes to CBED model 2013)

Data Year: 2013 - 2015

Exceedance:

This content requires the Adobe Flash Player. Get Flash (http://www.macromedia.com/go/getflash/) .

Post updated: Wed, 28/06/2017 - 15:36

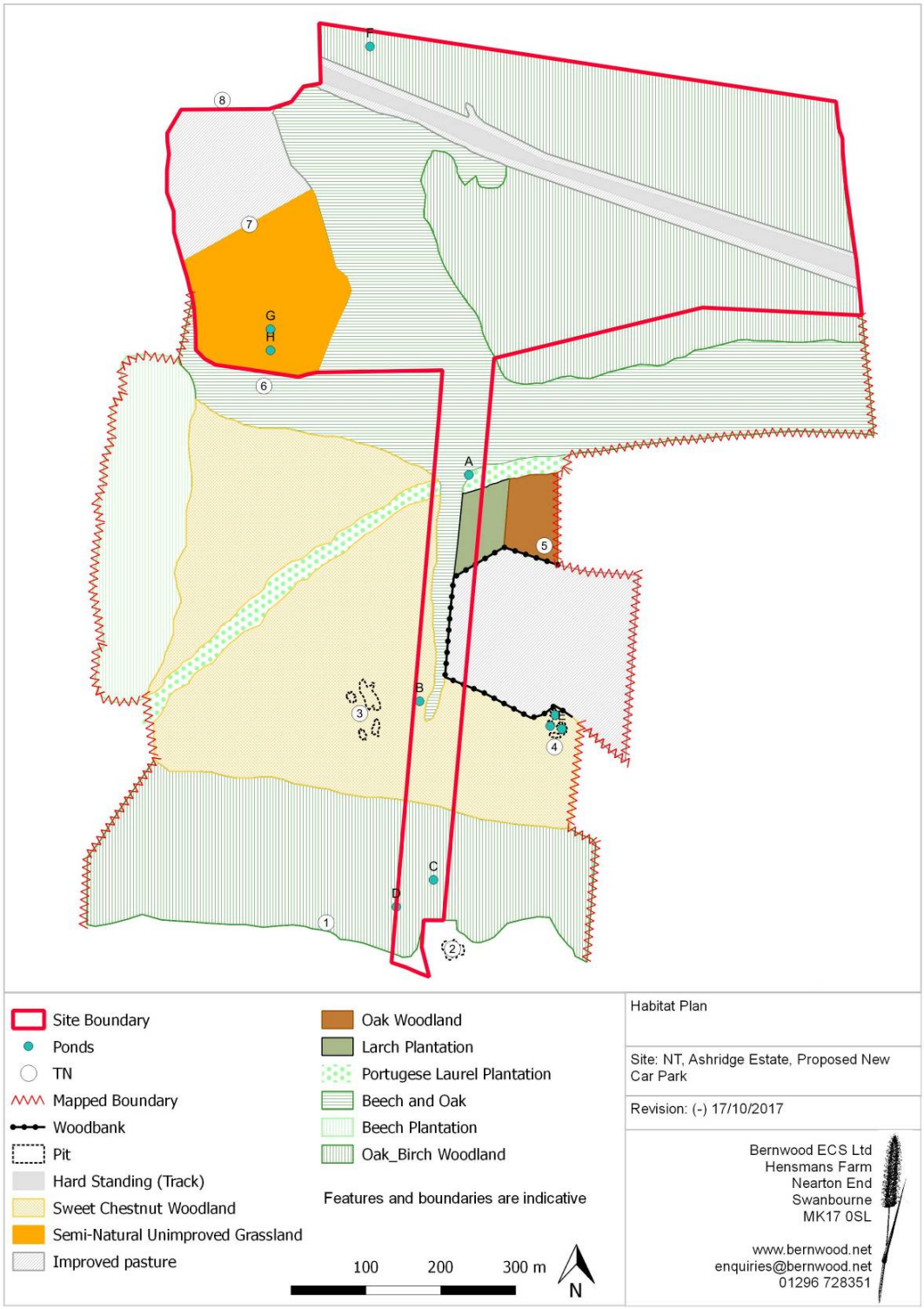
This page was accessed on Tuesday, October 17, 2017 10:14

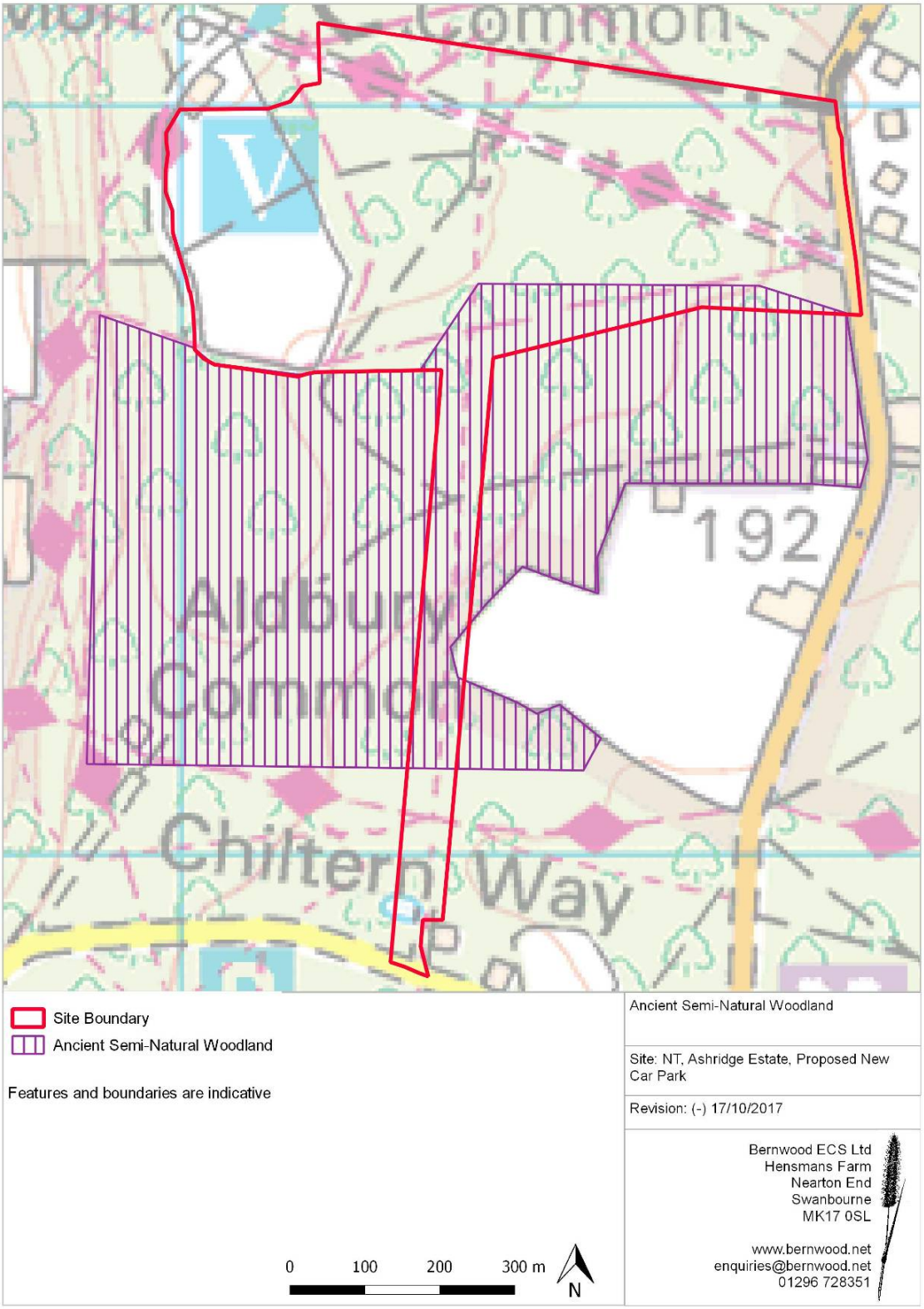
(http://jncc.defra.gov.uk/) (http://www.environment-agency.gov.uk/)

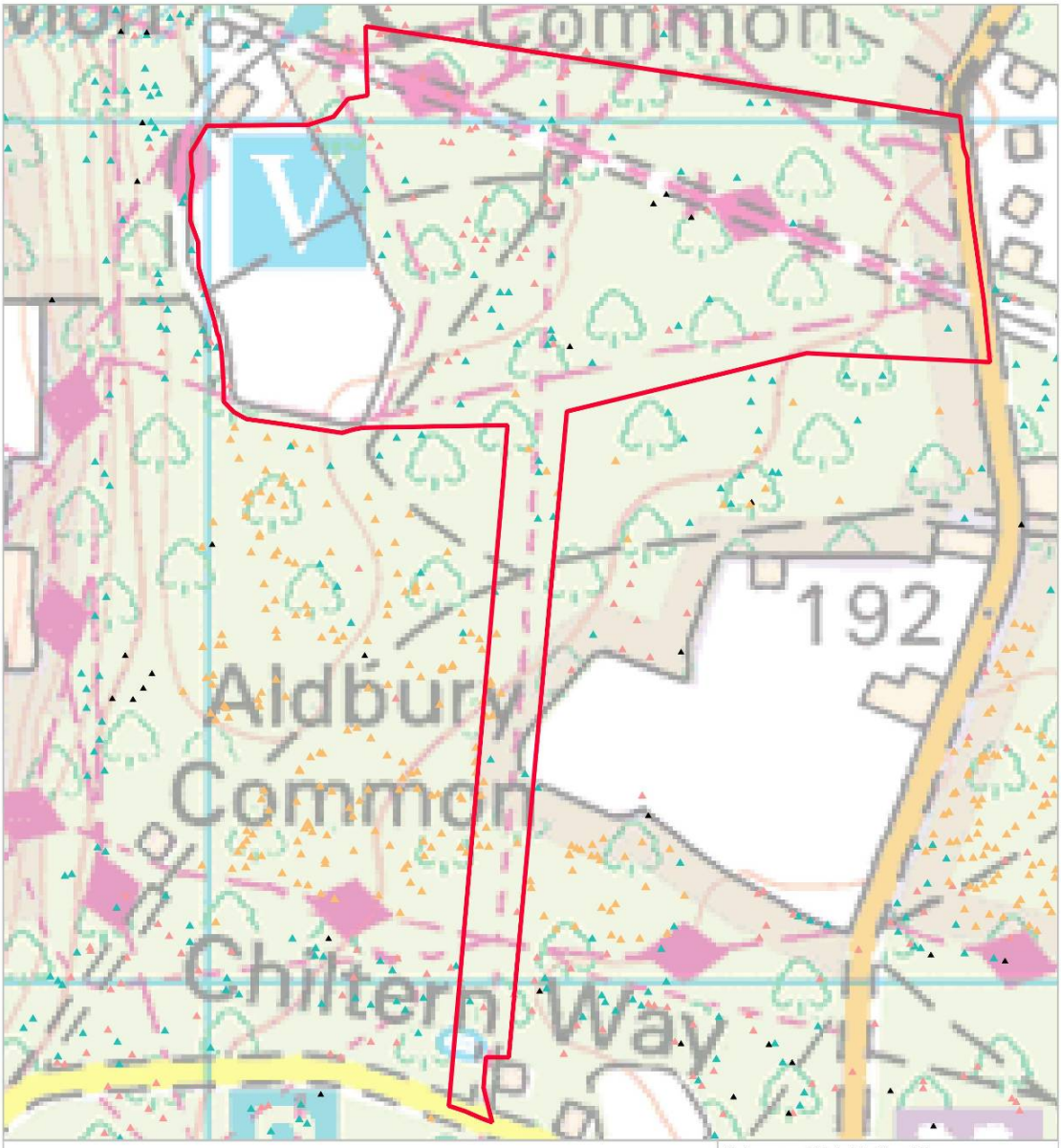
(http://www.doeni.gov.uk/niea/index.htm)

(http://www.snh.gov.uk/) (http://www.sniffer.org.uk/) (http://www.naturalengland.org.uk/) (http://www.ccw.gov.uk)

Appendix 4. Habitat summary plan, ancient semi-natural woodland, veteran and notable trees and tree density plans.




Common
192
Aldbury Common
Chiltern Way
Site Boundary
Ancient Semi-Natural Woodland
Features and boundaries are indicative
0
100
200
300 m
N
Ancient Semi-Natural Woodland
Site: NT, Ashridge Estate, Proposed New Car Park
Revision: (-) 17/10/2017
Bernwood ECS Ltd
Hensmans Farm
Nearton End
Swanbourne
MK17 0SL
www.bernwood.net
enquiries@bernwood.net
01296 728351



Site Boundary
Beech
Oak
Sweet chestnut
Everything else

Features and boundaries are indicative

0 100 200 300 m

N

Veteran and Notable Tree Plan

Site: NT, Ashridge Estate, Proposed New Car Park

Revision: (-) 17/10/2017

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Nearton End
Swanbourne
MK17 0SL

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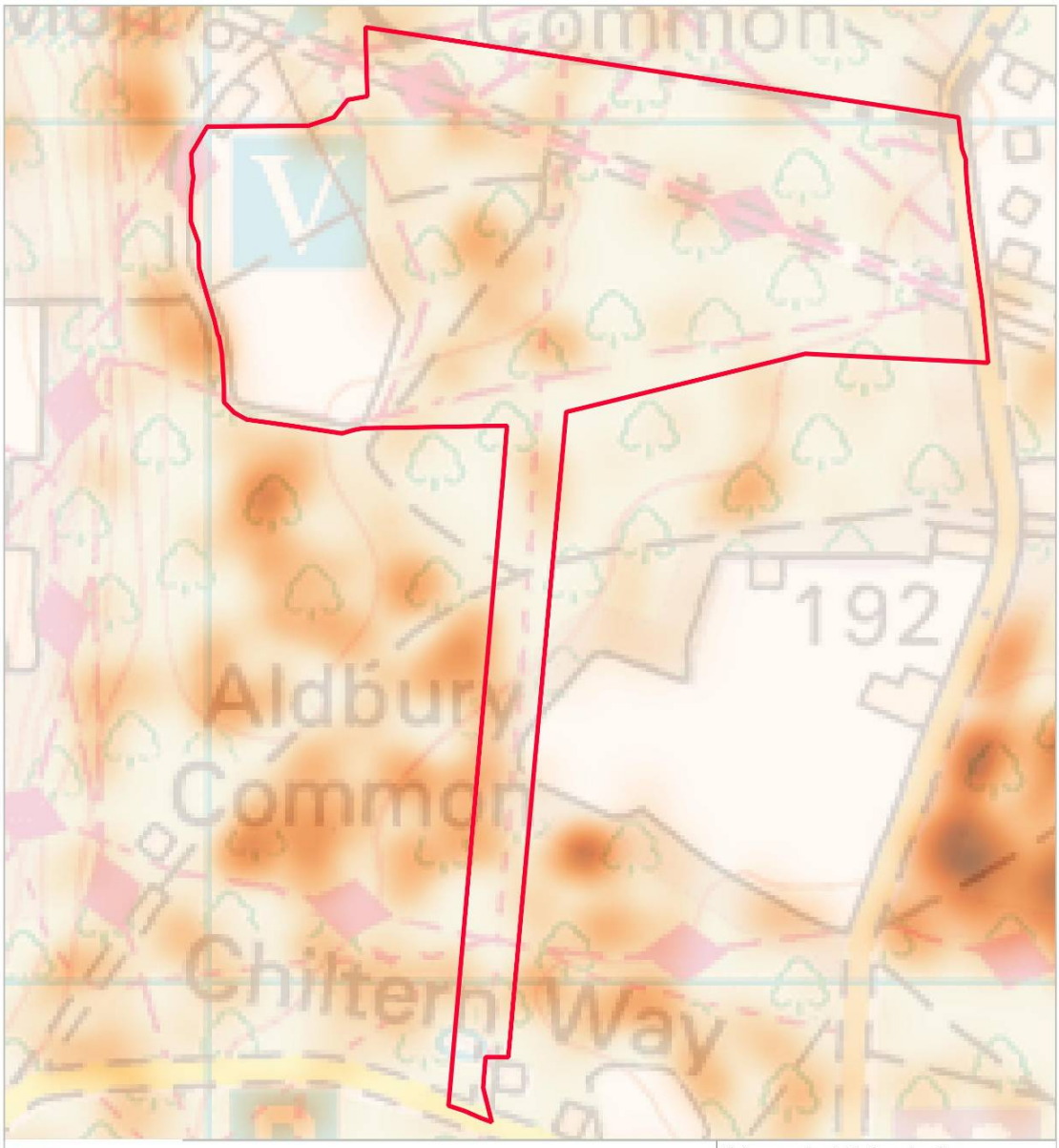
enquiries@bernwood.net
01296 728351



Site Boundary

Darker areas indicate a higher density of veteran and notable trees.

Features and boundaries are indicative.

0 100 200 300 m

N

Veteran and notable tree density

Site: NT, Ashridge Estate, Proposed New Car Park

Revision: (-) 17/10/2017

Bernwood ECS Ltd
Hensmans Farm
Nearton End
Swanbourne
MK17 0SL

www.bernwood.net
enquiries@bernwood.net
01296 728351

Ground Conditions

Appendix 19: Cranfield University:

Ground Compaction at Ashridge, June 2012

Cranfield UNIVERSITY

Ground Compaction at Ashridge

Report by NSRI staff, June 2012

Department of Environmental Science and Technology
June 2012

Report of NSRI staff following a visit to Ashridge Estate (1st June, 2012).

Context

Encouraging visitor access to the countryside (UK Govt. health agenda, increased leisure time etc.) without degrading the environment is an increasing dilemma for land managers, and in particular for national organisations like the National Trust. Increased traffic on footpaths and bridleways can lead to ground compaction. This is a form of physical land degradation "*resulting in densification and distortion of the soil, where biological activity, porosity and permeability are reduced, strength is increased and soil structure partly destroyed. Compaction can reduce water infiltration capacity and increase erosion risk by accelerating run-off*" (European Commission, Joint Research Centre).

Ground compaction leads to a decline in soil quality, in terms of delivery of ecosystem goods and services. The effect of compaction on soil properties includes:

Physical properties	Altered structure Reduced porosity Increased bulk density Reduced infiltration capacity and rate (leading to increased runoff and erosion, increased nutrient and pathogen transport and reduced groundwater recharge) Reduced hydraulic conductivity Reduced groundwater storage capacity Reduced permeability to air Increased shear strength
Biological properties	Altered root dimensions and distribution due to formation of compacted layer within soil profile Reduced available habitat for soil organisms due to reduced soil porosity Reduced metabolic processes of biota due to changes in pore structure indirectly modulating the dynamics of water, solutes, gases and volatiles Reduced activity of soil organisms due to altered soil aeration and humidity status Reduction in total collembolan, mite and earthworm abundance Damage/disruption of mycelia network
Chemical properties	Increased denitrification Increased emissions of nitrous oxide (N_2O) and ammonia (NH_3) Decreased uptake (oxidation) of methane (CH_4) (and occasionally net emission of CH_4) Decreased emission of NOX Reduced respiration and emission of carbon dioxide (CO_2).

We identified the following aspects of the ground compaction problem at Ashridge. It is likely that Ashridge reflects similar problems at other National Trust properties, where visitor numbers are putting land resources (especially soil and vegetation) under pressure.

1. Problem identification

The problems at Ashridge can be divided into two clearly definable, but interrelated problems: 1) footpath widening leading to damage/loss of species e.g. bluebells; and 2) soil compaction damaging the intrinsic and aesthetic quality/value of an important SSSI. Understanding the extent, severity and impacts of ground compaction will enable

appropriate targeting of areas for remediation, devise management strategies and justify resources spent on the remediation, mitigation and prevention of ground compaction.

a) What are the causes of ground compaction?

Controlling ground compaction requires understanding of the mechanisms of the process. It is assumed there is a positive correlation between visitor numbers, path use (including seasonal variability) and ground compaction. It is also important to investigate what contributions are made by the different types of traffic on the paths e.g. foot fall, wheeled vehicles or horse riding.

Visitor questionnaires (to gauge use of paths), literature review and/or experimental research (on-site, and/or within the soil management experimental facilities at Cranfield could be used to identify the causes of ground compaction.

b) What is the spatial extent of ground compaction?

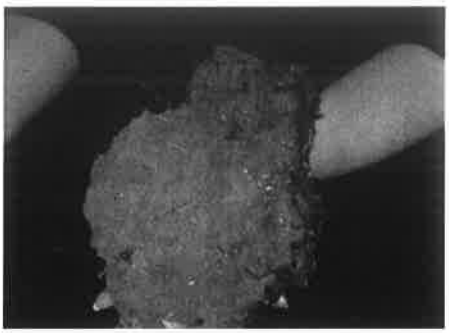
It is important to build a more precise picture of the spatial extent of the problem in order to 1) have a better appreciation of the scale of the problem, and 2) establish a reference set that can be used as a baseline against which to compare future changes. This can be achieved by conducting a ground survey to identify the location of compacted ground on the Estate. Subject to availability and quality of images, information from remotely sensed data (e.g. aerial photographs, satellite images) could also be used, but vegetation canopy may obscure the ground surface, so these techniques might be limited to areas of open ground only. The results of the survey could be presented in a GIS.

c) How has the extent of ground compaction changed over time?

In order to assess the impact of footpath widening and soil compaction on the sustainable use of the SSSI, it is important to gauge the rate of change in the spatial extent of compacted areas. While no historical data relating to soil compaction exists, it is possible to make assumptions based on changes in path width/vegetation loss, assuming these features to be indicative of ground compaction. Subject to availability, use of historic data (e.g. aerial photographs in non-wooded areas, County archives and historical photographs) could be used to monitor changes in the degree of footpath widening and ground compaction over time. The results of the temporal changes (e.g. expansion or contraction of compacted areas) presented in a GIS can be used to build a picture of the relationship between compacted areas and other features such as distance from car parks, relationship with soil type and specific points of visitor interest (e.g. monument and bluebell woods).

d) What is the severity of ground compaction?

Understanding the severity of ground compaction is important in establishing appropriate remedial treatments e.g. less compacted areas may be able to recover naturally, provided they are 'rested' from traffic; more compacted areas may need some direct physical intervention. The degree of ground compaction (e.g. expressed as bulk density or packing density; Mg m^{-3}) can be measured in the field using various direct and indirect techniques to produce a compaction severity map in a GIS for the Estate. The result can be used to identify priority areas for remediation. As well as monitoring the current state of ground compaction, susceptibility of areas to further compaction can be mapped, based on soil characteristics, visitor pressures and climatic factors.



e) What are the consequences of ground compaction?

A better appreciation of the impact of soil compaction at Ashridge Estate is important to ensure the future sustainability of this important SSSI and the provision of services provided by this landscape. Such information can be gathered in a number of ways: 1) we can draw on the experiences of other similar environments and landscapes (including other NT properties) in a desk top study; and/or 2) a site specific investigation can be conducted. The consequences of ground compaction can be assessed against the provision of ecosystem goods and services (e.g. flood attenuation, biodiversity, carbon sequestration). It should be possible to put a financial / economic cost on this. The methodology for this approach has already been devised in DEFRA SP1606 Total Costs of Soil Degradation project [1]

2. Remediation strategies

Appropriate remedial solutions will depend on the severity of the soil compaction. To ensure the most appropriate and economic solutions are considered, a desk based evaluation of the techniques used to reclaim (abiotic rehabilitation) and restore (biotic rehabilitation) already degraded ground in other similar situations (in the UK e.g. National Parks and internationally e.g. US National Parks) is required.

To further narrow down the most appropriate options for Ashridge, the desk based study should be used to inform field trials to evaluate the suitability of the most promising ground compaction remediation methods. These trials could be run in other areas too – or the results of the Ashridge trials extrapolated to other NT properties with similar problems.

3. Preventative strategies

[1] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=16992

It is critical to ensure the same degradation does not occur after the restoration has taken place. The question is: Can the carrying capacity of land be enhanced so that it is resilient to (increasing?) visitor pressures?

Are techniques available that avoid degradation (compaction, soil erosion, loss of biodiversity), without compromising the aesthetics or cultural services (e.g. archaeology, open and free access) of the area.

Working with Cranfield University

NSRI at Cranfield University can offer a range of options to help you answer these questions and we are happy to discuss with you which of the following approaches may best fit your needs.

- individual MSc projects
- MSc by research
- PhD
- MSc Group Project
- Research contract with Cranfield staff

Resource Requirements

Format	Duration	Start / end date	Indicative costs*
MSc thesis project	3 months	May 2013 – September 2013	£3.5k (includes Cranfield supervision of student)
MSc by Research	12 months	anytime	**£6.8k fees (UK/EU) c.£13k stipend
PhD	36 months	anytime	**£15k fees (UK/EU) c.£40k stipend
MSc Group Project (a group of c. 20 students working on the client's brief)	10 weeks	Mid Feb - end April	£5 – 10k
Research contract undertaken by Cranfield staff	Flexible	anytime	Depends on the research aims and objectives

*Additional costs may be incurred (e.g. T&S, consumables, experimental costs, etc.), depending on specific project activities

**Some funding may be available through the BBSRC Advanced Training Partnerships, UK Research Council KTN schemes, Silsoe Heritage Scholarships or Case Industrial Awards (to be discussed). Fees are quoted for academic year September 2012/13.

Jane Rickson
Lynda Deeks
Tim Brewer
National Soil Resources Institute
Department of Environmental Science and Technology
Cranfield University