Shaping growth in Dacorum

Appendices for Topic Paper for the Chilterns Beechwoods SAC

A summary/overview of available evidence

Dacorum Local Plan (2020-2038) Emerging Strategy for Growth
November 2020

Appendices

NATURAL ENGLAND

Natural England Reports

Chiltern Beechwoods Special Area of Conservation

Appendix 1: Citation for Chilterns Beechwoods Special Area of Conservation

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: Trevor Salmon
On behalf of the Secretary of State for Environment, Food and Rural Affairs

Appendix 2: Chilterns Beechwoods Special Area of Conservation Features Matrix

Chilterns Beechwoods SAC

	Ashridge Commons and Woods SSSI							Aston Rowant Woods SSSI								Bisham Woods SSSI		Bradenham Woods, Park Wood & The Coppice SSSI		Ellesborough and Kimble Warrens SSSI				Hollowhill and Pullingshill Woods SSSI		Naphill Common SSSI	Tring Woodlands SSSI	Windsor Hill SSSI
Feature	**001**	**002**	**003**	**004**	**005**	**006**	**007**	**001**	**002**	**004**	**005**	**006**	**007**	**008**	**001**	**002**	**001**	**002**	**001**	**002**	**003**	**004**	**001**	**002**	**001**	**001**	**001**
H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia), (note that this includes the priority feature "important orchid rich sites")																			UR	UR	?	UR					
H9130 Asperulo-Fagetum beech forests	F	?	F	UR	F	F	?	F	F	?	F	F	F	F	UR	?	?	?	F	F		F	?	?	F	UR	F
S1083 Stag beetle, Lucanus cervus																F											

Download

Key:	
F	Favourable
UR	Unfavourable recovering
UN	Unfavourable no change
UD	Unfavourable declining
PD	Partially destroyed
D	Destroyed
?	Not recorded

Appendix 3: European Site

Conservation Objectives for Chilterns Beechwoods Special Area of Conservation

Site Code UK0012724

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

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the “Habitats Regulations”). They must be considered when a competent authority is required to make a ‘Habitats Regulations Assessment’, including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term ‘favourable conservation status’ is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

Appendix 4: Site Improvement Plan for Chilterns Beechwoods Special Area of Conservation, 2015

Improvement Programme for England's Natura 2000 Sites (IPENS)

Planning for the Future

Site Improvement Plan

Chilterns Beechwoods

Site Improvement Plans (SIPs) have been developed for each Natura 2000 site in England as part of the Improvement Programme for England's Natura 2000 sites (IPENS). Natura 2000 sites is the combined term for sites designated as Special Areas of Conservation (SAC) and Special Protected Areas (SPA). This work has been financially supported by LIFE, a financial instrument of the European Community.

The plan provides a high level overview of the issues (both current and predicted) affecting the condition of the Natura 2000 features on the site(s) and outlines the priority measures required to improve the condition of the features. It does not cover issues where remedial actions are already in place or ongoing management activities which are required for maintenance.

The SIP consists of three parts: a Summary table, which sets out the priority Issues and Measures; a detailed Actions table, which sets out who needs to do what, when and how much it is estimated to cost; and a set of tables containing contextual information and links.

Once this current programme ends, it is anticipated that Natural England and others, working with landowners and managers, will all play a role in delivering the priority measures to improve the condition of the features on these sites.

The SIPs are based on Natural England's current evidence and knowledge. The SIPs are not legal documents, they are live documents that will be updated to reflect changes in our evidence/knowledge and as actions get underway. The information in the SIPs will be used to update England's contribution to the UK's Prioritised Action Framework (PAF).

The SIPs are not formal consultation documents, but if you have any comments about the SIP or would like more information please email us at IPENSLIFEProject@naturalengland.org.uk, or contact Natural England's Responsible Officer for the site via our enquiry service 0300 060 3900, or enquiries@naturalengland.org.uk

This Site Improvement Plan covers the following Natura 2000 site(s)

UK0012724 Chilterns Beechwoods SAC

Site description

The Chilterns Beechwoods SAC comprises nine separate sites scattered across the Chilterns.

There are three features of interest: semi-natural grasslands and scrubland on chalk; *Asperulo-Fagetum* beech woodland (for which this is considered to be one of the best areas in the UK and lies in the centre of the habitat's UK range); and Stag beetle *Lucanus cervus*, for which the area is considered to support a significant presence. The rare coralroot *Cardamine bulbifera* is found in these woods.

Plan Summary

This table shows the prioritised issues for the site(s), the features they affect, the proposed measures to address the issues and the delivery bodies whose involvement is required to deliver the measures. The list of delivery bodies will include those who have agreed to the actions as well as those where discussions over their role in delivering the actions is on-going.

Priority & Issue	Pressure or Threat	Feature(s) affected	Measure	Delivery Bodies
1 Forestry and woodland management	Pressure/ Threat	H9130 Beech forests on neutral to rich soils	Secure appropriate woodland management	Forestry Commission, Natural England, Landowner(s), Chilterns Woodland Project, Chilterns Conservation Board
2 Deer	Pressure/ Threat	H9130 Beech forests on neutral to rich soils	Improve deer management	Berks, Bucks and Oxon Wildlife Trust, Forestry Commission, National Trust, Natural England, Landowner(s), Local deer group, Chilterns Woodland Project, Chilterns Conservation Board, members of redundant Chilterns deer management groups
3 Changes in species distributions	Threat	S1083 Stag beetle	Monitor stag beetle population	Forestry Commission, Natural England, Landowner(s), Chilterns Conservation Board, Local records centre(s)
4 Invasive species	Pressure/ Threat	H9130 Beech forests on neutral to rich soils	Investigate the impacts of Grey squirrel	Forestry Commission, Natural England, Landowner(s), Chilterns Conservation Board

5 Disease	Threat	H9130 Beech forests on neutral to rich soils	Address box blight, and other diseases	Forestry Commission, Natural England, Chilterns Woodland Project, Chilterns Conservation Board
6 Public Access/Disturbance	Threat	S1083 Stag beetle	Reduce visitor impact on dead wood	Forestry Commission, National Trust, Natural England, Landowner(s), National Nature Reserve (NNR), Chilterns Woodland Project, Chilterns Conservation Board
7 Air Pollution: impact of atmospheric nitrogen deposition	Pressure	H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites), H9130 Beech forests on neutral to rich soils, S1083 Stag beetle	Establish a Site Nitrogen Action Plan	Natural England

Issues and Actions

This table outlines the prioritised issues that are currently impacting or threatening the condition of the features, and the outstanding actions required to address them. It also shows, where possible, the estimated cost of the action and the delivery bodies whose involvement will be required to implement the action. Lead delivery bodies will be responsible for coordinating the implementation of the action, but not necessarily funding it. Delivery partners will need to support the lead delivery body in implementing the action. In the process of developing the SIPs Natural England has approached the delivery bodies to seek agreement on the actions and their roles in delivering them, although in some cases these discussions have not yet been concluded. Other interested parties, including landowners and managers, will be involved as the detailed actions are agreed and delivered. Funding options are indicated as potential (but not necessarily agreed or secured) sources to fund the actions.

1 Forestry and woodland management

The local history of woodland management for beech timber has contributed towards a uniform age structure in some woods. With few gaps in the canopy, regeneration is restricted. To encourage regeneration and conservation of beech woodlands, restoration management is needed to diversify age and physical structure. Current and future threats of climate change are also likely to impact upon woodland regeneration and species composition.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
1A	In discussion with landowners and land managers, review RDPE agreements across the SAC to determine if more can be done to secure appropriate management. There are some parts of the SAC outside funded agreements in 2014.	Not yet determined	2014 onwards	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Rural Development Programme (RDPE)	Natural England	Forestry Commission, Landowner(s), Chilterns Woodland Project

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
1B	Increase resilience of the interest feature to climate change impacts by ensuring management of the habitat mosaic (woodland, scrub and grassland) creates and maintains structural and micro-climate heterogeneity across the SAC and removes or reduces other pressures.	Not yet determined	2015 onwards	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Rural Development Programme (RDPE)	Natural England	Forestry Commission, Landowner(s), Chilterns Woodland Project, Chilterns Conservation Board

2 Deer

Deer species across the Chilterns include fallow, roe and muntjac. Browsing by deer prevents or hinders natural regeneration of trees and ground flora. Without regeneration, diversity of woodland age and physical structure is declining and this is particularly acute where age distribution is already limited. Not all parts of the SAC are affected, however, in those that are, current control measures appear ineffective in managing the problem.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
2A	In accordance with deer management plans and authoritative guidance, use a range of techniques including deer culling to remove unsustainable browsing pressure across the SAC. Seek to sustain deer management in the long-term i.e. developing a market for Chilterns venison and awareness-raising amongst the public in order to gain support for deer management.	Not yet determined	2014 onwards	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Rural Development Programme (RDPE), Business	Forestry Commission	Berks, Bucks and Oxon Wildlife Trust, Forestry Commission, National Trust, Landowner(s), Chilterns Woodland Project

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
2B	Establish communication and information sharing amongst neighbouring landowners regarding deer management and deer numbers. Use these networks to co-ordinate deer culling activities.	Not yet determined	2014 onwards	Advice: Other	Rural Development Programme (RDPE), Chilterns Conservation Board, LEADER (RDPE)	Natural England	Berks, Bucks and Oxon Wildlife Trust, Forestry Commission, National Trust, Landowner(s), Chilterns Woodland Project, Chilterns Conservation Board, members of redundant Chilterns deer management groups

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
2C	Establish exclosures across the SAC and monitor these exclosures. Adapt deer management practices in response to observations.	Not yet determined	2015 onwards	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Rural Development Programme (RDPE), Chilterns Conservation Board, LEADER (RDPE)	Natural England	Forestry Commission, National Trust, Landowner(s), Local deer group, Chilterns Woodland Project, Chilterns Conservation Board

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
2D	Produce a deer management plan for each SSSI and provide a copy to each landowner. Draw on authoritative guidance when developing these plans.	Not yet determined	2015 onwards	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Rural Development Programme (RDPE), Chilterns Conservation Board, LEADER (RDPE)	Forestry Commission	Berks, Bucks and Oxon Wildlife Trust, Forestry Commission, National Trust, Natural England, Landowner(s), Chilterns Woodland Project, Chilterns Conservation Board

3 Changes in species distributions

Fit-for-purpose species recording and data to allow monitoring of the stag beetle population is not currently in place, making it difficult to manage the population and its habitat appropriately.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
3A	Establish a baseline and determine trends for the stag beetle population across the SAC. Establish a monitoring programme. Use species data to inform management.	Not yet determined	2015 onwards	Investigation / Research / Monitoring	Natural England	Natural England	Forestry Commission, Landowner(s), Chilterns Conservation Board, Local records centre(s)

4 Invasive species

Grey squirrels *Sciurus carolinensis* and edible dormouse *Glis glis* damage growing trees by bark stripping. Where natural regeneration is occurring the trees are attacked between the ages of 20 and 40 if not before. It is not known if this is impacting on tree health or regeneration but there may be a need for vigilance, and consider increased awareness of likely effects and signs of impacts. Control measures have resulted in little or no ecological change to date.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
4A	Explore options for control measures for grey squirrel and edible dormouse and implement control measures accordingly. Work with neighbours on a landscape scale to manage grey squirrel and edible dormouse.	Not yet determined	2014 onwards	Advice: Other	Not yet determined	Forestry Commission	Natural England, Landowner(s), Chilterns Conservation Board

5 Disease

Box blight has been observed at Ellesborough and Kimble Warrens SSSI which represent the rare habitat type of box-dominated woodland. Other diseases are possible.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
5A	Raise awareness amongst landowners about relevant diseases and appropriate management to prevent disease and address infections. Draw on existing best practice publications.	No cost	2015 onwards	Advice	Not yet determined	Natural England	Forestry Commission, Chilterns Woodland Project, Chilterns Conservation Board

6 Public Access/Disturbance

Removal of dead wood by the public is an issue on some parts of the SAC. This could impact in saproxylic invertebrate fauna. Also storm-damaged dead wood may be removed in the interests of health and safety, and tidiness.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
6A	Engage visitors in the nature conservation features of the SAC and how they are best conserved, (for example how deadwood needs to be left in- situ to provide habitat). Achieve this through rangering, interpretation/events and websites (integrated into existing activities or as new activities).	£2,000	2015 onwards	Advice: Education & awareness raising	Not yet determined	National Trust	Natural England, National Nature Reserve (NNR), Chilterns Woodland Project

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
6B	Raise awareness amongst landowners about appropriate deadwood management in order to conserve Stag beetle populations, including guidance about tree surgery and tree safety in publicly accessible areas. Draw on existing best practice publications.	£1,500	2015 onwards	Advice: Education & awareness raising	Not yet determined	Natural England	Forestry Commission, Landowner(s), Chilterns Woodland Project, Chilterns Conservation Board

7 Air Pollution: impact of atmospheric nitrogen deposition

Atmospheric nitrogen deposition exceeds the critical loads for ecosystem protection. Some parts of the site are recorded as unfavourable (recovering), but impacts associated with nitrogen deposition are unclear.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
7A	Prepare a Site Nitrogen Action Plan.	Not yet determined	2015 onwards	Site Nitrogen Action Plan	Not yet determined	Natural England	Not yet determined

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
7B	Implement actions arising from the Site Nitrogen Action Plan.	Not yet determined	2015 onwards	Site Nitrogen Action Plan	Not yet determined	Natural England	Not yet determined

Site details

The tables in this section contain site-relevant contextual information and links

Qualifying features

#UK Special responsibility

Chilterns Beechwoods SAC	S1083 *Lucanus cervus*: Stag beetle
	H6210# Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)
	H9130 *Asperulo-Fagetum* beech forests

Site location and links

Chilterns Beechwoods SAC

Area (ha) **1276.48** *Grid reference* **SP975134**	Map link
Local Authorities	Buckinghamshire; Hertfordshire; Oxfordshire; Windsor and Maidenhead
Site Conservation Objectives	European Site Conservation Objectives for Chilterns Beechwoods SAC
European Marine Site conservation advice	n/a
Regulation 33/35 Package	n/a
Marine Management Organisation site plan	n/a

Water Framework Directive (WFD)

The Water Framework Directive (WFD) provides the main framework for managing the water environment throughout Europe. Under the WFD a management plan must be developed for each river basin district. The River Basin Management Plans (RMBP) include a summary of the measures needed for water dependent Natura 2000 sites to meet their conservation objectives. For the second round of RBMPs, SIPs are being used to capture the priorities and new measures required for water dependent habitats on Natura 2000 sites. SIP actions for non-water dependent sites/habitats do not form part of the RBMPs and associated consultation.

Chilterns Beechwoods SAC

River basin	Thames RBMP
WFD Management catchment	Colne, Lower Thames, Thame and South Chilterns
WFD Waterbody ID (Cycle 2 draft)	n/a

Overlapping or adjacent protected sites

Site(s) of Special Scientific Interest (SSSI)	
Chilterns Beechwoods SAC	Naphill Common SSSI
	Bisham Woods SSSI
	Windsor Hill SSSI
	Tring Woodlands SSSI
	Hollowhill & Pullingshill Woods SSSI
	Ellesborough & Kimble Warrens SSSI
	Bradenham Woods, Park Wood & The Coppice SSSI
	Ashridge Commons & Woods SSSI
	Aston Rowant Woods SSSI

National Nature Reserve (NNR)	
Chilterns Beechwoods SAC	n/a

Ramsar	
Chilterns Beechwoods SAC	n/a

Special Areas of Conservation (SAC) and Special Protection Areas (SPA)	
Chilterns Beechwoods SAC	n/a

Other relevant documents and links	
	The Management of Deer on National Trust Land, July 2009
	Chilterns AONB Management Plan 2014 - 2019

Version	*Date*	*Comment*
1.0	04/03/2015	

Ashridge and Woods SSSI

Appendix 5: Ashridge Commons and Woods 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 Beaut

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.

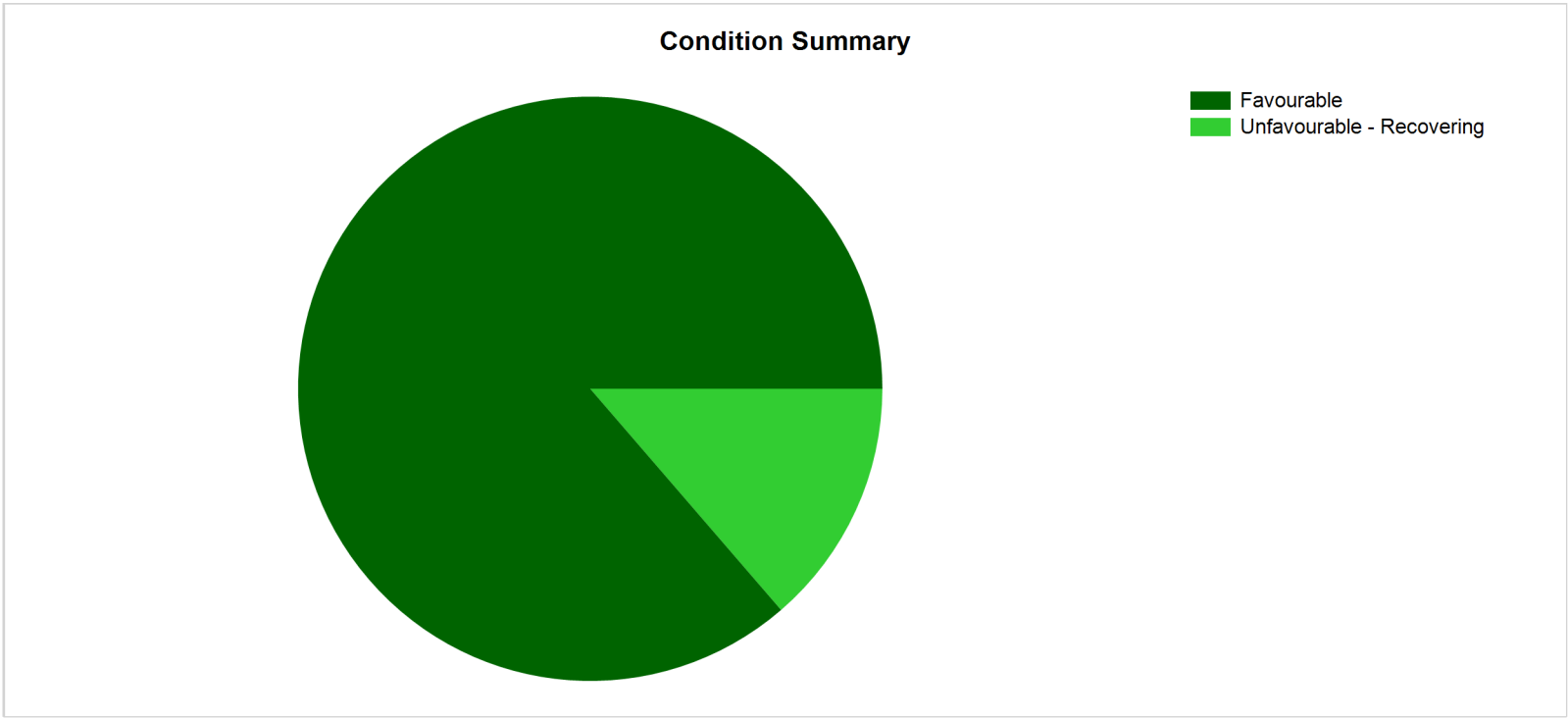
Appendix 6: Condition summary from Natural England's website for Ashridge Commons and Woods SSSI

Site: Ashridge Commons and Woods SSSI

Report generated on: 26 Sep 2020

	Sites	Units	Units Assessed
Total number	1	7	7
Total area (ha)	626.41	626.41	626.41

	% meeting area of favourable or unfavourable recovering	Favourable	Unfavourable - Recovering	Unfavourable - No change	Unfavourable - Declining	Partially destroyed	Destroyed	Not Recorded
Area (ha)	626.41	540.79	85.61					
Percentage	100.00%	86.33%	13.67%	0.00%	0.00%	0.00%	0.00%	0.00%


Condition Summary
Favourable
Unfavourable - Recovering

Appendix 7: Condition assessment from Natural England's website for Ashridge Commons and Woods SSSI

Condition of SSSI Units for Site Ashridge Commons and Woods SSSI

See the SSSI glossary (SSSIglossary.aspx) for an explanation of terms.

Report generated on: 12 Nov 2020

Main Habitat	Responsible Officer	Unit Number	Unit Id	Area (ha)	NNR Overlap Area (ha)	Latest Assessment Date	Assessment Description	Comment	Adverse Condition Reasons
Ashridge Commons and Woods SSSI - BUCKINGHAMSHIRE, HERTFORDSHIRE (AYLESBURY VALE, DACORUM)									
BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	DOUG WALLACE	001	1002589	31.1582	0.00	13/06/2014	Favourable	The unit is comprised largely of semi-natural high forest dominated by mature beech including old pollards which are thought to be 200-300 years of age, and numerous beech standards. These, along with mature standards of ash, pedunculate oak , and downy birch, form a canopy cover in excess of 80%. There is an understorey of young regenerating beech, often in dense thickets. Holly and hawthorn are also present in the understorey. Standing and lying dead wood is frequent across the site. Ground flora is sparse under the dense canopy, however, where found is typical of the woodland type. Noted during a brief survey were wood millet, yellow archangel, bluebell, wood sorrel, wild garlic and wild arum. There are signs of deer browsing, however, this does not appear to be preventing regeneration. There is sufficient young growth to maintain canopy cover. Overall this unit is meeting objectives.	
BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	DOUG WALLACE	002	1002583	47.5658	0.00	30/06/2008	Favourable	Annual cutting of bracken is maintained the unimproved acid grassland area in good condition and should continue. Good variation of tree and scrub cover over the unit.	

BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	DOUG WALLACE	003	1002591	168.7747	0.00	22/07/2009	Favourable	This large unit is a matrix of broad-leaved semi-natural woodland, dense scrub, plantation, open rides, glades, and a strip of unimproved acid grassland. The woodland is dominated in places by mature beech and oak stands with an even age structure. Much of the unit is composed of secondary woodland containing younger trees of similar age structure. Silver Birch is dominant over a large areas and Sweet Chestnut is locally dominant near Princes Riding. Conifers are present but not in large numbers. Some regeneration was noted in places.The shrub layer is sparse over much of the unit due to the dense canopy of Beech and Oak, however, where present it consisted mainly of holly, and hawthorn. Where dense scrub occurs it is dominated by Hawthorn. Ground flora is sparse or absent in places, particularly under the dense canopy, where present it includes Bramble, Bluebell, Foxglove, and Wood Sorrel, the latter mainly along ride edges. Bracken is the dominant species over large areas of Berkhamsted Common.There is plenty of dead wood standing and laying across the unit. This unit contributes to the overall mosaic of habitats over the SSSI.	
BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	DOUG WALLACE	004	1002590	85.6136	0.00	13/06/2014	Unfavourable - Recovering	There is great variation in woodland composition and structure across this unit. There is little or no management intervention. The area known as ‘The Hangings’ is composed of ash, beech and sycamore standards over a sparse shrub layer of elder and hawthorn, holly and hazel. The ground flora is dominated by dog's mercury. To the east, in the area of Rail Copse there are mature pedunculate oak over hazel, hornbeam, crab apple, holly and dogwood. Birch occurs throughout, along with younger oak, ash, and beech. Sycamore is present in the southern area whilst on the western edge there are very large sweet chestnut and wild cherry. The bank surrounding the wood bears beech. Ground flora is sparse or absent in areas of dense shade and where bracken dominates, however, where present it is characteristic of the woodland type with wood sorrel, dog’s mercury, bluebell, yellow pimpernel, wood millet, enchanters nightshade, wood sedge, greater stitchwort and honeysuckle. To the immediate south of Rail Copse the woodland is composed of huge even-aged beech and oak standards. There are younger trees in the gaps in the canopy. Standing and fallen deadwood is well represented. There is no reduction in the extent of woodland and canopy cover is sufficient to maintain the special interest. There are signs of deer browsing on young growth which appears to be having an adverse impact on regeneration. There is a deer control programme on the estate, therefore, the unit has been assessed as unfavourable recovering	

BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	DOUG WALLACE	005	1002579	121.9814	0.00	17/09/2009	Favourable	A large and varied unit with secondary woodland and plantation on the plateau, and older woodland on the north-west facing slopes. Beech, Ash and Oak are the main canopy trees over much of the unit. Sweet Chestnut predominates in some place, most notably in the area of Aldbury Common to the north and east of Old Copse. Silver Birch is also dominant in some parts of the unit. Conifers are within limits as are exotics. Beech occurs in even aged stands in some areas. The older woodland on the north -west facing slopes is well structured in places having a distinct shrub layer of hawthorn, elder, hazel, and holly. Ash, beech and birch are regenerating here in gaps left by windthrown trees, often forming dense thickets. Elsewhere there is little or no shrub layer under the a dense canopy . There is plenty of fallen and standing dead wood across the unit. Ground flora is negligible where there is dense shading as would be expected. There are a few isolated glades of species rich calcareous grassland on the slopes. There are some signs of deer browsing in the unit, however, a control strategy is in place over the whole estate. Overall, a diverse unit which is meeting objectives.	
BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	DOUG WALLACE	006	1002587	157.8467	0.00	17/09/2009	Favourable	A large unit with secondary and planted woodland (conifer and broadleaved), and older woodland on the north west facing slopes (Hanging Isley and Duncombe Terrace. There are open glades and a good network of rides. The main canopy species across the unit are Ash, Beech, Oak, Birch, Sweet Chestnut and Sycamore. Conifers are within the 5% threshold. Some areas of the unit are have a diverse ground flora and are well structured with vigorous regeneration in gaps resulting from storm damage. In other areas the dense canopy inhibits this. There are good quantities of standing and fallen dead wood. Some deer browsing noted, however, there is a deer control strategy in place over the estate. Overall, the unit is meeting objectives.	
BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	DOUG WALLACE	007	1002588	13.4652	0.00	27/03/2009	Favourable	The woodland is in good condition and is meeting targets for the key attributes set out in the conservation objectives. There is a typical ground flora with wood sorrel, bluebell and dog's mercury. The canopy is mainly mature and closed with a sparse understorey of hazel and elder. Exotic species are present at low cover. There is some evidence of deer browsing but this is not having significant adverse effects at present.	

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Appendix 8: Operations likely to damage the special interest features at Ashridge Commons and Woods SSSI

Operations likely to damage the special interest

Site name: Ashridge Commons and Woods, SSSI, Hertfordshire/Buckinghamshire

OLD1000452

Ref. No.	Type of Operation
1	Cultivation, including ploughing, rotovating, harrowing, and re-seeding.
2	Grazing and changes in the grazing regime (including type of stock or intensity or seasonal pattern of grazing and cessation of grazing).
3	Stock feeding and changes in stock feeding practice.
4	Mowing or other methods of cutting vegetation and changes in the mowing or cutting regime (including hay making to silage and cessation).
5	Application of manure, fertilisers and lime.
6	Application of pesticides, including herbicides (weedkillers).
7	Dumping, spreading or discharge of any materials.
8	Burning.
9	The release into the site of any wild, feral or domestic animal*, plant or seed.
10	The killing or removal of any wild animal* including pest control.
11	The destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, moss, lichen, fungus, leaf-mould, turf etc.
12	Tree and/or woodland management+ and changes in tree and/or woodland management+.
13a	Drainage, including the use of mole, tile, tunnel or artificial drains.
13b	Modification of the structure of watercourses (eg streams, springs, ditches, dykes, drains), including their banks and beds, as by re-alignment, re-grading and dredging.
13c	Management of aquatic and bank vegetation for drainage purposes.
14	The changing of water levels and tables and water utilisation, including irrigation, storage and abstraction from existing water bodies and through boreholes.
15	Infilling of ditches, drains, ponds, pools or pits.
20	Extraction of minerals, including shingle, sand and gravel, topsoil, subsoil, chalk, lime and spoil.
21	Construction, removal or destruction of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables, above or below ground.
22	Storage of materials.
23	Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling.
26	Use of vehicles likely to damage or disturb features of interest.
27	Recreational or other activities likely to damage features of interest.
28	Game and waterfowl management and hunting practices, and changes in game and waterfowl management and hunting practices.

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* 'animal' includes any mammal, reptile, amphibian, bird, fish or invertebrate.

\+ including afforestation, planting, clear and selective felling, thinning, coppicing, modification of the stand or underwood, changes in species composition, cessation of management.

Appendix 9: Views about management: a statement of English Nature's views about the management of Ashridge Commons and Woods SSSI, 2003

ENGLISH NATURE

Views About Management

A statement of English Nature's views about the management of Ashridge Commons and Woods Site of Special Scientific Interest (SSSI).

This statement represents English Nature's views about the management of the SSSI for nature conservation. This statement sets out, in principle, our views on how the site's special conservation interest can be conserved and enhanced. English Nature has a duty to notify the owners and occupiers of SSSI of its views about the management of the land.

Not all of the management principles will be equally appropriate to all parts of the SSSI. Also, there may be other management activities, additional to our current views, which can be beneficial to the conservation and enhancement of the features of interest.

The management views set out below do not constitute consent for any operation. English Nature's written consent is still required before carrying out any operation likely to damage the features of special interest (see your SSSI notification papers for a list of these operations). English Nature welcomes consultation with owners, occupiers and users of the SSSI to ensure that the management of this site conserves and enhances the features of interest, and to ensure that all necessary prior consents are obtained.

Management Principles

There may be several different ways in which the wood can be managed to best conserve its value for wildlife - by promoting an appropriate woodland structure, by ensuring regeneration and by looking after the things that make this wood special. The attached notes give broad views on a range of regimes that may be appropriate on your site.

A diverse woodland structure with some open space, some areas of dense understorey, and an overstorey of more mature trees (which may be the standard trees under a coppice-with-standards regime) is important. A range of ages and species within and between stands is desirable.

Some dead and decaying wood such as fallen logs, old hollow trees or old coppice stools is essential for providing habitats for fungi and dead wood invertebrates. Work may, however, be needed to make safe dangerous trees where they occur in areas of high public access.

Open spaces, either temporary gaps created by felling or coppicing or more permanent areas such as rides and glades, benefit other groups of invertebrates such as butterflies. They should be of sufficient size to ensure that sunny conditions prevail for most of the day. Rides and glades may require cutting to keep them open.

Felling, thinning or coppicing may be used to create or maintain variations in the structure of the wood, and non-native trees and shrubs can be removed at this time. To avoid disturbance to breeding birds the work is normally best done between the beginning of August and the end of February. Work should be avoided when the ground is soft, to prevent disturbing the soil and ground flora. Normally, successive felling, thinning or coppicing operations should be spread through the wood to avoid too much disturbance in one area. However, where there is open space interest (e.g. rich butterfly populations) adjacent plots may be worked to encourage the spread of species that are only weakly mobile.

Natural regeneration from seed or stump regrowth (as in coppice) is preferred to planting because it helps maintain the local patterns of species and the inherent genetic character of the site.

Wood pastures are typically mosaics of scattered old trees, often pollards, relatively extensive open areas (often acid grass or heath) with patches of scrub and young growth: the whole being maintained in this mixed state by higher levels of grazing than are common in woods with a coppice or high forest history. Many wood pastures now lack one or other of the components of the mosaic or are no longer grazed. Our preferred management is usually aimed at restoring the missing elements.

Old pollards may need attention in terms of reducing competition from younger growth or lightening the crown, for example, by repollarding. Dealing with old pollards is a specialist job as each has a unique structure and context. Large cut branches, fallen dead wood or the remains of old trees should be left on site as they may contain populations of important fungi or invertebrates.

Grazing or cutting helps to maintain old trees in relatively open conditions, which is desirable where these are important for lichens on the lower trunks. Grazing or cutting also promotes open semi-natural vegetation with some scrub and young trees in between the trees.

Indeed, the pasture may be of conservation interest in its own right. Care needs to be taken to establish the most appropriate stocking density or cutting regime. The application of pesticides, including herbicides, and fertilizer will often be damaging and best avoided.

Parts of the wood should be left unmanaged to benefit species that do best under low disturbance. In addition, lack of management allows for the operation of natural processes such as windblow. Within these areas some trees will eventually die naturally and dead wood accumulate.

Where they are a threat to the interest of the wood, invasive introductions such as *Rhododendron ponticum* should, where practical, be controlled.

Tring Woodlands SSSI

Appendix 10: Tring Woodlands SSSI citation

File ref: WCS/423 17 WBA

County: Hertfordshire **Site Name: Tring Woodlands**

District: Dacorum

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

Local Planning Authority: Dacorum District Council

National Grid Reference: SP 917100 **Area:** 23.8 (ha) 58.8 (ac)

Ordnance Survey Sheet 1: 50 000: 165 **1: 10 000** SP 91 SW, SW 90 NW

Date Notified (Under 1949 Act): 1968 **Date of Last Revision** 1972

Date Notified (Under 1981 Act): 1985 **Date of Last Revision** -

Other Information:

This site was previously known as Grove and Stubbings Wood SSSI. This site is within the Chilterns Area of Outstanding Natural Beauty.

Reasons for Notification:

This site is one of the best examples in Hertfordshire of ancient semi-natural beech *Fagus sylvatica* woodland, a habitat which is in decline nationally. The woods lie at the eastern end of the Chilterns on the steep north-west facing Middle Chalk escarpment, and extend onto the plateau capped by clay-with-flints. There is a rich flora present, indicating that the woodland has been long established.

Associated with beech high forest are areas of standard ash *Fraxinus excelsior* and pedunculate oak *Quercus robur*. Holly *Ilex aquifolium* and yew *Taxus baccata* comprise the sparse shrub layer on upper slopes, though lower down there is more variety with dogwood *Cornus sanguinea*, field maple *Acer campestre*, wayfaring tree *Viburnum lantana* and coppiced hazel *Corylus avellana*. A small mixed plantation of larch *Larix decidua* and species native to the site is situated on the plateau, and retains elements of the established plant community.

The diverse flora is dominated by woodruff *Galium odoratum*, wood anemone *Anemone nemorosa*, dog's mercury *Mercurialis perennis* and brambles *Rubus fruticosus* with frequent sanicle *Sanicula europaea* and wood spurge *Euphorbia amygdaloides*. Notable amongst twenty species of grass present are wood melick *Melica uniflora* and two local species, wood barley *Hordelymus europaeus* and lesser hairy brome *Bromus benekenii*. In the central part of the wood floral diversity is enhanced by the presence of more restricted species such as yellow

cont...

Tring Woodlands (cont...)

birds nest *Monotropa hypopitys*, common wintergreen *Pyrola minor* and narrow-lipped helleborine *Epipactis leptochila* at one of its few county localities. Two other typical beech wood orchids present are fly orchid *Ophyrs insectifera* and white helleborine *Cephalanthera damasonium*.

A good range of woodland bird species have been recorded including breeding tawny owl *Strix aluco* and great spotted woodpecker *Dendrocopus major*.

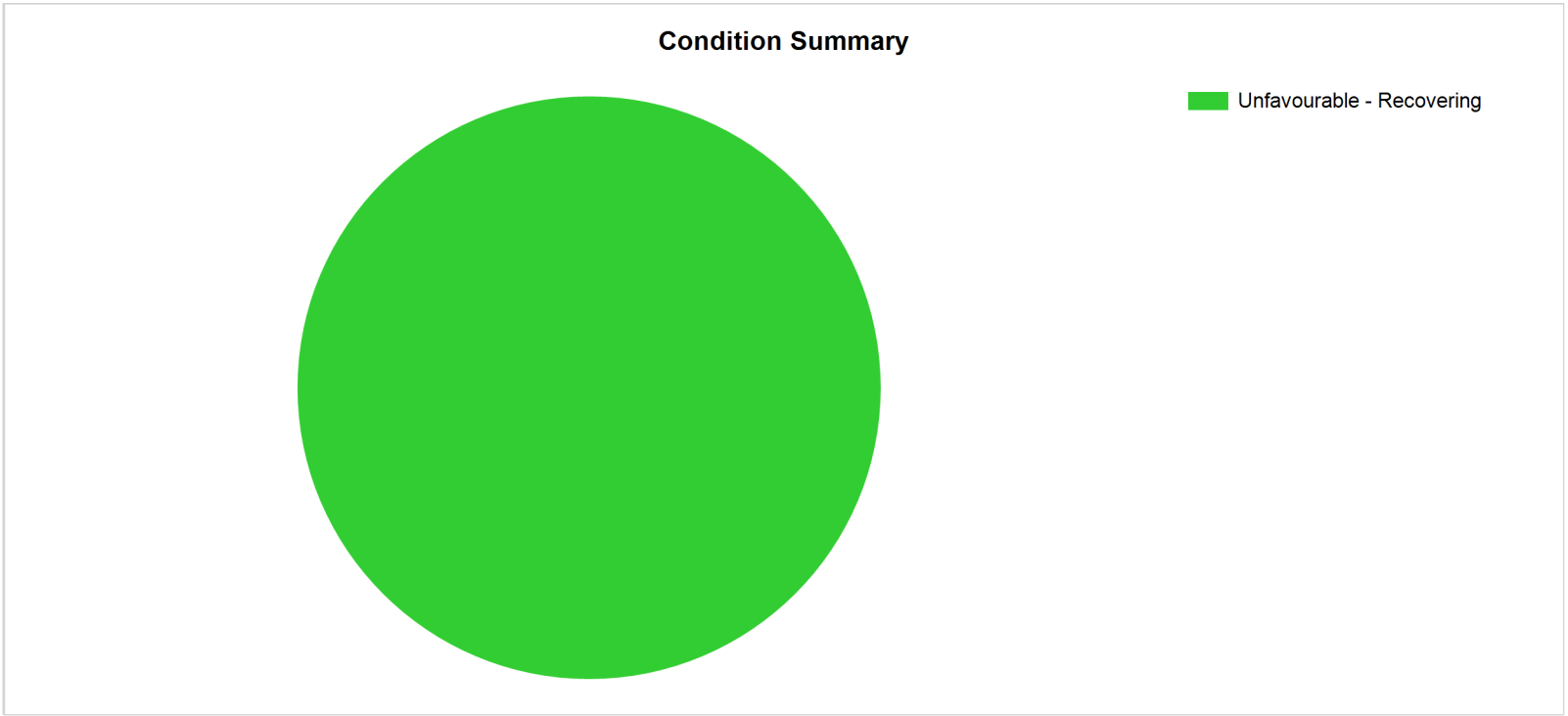
Appendix 11: Condition summary from Natural England's website for Tring Woodlands SSSI

Site: Tring Woodlands SSSI

Report generated on: 26 Sep 2020

	Sites	Units	Units Assessed
Total number	1	1	1
Total area (ha)	24.19	24.19	24.19

	% meeting area of favourable or unfavourable recovering	Favourable	Unfavourable - Recovering	Unfavourable - No change	Unfavourable - Declining	Partially destroyed	Destroyed	Not Recorded
Area (ha)	24.19		24.19					
Percentage	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%


Condition Summary
Unfavourable - Recovering

Appendix 12: Condition assessment from Natural England's website for Tring Woodlands SSSI

Condition of SSSI Units for Site Tring Woodlands SSSI

See the SSSI glossary (SSSIglossary.aspx) for an explanation of terms.

Report generated on: 12 Nov 2020

Main Habitat	Responsible Officer	Unit Number	Unit Id	Area (ha)	NNR Overlap Area (ha)	Latest Assessment Date	Assessment Description	Comment	Adverse Condition Reasons
Tring Woodlands SSSI - HERTFORDSHIRE (DACORUM)									
BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	ANDREW MILLS	001	1005030	24.1926	0.00	16/09/2009	Unfavourable - Recovering	Overall, still below FC targets for temporary open space, regeneration targets and canopy composition. No loss of extent of ancient woodland and semi-natural stands or veteran trees. Structure: 80-90% canopy cover with 5-10% open space, chiefly provided by rides. Over three age classes present although beech saplings and young coppice poles are rare. Understorey covers c20% of wood, with diverse mix of shrubs (eg. privet, dogwood, holly, hawthorn)including coppice (eg. hazel). Composition: 5-10% cover of undesirable tree species (Sycamore, Hazel & Larch) require continued thinning. Otherwise good mix of tree species with c30% Beech canopy cover in core escarpment areas, alongside Ash as major supporting canopy tree. Large veteran Beeches and boundary coppice trees (eg. cherry). Quality: Ground flora representative of W12 & W14 and key species Wood Barley & Lesser Hairy Brome recorded on site. Regeneration: Beech - rare, Ash - freq, Sycamore & Hawthorn - occ. Hawthorn	

Appendix 13: Operations likely to damage the special interest features at Tring Woodlands SSSI

Operations likely to damage the special interest

Site name: Tring Woodlands

OLD1001430

Ref. No.	Type of Operation
2	The introduction of, and changes in, a grazing regime, (including type of stock or intensity or seasonal pattern of grazing and cessation of grazing).
3	The introduction of, and changes in, stock feeding practice.
6	Application of pesticides, including herbicides (weedkillers).
7	Dumping, spreading or discharge of any materials.
8	Burning.
9	The release into the site of any wild, feral or domestic animal*, plant or seed.
10	The killing or removal of any wild animal*, including pest control.
11	The destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, moss, lichen and leaf-mould.
12	Tree and/or woodland management+.
14	The changing of water levels and tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes).
20	Extraction of minerals, including topsoil and subsoil, chalk and lime.
21	Construction, removal or destruction of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables, above or below ground.
22	Storage of materials.
23	Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling.
26	Use of vehicles or craft likely to damage or disturb the woodland and its flora and fauna.
27	Recreational or other activities likely to damage woodland and its flora and fauna.
28	Introduction of, game and waterfowl management and hunting practices.

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* 'animal' includes any mammal, reptile, amphibian, bird, fish or invertebrate.

\+ including afforestation, planting, clear and selective felling, thinning, coppicing, modification of the stand or underwood, changes in species composition, cessation of management.

Appendix 14: Views about management: a statement of Englisg Nature's views about the management of Tring Woodlands SSSI, 2003

ENGLISH NATURE

Views About Management

A statement of English Nature's views about the management of Tring Woodlands Site of Special Scientific Interest (SSSI).

This statement represents English Nature's views about the management of the SSSI for nature conservation. This statement sets out, in principle, our views on how the site's special conservation interest can be conserved and enhanced. English Nature has a duty to notify the owners and occupiers of SSSI of its views about the management of the land.

Not all of the management principles will be equally appropriate to all parts of the SSSI. Also, there may be other management activities, additional to our current views, which can be beneficial to the conservation and enhancement of the features of interest.

The management views set out below do not constitute consent for any operation. English Nature's written consent is still required before carrying out any operation likely to damage the features of special interest (see your SSSI notification papers for a list of these operations). English Nature welcomes consultation with owners, occupiers and users of the SSSI to ensure that the management of this site conserves and enhances the features of interest, and to ensure that all necessary prior consents are obtained.

Management Principles

There may be several different ways in which the wood can be managed to best conserve its value for wildlife - by promoting an appropriate woodland structure, by ensuring regeneration and by looking after the things that make this wood special. The attached notes give broad views on a range of regimes that may be appropriate on your site.

A diverse woodland structure with some open space, some areas of dense understorey, and an overstorey of more mature trees (which may be the standard trees under a coppice-with-standards regime) is important. A range of ages and species within and between stands is desirable.

Some dead and decaying wood such as fallen logs, old hollow trees or old coppice stools is essential for providing habitats for fungi and dead wood invertebrates. Work may, however, be needed to make safe dangerous trees where they occur in areas of high public access.

Open spaces, either temporary gaps created by felling or coppicing or more permanent areas such as rides and glades, benefit other groups of invertebrates such as butterflies. They should be of sufficient size to ensure that sunny conditions prevail for most of the day. Rides and glades may require cutting to keep them open.

Felling, thinning or coppicing may be used to create or maintain variations in the structure of the wood, and non-native trees and shrubs can be removed at this time. To avoid disturbance to breeding birds the work is normally best done between the beginning of August and the end of February. Work should be avoided when the ground is soft, to prevent disturbing the soil and ground flora. Wet woodland by streams and other waterbodies is often best left undisturbed. Normally, successive felling, thinning or coppicing operations should be spread through the wood to avoid too much disturbance in one area. However, where there is open space interest (e.g. rich butterfly populations) adjacent plots may be worked to encourage the spread of species that are only weakly mobile.

Natural regeneration from seed or stump regrowth (as in coppice) is preferred to planting because it helps maintain the local patterns of species and the inherent genetic character of the site.

Deer management and protection from rabbits or livestock are often necessary. Whilst light or intermittent grazing may increase woodland diversity, heavy browsing can damage the ground flora and prevent successful regeneration.

Parts of the wood may be left unmanaged to benefit species that do best under low disturbance. In addition, lack of management allows for the operation of natural processes such as windblow. Within these areas some trees will eventually die naturally and dead wood accumulate.

Where they are a threat to the interest of the wood, invasive introductions such as sycamore, *Rhododendron ponticum* or cherry laurel should, where practical, be controlled.

National Trust

National Trust reports for the Ashridge Estate

Ecological reports

Appendix 15: A survey of Saproxylic coleopteran (and other invertebrates) of selected areas of Ashrudge Estate, 2017

A SURVEY OF SAPROXYLIC COLEOPTERA (AND OTHER INVERTEBRATES) OF SELECTED AREAS OF THE ASHRIDGE ESTATE, HERTFORDSHIRE & BUCKINGHAMSHIRE

A report commissioned by the National Trust

A. P. Foster

2017

CONTENTS

1 SUMMARY

This report provides a reassessment of the saproxylic[1] beetle (Coleoptera) assemblages at the National Trust (NT) Ashridge property, based on field work conducted within some areas of the estate during 2017. It also compares the results with previous studies from the wider estate, with the objective of assessing the current condition and significance of the saproxylic invertebrate fauna, and considers management that will aid the conservation of wood-decay habitats and their associated fauna in the future.

Brief observations on other saproxylic invertebrates, other arboreal species, and invertebrates from other habitats are also provided.

1.1 Overview

- Ashridge is shown to be of high national significance for saproxylic invertebrates, and is close to qualifying for international status based on the beetle fauna – with further recording it is anticipated that this status will be achieved.
- All tree species sampled supported noteworthy wood-decay invertebrates, though oak and beech appear to be the most important resource by supporting the greatest range of saproxylic invertebrates and notable species.
- Similarly, trees in shade, partial shade, or open sunny situations all supported notable wood-decay insects, although the species composition in each situation can differ.

1.2 Saproxylic beetle assessment

- The current survey focussed on the veteran trees at Aldbury Common, along with some areas of Northchurch, Pitstone & Ivinghoe Commons, and Sallow Copse. It recorded 115 species of saproxylic beetle, of which 43 are additions to the Ashridge list (Appendix 1) and 29 have national conservation status (Table 2, p. 14), with some having highly restricted distributions in the UK.

- The veteran trees are shown to be of national significance for their wood-decay beetle fauna on the results of the 2017 survey alone, and score higher within a national context when combining these results with previous data. Furthermore, the combined data shows Ashridge to be on the cusp of attaining international significance for wood-decay beetles.

- Particularly significant species found on the veteran trees in this study are the Red Data Book (RDB) Endangered false click beetle *Eucnemis capucina* and the root-feeding beetle *Rhizophagus oblongicollis*, and another false click beetle, *Hylis olexai*, that is RDB Rare. Two more RDB, and a further 24 Nationally Notable/Nationally Scarce species were also found, and a third false click beetle, *Epiphanis cornutus,* is on the European Red List – Near

[1] Species that are dependent, during some part of their life cycle, upon dead or decaying wood (in living or dead trees, whether standing or fallen), or wood-inhabiting fungi, or on the presence of other saproxylics.

Threatened category. See Main Table of notable invertebrates (p. 35) for further information on these and other species.

- Collectively these 2017 discoveries, combined with those of previous surveys across the estate include 1 IUCN (historic record only), 10 RDB/Nationally Rare (NR) and 45 Nationally Notable/Scarce (Na, Nb & NS)[2] saproxylic beetles.

- The saproxylic beetle fauna is assessed using two established methodologies – The Index of Ecological Continuity (IEC) & the Saproxylic Quality Index (SQI). From this study 115 beetle species qualify for these analyses, resulting in an IEC score of 52 – indicating that Ashridge is easily of national significance, and SQI of 504.4 also indicating national importance. Taking the combined data for the 2017 survey with that of previous studies, 183 beetles qualify, resulting in an IEC of 76 – at the top end of the nationally important range (25-79), and close to international importance (≥80), and an SQI of 503.8, also of national significance.

- Comparing the overall scores for Ashridge with other sites of nationally, Ashridge is now ranked as 19th in the national league table of important saproxylic sites based on the IEC (previously ranked 68th), and 44th based on the SQI (previously ranked 94th). Strong emphasis need not be placed on the 'league' position, as this regularly changes with recording effort. More important is that Ashridge is of high national importance and ranks close to other sites that are renowned for their saproxylic invertebrate interest, such as Clumber Park (Nottinghamshire), Wimpole Hall (Cambridgeshire) and Calke Abbey (Derbyshire) – all NT properties, and the latter recently declared a National Nature Reserve for its wood-decay invertebrate assemblages.

- Collectively these results show that the NT Ashridge Estate is of highly significant importance for the conservation of saproxylic communities dependent on ancient/veteran trees, and is among the best sites in NT ownership.

- The overall diversity of saproxylic beetles highlights the significance of several key wood-decay habitats, such as heartrot, sapwood decay, rot holes, loose bark, bracket fungi and decaying aerial branches.

- Further analysis using Pantheon[3] shows that three key Specific Assemblage Types (SATs), which are characterised by ecologically restricted species, are represented at Ashridge: heartwood decay; bark & sapwood decay; and fungal fruiting bodies. All three support notable species here and importantly score as being in Favourable Condition.

[2] Nationally Scarce or Nationally Notable species are those recorded within 16 to 100 hectads (10 km squares) in GB and hence are of significant nature conservation importance. See p.6 and Appendix 4 for details of conservation status catgories.

[3] A database tool now in widespread use for identifying key habitat features for invertebrates and assessing their condition.

1.3 Other saproxylic interest

- Several notable wood-decay flies were recorded including the RDB Endangered smudge-winged comb-horn cranefly *Ctenophora ornata*, the Nationally Rare forest windowfly *Scenopinus niger* and two Nationally Scarce hoverflies – *Pocota personata* & *Brachyopa pilosa* (earlier studies have reported many more notable flies at Ashridge). Among the Hymenoptera (ants, bees & wasps) there were also several notable species: the brown tree ant *Lasius brunneus* (Na), and the digger wasps *Pemphredon morio* (Nb) and *Stigmus pendulus* (RDBK).

1.4 Other arboreal invertebrate interest

- Non-saproxylic interest is also represented on the trees – the Nationally Scarce Silphid beetle *Dendroxena quadrimaculata*, which is a predator of moth larvae, and the leaf beetle *Orsodacne humeralis* were recorded from Ivinghoe Common in this survey.

1.5 Records/Data

- A full list of invertebrate records (>750) from the 2017 survey is provided as a separate Excel spreadsheet.
- A species list from the current study is provided in Appendix 3.

1.6 Suggestions for further study

- Further sampling for heartrot specialists is recommended as the current data set lacks many of these species which, in view of the habitat resource available, can be expected to occur here.
- The birch fauna was relatively poorly sampled in the current study and it is suggested that further work be undertaken on decaying examples of this tree species as it may support significant interest.
- This survey focussed on Aldbury Common and some adjoining areas, whilst earlier studies by Jones (1998 & 1998) covered additional areas such as Fristhden Beeches. Consequently, other Geographic areas regarded as priorities for further sampling of saproxylics, these include Ivinghoe & Pitstone Commons, as they support many veteran trees (these Commons sampled in the current study but only superficially), likewise the southern sector of Northchurch Common. Areas dominated by sweet chestnut, e.g. Sallow Copse & Thunderdell Wood are less likely to support key saproxylic species and are considered less of a priority, although the latter is relatively poorly studied in comparison to other areas, if more uniform coverage is deemed a priority.

1.7 Key management considerations

- This, and previous surveys have shown that the veteran trees on the estate are of national significance for wood-decay invertebrates – this importance has been recognised in the SSSI designation.

- It is recommended that all the land continues to be managed sympathetically for its tree populations, which are actively conserved – a policy already in place.
- Ensure there is a continual supply of wood-decay habitat within the overall habitat mosaic - all dead and decaying wood should be retained to provide a habitat for dead wood-decay communities, subject to safety concerns.
- It is encouraging that dead wood management at the property is already sympathetic to the preservation of trees and their associated wood-decay habitats. For example, standing dead trees are being left in situ – this is especially important, as visually dead trees are full of life and can retain significant interest for long periods. There is an abundance of wood-decay habitat throughout including complete fallen specimen trees being allowed to decay naturally.
- There may be a need for sensitive tree surgery to prolong the life of some veterans – several of the largest specimens examined in the current study had shed limbs recently. These included beech and oak pollards which had split apart in high winds.
- If tree surgery works are deemed essential, then in such circumstances the possibility of tree bat roosts and nesting birds should be considered before any tree management work is carried out, and felled timber left as close to the tree of origin as possible, where displacement of deadwood is unavoidable then it should be minimal.
- Continue with the programme of haloing veteran trees that are becoming shaded by younger specimens, as excessive shading may affect tree health over the long-term, and proportionally there are relatively few open grown veteran specimens across the Commons.
- An overall aim should be to retain a continuous supply of wood-decay habitat in a variety of situations – including sun-exposed, partial shade/dappled sunlight, and full shade. Distinct invertebrate assemblages may occur in each situation, and whilst partial shade may benefit the widest variety of saproxylics, some specialise in sun-exposed trees (notably, nesting solitary bees & wasps), or shaded dead wood supporting wet rotten habitats and abundant fungi (some flies).
- As many areas are becoming shaded out by younger trees, the programme of haloing of veteran specimen trees and the creation of small glades will aid the process diversifying the wooded habitats – historically it is likely that many areas would have been more open structured under a pasture woodland system.
- Ensure provision of nectar sources – this is crucial for the adult stages of many saproxylic insects. Important nectar providing species that are frequent at Ashridge include sallow (for spring insects), hawthorn & holly (for early summer insects) and bramble (for mid-late summer insects). Many veteran hawthorns that will have been open grown in the past are now shaded out and are less-attractive to nectaring insects. In common with haloing of veteran trees it would be beneficial to halo a section of old hawthorns, again this will aid diversification of the overall habitat structure.
- Tree health should be a primary concern and any damaging activities which compromise their health avoided – activities which are potentially damaging to

mature trees include compaction of tree roots by machinery or parking of vehicles in close proximity of trees.
- The tree population dynamics should be investigated across the estate and, if necessary, be used to develop a tree recruitment plan which favours natural regeneration wherever feasible.
- Tree recruitment planning should favour both open-grown trees and some denser wooded areas.
- A programme of educational work should be developed by the Trust to ensure that everyone involved in the management of the estate is aware of the nature conservation issues, including veteran trees and their associated interests, in broad terms at least, to ensure that good practice prevails. Raising wider public awareness would also be of benefit.

2 BACKGROUND

The Ashridge NT property is located on the Chiltern Hills to the east of Tring and to the north of Berkhamsted in Hertfordshire & Buckinghamshire (ca SP91). It consists primarily of large areas of wooded common – former pasture woodland, with a few remnants of acid grassland and heath, along with unimproved calcareous and farmland in other outlying areas. The property incorporates one of the largest areas of semi-natural habitat in the Chilterns, and the outstanding nature conservation interests of the estate including considerable importance for invertebrate conservation, notably wood-decay associated species, has been recognised by Natural England in its designation as a Site of Special Scientific Interest (SSSI).

The veteran trees at Ashridge have been recorded for saproxylic invertebrates in the past, particularly the beetles (Coleoptera) and flies (Diptera): The National Trust's in-house Biological Survey Team covered the property in 1996 (Hearn et al., 1997), following this Richard Jones was commissioned to undertake saproxylic beetle surveys in 1998 & 1999 (Jones 1998 & 1999), and Peter Chandler surveyed the Diptera (Chandler, 1997).

The current survey was commissioned to further investigate the invertebrate fauna associated with the veteran trees, assess the current significance, and investigate the species associated with various tree species, and trees in differing situations – open sun-exposed, partially shade, or shaded.

Richard Allen & Peter Brash of the NT in-house Biological Survey Team were also conducting a survey at the time of this study - their work will provide more descriptive detail of habitats, information on other invertebrates, and cover a wider area of the estate.

Veteran Tree resource

During 2015 & 2016 a team of NT volunteers have documented over 900 trees across the estate. This was part of a Trust-wide ancient tree survey, which is now stored on the NT Intranet Browser. Subsequently the more notable veterans are indicated on a series of maps provided by Emily Smith - see Maps 2 A&B.

Some trees are marked with metal tags – when present, a note was made of these during field survey, though not all trees still had the tags attached. Those tag numbers are included in the species records spreadsheet.

Nomenclature

The nomenclature for the Coleoptera in this study follows Duff (2012). With other main groups conforming to: Chandler (1998) for Diptera; Bantock (2012) for Hemiptera; Archer (2004) for Hymenoptera.

Conservation status categories

At the time of earlier surveys, the UK conservation status categories for Coleoptera would have followed Hyman & Parsons (1992 & 1994). For some beetle groups those status categories still apply, but several other beetle and other invertebrate groups they have recently been (or are in the process of being) reviewed by various contractors for Natural England within the Species Status Project.

These more recent reviews follow International Union for Conservation of Nature (IUCN) threat criteria and result in the use Red List Categories - Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN) and Vulnerable (VU).

These modern reviews also re-assess the national status of species – which affects several species known at Ashridge. This has led to a number of status changes, and there has also been a change in the terminology – essentially the Red Data Book (RDB) categories of the past, of which there were several, are now under one category known as Nationally Rare (NR), and the Nationally Notable status used in Hyman & Parsons (1992 & 1994) is now equivalent to Nationally Scarce, although there no longer a distinction between categories Nationally Notable A (Na) & Nationally Notable B (Nb) – all are now Nationally Scarce (NS). The accompanying tables in this report take account of the latest changes.

For details of the various status categories and their definitions – see Appendix 4 at the end of this report.

In addition to the IUCN & national species reviews a European Red List of Saproxylic Beetles has been published (Nieto & Alexander, 2010), with Alexander (2011) highlighting species in the UK. This includes the European Red List - Near Threatened false click beetle *Epiphanis cornutus* which is present at Ashridge.

3 SURVEY METHODS

The timings of visits spanned May to October to maximise recording of species with different emergence peaks. Survey methods involved active searching & sampling, combined with the use of some invertebrate traps – see below. More survey visits were made than originally intended, because the setting and

emptying of invertebrate traps proved to be quite time consuming, resulting in 'catch-up' field search time being required. It was intended to undertake extensive sampling of hawthorn blossom (a major nectar source for many saproxylic species) but unfortunately much of the blossom was 'over' by the time of the initial visits.

Main field visits were made on the following dates:

22nd (preliminary visit)
1st, 7th & 22nd June
13th & 27th July
15th & 16th August
10th October.

Weather conditions were generally favourable during the field visits – warm, dry and sunny, although there was a moderate breeze on some visits which limited effectiveness of sampling branches, and there were heavy rain shows on 27th July.

3.1 Study area

This survey focussed on the veteran trees at Aldbury Common, the adjoining northern sector of Northchurch Common, along with parts of Sallow Copse, Pitstone & Ivinghoe Commons. A single recently fallen beech tree was also examined during the preliminary visit further to the east in Thunderdell wood.

3.2 Field survey – active searching

This involves various activities, then main ones including:

- Beating foliage and decaying branches or boughs over a white beating tray.
- Beating of nectar sources, especially flowering shrubs (notably hawthorn), over a beating tray – this can be a highly effective technique for recording many saproxylic beetles, and avoids disturbance/damage to wood decay habitats.
- Sweeping ground vegetation under and in the vicinity of veteran trees.
- Direct observation of trunks, logs, rot holes etc. for resting or active invertebrates – this is more useful when recording species that are actively visiting trees, such as bees and wasps, and some flies.
- Lifting loose bark and breaking open dead wood – although minimal use of these techniques was employed in order to avoid lasting damage to wood decay habitats.
- Examination of fungal fruiting bodies, especially bracket fungi on trees, by tapping over a tray. In some cases samples of bracket fungi were retained and beetles reared from them. Although, overall only a limited number of bracket fungi were observed or accessible for sampling.
- Collection of heartrot or other sieved material to be extracted using a Winkler extractor – see below.

3.3 Trapping techniques

A variety of trapping techniques have been developed in recent years and are employed to augment active field searching – these trapping methods normally add species which are not otherwise easy to find by field searching. A series of interception - vane & bottle traps, one yellow pan trap, a series of pitfall traps, and two underground pitfall traps were used in this study – these are summarised in Table 1 below, and their locations indicated on Maps 1 A-D.

The property is popular with the public and receives heavy use, especially during school holidays. Unfortunately, some traps were dismantled, vandalised, or even removed altogether by persons unknown, resulting in the loss of some samples. However, those remaining intact all captured saproxylic species, with the majority recording notable/significant species.

Table 1: Ashridge invertebrate traps.

Trap number Grid ref	*Tree type/situation*	*Location*	*Dates operated*
Vane Traps			
VT1 SP97901437	Oak (dead standing) /shade	Ivinghoe Common	22/5-1/6/2017
VT2a SP97841324	Sweet chestnut/partial shade	Sallow Copse	22/5-7/6/2017
VT2b SP97801326	Sweet chestnut/partial shade	Sallow Copse	7/6-13/7/2017 13-27/7/2017
VT3 SP97101213	Sweet chestnut/shade	Old Copse	22/5-1/6/2017 1-22/6/2017 22/6-13/7/2017 13-27/7/2017
VT4 SP96991208	Beech (dead standing hulk)/shade	Aldbury Common	22-1/6/2017
VT5 SP96871198	Oak (fallen)/shade	Aldbury Common	22-25/52017
VT6 SP97571188	Oak (fallen)/shade	Aldbury Common	25/5-1/6/2017 1-22/6/2017
VT7 SP96851204	Beech (snapped & fallen)/sunny	Aldbury Common	25/5-1/6/2017
VT8 SP96991209	Sallow/sunny	Aldbury Common	1-22/6/2017 22/6-13/7/2017
VT9 SP97141192	Oak/ partial shade	Aldbury Common	7/6-13/7/2017 13/7-15/8/2017 15/8-10/10/2017
VT10 SP96991196	Oak/shade	Aldbury Common	7/6-13/7/2017 13/7-15/8/2017 (trap dismantled – no catch)
VT11 SP97551193	Ash/shade	Aldbury Common	76-13/7/2017 (trap damaged but partial catch)
VT12 SP97591190	Beech/partial shade	Aldbury Common	13/7-15/8/2017 15/8/-10/10/2017
VT13	Oak/partial shade	Aldbury Common	27/7-15/8/2017

SP96991201			(trap dismantled – no catch)
VT14 SP97251194	Beech (dead standing)/shade	Aldbury Common	27/7-15/8/2017 15/8-10/10/2017
Bottle traps			
BT1 SP97591198	Beech (dead standing)/sunny	Aldbury Common	25/5-7/6/2017 7/6-13/7/2017
BT2 SP97111197	Birch/shade	Aldbury Common	13-27/7/2017 (trap missing not found – no catch)
Yellow pan trap			
YPT1 SP97851443	Beech/shade	Ivinghoe Common	25/5-7/6/2016
Pitfall traps			
PFT1 SP971120	Beech/shade	Aldbury Common	25/5-22/62017 (trap missing – no catch)
PFT2 SP97141321	Oak (fallen)/partial shade	Pitstone Common	1-7/6/2017
PFT3 SP96811179	Oak/sunny	Northchurch Common	7-22/6/2017
PFT4 SP96941180	Crab Apple/partial shade	Northchurch Common	7-22/6/2017 22/6-13/7/2017
PFT5 SP97351203	Oak/sunny	Aldbury Common	7-22/6/2017
PFT6 SP97011191	Beech (fallen)/sunny	Aldbury Common	13-27/7/2017 27/7-16/8/2017
Underground/Subterranean pitfall traps			
UPFT1 SP97011191	Beech (fallen)/sunny	Aldbury Common	7-22/6/2017 22/6-13/7/2007
UPFT2 SP97351203	Oak/sunny	Aldbury Common	15/8-10/10/2017

3.3.1 Interception Traps

Various types of interception trap are now widely used in saproxylic invertebrate surveys – suitably placed these can be highly effective in recording species which are otherwise difficult to find, especially taxa that inhabit heartrot deep within trees, or species that are primarily nocturnal. The traps have the added advantage of not damaging the dead wood habitat resource. The success (or failure) of traps in recording significant species is likely to be highly dependent on their location – the most productive locations (pers. obs.) are in close proximity to fissures, rot holes or large cavities of veteran trees.

Interception traps, otherwise known as vane traps, were operated on fifteen trees over various periods across the areas surveyed, though some were only operational for short periods – usually due to damage or ineffectiveness. Most were set on veteran oak, beech or sweet chestnut, but also one on ash and one on a large old sallow.

The traps consisted of intersecting panels of Perspex 30cm high connected through a funnel 17.5 cm diameter to a screw top collecting bottle that had 50% non-toxic propylene glycol to act as preservative. A small quantity of detergent (washing up liquid) is also added to break the surface tension, and chicken wire is placed in the funnel to prevent large twigs and other debris blocking the narrow

part of the funnel – this is also used as a precaution to avoid bats or birds falling into the trap. Flying insects hit the vanes of the trap and drop into the collecting bottle.


Examples of two vane traps – VT1 & VT2a

3.3.2 Bottle traps

Bottle traps are effectively another form of interception trap. This type of trap has been widely used by Dr Keith Alexander in other saproxylic surveys and has proved very effective in recording a variety of significant species. The four bottles are fixed to a square of wood/hardboard and hung upside down with some preservative (50% propylene glycol) in the lower section. The principle is that insects fly into the open window of the bottles and fall into the preserving liquid in the base.

A single bottle trap consisting of four partly cut-open 1 litre plastic drink bottles was operated on one beech tree for two periods in high summer. The trap was then reset on a veteran birch tree, but was unfortunately removed and not found again. The trap on the beech tree recorded several key species including the RDB3 false click beetle *Hylis olexai*, several Nationally Scarce beetles, and the digger wasps *Pemphredon morio* (Nb) and *Stigmus pendulus* (RDBk).

Bottle trap 2 on birch

3.3.3 Yellow pan trap

This is simply a shallow yellow bowl, 24cm diameter, part filled with 50% propylene glycol. A single trap was set in the hollow of a huge old beech at Ivinghoe Common and was only operated for one short period as it was capturing numbers of lesser stag beetle. It did record several notable species including the Nationally Rare forest window fly *Scenopinus niger*.

YPT1 in beech hollow

3.3.4 Pitfall traps

Pitfall traps (small cups, beakers, or pots) are sunk into the substrate with the upper rim flush with the surrounding ground – crawling invertebrates fall into the container and are retained. They are most frequently used to sample invertebrates in grassland/agricultural land, but can be useful in recording saproxylic invertebrates when placed in rot holes/cavities of veteran trees. A preservative is used to conserve the captured specimens – as with the interception traps, 50% propylene glycol, which is non-toxic. Chicken wire was also placed over the trap to prevent amphibians or small mammals from falling in.

Several pitfall traps (plastic pot 7cm diameter & 8 cm deep) were set inside rot holes, or at the base of veteran trees.

In all six pitfall traps were used, sometimes at the base of trees, sometimes set in rot holes or cavities. They varied in effectiveness. The most significant record was for the RDB Endangered root-feeding beetle *Rhizophagus oblongicollis* at the base of a huge veteran oak at Aldbury Common.

3.3.5 Subterranean pitfall traps

A pitfall trap for sampling subterranean invertebrates was devised by the late Prof. John Owen (Owen, 1995). This comprises a collecting pot set at the base of mesh tube about 40 cm below the surface of the ground, with same preservative used in surface pitfall traps. One subterranean/underground pitfall trap, originally provided to the author by John Owen, was used in two localities at Aldbury Common in the current survey: beside a huge fallen, well-rotted beech hulk (SP SP97011191) between 7th June & 13th July 2017, and at the base of a huge veteran oak (tag No. SP97361203, tag No. 0508) between 15th August & 10th October 2017.

Neither trap was particularly successful in capturing specialist subterranean species, although the one at the base of the oak did capture *Leptinus testaceus* a beetle associated with small mammal nests. Ironically, as mentioned above, a surface pitfall trap (PFT5) placed at the base of the same oak tree did record the RDB1 beetle *Rhizophagus oblongicollis* that is thought to develop in roots of ancient oaks.

3.3.6 Light trap

A Robinson mercury vapour light trap using a 125-Watt bulb was operated next to the Base Camp on the night of 15th/16th August and attracted a male of the RDB1 smudge-winged comb-horn cranefly *Ctenophora ornata*. The trap recorded a variety of woodland moths, mostly common species, though no saproxylic beetles.

3.4 Extraction samples

Samples of heartrot can be sieved and placed in Winkler Extractor – usually an effective alternative to the more familiar Tullgren Funnel method. The sieved sample is placed in small mesh bags hanging within a larger muslin bag which has a collecting bottle at the base. Invertebrates gradually move down through the

sieved samples, drop out of the mesh bags and end up in the collecting pot (Owen, 1987). No heat/light source is used (as in Tullgren funnels), so the process of desiccation of the sample is slower – though two weeks is usually sufficient to extract most invertebrates in dry warm conditions.

Example of a Winkler Extractor

A sample of heart rot from a recently split apart beech in x Wood, and some red rot from an oak at Aldbury Common were sieved and placed in Winkler Extractors. The Nationally Notable feather -winged beetle *Ptenidium gressneri* was in the beech and not recorded by other methods in this survey.

4 SAPROXYLIC INVERTEBRATE FAUNA

4.1 Coleoptera (Beetles)

This survey focussed on the saproxylic beetle fauna. Most beetles were identified to species level, the only exceptions being some examples of the small and 'difficult' groups captured in the traps. These include feather-wing beetles of the family Ptilidae and rove beetles in the subfamily Aleocharinae - there are 100s of species, most requiring dissection to confirm identity and many are generalists (eurytopic), and it is not thought that the lack of comprehensive cover from within these groups would significantly change the overall assessment of the beetle fauna. However very few were encountered and a few of them were identified anyway.

The saproxylic beetle fauna at Ashridge is of national importance – see section 4.2 below for an analysis of the beetle fauna. From the current study 115 species qualified for that analysis, among them are 43 which are additions to the Ashridge saproxylic list (see Appendix 1) and 29 that have national conservation status see Table 2 below. Some are known only from very few sites in the whole of the UK.

Table 2: Saproxylic beetles with national conservation status recorded from Ashridge in this study

Scientific Name & Conservation Status	Vernacular Name
Red Data Book – Endangered	
Eucnemis capucina	A false click beetle
Rhizophagus oblongicollis	A root feeding beetle
Red Data Book Rare	
Aulonothroscus brevicollis	
Hylis olexai	A small false click beetle
	A false click beetle
Red Data Book – Insufficiently known	
Atomaria morio	A silken fungus beetle
Nationally Notable A (Na)	
Ernoporicus fagi	A bark beetle
Stictoleptura scutellata	A longhorn beetle
Uleiota planata	A flat timber beetle
Nationally Notable B (Nb)	
Cerylon fagi	A minute bark beetle
Cis festivus	A small fungus beetle
Magdalis carbonaria	A weevil
Melasis buprestoides	A false click beetle
Poecilium alni	A longhorn beetle
Sepedophilus bipunctatus	A rove beetle
Taphrorychus bicolor	A bark beetle
Nationally Notable (N)	
Ptenidium gressneri	A feather-winged beetle
Nationally Scarce (NS)	
Aeletes atomarius	A clown beetle
Anaspis costai	A false flower beetle
Anaspis thoracica	A false flower beetle
Cicones variegatus	A cylindrical bark beetle
Dorcatoma dresdensis	A wood-borer beetle
Dropephylla gracilicornis	A rove beetle
Enicmus brevicornis	A minute brown scavenger beetle
Enicmus rugosus	A minute brown scavenger beetle
Euglenes oculatus	An ant-like leaf beetle
Orchesia micans	A false darkling beetle
Orchesia minor	A false darkling beetle
Tillus elongatus	A checkered beetle
Tomoxia bucephala	A tumbling flower beetle

Further notes on these saproxylic species are provided in the Main Table, page 35. Many other notable saproxylics have been recorded previously and these are included in Appendix 2.

Among the more significant discoveries in this survey were five RDB species, all additions to the Ashridge list: the RDB Endangered (RDB1) false click beetle *Eucnemis capucina*, known to have larvae in decaying wood or under bark; the root-feeding beetle *Rhizophagus oblongicollis*, thought to develop in the roots of ancient trees; another false click beetle, *Hylis olexai* RDB Rare (RDB3), that

develops in rotting wood, often that of beech; the small false click beetle *Aulonothroscus brevicollis* usually recorded from the decaying branches of oak and is also RDB3; and the silken fungus beetle *Atomaria morio* RDBK, often associated with bird's nests in tree cavities. A third false click beetle, *Epiphanis cornutus,* is on the European Red List – Near Threatened category. A further 27 Nationally Notable/Nationally Scarce species were also found and occupy a variety of wood-decay habitats, some of these are mentioned under habitat associations below – see section 6.

Previous studies, for example Jones (1998), have recorded several other RDB species such as the false blister beetle *Ischnomera cinerascens*, the rove beetle *Gyrophaena munsteri* and the tumbling flower beetle *Mordellistena neuwaldegianna*, the latter now downgraded to Nationally Scarce.

Several notable species reported previously were not encountered during this survey, and vice versa. This not unexpected as any invertebrate survey cannot be expected to record all species present. Even with detailed sampling effort some species are difficult to locate - due to secretive habits, e.g. confined to inaccessible habitats, such as heart rot deep within veteran trees. Others may be nocturnal and not usually encountered by day sampling, and there are also natural 'ebb & flows' in abundance of individual species. Vane, and other, trapping techniques help to record some of these species, but a complete inventory of the invertebrate fauna is not practical.

In view of the habitat resource witnessed in this study, it is considered likely that species recorded previously in other areas of the estate, such as Frithsden Beeches, will also occur within current study area.

4.2 Assessment of saproxylic interest based on Coleoptera

Two systems developed for assessing the significance of the saproxylic interest of veteran trees, based on the recorded beetle fauna, are The Index of Ecological Continuity (IEC) and the Saproxylic Quality Index (SQI).

Full lists of the qualifying species, their conservation status, rarity & IEC scores are provided in Appendix 2.

4.2.1 Index of Ecological Continuity (IEC)

For many years this scoring system has been used to assess the significance of saproxylic interests at sites, originally using the list of beetles provided in Harding & Rose (1986). These beetles are regarded as being largely restricted to, or collectively indicative of, ancient woodland systems and were divided into three categories (1, 2 or 3) - those in category 1 regarded as the most reliable indicators, whilst those in 3 are most often associated with ancient woodlands but also occur more widely. The majority of these species are scarce and localised in a national context. Alexander (1988) proposed a scoring system whereby category 1 species score 3 points, category 2 score 2, and category 3 score 1.

Alexander (2004) has revised the list of qualifying beetles - 180 species in all are included, which incorporates additions and deletions from the original 1986 list of species, along with changes in scores for various species – this is the current IEC.

Alexander (2004) regards scores of 15-24 as of regional significance, 25-79 of UK importance, and 80 or more of international importance for the saproxylic beetle fauna.

4.2.2 Saproxylic Quality Index (SQI)

Fowles (1997) proposed a scoring system based on a wider range of beetle species. This takes account of common as well as rarer saproxylics and may be applied to a wider range of woodland systems. This has subsequently been refined by Fowles *et al.* (1999) and is based on the national rarity status of each species, here a geometric rarity scoring system (1,2,4,8,16, 24 & 32) is used - the most common species scoring 1 point whilst the rarest scoring 32, thus much greater weight is placed on the occurrence of an assemblage of scarce species. 598 species in all are included. Fowles *et al.* (1999) point out that a threshold of 40 or so qualifying species are required in order to employ this scoring system – easily met from the 2017 study, and by combining those results with previous data.

Fowles et al (1999) suggest that an SQI of 500 is probably an appropriate threshold for assessing national importance. However, very few sites nationally attain this score, and Alexander (2006) has pointed out that many sites which are nationally famous for their saproxylic beetles have SQI figures in the 300s and 400s, suggesting that this threshold of 500 or more seems to be set too high. A threshold of 400 may be more realistic.

A summary of the IEC & SQI scores from the 2017 study, and those from combining with previous data for the whole property are presented in Table 3 below.

Table 3: The SQI & IEC scores for Ashridge.

Survey	No. SQI species*	SQI	No. IEC species	IEC**
Ashridge 2017 survey	115	504.4	Grade 1 = 5 Grade 2 = 8 Grade 3 = 21 Total = 34	52
Ashridge All records	183	503.8	Grade 1 = 5 Grade 2 = 12 Grade 3 = 37 Total = 54	76

* qualifying threshold = 40
** ≥15 Regional importance, ≥ 25 National importance, ≥ 80 International Importance

Based on IEC the 2017 survey results alone show that Ashridge rates as easily within the nationally significant range, and combining those results with all other available data the score rises to 76 – just short of internationally significant. With

further recording it is anticipated that an internationally significant rating would be achieved.

Based on SQI, the scores from 2017 and the combined data are remarkably similar, with both rating as nationally significant.

4.3 National rankings based on Coleoptera

National rankings of 203 sites can be viewed at http://khepri.uk/main. Based on the table available there (accessed 12/11/2017), the current rankings for Ashridge have been added to the tables below using the SQI & IEC scores – the updated rankings indicated in red, and previous ranking in blue. The top ten national sites and selected other sites with scores near to those of Ashridge are presented.

Based on the IEC (Table 4) the ranking for the 2017 survey data is 41st and on a par with other important sites for wood-decay species such as Staverton Park (Suffolk) and Petworth Park (Sussex). Whilst the updated combined score for the 2017 survey along with all previously available records is 19th and on a par with other key NT sites such as Wimpole Hall (Cambridgeshire) & Clumber Park (Nottinghamshire), and just above Calke Abbey (Derbyshire) which is designated as an NNR for saproxylic interests. The previous ranking was lower at 68th.

Based on SQI (Table 5) the scores for both the 2017 survey and combined data are almost identical, and the national rankings lower – 44th for both. However, scores over 500 and are of national importance. The previous ranking was lower at 94th.

Table 4: National ranking by IEC
Based on table available at http://khepri.uk/main/ on 12 Nov. 2017

Rank	***Site***	***No of qualifying species***	***SQI***	***IEC***
1	Windsor Forest, Berkshire	364	850.0	251
2	New Forest, Hants	326	857.1	207
3	Richmond Park, Surrey	254	709.4	153
4	Bushy Park & Home Park, Middlesex	255	707.5	152
5	Moccas Park, Herefordshire	240	632.9	137
6	Hatfield Forest, North Essex	232	686.2	131
7	Epping Forest, South Essex	255	599.6	128
8	Bredon Hill, Worcestershire	140	849.3	115
9	Langley Park, Buckinghamshire	153	777.8	115
10	Richmond Park, Surrey	205	575.6	110
17	Grimsthorpe Park, South Lincolnshire	149	519.5	77
18	Clumber Park, Nottinghamshire	153	462.7	77
19	Wimpole Hall, Cambs	176	577.8	76
	Ashridge, Hertfordshire (2017 + previous data)		**503.8**	**76**
20	Stanford PTA, West Norfolk	184	487.0	74
21	Calke Abbey, Derbyshire	166	451.8	74

40	Arundel Park, West Sussex	131	543.5	54
41	The Mens, West Sussex	140	475.7	54
	Ashridge, Hertfordshire (2017 data)		**504.4**	**52**
42	Staverton Park, Suffolk	106	473.6	51
43	Petworth Park, Sussex	142	437.3	49
68	**Ashridge, Hertfordshire (previous ranking)**	**93**	**393.5**	**37**
203	Melton Wood, Yorkshire	49	193.9	3

Table 5: National ranking by SQI
Based on table available at http://khepri.uk/main/ on 12 Nov. 2017

Rank	***Site***	***Number of qualifying species***	***SQI***	***IEC***
1	New Forest, Hants	326	857.1	207
2	Windsor Forest, Berkshire	364	850.0	251
3	Bredon Hill, Worcestershire	140	849.3	115
4	Langley Park, Buckinghamshire	153	777.8	115
5	Richmond Park, Surrey	254	709.4	153
6	Bushy Park & Home Park, Middlesex	255	707.5	152
	Croome Park Estate, Worcestershire	**177**	**699.7**	**109**
7	Hatfield Forest, North Essex	232	686.2	131
8	Silwood Park, Berkshire	159	685.5	90
9	Longdon Marsh, Worcestershire	57	668.4	36
10	Moccas Park, Herefordshire	240	632.9	137
41	Ebernoe Common, West Sussex	142	510.6	56
42	Eastnor Park, Herefordshire	93	508.6	57
43	Forest of Bere, Hants	109	505.5	39
	Ashridge, Hertfordshire (2017 data	**115**	**504.4**	**52**
	Ashridge, Hertfordshire (2017 + previous data)	**183**	**503.8**	**76**
44	Hatchlands Park, Surrey	165	503.6	73
45	Pamber Forest, Hants	53	498.1	24
94	**Ashridge, Hertfordshire (previous ranking)**	**93**	**393.5**	**37**
203	Melton Wood, Yorkshire	49	193.9	3

4.4 Other saproxylic invertebrate groups

As well as recording Coleoptera observations were made on other invertebrate groups associated with veteran trees. This resulted in recording of several flies (Diptera), including one RDB, one Nationally Rare and a few Nationally Notable/Scarce species, the Nationally Notable brown tree ant, and two Nationally Notable wood-nesting digger wasps.

4.4.1 Mollusca (slugs & snails)

No notable molluscs were recorded during the current study though Hearn et al. (1997) report the lemon slug *Limax tenellus* from Aldbury Common – it is a species of ancient woodland and wood pastures and feeds on bracket fungi on trees.

4.4.2 Diptera (Flies)

A male of the RDB1 (Endangered) smudge-winged comb-horn cranefly *Ctenophora ornata* was attracted to a light trap operated just behind the Base Camp and undoubtedly emerged from a nearby veteran tree, probably beech with which it is most frequently associated.

Smudge-winged comb-horn cranefly

Also found in the survey was the forest window fly *Scenopinus niger,* which has Nationally Rare status in Drake (2017), a single example was captured in a yellow pan trap located inside of a hollow veteran beech at Ivinghoe Common (next to the tree with *Pocota* - see below), and a second example seen at a dead standing beech at Aldbury Common. The larvae of this fly are thought to be predators on wood-borer beetles.

Active field searching recorded two Nationally Scarce hoverflies. A single female *Pocota personata*, a bumble bee mimic, was seen investigating a large hollow of a veteran beech at Ivinghoe Common. The larvae develop in wet rot holes, and until recently it had RDB status, but was regraded to Nationally Scarce by Ball & Morris (2014), nevertheless it seems to be restricted to ancient woodland and wood-pasture situations. The second Nationally Scarce hoverfly is *Brachyopa pilosa* – several adults on a cut birch stump, again at Ivinghoe Common, that was exuding sap – the larvae develop in sap.

Pocota personata

Other more widespread, but significant, hoverflies were also recorded. *Brachypalpus laphriformis* occurred fairly widely in the survey, usually seen investigating rot holes or fissures on oaks, but was also captured in a vane trap on sweet chestnut. Until recently this species had Nationally Notable status, but was downgraded by Ball & Morris (2014). Nevertheless, most records are from ancient woodland/pasture woodland sites, and it is frequently associated with high quality sites (pers. observation.). Other hoverflies observed in the study include a single example of the locally distributed hoverfly *Criorhina floccosa* was seen investigating the base of a huge veteran beech at Ivinghoe Common - it has larvae developing in rot holes and other soft wood-decay situations. Also recorded in the survey were the more common and widespread saproxylic hoverflies *Myathropa florea*, *Xylota segnis* & *X. sylvarum.*

Chandler (1997) studied several areas of Ashridge for Diptera, including Aldbury Common (he also sampled at Frithsden Beeches & The Coombe). At Aldbury Common he noted that important features were the rows of pollards along the boundaries, old beeches well distributed throughout the remaining parts, and with old birches providing an important habitat for some species in the south-western part of the site. Whilst Aldbury Common did not support the highest number of species (134) in his study, it did support the highest number of saproxylics (39) along with a good number of fungus associated species. This was the most productive site for Syrphidae during the survey, eight saproxylic species recorded. The craneflies and fungus gnats were also well represented, although less so than at Frithsden Beeches or The Coombe. Overall 4 RDB and 10 Nationally Notable species were recorded at Aldbury.

The four RDB species were: *Acartophthalmus bicolor* (Acartophthalmidae), RDB3 - several of both sexes were found running about on caps of a colony of *Pleurotus* on fallen beech branches, it is usually found on rotting fungi but sometimes on carrion; *Eustalomyia hilaris* (Anthomyiidae) RDB3. - found on the beech stump; *Elodia ambulatoria* (Tachinidae) RDB3 - found on fresh *Bjerkandera adusta* fungus on the same stump, this fly has larva that are parasitic on moth larvae in fungi; and *Amiota subtusradiata* (Drosophilidae) RDBK - found around a fallen beech.

At the time of his 1997 survey ten Nationally Notable species were found at Aldbury, although three hoverflies, *Didea fasciata, Brachypalpus laphriformis* & *Volucella inflata*, have subsequently been removed from that listing by Ball & Morris (2014). The former is not a saproxylic, though the other two are and locally distributed and usually associated with ancient wooded sites. The former was observed widely in the 2017 survey, although the latter was not seen – it has larvae in sap runs. The seven remaining Nationally Notable species include the hoverfly *Xylota xanthocnema* which has larvae in rotting wood, and several flies associated with fungoid growth on dead wood.

4.4.3 Hemiptera (Bugs)

Very few bugs can be considered truly saproxylic, but there are various species that live under bark. One such species, the flat bark bug *Aradus depressus* was recorded from a veteran crab apple at Northchurch Common.

4.4.4 Hymenoptera (Ants, bees & wasps)

The Nationally Notable brown tree ant *Lasius brunneus* was encountered in most areas sampled but usually in only fairly low numbers, except on one beech which clearly supported a large colony. Nowadays this species is more widespread and frequently encountered than in the past, so it may no longer warrant Nationally Notable conservation status. However, it requires large old trees with heartrot in which to establish colonies, is certainly locally distributed, and usually occurs at sites of significant nature conservation interest. Colonies of this ant are also known to support a variety of scarce or threatened saproxylic beetles, and whilst none were found in this survey, their occurrence should not be discounted.

Dead standing trees in open sunny situations are often of value to nesting solitary bees and wasps, and several suitable trees were sampled/examined in this survey. One of the best examples is the dead standing beech hulk at Aldbury Common with bottle trap 1. This recorded the Nationally Notable digger wasp *Pemphredon morio*, along with *Stigmus pendulus*, a solitary wasp that currently has RDB Insufficiently known status, though this may change as it appears to be more widespread than previously thought.

Hornets *Vespa crabro* were seen on a several occasions, and often nest in tree cavities.

4.4.5 Araneae (Spiders)

Few spiders are truly saproxylic, but *Nuctenea umbratica* (a relative of the familiar orb-web/garden spiders) lives under bark and is closely associated with decaying timber - it was frequently encountered during the current survey and is common and widespread nationally.

5 PANTHEON ANALYSIS

Pantheon is a database tool developed by Natural England and the Centre for Ecology & Hydrology to analyse invertebrate sample data (Webb et. al., 2017). It is an online tool designed to provide a consistent and standardised approach to the assessment of the conservation importance of a sample or site. Users import lists of invertebrates into Pantheon, which then analyses the species, attaching associated habitats and resources, conservation status and other codings against them. This information can then be used to assign quality to sites, assist in management decisions and augment other ecological study. Not all the macro-invertebrate taxa are currently included in the database - to date it includes about a quarter of the total macro-invertebrate fauna (just under 12,000 species), and focuses on species primarily found in England. However, it is now in widespread use for identifying key habitat features for invertebrates and assessing their condition. More information is provided by Heaver et al. (2017).

Essentially two levels of habitat classification are used: Broad Assemblage Types (BATs) - a comprehensive series of assemblage types that are characterised by more widespread species; and Specific Assemblage Types (SATs) which are characterised by ecologically restricted species and are generally only expressed in lists from sites with conservation value.

Using the data from the current survey, within the Decaying Wood BAT, three SAT types are represented at Ashridge: heartwood decay; bark & sapwood decay; and fungal fruiting bodies. All three support notable species here and a summary of the Pantheon analysis is provided in the table below. Importantly, all three SATs score as being in Favourable Condition based on data from this 2017 survey. Clearly, further analysis using all data from Ashridge would increase the scores significantly.

Table 6: Summary of Pantheon Analysis for Ashridge from 2017 survey

SAT Code	SAT Name	No. species present	% of national fauna	No. of sp. with Conservation Status*	Condition**
A 211	Heartwood decay	33	19	16	Favourable
A 212	Bark & sapwood decay	67	13	19	Favourable
A 213	Fungal fruiting bodies	19	21	5	Favourable

* Takes account of recent status revisions. Status definitions are provided in Appendix 4 at the end of the report.
**A minimum of 15 species is generally required to provide a reliable assessment – met in all three SATs here.

Lists of the notable species recorded from each of the three SATs in 2017 are provided below with comments on some of these, and other, species is included in the following section of the report.

A 211 SAT - Heartwood Decay Notable Species

Beetles
Aeletes atomarius NS

Anaspis thoracica	NS
Atomaria morio	RDBK
Aulonothroscus brevicollis	RDB3
Epiphanis cornutus	European NT
Eucnemis capucina	RDB1
Euglenes oculatus	NS
Hylis olexai	RDB3
Ptenidium gressneri	N
Stictopleura scutellata	Na
Tillus elongatus	NS
Tomoxia bucephala	NS

Flies

Ctenophora ornata	RDB1
Pocota personata	NS
Scenopinus niger	NR/NT

Ants

Lasius brunneus	Na

(another 17 less notable species in the dataset fall into this category)

A 212 SAT – Bark & Sapwood Decay Notable Species

Beetles

Anaspis costai	NS
Cerylon fagi	Nb
Cicones variegatus	NS
Cryptarcha strigata	Nb
Dropephylla gracilicornis	N
Enicmus brevicornis	N
Enicmus rugosus	N
Ernoporicus fagi	Na
Magdalis carbonaria	Nb
Melasis buprestoides	Nb
Poecilum alni	Nb
Rhizophagus oblongicollis	RDB1
Taphrorychus bicolor	Na
Tetratoma desmarestii	NS
Uleiota planata	Na
Xyleborus dryographus	Nb

Flies

Brachyopa pilosa	NS

Solitary wasps

Pemphredon morio	Nb
Stigmus pendulus	RDBK

(another 48 less notable species in the dataset fall into this category)

A 213 SAT – Fungal Fruiting Bodies Notable Species

Beetles

Cis festivus	Nb
Dacne rufifrons	Data Deficient (DD) (Europe)
Dorcatoma dresdensis	NS
Orchesia micans	NS

Orchesia minor NS

(another 14 less notable species in the dataset fall into this category)

6 KEY SAPROXYLIC HABITATS

6.1 Heartrot

Heartrot can be broadly divided into three types:

- red (or brown) rot caused by sulphur polypore and beefsteak fungus, and is the familiar cuboid crumbly rot found in veteran oak trees;
- white rot caused by other fungi such as *Ganoderma* species and *Inonotus hispidus* (especially on ash), this type of rot is less common in oak and more familiar in other trees such as beech, ash and lime;
- and wood mould, a term used to describe the material which accumulates in the base of cavities and hollow trunks resulting from fungal decay of the woody tissues.

Heart-rotting bracket fungi are highlighted by Alexander (1999b) as keystone species - they are crucial in forming the various types of heartrot in trees. A habitat that supports some of the most threatened and scarce saproxylic invertebrates in the UK, and a habitat resource that cannot be quickly replaced as it is generally restricted to ancient/veteran trees. Certain invertebrates are also associated with the various bracket fungi fruiting bodies – see section 6.3 below.

Pantheon assigns 33 species in the dataset to the heartwood decay SAT – 19% of the allocated national fauna, the sixteen notable species are listed above. Some are primarily associated with red rot, some with white rot and others with wood-mould.

6.1.1 Red rot associates

This type of rot is common in veteran oaks and is well represented in the oaks at Ashridge, but is not always readily accessible for easy sampling. Nevertheless, adult beetles do disperse and can occasionally be recorded from tree foliage and nearby vegetation; otherwise sampling relies on the red rot being exposed through damage to a tree and sieving searching through the material, or via the use of vane traps. Other trees supporting this habitat here included sweet chestnut and birch.

Example of a red rot hollow, from a split apart oak – the one with vane trap 9

Surprisingly few red rot associates were recorded in this survey but did include several notable species that are most frequently associated with this habitat. The RDB3 small false click beetle *Aulonothroscus brevicollis* at Aldbury Common – though actually recorded from a veteran beech, the Nationally Scarce ant-like beetle *Euglenes oculatus* from Aldbury Common, and the fungus beetle *Mycetophagus piceus* from Ivinghoe Common, though recently removed from Nationally Scarce listing, it has a very localised in distribution. Other beetles normally recorded from red rot include the wood-borer beetles *Dorcatoma chrysomelina* & *D. flavicornis* which are curiously absent from the dataset – they often occur in large numbers in suitably placed vane traps. Similarly, scarce heartrot click beetles have not been reported from Ashridge, though their occurrence should not be ruled out - it is perhaps surprising that none are known here so far.

The Nationally Notable brown tree ant *Lasius brunneus* that nests in hollow trees, often red rot habitats in veteran oaks, was widespread in the current survey, albeit in surprisingly low numbers overall.

6.1.2 White rot associates

White rot occurs widely at Ashridge, especially in the veteran beeches - many of these trees support an abundance of *Ganoderma* brackets, and ash will also be an important resource for this habitat, although there are relatively few veteran ash present at Ashridge. The associated invertebrate fauna is well-represented here. Among the more notable are the RRDB1 smudge-winged comb-horn cranefly, the RDB1 false click beetle *Eucnemis capucina,* and the RDB3 false click beetle *Hylis olexai*. More widespread and frequent species including lesser stag beetle *Dorcus parallelipipedus,* rhinoceros beetle *Sinodendron cylindricum,*

and the small clown beetle *Plagaderus dissectus*, all most frequently found in white rot situations.

6.1.3 Wood mould

An example of wood-mould species is the darkling beetle *Prionychus ater*, the larvae being predators of other invertebrates - it was recorded from the dead standing beech with bottle trap 1 at Aldbury Common, and is very localised nationally.

6.2 Sapwood decay

Pantheon assigns 67 species in the dataset to the Sapwood decay SAT – 13% of the allocated national fauna, the 19 more notable species are listed in Section 5 above. They inhabit a variety of situations - some are wood-borers, some feed on encrusting fungoid growth, on or under bark, and some are predators of other invertebrates, they may also be associated either with smaller branches or main trunks. Sapwood often forms the hard dead wood, familiar on dead standing oaks especially when loose bark has fallen away, and some beetles bore into this sapwood, and for some species there is a link between the bark being attached and intact on the sapwood.

Species boring into the sap wood include the Nationally Notable bark beetles *Ernoporicus fagi, Taphrorychus bicolor* and *Xyleborus dryographus.* The former two most frequently associated with beech, the latter on oak and sweet chestnut. Also present is the locally distributed ambrosia beetle *Trypodendron domesticum*, it too bores into sap wood.

One of the most familiar species is the formerly notable oak jewel beetle *Agrilus biguttatus* that has distinctive ‘D’ shaped exit holes. The adult beetle is rarely seen, but the exit holes can be abundant and obvious and were present on one of the oaks on the edge of the large open area south of the visitor centre – the beetle requires sun-exposed trees in open situations.

Local species living under bark include the flat timber beetle *Uleiota planata* whilst currently graded at Na it is unlikely to qualify in view of an apparent spread and increase in records recently), *Silvanus unidentatus*, and the black-headed cardinal beetle *Pyrochroa coccinea*. The latter has undoubtedly become more common and widespread recently – the large larvae were found under bark on several trees, they feed on other invertebrates.

6.3 Fungal fruiting bodies

Bracket fungi are important in forming various types of heartrot in trees (See 6.1 above), a habitat that supports a large variety of specialist invertebrates, but certain invertebrates are also associated with the various bracket fungi fruiting bodies.

Pantheon assigns 17 species in the dataset to the heartwood decay SAT – 19% of the allocated national fauna, the 5 notable species are listed in Section 5 above.

Other than *Ganoderma* brackets that were frequent on the veteran beeches and *Piptoporus betulinus* that was frequent on birch, relatively few bracket fungi were encountered during the survey even during the October visit. Although a few examples of the following were seen - beef steak fungus *Fistulina hepatica* on oak, a few ashes had shaggy bracket *Inonotus hispidus*, dryads saddle *Polyporus squamosus* on beech, and sulphur polypore *Laetiporus sulphureus* on a dead cherry.

Some beetles have a particular association with certain bracket fungi, and among those present at Ashridge are Nationally Scarce false darkling beetle *Orchesia micans*, that has larvae in shaggy bracket. With other locally distributed species including the darkling beetle *Eledona agricola* on sulphur polypore (formerly Nationally Notable but removed from that list (Alexander et al., 2014) and the Nationally Scarce wood-borer beetle *Dorcatoma dresdensis* and the small fungus beetle *Cis castaneus (= nitidus)* in *Ganoderma* species.

Various locally distributed species are also recorded including *Dacne rufifrons* – whilst this species has no conservation status in the UK (it is fairly widespread and not uncommon) it has been included on the European Red List as Data Deficient, so UK populations may have some European significance.

6.4 Other habitats – sap runs, bird nests in cavities, rot holes/hollows, and subterranean root decay

These habitats fall within the heartrot decay and sapwood decay SATs of Pantheon, but are worth mentioning separately as they can support distinctive invertebrate assemblages. Even though no especially significant assemblages were encountered from these situations in the current study, some notable species were recorded and there is scope for other specialist species to occur.

Only a few active sap runs were encountered during the current survey, though the bark on a few oaks appeared to be stained from previously active sap runs. They can support a distinctive fauna, including scarce or threatened species, notably Diptera and certain Coleoptera, especially in the family Nitidulidae (sap beetles). Nationally Scarce sap run species recorded were the sap beetle *Cryptarcha strigata* by beating hawthorn blossom at Ivinghoe Common, and adults of the hoverfly *Brachyopa pilosa* seen on a cut birch stump exuding sap, again at Ivinghoe Common. Other species of *Brachyopa* that also breed in sap have been reported from the property in the past.

Bird nests in trees can support a distinctive invertebrate fauna and several species were recorded. Most notable is the silken fungus beetle *Atomaria morio* that was present in vane trap 9 set high up in a red rot cavity on huge old oak by the Aldbury Road (SP97141192). There was clear evidence of an old bird nest within the cavity and two other locally distributed beetles frequently associated with this habitat were also present – the scarab *Trox scaber* and the clown beetle

Dendrophilus punctatus. A further species, the local rove beetle *Bisnius subuliformis*, was present in vane trap 11 set by a rot hole on ash.

Rot Holes, especially those with wet substrates, can be especially important to saproxylic Diptera (flies) with a variety of hoverflies associated with this habitat. The RDB1 smudge-winged comb-horn cranefly has been reared from porridge-like wet wood mould in decaying beech. Whist hoverflies associated with rot holes include the Nationally Scarce bumble bee mimic hoverfly *Pocota personata*, and *Criorhina floccosa,* both were observed at Ivinghoe Common investigating rot holes in veteran beech trees.

The subterranean root-decay fauna is difficult to sample, usually requiring the use of underground pitfall traps. One particularly notable beetle the RDB – Endangered root-feeding *Rhizophagus oblongicollis* was found at the base of a veteran oak at Aldbury Common.

6.5 Dead standing trees

This is a rather broad category, which may encompass most, if not all, of the above habitats, but is perhaps most relevant to some non-beetle groups, such as solitary bees & wasps – which may nest in fissures and old vacated beetle exit holes favouring open, sun-exposed trees in relatively warm situations.

Among the solitary wasps recorded are *Stigmus pendulus* and *Pemphredon morio* both from the same tree – the dead standing beech with bottle trap 1 (see photo below). The latter is Nationally Notable, whilst the former, although given RDBK status, may no longer qualify in view of an apparent spread following its discovery in the UK in 1986.

Among the other Nationally Scarce species are the predatory checkered beetle *Tillus elongatus* that is most frequently found on sun-exposed decaying trees – it is a predator of other wood-boring beetles.

Dead standing beech (with Bottle Trap 1) in open glade

7 TREE SPECIES

All tree species examined or trapped were found to support locally distributed or scarce saproxylic species, though oak and beech supported the greatest number of both common and notable taxa within the study. This was perhaps inevitable as these species are the most frequent trees as veterans within the study area, and received more sampling effort than other species. Selected examples of significant species are mentioned below.

Maps 2a & b map indicate the locations of the more notable trees by species.

7.1 Ash

Relatively few veteran ash trees are present, and whilst the ancient tree database documents 58 examples across the estate, only three were encountered in this survey – two on Northchurch Common and one at Aldbury Common. Wood-decay features on the former were out of reach for easy sampling, though one fallen branch did support cramp balls fungus *Daldinia concentrica*. This fungus is known to support several beetles, and although none were found here in the current survey, Peter Brash (pers. comm.) has recorded the Nationally Notable fungus weevil *Platyrhinus resinosus* elsewhere on the property. The ash at Aldbury Common was sampled using a vane trap (VT11), and although the trap had been damaged during the sampling period, a partial catch was present. This revealed the RDB1 false click beetle *Eucnemis capucina* that is known to have an association with ash and beech, and the Nationally Scarce false darkling beetle *Orchesia micans* that has larvae in shaggy bracket fungus that is most frequently associated with ash.

Whilst there are relatively few veteran ash, the indications are that those present support significant species, including some that are most frequently associated with this tree nationally.

7.2 Beech

Veteran beech were present throughout much of the study area, and supported the largest number of notable saproxylics in this study, mostly beetles, but also several flies and solitary wasps of significance, along with the brown tree ant.

Among the beetles were the false click beetles *Hylis olexai* (RDB3) and *Epiphanis cornutus* (European Red List), the latter also recorded from sallow in this survey. Several Nationally Notable/Scarce species that are most frequent reported from beech include the longhorn *Stictoleptura scutellata*, the tumbling flower beetle *Tomoxia bucephala*, the checkered beetle *Tillus elongatus*, the bark beetles *Taphrorhychus bicolor* & *Ernoporicus fagi*, and the wood borer beetle *Dorcatoma dresdensis* which breeds in *Ganoderma* bracket fungi.

Flies included the Nationally Rare forest window fly *Scenopinus niger* and the Nationally Scarce hoverfly *Pocota personata*. The RDB1 smudge-winged comb-horn cranefly *Ctenophora ornata* (captured in a light trap) is also most likely to breed in the veteran beeches. Two notable solitary wasps also found on a dead standing beech in an open sunny glade at Aldbury Common (BT1) – the Nationally Notable *Pemphredon morio* & RDBK *Stigmus pendulus*. Although both may be downgraded in the future.

7.3 Birch

Birch (silver & downy not distinguished) was relatively under-recorded in this study, though it is abundant in many areas with some impressive veteran specimens seen. A bottle trap was set on one of the largest examples at Aldbury Common, but was unfortunately removed by persons unknown, hence no catch available.

However, some notable species were recorded by active searching. Although the Nationally Scarce weevil *Magdalis carbonaria* was recorded from a fairly young decaying oak in this survey but it is more usually associated with birch, and the Nationally Scarce hoverfly *Brachyopa pilosa* was also found on a birch stump exuding sap – both species were recorded from Ivinghoe Common.

Chandler (1997) noted the significance of birch at Aldbury Common for wood-decay Diptera.

7.4 Oak

Veteran oaks occurred throughout most of the study area, with concentrations of the largest specimens at Aldbury and Ivinghoe Commons.

Ten scarce or threatened saproxylic beetle species were recorded from oak, perhaps the most significant being the RDB1 root-feeding beetle *Rhizophagus oblongicollis* - on one of the largest oaks at Aldbury Common. And among the Nationally Notable/Scarce species were the polypore beetle *Tetratoma desmarestii* and the ant like leaf beetle *Euglenes oculatus*, the latter a heart rot specialist. Another heartrot associate, the locally distributed fungus beetle *Mycetophagus piceus*, was also recorded. However, there is a curious absence of many other red rot specialists from the current dataset, especially among the click beetles, although the habitat resource would suggest that they may occur as yet not undetected.

7.5 Sweet chestnut

Sweet chestnut is the dominant tree in several areas, notably Sallow Copse and Old Copse (treated as part of Aldbury Common in this survey). Three vane traps were operated in these areas - 2 in sallow Copse (VT2 a & b) and 1 in Old Copse (VT3), and whilst these did pick up few notable species, there were fewer than on oak and beech, even though there was abundant dead wood within the areas sampled. Two factors may be significant. Firstly, whilst there were plenty of examples of post-mature trees, most are probably not as old as many of the oak and beech in nearby areas, and might lack suitable heart rot habitat, although red rot was evident in several of the trees. And secondly, sweet chestnut tends to have very hard sapwood which may not be suitable for various species.

The vane traps recorded four notable species: the false click beetle *Melasis buprestoides* that is known to occur on variety of tree species; the small scavenger beetle *Enicmus rugosus*; the false flower beetle *Anaspis costai*; and the brown tree ant.

Active searching was also undertaken and recorded significant species as the local hoverfly *Brachypalpus laphriformis*.

7.6 Other

Several other tree species were examined or had traps set on them. These included a pitfall trap (PFT4) set in a rot hole of a veteran crab apple at Northchurch Common, and a vane trap (VT8) set on a large split apart sallow at Aldbury Common.

The PFT4 on crab apple recorded the Nationally Notable beetle *Enicmus brevicornis*, along with several locally distributed saproxylics, such as the comb-horn cranefly *Dictenidia bimaculata*. And VT8 on the split sallow captured the European Red Listed false click beetle *Epiphanis cornutus* on two separate trapping periods suggesting that it may have been breeding in the tree. The Nationally Notable brown tree ant *Lasius brunneus* was also present.

Active field sampling of other trees resulted in other notable species: a large dead standing cherry on Aldbury Common with a withered specimen of sulphur polypore fungus supported the darkling beetle *Eledona agricola* – a local species

most frequently associated with this fungus; and some old hazels supported the Nationally Notable small fungus beetle *Cis festivus*.

8 DEAD WOOD SITUATION/POSITION - FULL SUN, PARTIAL OR DENSE SHADE

All decaying timber is valuable, and depending on its situation/position the saproxylic assemblages may differ, and indeed be distinct. Wood-decay habitats in partial shade are generally thought support the richest invertebrate fauna, though sun-exposed timber can be of particular value to certain groups such as solitary bees & wasps nesting in old beetle borings or other cavities. However, decaying wood in full sun may become too hot, baked and desiccated and for many species, this may be particularly acute for dead standing trees or fallen timber, though live veteran trees in open sun probably retain diverse saproxylic interest for longer. Decaying wood in dense shade may favour various flies which have larvae in we rotten wood or fungi, but conversely may be too cold and damp for other species. Kirby (1992) indicates that overall dappled shade provides the ideal compromise.

Several studies have investigated the saproxylic fauna of decaying timber in sunny, partially or densely shaded situations:

Alexander (1999a), in a study undertaken near Bristol, albeit with a small sample size, reports that there was no degree of overlap between the fauna of decaying wood from unshaded, transition zone and shaded situations, with each situation having its own specialists, including scarce species.

Ranius & Jansson (2000) sampled the saproxylic beetles on old oaks in three situations in Sweden - original free-standing specimens, half-open pasture woodland and closed pasture woodland, and showed that for beetles, species richness was greatest in stands of large free-standing oaks, and that forest regrowth, causing shading, was detrimental for many beetle species. Although beetles associated with fruiting bodies of saproxylic fungi preferred large trees with dense canopy cover. However, the study was undertaken near the northern limit of distribution for some of the beetles, and such species in hollow trees near the northern limits of their distribution may prefer sun-exposed trees, and might occupy shadier habitats further south. It was also shown that large girth trees also increased the frequency of several species.

A further study, also from Sweden (Lindhe et al., 2005), investigated the saproxylic beetles associated with cut trees over a seven-year period, sampling in full sun or semi- exposed, and shaded trees. Two thirds of species favoured fully or semi-exposed situations, and one third shaded.

It is important to note that neither of the Scandinavian studies investigated saproxylic fly (Diptera) fauna – a group more likely to utilise dead wood in shade.

In common with the Scandinavian studies, the current survey, although not quantitative, focussed on beetles and showed that trees (mostly beech) in full sun

did support a good number of notable species. But also demonstrated that all tree species, whether in full-sun, partial shade or full shade supported saproxylics, and in most instances notable examples. A summary is provided in Table 7 below.

For a site as large and varied as Ashridge, the overall message is clear – all dead wood has value and that in order to conserve the full spectrum of saproxylic invertebrates, a continual supply of wood-decay habitat in full-sun, partial shade/dappled sunlight and full shade should be retained across the site.

Table 7: Notable saproxylic species by situation and tree species recorded in 2017 survey

*Group/Scientific Name**	*Conservation Status*	*Sunny*	*Partial shade*	*Shade*
Coleoptera (Beetles)				
Aeletes atomarius	Nationally Scarce	Beech		
Anaspis costai	Nationally Scarce		Sweet chestnut	
Anaspis thoracica	Nationally Scarce		Oak	Ash
Atomaria morio	Red Data Book - K		Oak	
Aulonothroscus brevicollis	Red Data Book - Rare	Beech		
Cerylon fagi	Nationally Scarce/Notable B		Oak	Oak
Cicones variegatus	Nationally Scarce		Beech	Beech, Oak
Cis festivus	Nationally Scarce/Notable B	Beech, Oak	Beech	Hazel, Oak, Beech
Dorcatoma dresdensis	Nationally Scarce	Beech		
Dropephylla gracilicornis	Nationally Scarce		Oak	
Enicmus brevicornis	Nationally Scarce		Oak	Beech, Crab apple
Enicmus rugosus	Nationally Scarce	Beech	Beech, Oak	Ash, Sweet chestnut
Epiphanis cornutus	European Red List - Near Threatened	Beech	Sallow	
Ernoporicus fagi	Nationally Scarce/Notable A	Beech		
Eucnemis capucina	Red Data Book - Endangered			Ash
Euglenes oculatus	Nationally Scarce	Beech	Oak	
Hylis olexai	Red Data Book - Rare	Beech		
Magdalis carbonaria	Nationally Scarce/Notable B	Oak		
Melasis buprestoides	Nationally Scarce/Notable B			Sweet chestnut
Orchesia micans	Nationally Scarce			Ash
Orchesia minor	Nationally Scarce	Beech		
Poecilium alni	Nationally Scarce/Notable B	Oak		
Ptenidium gressneri	Nationally Notable		Beech	
Rhizophagus oblongicollis	Red Data Book - Endangered		Oak	
Sepedophilus bipunctatus	Nationally Scarce/Notable B			Beech
Stictoleptura scutellata	Nationally Scarce/Notable A	Beech		
Taphrorychus bicolor	Nationally Scarce/Notable B	Beech		
Tetratoma desmarestii	Nationally Scarce			Oak
Tillus elongatus	Nationally Scarce	Beech		
Tomoxia bucephala	Nationally Scarce	Beech		
Uleiota planata	Nationally Scarce/Notable A	Beech		
Diptera (Flies)				
Brachyopa pilosa	Nationally Scarce	Birch		

Pocota personata	Nationally Scarce			Beech
Scenopinus niger	Nationally Scarce	Beech		Beech
Hymnoptera (Ants, bees & wasps)				
Lasius brunneus	Nationally Scarce/Notable A	Beech, Sallow	Oak, Sallow, Sweet chestnut	Beech
Pemphredon morio	Nationally Scarce/Notable B	Beech		
Stigmus pendulus	Red Data Book - K	Beech		

*Non-saproxylics and species not found on particular trees omitted.

9 NON-SAPROXYLIC INVERTERBATE FAUNA

General sampling/beating of trees and shrubs resulted in several non-saproxylic notable species being found, these are included in the species list at the end of this report and in the separate Excel spreadsheet of all individual records.

Species worthy of specific mention include the Nationally Scarce leaf beetle *Orsodacne humeralis* found by beating hawthorn a Ivinghoe Common – it is usually associated with this shrub, and the Silphid beetle *Dendroxena quadrimaculata*, that is a predator on moth larvae on tree foliage, again it was found at Ivinghoe Common.

10 ACKNOWLEDGEMENTS

Thanks go to Emily Smith and Matthew Bond (National Trust, Ashridge) for commissioning the survey, providing data on veteran trees, and helping with trap setting & emptying. Mark Telfer and Peter Brash have kindly provided data on saproxylic species recorded in recent years.

MAIN TABLE: SCARCE & THREATENED INVERTEBRATES FROM 2017 SURVEY

Species are arranged alphabetically within group.

*Includes updates from recent status reviews.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
Beetles Coleoptera		
A clown beetle *Aeletes atomarius* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96851209, vane trap 7, beech	Usually in burrows of lesser stag beetle in moist crumbly decaying heartwood, although also recorded with rhinoceros beetle and brown tree ant; in beech, ash, willow, alder. Ancient wood pastures; mostly central England, to Yorkshire in north, and Hampshire and Kent in south-east.
A false flower beetle *Anaspis costai* Nationally Scarce	2017, A.P. Foster • Sallow Copse, SP97801326, vane trap 2b, sweet chestnut	A small yellow beetle, scarce and very local in Britain, with most records from the south-west, south-east, west Midlands and south-east wales. Larvae thought to develop in decaying wood.
A false flower beetle *Anaspis thoracica* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97571188, vane trap 6, fallen oak • Aldbury Common, SP97551193, vane trap 11, ash	A small yellow beetle found on hawthorn blossom. Larvae thought to develop in dead wood. Adults recorded from May to July. Widely scattered records from southern England to Scottish Borders with perhaps an easterly bias.
A silken fungus beetle *Atomaria morio* Red Data Book – Insufficiently Known	2017, A.P. Foster • Aldbury Common, SP97141192, vane trap 9, oak red rot hollow with old bird nest	A small beetle primarily associated with bird nests in tree cavities, but also reported from squirrel dreys, a mole nest and a cut stump. Recorded from southern England, the Midlands and Yorkshire.
A small false click beetle *Aulonothroscus brevicollis* Red Data Book – Rare	2017, A.P. Foster • Aldbury Common, SP97591198, bottle trap 1, beech	Recorded from pasture-woodland and rarely from closed broad-leaved woodland, associated with oak. Larvae probably develop in dead wood. Very local and scattered in southern England. Adults recorded from April to August.
A minute bark beetle *Cerylon fagi* Nationally Notable–category B	2017, A.P. Foster • Aldbury Common, SP96871198, fallen oak, vane trap5 • Aldbury Common, SP97571188, fallen oak, vane trap 6	Associated with pasture woodland and ancient broad-leaved woodland where it lives under fungus infected bark and heartwood in advanced stages of decay, usually oak, ash or beech. Most frequently recorded from southern and south-eastern England, though its range extends to Wales and southern Scotland. Adults recorded from March to October.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A cylindrical bark beetle *Cicones variegatus* Nationally Scarce	2017, A.P. Foster • Ivinghoe Common, SP97851443, beech hollow, yellow pan trap • Aldbury Common, SP96991198, beech, vane trap 4 • Aldbury Common, SP96871198, fallen oak, vane trap5 • Aldbury Common, East, SP97261260, beech, on bark	Small beetle associated with decayed bark or wood, often infected with the fungus *Ustulina vulgaris*. Usually found on beech, hornbeam or sycamore. Restricted to southern England.
A small fungus beetle *Cis festivus* Nationally Notable-category B	2017, A.P. Foster • Aldbury Common, widely, oak, beech & hazel	Associated with fungi on decaying timber, especially on old trees, recorded from *Piptoporus betulinus* and *Stereum* on hazel, but a wider range of fungi are probably eaten. Widely distributed but localised in occurrence.
A silphid beetle *Dendroxena quadrimaculata* Nationally Notable-category B	2017, A.P. Foster • Ivinghoe Common, SP975143, beating hawthorn	An active predator of geometrid moth caterpillars feeding on tree foliage in ancient woodlands. Primarily a western oceanic species, occurring across the oakwoods of northern and western Britain as well as in the Weald.
A wood-borer beetle *Dorcatoma dresdensis* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96851209, beech, vane trap7	Larvae develop in hard, woody bracket fungi, e.g. *Ganoderma*, *Fomes* and *Phellinus*, growing on old trees usually in areas of ancient woodland or pasture woodland. Very locally distributed in southern England. Adults recorded from May to August.
A rove beetle *Dropephylla gracilicornis* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97141192, oak, vane trap 9	A small rove beetle occurring under bark or in decaying wood, especially oak. Widespread but very local in England and southern Scotland.
A fasle click beetle *Epiphanis cornutus* European Red List – Near Threatened	2017, A.P. Foster • Aldbury Common, SP96991209, sallow, vane trap	A wood-decay associated beetle. Its UK origins are unclear as it was first discovered in Glos. in the 1960s in association with Norway Spruce, and it has subsequently been reported from other non-native trees, leading to the belief that it is a non-native. However, it also occurs in old pasture woodland sites and is sometimes associated with veteran trees. It is regarded as native in other parts of northern Europe and has recently been given Near Threatened Conservation status in a European context (Nieto & Alexander, 2010). There have been an increasing number of UK records in recent years.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A minute brown scavenger beetle *Enicmus brevicornis* Nationally Notable	2017, A.P. Foster • Aldbury Common, SP96991198, beech, vane trap 4 • Aldbury Common, SP97571188, fallen oak, vane trap 6 • Northchurch Common, SP96941180, crab apple	Most often associated with ancient broad-leaved and pasture woodland habitats, though has recently been discovered in suburban gardens and may have spread in recent years. Found under bark and in dead wood. Widespread but local in southern England, also reported from the north west.
A minute brown scavenger beetle *Enicmus rugosus* Nationally Notable	2017, A.P. Foster • Aldbury Common, widely, oak, beech, ash & sweet chestnut	A widely distributed but very scarce and localised species associated with encrusting fungi on decaying timber. Previously recorded from *Corticium quercinum* on oak, and *Collybia radicata*.
A bark beetle *Ernoporicus fagi* Nationally Notable–category A	2017, A.P. Foster • Aldbury Common, SP97011197 & SP97701205, dead beeches • Sallow Copse, SP98281383, dead standing beech	A small bark beetle occurring in ancient woodland and parkland, with the larvae boring in the smaller branches and twigs of beech. Widespread, though very localised, in southern England occurring as far north as Yorkshire. Adults recorded in most months.
A false click beetle *Eucnemis capucina* Red Data Book - Endangered	2017, A. P. Foster • Aldbury Common, SP97551193, ash, vane trap11	A false click beetle with larvae developing in decaying hard wood and under bark. Usually recorded from beech or ash, though several recent records from old orchard trees. Recorded more frequently with the use of vane traps, but still regarded as rare. Restricted to southern half of England and found in ancient pasture woodlands and orchards.
An ant-like leaf beetle *Euglenes oculatus* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96991196, oak, vane trap10 • Aldbury Common, SP97591198, beech, bottle trap 1	Found in broad-leaved woodland and pasture woodland. Recorded from the stumps and boughs of oak, it is thought to have a preference for the tops of stag-horn oaks. Also found on lime, hawthorn, beech, birch and chestnut. Adults have been recorded from elder blossom. Larvae develop in dead wood. Widespread but local in England.
A false click beetle *Hylis olexai* Red Data Book - Rare	2017, A.P. Foster • Aldbury Common, SP97591198, beech, bottle trap 1	A little-known dead-wood beetle. Usually associated with broad-leaved trees especially beech, though also reported from spruce. Restricted to southern England New to Britain in 1951, and seemingly recorded with increasing frequency in recent years, possibly expanding or becoming commoner. Adults recorded from July to September.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A weevil *Magdalis carbonaria* Nationally Notable-category B	2017, A.P. Foster • Ivinghoe Common, SP97801442, young oak with die-back, beating branches	A black weevil with larvae that feed internally in the twigs and branches of birch. Adults recorded between April and July. Scattered distribution in England and Scotland with a northerly bias.
A false click beetle *Melasis buprestoides* Nationally Notable-category B	2017, A.P. Foster • Aldbury Common, SP97101213, sweet chestnut, vane trap 3	Larvae bore galleries in hard dead branches of various broad-leaved trees e.g. oak, ash, beech and birch. Widespread though local in England and south Wales, but apparently absent from the far south west.
A false darkling beetle *Orchesia micans* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97551193, ash, vane trap 11	Associated with large bracket fungi on trees in woodland and pasture woodland, but especially *Inonotus hispidus* on ash. Also recorded from fungi on alder and beech. A widespread but very local species. Adults recorded from March to October.
A false darkling beetle *Orchesia minor* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97011197, beech, on dead branches	Associated with fungi on trees, particularly *Polyporus* and dead wood from a variety of tree species. Widespread but very local in Great Britain and is most frequently reported from ancient woodland or pasture woodland sites, often in damp shady situations. Adults recorded in most months.
A leaf beetle *Orsodacne humeralis* Nationally Scarce	2017, A.P. Foster • Ivinghoe Common, SP975143, beating hawthorn	Larvae feed on roots of various rosaceous shrubs, especially hawthorn; adults attracted to blossom. Broadleaved woods, parks and scrub. Widespread but very localised.
A longhorn beetle *Poecilum alni* Nationally Notable-category B	2017, A.P. Foster • Ivinghoe Common, SP97801442, beating young dying oak	A small longhorn beetle with larvae probably developing in dead wood of small boughs and possibly also in twigs. It has been found on dead hedgerow shrubs and recently fallen boughs of trees. Recorded from alder, aspen, elm, hazel, oak, hawthorn and willows. Adults have been found from April to July. Continental literature states that the life cycle lasts one year. Widespread but very local in England and Wales.
A feather-winged beetle *Ptenidium gressneri* Nationally Notable	2017, A.P. Foster • Thunderdell Wood, SP98881214, in white rot	Only found in ancient deciduous forests, generally in moist crumbly wood mould in hollow trunks & rot holes; also in nests of hornet, bird nests and squirrel dreys in hollow trees; most records from beech. Widespread in England, but very localised, also reported from south-west Scotland.
A root-feeding beetle *Rhizophagus oblongicollis* Red Data Book - Endangered	2017, A.P. Foster • Aldbury Common, SP97351203, oak, pitfall trap 5	Probably develops underground at the roots of old oaks, though above ground is attracted to sap associated with damaged bark. Widely scattered records from southern England t Yorks, though rarely recorded – probably in part due to its subterranean habitat.

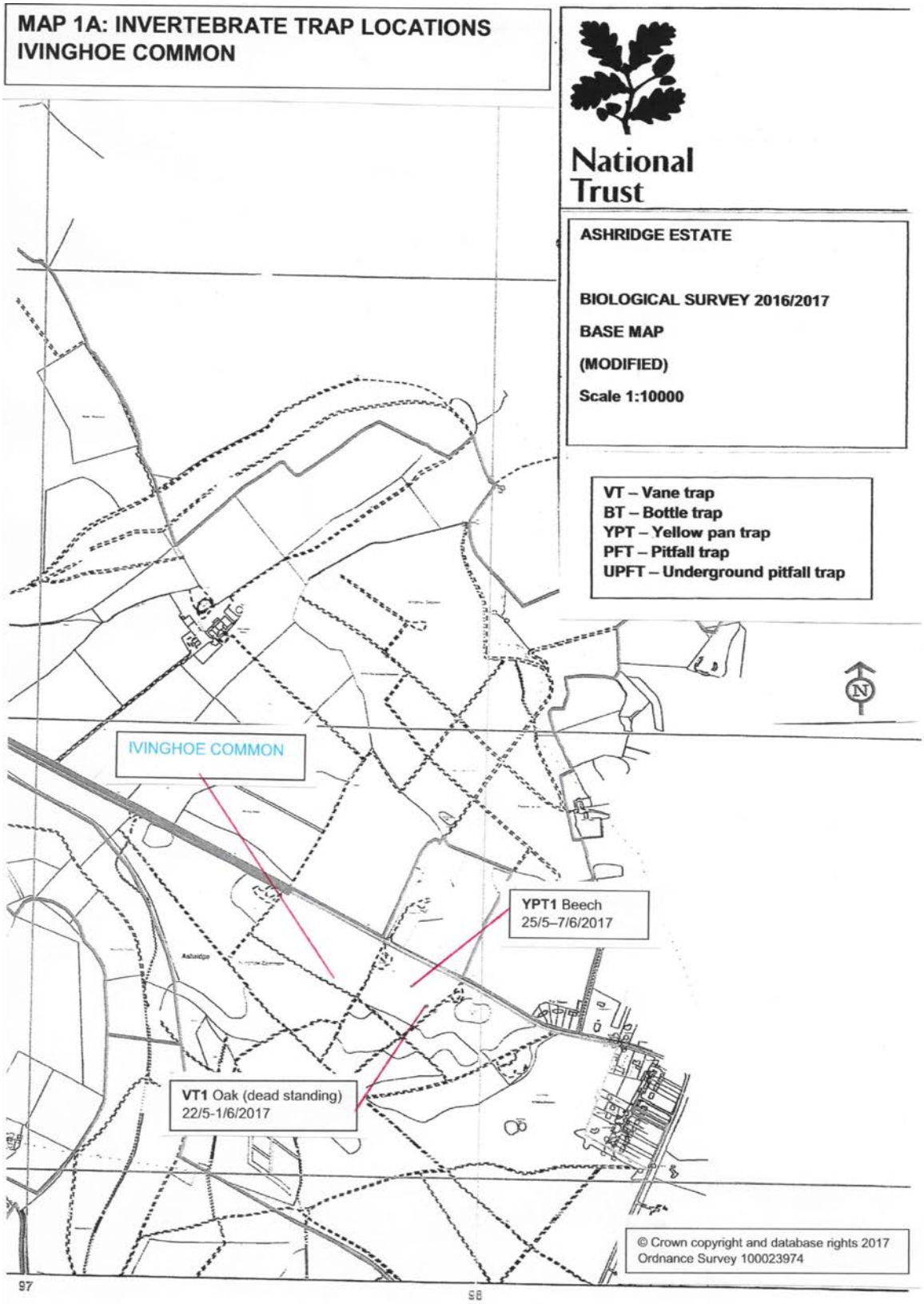
Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A rove beetle *Sepedophius bipunctatus* Nationally Notable-category B	2017, A.P. Foster • Aldbury Common, SP96991198, beech, vane trap 4	A rove beetle occurring in moist rotten wood or under bark, most records are from willow, though it has also been recorded from other tree species. Only known from the southern half of England.
A longhorn beetle *Stictoleptura scutellata* Nationally Notable–category A	2017, A.P. Foster • Aldbury Common, SP97011197, beech, observed	A moderately sized, black longhorn beetle strongly associated with broad-leaved woodland. Larvae develop in dead wood, particularly beech but also hornbeam, birch and oak. Southern England north to Nottinghamshire. Adults on the wing from March to August, most frequently in July.
A bark beetle *Taphrorychus bicolor* Nationally Notable–category B	2017, A.P. Foster • Aldbury Common, SP97591198, beech, under bark	Bores in the bark of dead beech, and occasionally other trees. Restricted to southern and south-eastern England and only recently recorded from a few counties. Adults from April to October.
A polypore fungus beetle *Tetratoma desmarestii* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96871198, fallen oak, beating branches	Most often found in fungi or under bark of oak. Occurs in England as far north as Northumberland. Adults recorded from September to January.
A checkered beetle *Tillus elongatus* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97591198, dead standing beech, bottle trap 1 • Aldbury Common, SP96851209, beech, vane trap 7 • Sallow Copse, SP98281383, dead standing beech, observed	A red and black beetle predatory on wood-boring Anobiid beetles, particularly *Ptilinus pectinicornis.* Widespread but scattered records in England and Wales, especially in the south where it is most often recorded from old woodland sites. Adults from April to September.
A tumbling flower beetle *Tomoxia bucephala* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96851209, beech, vane trap 7	Restricted to ancient broad-leaved woodland and pasture woodland where the larvae develop in rotten wood, particularly the stumps and trunks of beech. Most records are from the south and east of Severn to Wash line, though it has been noted as far north as Durham. Adults recorded from June to August.
A flat timber beetle *Uleiota planata* Nationally Notable–category A (now unlikely to qualify for this status in view of recent increase in distribution/occurrence)	2017, A.P. Foster • Aldbury Common SP96901187, fallen beech, under bark	A species most frequently recorded from ancient broad-leaved woodland in the south of England, though its range extends Lancs and south Wales. Lives under the bark of various broad-leaved trees where adults and larvae are believed to feed on fungal hyphae. Formerly given Red Data Book status, then Nationally Notable, and now unlikely to qualify in view of further spread.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
Flies **Diptera**		
A hoverfly *Brachyopa pilosa* Nationally Scare	2017, A.P. Foster • Ivinghoe Common, SP97781449, cut birch stump with sap	Occurs in ancient broad-leaved woodland and there seems to be a particular association with beech. Most records are from southern England, particularly the New Forest and Windsor Forest, though it has also been reported from Northants and Scotland. Larvae develop under the bark of dying or recently dead large beech trees.
Smudge-winged comb-horn cranefly *Ctenophora ornata* Red Data Book - Endangered	2017, A. P. Foster • Aldbury Common, Base Camp, SP974118, male at m.v. light	A large and striking yellow & brownish-red cranefly - markings reminiscent of a hornet, with a smudge mark on the forewing. Restricted to ancient pasture woodlands with known strongholds including Epping, New & Windsor Forests along with Ashridge. Adults a probably nocturnal (it occurs in moth traps) and are on the wing from June to August (later than related species). The larvae have been reared from 'wet porridge' textured wood mould in beech.
A hoverfly *Pocota personata* Nationally Scarce	2017, A.P. Foster • Ivinghoe Common, SP97851443, beech, visiting rot hole	A bumblebee mimic with larvae that develop in rot-holes in veteran trees, especially beech. An old forest species with records mainly from the south-east. Also recorded from ancient woodland sites as far north as Yorkshire. Adults recorded from April to June.
Forest window fly *Scenopinus niger* Nationally Scarce	2017, A.P. Foster • Ivinghoe Common, SP97851443, beech, yellow pan trap • Aldbury Common, SP96991218, dead standing beech	Larvae predatory on dermestid & probably other beetle larvae in dry rotting heartwood of various broadleaves in ancient pasture-woodlands. Very few modern records, though they are widely distributed in England, with a few from Wales and one in Ireland. Adults normally found inside or close to large hollow trees.
Ants **Hymenoptera**		
Brown tree ant *Lasius brunneus* Nationally Notable-category A	2017, A.P. Foster • Aldbury Common, several trees, including oak, beech and sallow • Sallow Copse, SP97801326, sweet chestnut, vane trap 2b	Nests within decaying heartwood of broad-leaved trees, usually open-grown individuals with well-lit trunks. Forage over canopy. Restricted distribution based on Severn Basin and Thames Basin extending south westwards. Appears to be expanding in range and more frequently recorded than in the past – may no longer qualify for Nationally Notable status.

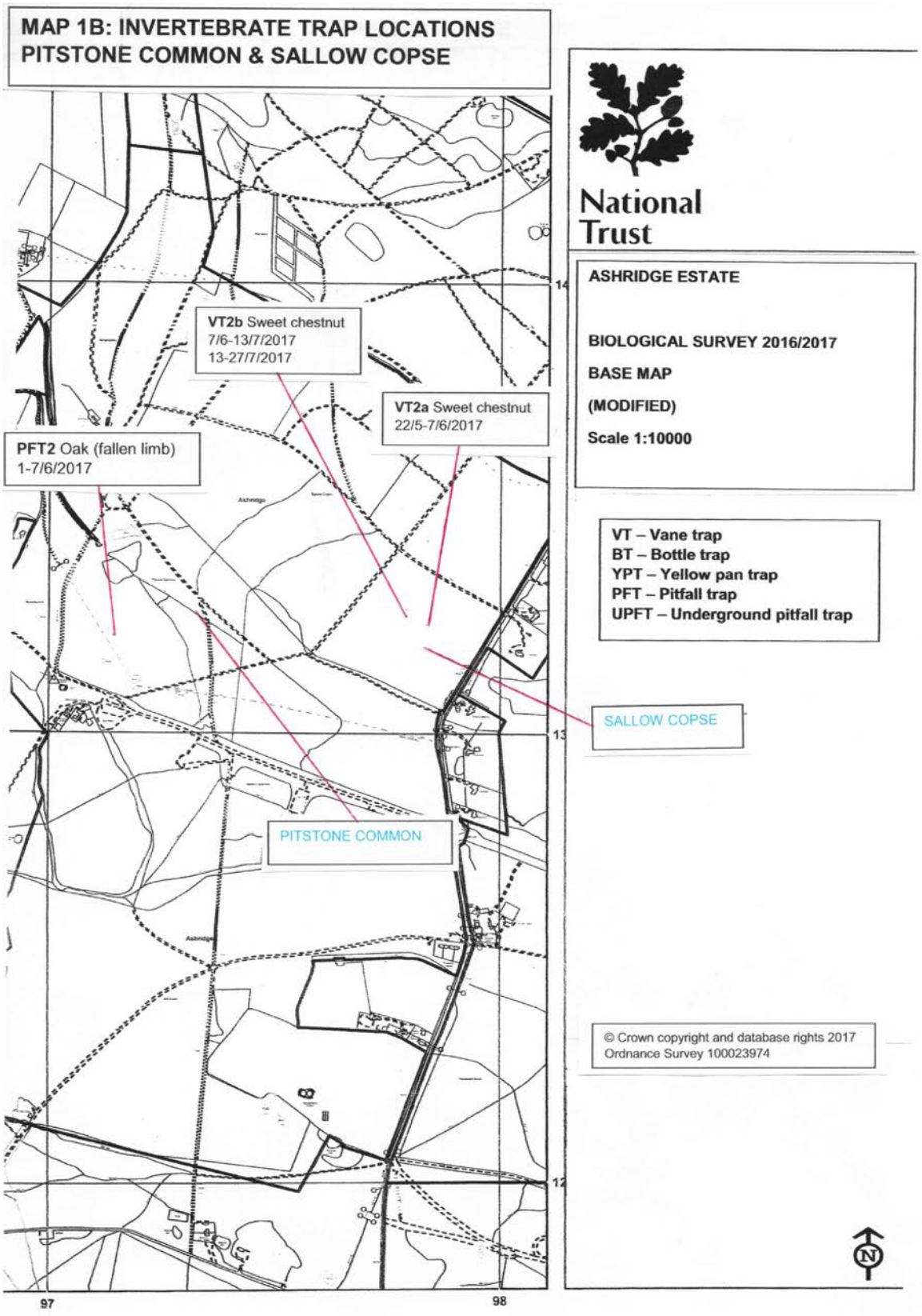
Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A digger wasp *Pemphredon morio*	2017, A.P. Foster • Aldbury Common, dead standing beech hulk in open glade SP97591198, bottle trap	A small solitary wasp nesting in dead wood (often old beetle borings) including fence posts and stumps. Nests are stocked with aphids. Recorded mostly south of a line from Thames to Solent but also as far north as Yorkshire. This species has been lumped together with *P. clypealis*. Adults on the wing from May to August.
A digger wasp *Stigmus pendulus*	2017, A.P. Foster • Aldbury Common, dead standing beech hulk in open glade SP97591198, bottle trap	Only discovered in 1986 and has been recorded from Essex and Kent. Nests in abandoned tunnels of wood-boring beetles in timber exposed to full sunlight, stocks nests with aphids.

Further information on the above species is also provided in Alexander (2002)

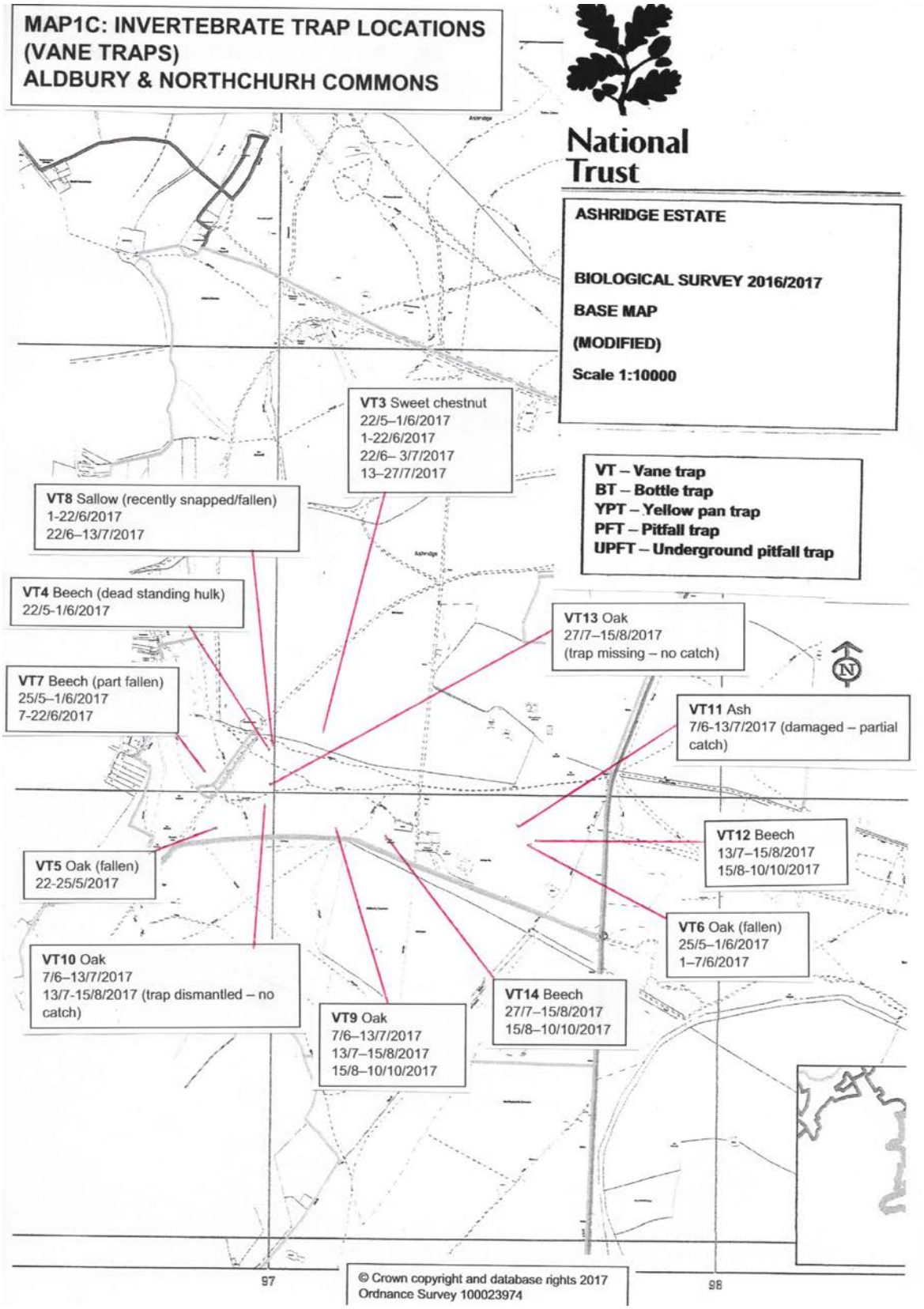
MAP 1A – Invertebrate Trap Locations, Ivinghoe Common



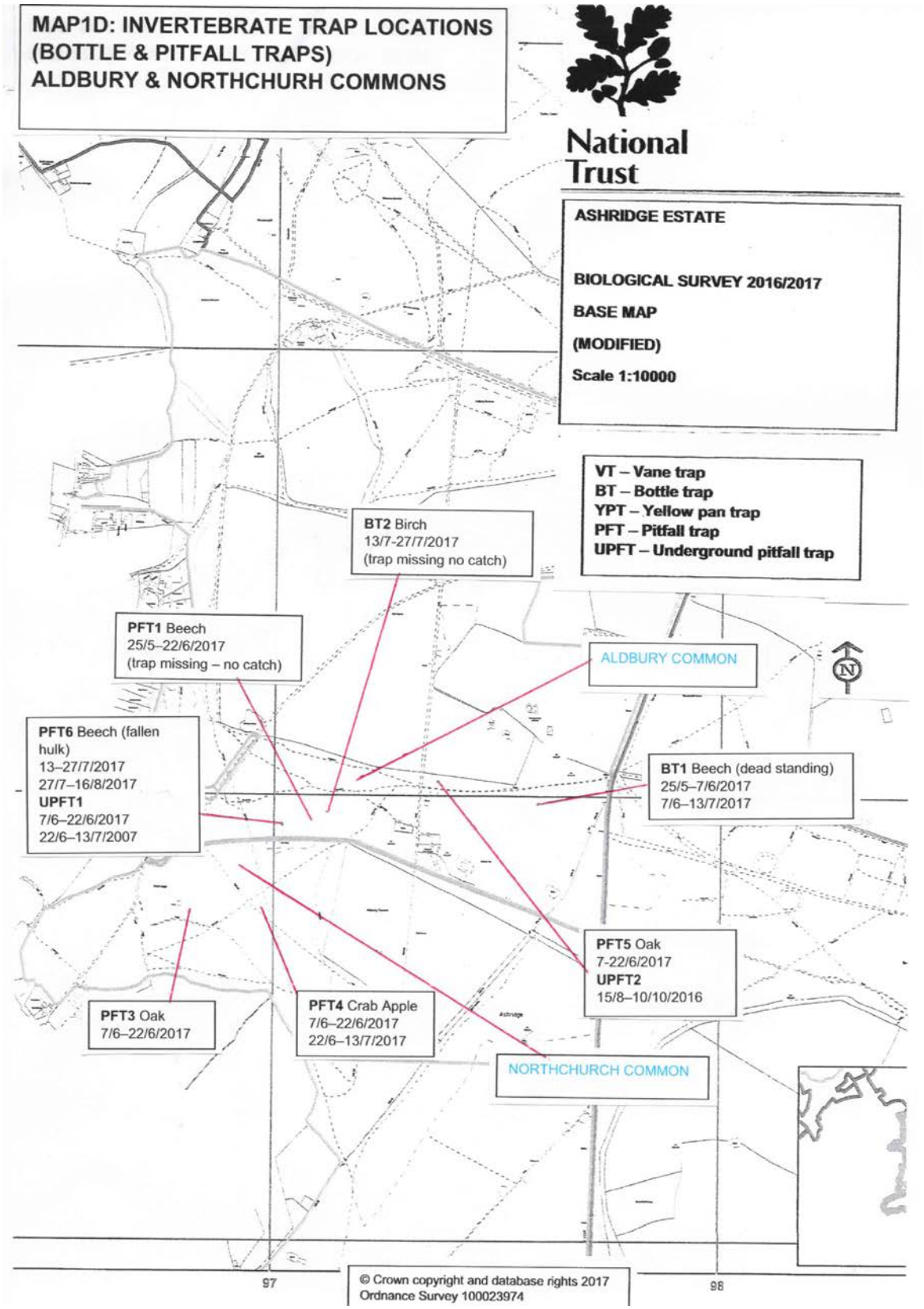
MAP 1B – Invertebrate Trap Locations, Pitstone Common & Sallow Copse



MAP 1C: Invertebrate Trap Locations (Vane Traps), Aldbury & Northchurch Commons

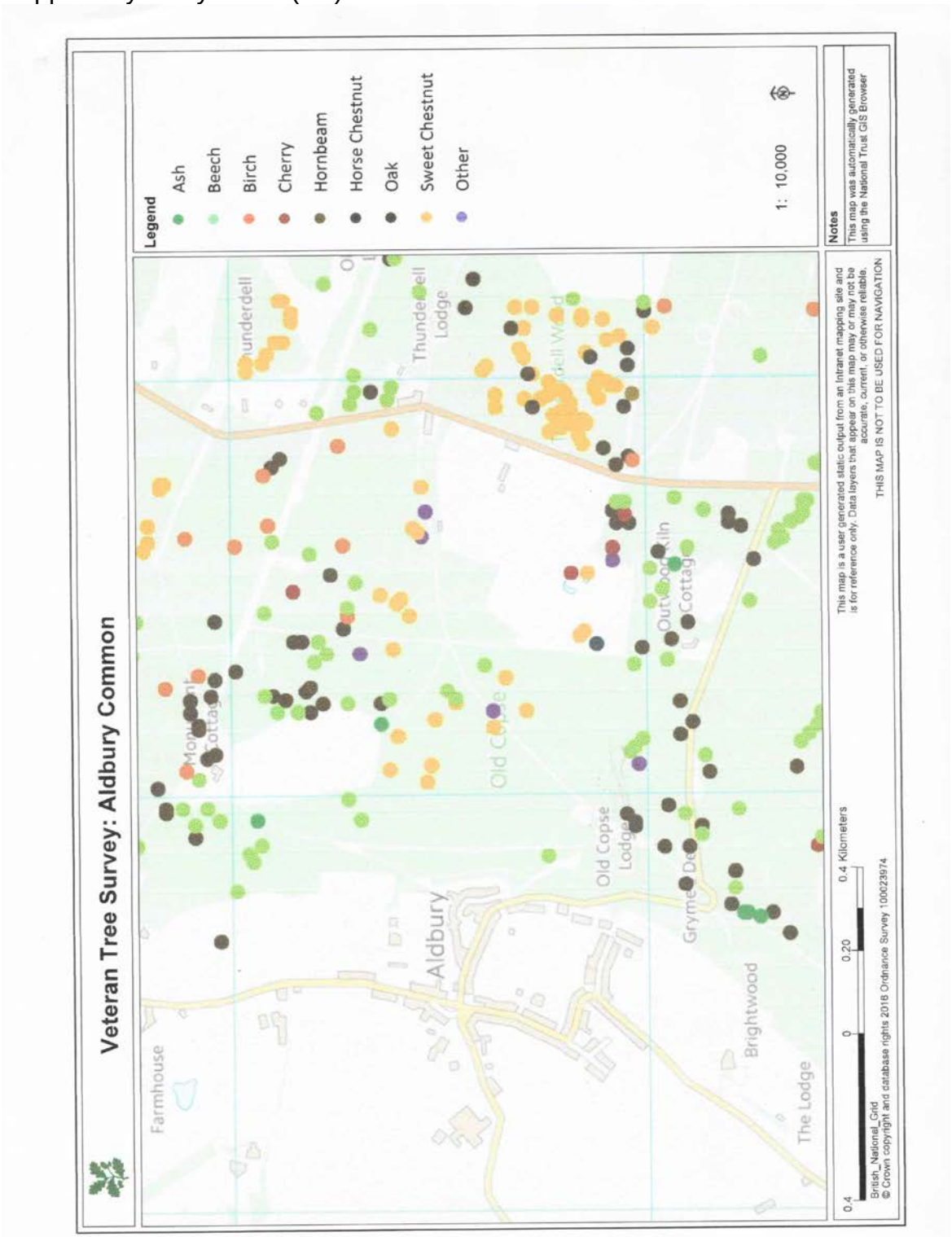


MAP 1D: Invertebrate Trap Locations (Vane Traps), Aldbury & Northchurch Commons



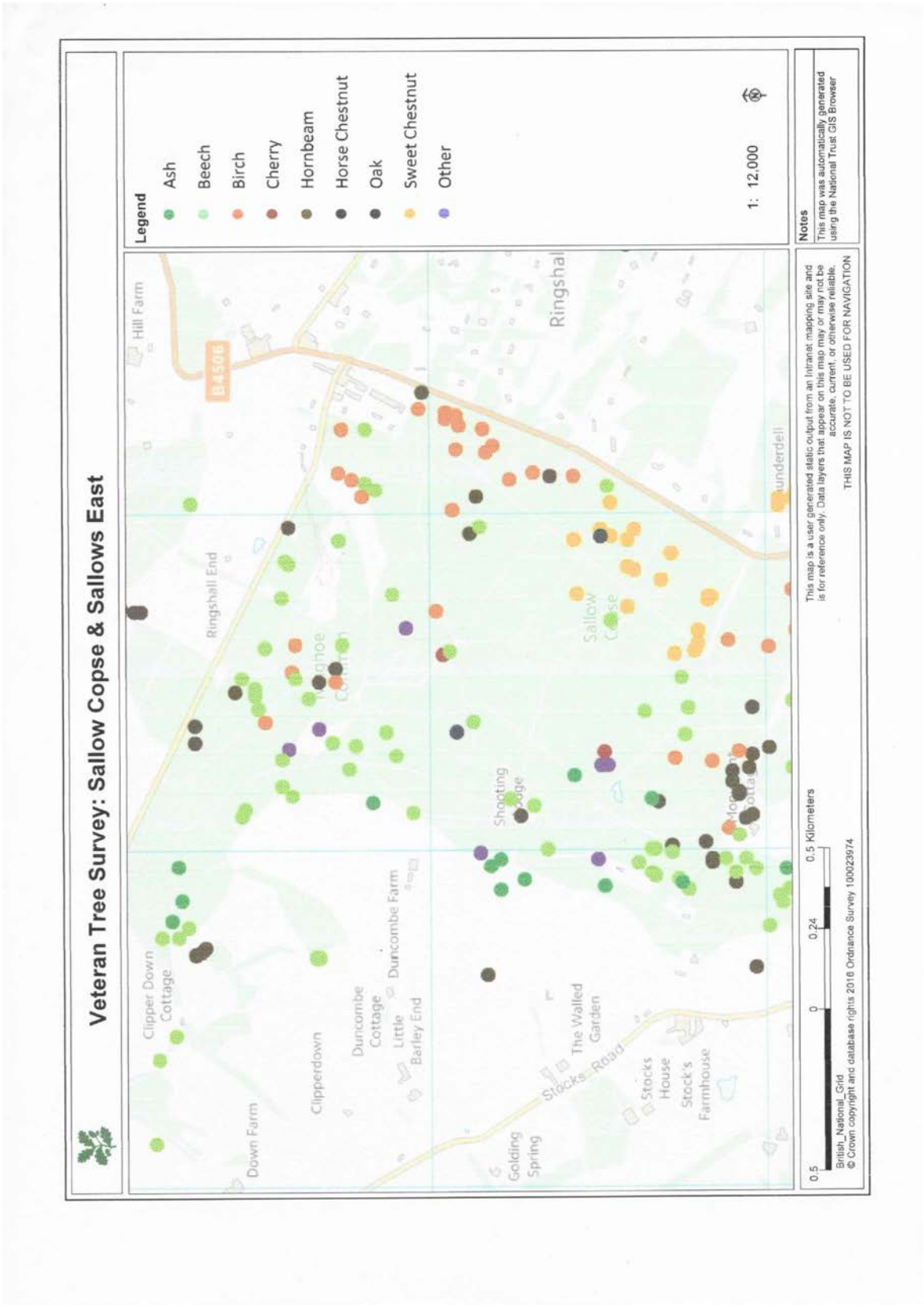
MAP 2A – Ancient Trees, Aldbury Common

Supplied by Emily Smith (NT)



MAP 2B – Ancient Trees, Sallow Copse

Supplied by Emily Smith (NT)



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APPENDIX 1: ADDITIONS TO THE ASHRIDGE SAPROXYLIC COLEOPTERA LIST RESULTING FROM 2017 SURVEY

Arranged alphabetically

Scientific Name	Vernacular Name	Conservation status
Aeletes atomarius	A clown beetle	Nationally Scarce
Anisotoma orbicularis	A round fungus beetle	
Anaspis costai	A false flower beetle	
Anaspis lurida	A false flower beetle	
Anaspis thoracica	A false flower beetle	Nationally Scarce
Anobum punctum	The woodworm beetle	
Anobium fulvicorne	A wood-borer beetle	
Atomaria morio	A silken fungus beetle	Red Data Book K
Aulonothroscus brevicollis	A false click beetle	Red Data Book - Rare
Bisnius subuliformis	A rove beetle	
Cis festivus	A small fungus beetle	Nationally Notable - B
Cis vestitus	A small fungus beetle	
Cis villosulus	A small fungus beetle	
Cryptarcha strigata	A sap beetle	Nationally Notable - B
Cryptolestes ferruginuem	A lined flat-bark beetle	
Cryptophagus dentatus	A silken fungus beetle	
Dorcatoma dresdensis	A wood-borer beetle	Nationally Scarce
Enicmus brevicornis	A minute brown scavenger beetle	Nationally Notable
Enicmus rugosus	A minute brown scavenger beetle	Nationally Notable
Enicmus testaceus	A minute brown scavenger beetle	
Ennearthron cornutum	A small fungus beetle	
Epiphanis cornutus	A false click beetle	European Red List – Near Threatened
Eucnemis capucina	A false click beetle	Red Data Book - Endangered
Euglenes oculatus	An ant-like leaf beetle	Nationally Scarce
Euplectus karstenii	A short-winged mould beetle	
Euplectus piceus	A short-winged mould beetle	
Hylis olexai	A false click beetle	Red Data Book - Rare
Magdalis carbonaria	A weevil	Nationally Notable - B
Mycetophagus multipunctatus	A fungus beetle	
Nemadus colonoides	A round fungus beetle	
Orchesia micans	A false arkling beetle	Nationally Scarce
Orthoperus corticalis	A minute fungus beetle	
Phymatodes testaceus	Oak tan borer beetle	
Phloeophagus lignarius	A weevil	
Poecilum alni	A longhorn beetle	Nationally Notable - B
Ptenidium gressneri	A feather-winged beetle	Nationally Notable - B
Rhizophagus oblongicollis	A root-eating beetle	Red Data Book - Endangered
Rhizophagus perforatus	A root-eating beetle	

Scolytus intricatus	Oak bark beetle	
Sepedophilus bipunctatus	A rove beetle	Nationally Notable - B
Sepedophilus littoreus	A rove beetle	Nationally Scarce
Sepedophilus lusitanicus	A rove beetle	Nationally Scarce
Uleiota planata	A flat timber beetle	Nationally Notable - A

Arranged by status

Scientific Name	Vernacular Name	Conservation status
Eucnemis capucina	A false click beetle	Red Data Book - Endangered
Rhizophagus oblongicollis	A root-eating beetle	Red Data Book - Endangered
Aulonothroscus brevicollis	A false click beetle	Red Data Book - Rare
Hylis olexai	A false click beetle	Red Data Book - Rare
Atomaria morio	A silken fungus beetle	Red Data Book - K
Uleiota planata	A flat timber beetle	Nationally Notable - A
Cis festivus	A small fungus beetle	Nationally Notable - B
Cryptarcha strigata	A sap beetle	Nationally Notable - B
Magdalis carbonaria	A weevil	Nationally Notable - B
Poecilum alni	A longhorn beetle	Nationally Notable - B
Ptenidium gressneri	A feather-winged beetle	Nationally Notable - B
Sepedophilus bipunctatus	A rove beetle	Nationally Notable - B
Enicmus brevicornis	A minute brown scavenger beetle	Nationally Notable
Enicmus rugosus	A minute brown scavenger beetle	Nationally Notable
Aeletes atomarius	A clown beetle	Nationally Scarce
Anaspis thoracica	A false flower beetle	Nationally Scarce
Dorcatoma dresdensis	A wood-borer beetle	Nationally Scarce
Euglenes oculatus	An ant-like leaf beetle	Nationally Scarce
Orchesia micans	A false arkling beetle	Nationally Scarce
Epiphanis cornutus	A false click beetle	European Red List – Near Threatened
Anisotoma orbicularis	A round fungus beetle	
Anaspis costai	A false flower beetle	
Anaspis lurida	A false flower beetle	
Anobum punctum	The woodworm beetle	
Anobium fulvicorne	A wood-borer beetle	
Bisnius subuliformis	A rove beetle	
Cis vestitus	A small fungus beetle	
Cis villosulus	A small fungus beetle	
Cryptolestes ferruginuem	A lined flat-bark beetle	
Cryptophagus dentatus	A silken fungus beetle	
Enicmus testaceus	A minute brown scavenger beetle	
Ennearthron cornutum	A small fungus beetle	
Euplectus karstenii	A short-winged mould beetle	
Euplectus piceus	A short-winged mould beetle	
Mycetophagus multipunctatus	A fungus beetle	
Nemadus colonoides	A round fungus beetle	

Orthoperus corticalis	A minute fungus beetle	
Phymatodes testaceus	Oak tan borer beetle	
Phloeophagus lignarius	A weevil	
Rhizophagus perforatus	A root-eating beetle	
Scolytus intricatus	Oak bark beetle	
Sepedophilus littoreus	A rove beetle	
Sepedophilus lusitanicus	A rove beetle	

APPENDIX 2: COLEOPTERA QUALIFYING FOR SQS OR IEC SCORES

The species National Conservation Status quoted in column 2 below follow those by Hyman (1992 & 1994) and have been used to inform the SQS Rarity Scores – the latter of which have not yet been updated with the more recent status changes in column3. IEC scores are unaffected by these changes.

*Recently updated status changes - note this only applies to some families. Where species have been removed from RDB or Na/Nb they have been assigned to Local for the purposes of this table.
**Rarity Score based on original status categories - likely to be amended to reflect Reviewed Status in future

List of saproxylic Coleoptera from trees at Ashridge qualifying for SQS or IEC

SPECIES	***National Status***	***Reviewed National Status changes****	***SQS Rarity score****	***IEC Score (2004)***	*2017 Survey*	*All data*
HISTERIDAE						
Reviewed by Lane (2017)						
Abraeus perpusillus	Local		4		✔	✔
Plegaderus dissectus	Nb	Local	8	2	✔	✔
Aeletes atomarius	RDB3	NS	16	3	✔	
Paromalus flavicornis	Local		2		✔	✔
PTILIIDAE						
Ptenidium gressneri	Nb		8	2	✔	
Ptenidium turgidum	RDBK		16	2		✔
Pteryx suturalis	Local		2			✔
LEIODIDAE						
Anisotoma humeralis	Local		2		✔	✔
Anisotoma orbicularis	Local		2		✔	
Agathidium nigripenne	Local		2			✔
Agathidium seminulum	Local		2		✔	✔
Agathidium varians	Local		2			✔
Nemadus colonoides	Local		2		✔	
STAPHYLINIDAE: Omaliinae						
Phyllodrepoidea crenata	Nb		8			✔
Dropephylla ioptera	Common		1		✔	✔
Dropephylla koltzei/ vilis	Common		1			✔
Phloeonomus punctipennis	Local		2		✔	✔
STAPHYLINIDAE: Pselaphinae						
Euplectus karstenii	Local		2		✔	
Euplectus piceus	Common		2		✔	
STAPHYLINIDAE: Tachyporinae						
Sepedophilus bipunctatus	Nb		8		✔	
Sepedophilus littoreus	Local		2		✔	
Sepedophilus lusitanicus	Local		2		✔	
STAPHYLINIDAE: Aleocharinae						
Dinaraea aequata	Common		1			✔
Bolitochara lucida	Local		2		✔	✔
Leptusa fumida	Common		1			✔
Leptusa ruficollis	Common		1			✔
Agaricochara latissima	Local		2			✔
Gyrophaena munsteri	RDBK		16			✔

SPECIES	***National Status***	***Reviewed National Status changes****	***SQS Rarity score****	***IEC Score (2004)***	*2017 Survey*	*All data*
Haploglossa gentilis	Local		2			✔
Placusa pumilio	Local		2			✔
STAPHYLINIDAE: Scaphidiinae						
Scaphidium quadrimaculatum	Local		2			✔
Scaphisoma agaricinum	Local		2			✔
Scaphisoma boleti	Nb		8			✔
STAPHYLINIDAE: Staphylininae						
Atrecus affinis	Common		1		✔	✔
Bisnius subuliformis	Local		2		✔	
Gabrius splendidulus	Common		1		✔	✔
Quedius brevicornis	Nb		8			✔
Quedius maurus	Local		4	1		✔
Hypnogyra angularis	Na		16	2		✔
LUCANIDAE						
Sinodendron cylindricum	Common		2		✔	✔
Dorcus parallelipipedus	Local		2		✔	✔
SCIRTIDAE **Reviewed by Foster (2010)** Prionocyphon serricornis	Nb	Local	8	1	✔	✔
BUPRESTIDAE **Reviewed by Alexander (2014)** Agrilus biguttatus	Na	Local	8		✔	✔
Agrilus sinuatus	Na	Local	4			✔
EUCNEMIDAE						
Melasis buprestoides	Nb		4	1	✔	✔
Hylis olexai	RDB3		24		✔	
Epiphanis cornutus	Local		8		✔	
Eucnemis capucina	RDB1		32	3	✔	
THROSCIDAE						
Aulonothroscus brevicollis	RDB3		24	3	✔	
ELATERIDAE						
Denticollis linearis	Common		1		✔	✔
Stenagostus rhombeus	Local		4	1	✔	✔
Melanotus castanipes/ villosus	Common		1		✔	✔
LYCIDAE **Reviewed by Alexander (2014)** Platycis minutus	Nb	Local	8	1	✔	✔
CANTHARIDAE **Reviewed by Alexander (2014)** Malthinus balteatus	Nb	Local	8			✔
Malthinus flaveolus	Common		1			✔
Malthodes fibulatus	Nb	NS	8			✔
Malthodes marginatus	Common		1		✔	✔
Malthodes minimus	Common		1			✔
DERMESTIDAE **Reviewed by Alexander (2017)** Ctesias serra	Nb	Local	4		✔	✔
BOSTRICHIDAE **Reviewed by Alexander (2017)** Lyctus linearis	Nb	IUCN-CR & NR	8			✔ historic only
ANOBIIDAE **Reviewed by Alexander (2017)** Hedobia imperialis	Nb	Local	8		✔	✔

SPECIES	***National Status***	***Reviewed National Status changes****	***SQS Rarity score****	***IEC Score (2004)***	*2017 Survey*	*All data*
Grynobius planus	Local		2		✔	✔
Xestobium rufovillosum	Common		4	1		✔
Anobium fulvicorne	Common		1		✔	
Anobium punctatum	Common		1		✔	
Ptilinus pectinicornis	Common		1		✔	✔
Dorcatoma dresdensis	Na	NS	16	2	✔	
LYMEXYLIDAE **Reviewed by Alexander (2014)** Hylecoetus dermestoides	Nb	Local	4	1	✔	✔
PHLOIOPHILIDAE **Reviewed by Alexander (2014)** Phloiophilus edwardsi	Nb	NS	8	1		✔
CLERIDAE **Reviewed by Alexander (2014)** Tillus elongatus	Nb	NS	8	1	✔	✔
Thanasimus formicarius	Local		4	1		✔
DASYTIDAE						
Dasytes aeratus	Local		2		✔	✔
MALACHIIDAE						
Malachius bipustulatus	Common		1		✔	✔
SPHINDIDAE						
Sphindus dubius	Nb		8			✔
Aspidiphorus orbiculatus	Local		2		✔	✔
NITIDULIDAE						
Epuraea biguttata	Local		2			✔
Cryptarcha strigata	Nb		8		✔	
Glischrochilus quadriguttatus	Local		2			✔
MONOTOMIDAE						
Rhizophagus bipustulatus	Common		1		✔	✔
Rhizophagus dispar	Common		1		✔	✔
Rhizophagus nitidulus	Nb		4	1		✔
Rhizophagus oblongicollis	RDB1		24	3	✔	
Rhizophagus perforatus	Local		2		✔	
SILVANIDAE						
Uleiota planata	Na		16	2	✔	
Silvanus bidentatus	Nb		8	2		✔
Silvanus unidentatus	Local		4	1	✔	✔
CUCUJIDAE						
Pediacus dermestoides	Local		4	1		✔
LAEMOPHLOEIDAE						
Cryptolestes ferrugineus	Common		2		✔	
CRYPTOPHAGIDAE						
Cryptophagus dentatus	Common		1		✔	
Cryptophagus labilis	N		8			✔
Atomaria vespertina	Local		2			✔
Atomaria morio	RDBK		16		✔	
EROTYLIDAE						
Dacne bipustulata	Local		2			✔
Dacne rufifrons	Local		2		✔	✔
Triplax aenea	Local		2			
BIPHYLLIDAE						

SPECIES	***National Status***	***Reviewed National Status changes****	***SQS Rarity score****	***IEC Score (2004)***	*2017 Survey*	*All data*
Biphyllus lunatus	Local		4	1		✔
Diplocoelus fagi	Nb		8	1		✔
CERYLONIDAE						
Cerylon fagi	Nb		8	2	✔	✔
Cerylon ferrugineum	Local		2		✔	✔
Cerylon histeroides	Local		4		✔	✔
ENDOMYCHIDAE						
Endomychus coccineus	Local		2		✔	✔
CORYLOPHIDAE						
Orthoperus aequalis	~~RDBK~~		16			✔
Orthoperus corticalis	Local		4		✔	
LATRIDIIDAE						
Cartodere constricta	Local		4			✔
Enicmus brevicornis	Nb		8	1	✔	
Enicmus rugosus	Nb		8	2	✔	
Enicmus testaceus	Local		2		✔	
MYCETOPHAGIDAE Reviewed by Alexander et al. (2015)						
Pseudotriphyllus suturalis	Local		4	1		✔
Triphyllus bicolor	Local		4	2		✔
Litargus connexus	Local		2		✔	✔
Mycetophagus atomarius	Local		2	1		✔
Mycetophagus multipunctatus	Local		2		✔	
Mycetophagus piceus	Nb	Local	4	2	✔	✔
Mycetophagus quadripustulatus	Local		2			
CIIDAE						
Octotemnus glabriculus	Common		1			✔
Orthocis alni	Local		2		✔	✔
Cis bidentatus	Local		2		✔	✔
Cis boleti	Common		1		✔	✔
Cis fagi	Local		2			✔
Cis festivus	Nb		2		✔	
Cis micans (was hispidus)	Local		4			
Cis submicans (was micans)	Local		4		✔	✔
Cis castaneus (was nitidus)	Local		2		✔	✔
Cis pygmaeus	Local		2		✔	✔
Cis vestitus	Local		2		✔	
Cis villosulus	Local		2		✔	
Ennearthron cornutum	Local		2		✔	
TETRATOMIDAE Reviewed by Alexander et al. (2015)						
Tetratoma desmarestii	Na	NS	16	1	✔	✔
Tetratoma fungorum	Local		2		✔	✔
MELANDRYIDAE Reviewed by Alexander et al. (2015)						
Orchesia micans	Nb	NS	4		✔	
Orchesia minor	Nb	NS	8		✔	✔
Orchesia undulata	Local		4	1	✔	✔
Melandrya caraboides	Nb	NS	4	1		✔

SPECIES	*National Status*	*Reviewed National Status changes**	*SQS Rarity score***	*IEC Score (2004)*	*2017 Survey*	*All data*
MORDELLIDAE Reviewed by Alexander et al. (2015)						
Tomoxia bucephala	Na	NS	16	1	✔	✔
Variimorda villosa	Nb	NS				✔
Mordellistena neuwaldeggiana	RDBK	NS	16	1		✔
COLYDIIDAE Reviewed by Alexander et al. (2015)						
Cicones variegatus	Na	NS	8	2	✔	✔
Bitoma crenata	Local		4	1		✔
TENEBRIONIDAE Reviewed by Alexander et al. (2015)						
Eledona agricola	Nb	Local	4	1	✔	✔
Prionychus ater	Nb	Local	8	1	✔	✔
Gonodera luperus	Local	NS	2			✔
OEDEMERIDAE Reviewed by Alexander et al. (2015)						
Ischnomera cinerascens	RDB2	NR	32	1		✔
Ischnomera cyanea	Nb	Local	4	1	✔	✔
PYROCHROIDAE Reviewed by Alexander et al. (2015)						
Pyrochroa coccinea	Nb	Local	4	1	✔	✔
Pyrochroa serraticornis	Common		1		✔	✔
SALPINGIDAE Reviewed by Alexander et al. (2015)						
Lissodema denticolle	Nb	NS	8			✔
Vincenzellus ruficollis	Local		2			✔
Salpingus planirostris	Common		1		✔	✔
Salpingus ruficollis	Common		1			✔
ADERIDAE Reviewed by Alexander et al. (2015)						
Euglenes oculatus	Nb	NS	8	1	✔	
SCRAPTIIDAE Reviewed by Alexander et al. (2015)						
Anaspis costai	Common		2		✔	
Anaspis fasciata	Common		2		✔	✔
Anaspis frontalis	Common		1		✔	✔
Anaspis lurida	Local		2		✔	
Anaspis rufilabris	Common		1			
Anaspis thoracica	Na	NS	8		✔	
CERAMBYCIDAE						
Rhagium mordax	Common		1		✔	✔
Stenocorus meridianus	Local		2		✔	✔
Grammoptera ruficornis	Common		1		✔	✔
Stictoleptura scutellata	Na		16	3	✔	✔
Alosterna tabacicolor	Local		2		✔	✔
Rutpela maculata	Common		1			✔
Stenurella melanura	Local		2			✔
Phymatodes testaceus	Local		4	1	✔	
Poecilium alni	Nb		16		✔	

SPECIES	***National Status***	***Reviewed National Status changes****	***SQS Rarity score****	***IEC Score (2004)***	*2017 Survey*	*All data*
Clytus arietis	Common		1		✔	✔
Pogonocherus hispidus	Local		2			✔
Leiopus linnei/ nebulosus	Local		2			✔
ANTHRIBIDAE						
Platyrhinus resinosus	Nb		4	1		✔
Platystomos albinus	Nb		8	1		✔
CURCULIONIDAE						
Phloeophagus lignarius	Local		2		✔	
Acalles misellus	Local		2		✔	✔
Kyklioacalles roboris	Nb		8			
Magdalis carbonaria	Nb		4		✔	
Magdalis ruficornis	Local		2			
CURCULIONIDAE: Scolytinae						
Scolytus intricatus	Local		2		✔	
Ernoporicus fagi	Na		8	1	✔	✔
Dryocoetes villosus	Local		2		✔	✔
Taphrorychus bicolor	Na		8		✔	✔
Xyleborus dryographus	Nb		8	1	✔	✔
Trypodendron domesticum	Local		2	1	✔	✔
Hylesinus crenatus	Local		2			
PLATYPODIDAE						
Platypus cylindrus	Nb		8	1		✔

APPENDIX 3: SPECIES LIST FROM 2017 SURVEY

Arranged alphabetically by Group, Family & Species

Scientific Name	*Family*	*Order/Group*	*Conservation Status*
Nuctenea umbratica	Araneidae	Araneae	
Euglenes oculatus	Aderidae	Coleoptera	Nationally Scarce
Agrilus biguttatus	Buprestidae	Coleoptera	
Byturus tomentosus	Byturidae	Coleoptera	
Malthodes marginatus	Cantharidae	Coleoptera	
Bembidion harpaloides	Carabidae	Coleoptera	
Bradycellus verbasci	Carabidae	Coleoptera	
Calodromius spilotus	Carabidae	Coleoptera	
Carabus problematicus	Carabidae	Coleoptera	
Carabus violaceus	Carabidae	Coleoptera	
Dromius quadrimaculatus	Carabidae	Coleoptera	
Nebria brevicollis	Carabidae	Coleoptera	
Notiophilus quadripunctatus	Carabidae	Coleoptera	
Platynus assimilis	Carabidae	Coleoptera	
Pterostichus madidas	Carabidae	Coleoptera	
Pterostichus niger	Carabidae	Coleoptera	
Pterostichus vernalis	Carabidae	Coleoptera	
Trechus quadristriatus	Carabidae	Coleoptera	
Alosterna tabacicolor	Cerambycidae	Coleoptera	
Clytus arietis	Cerambycidae	Coleoptera	
Phymatodes testaceus	Cerambycidae	Coleoptera	
Poecilium alni	Cerambycidae	Coleoptera	Nationally Notable B
Rhagium mordax	Cerambycidae	Coleoptera	
Stenocorus meridianus	Cerambycidae	Coleoptera	
Stictoleptura scutellata	Cerambycidae	Coleoptera	Nationally Notable A
Cerylon fagi	Cerylonidae	Coleoptera	Nationally Notable B
Cerylon ferrugineum	Cerylonidae	Coleoptera	
Cerylon histeroides	Cerylonidae	Coleoptera	
Chalcoides aurea	Chrysomelidae	Coleoptera	
Orsodacne humeralis	Chrysomelidae	Coleoptera	Nationally Scarce
Psylliodes chrysocephala	Chrysomelidae	Coleoptera	
Cis bidentatus	Ciidae	Coleoptera	
Cis bilamellatus	Ciidae	Coleoptera	
Cis boleti	Ciidae	Coleoptera	
Cis castaneus	Ciidae	Coleoptera	
Cis festivus	Ciidae	Coleoptera	Nationally Notable B
Cis micans	Ciidae	Coleoptera	
Cis pygmaeus	Ciidae	Coleoptera	
Cis setiger	Ciidae	Coleoptera	

Cis vestitus	Ciidae	Coleoptera	
Ennearthron cornutum	Ciidae	Coleoptera	
Orthocis alni	Ciidae	Coleoptera	
Clambus nigrellus	Clambidae	Coleoptera	
Tillus elongatus	Cleridae	Coleoptera	Nationally Scarce
Cicones variegatus	Colydiidae	Coleoptera	Nationally Scarce
Orthoperus atomus	Corylophidae	Coleoptera	
Orthoperus nigrescens	Corylophidae	Coleoptera	
Sericoderus lateralis	Corylophidae	Coleoptera	
Atomaria morio	Cryptophagidae	Coleoptera	Red Data Book - K
Cryptophagus dentatus	Cryptophagidae	Coleoptera	
Cryptophagus laticollis	Cryptophagidae	Coleoptera	
Cryptophagus scanicus	Cryptophagidae	Coleoptera	
Cryptophagus simplex	Cryptophagidae	Coleoptera	
Uleiota planata	Cucujidae	Coleoptera	Nationally Notable A
Acalles misellus	Curculionidae	Coleoptera	
Archarius salicivorus	Curculionidae	Coleoptera	
Barypeithes araneiformis	Curculionidae	Coleoptera	
Coeliodes rana	Curculionidae	Coleoptera	
Dorytomus taeniatus	Curculionidae	Coleoptera	
Dryocoetes villosus	Curculionidae	Coleoptera	
Ernoporicus fagi	Curculionidae	Coleoptera	Nationally Notable A
Euophryum confine	Curculionidae	Coleoptera	
Magdalis carbonaria	Curculionidae	Coleoptera	Nationally Notable B
Phloeophagus lignarius	Curculionidae	Coleoptera	
Phyllobius argentatus	Curculionidae	Coleoptera	
Scolytus intricatus	Curculionidae	Coleoptera	
Strophosoma melanogrammum	Curculionidae	Coleoptera	
Taphrorychus bicolor	Curculionidae	Coleoptera	Nationally Notable B
Trypodendron domesticum	Curculionidae	Coleoptera	
Xyleborus dryographus	Curculionidae	Coleoptera	
Dasytes aeratus	Dasytidae	Coleoptera	
Ctesias serra	Dermestidae	Coleoptera	
Agriotes acuminatus	Elateridae	Coleoptera	
Agriotes pallidulus	Elateridae	Coleoptera	
Athous haemorrhoidalis	Elateridae	Coleoptera	
Athous hirtus	Elateridae	Coleoptera	
Athous vittatus	Elateridae	Coleoptera	
Dalopius marginatus	Elateridae	Coleoptera	
Denticollis linearis	Elateridae	Coleoptera	
Limonia poleni	Elateridae	Coleoptera	
Melanotus castanipes	Elateridae	Coleoptera	
Stenagostus rhombeus	Elateridae	Coleoptera	
Endomychus	Endomychidae	Coleoptera	

coccineus			
Dacne rufifrons	Erotylidae	Coleoptera	
Epiphanis cornutus	Eucnemidae	Coleoptera	European Red List – Near Threatened
Eucnemis capucina	Eucnemidae	Coleoptera	Red Data Book - Endangered
Hylis olexai	Eucnemidae	Coleoptera	Red Data Book - Rare
Melasis buprestoides	Eucnemidae	Coleoptera	Nationally Notable B
Typhaeus typhoeus	Geotrupidae	Coleoptera	
Abraeus perpusillus	Histeridae	Coleoptera	
Aeletes atomarius	Histeridae	Coleoptera	Nationally Scarce
Carcinops pumilio	Histeridae	Coleoptera	
Dendrophilus punctatus	Histeridae	Coleoptera	
Paromalus flavicornis	Histeridae	Coleoptera	
Plegaderus dissectus	Histeridae	Coleoptera	
Cryptolestes ferrugineus	Laemophloidae	Coleoptera	
Cartodere nodifer	Latriidae	Coleoptera	
Cortinicara gibbosa	Latriidae	Coleoptera	
Dienerella clathrata	Latriidae	Coleoptera	
Enicmus brevicornis	Latriidae	Coleoptera	Nationally Scarce
Enicmus rugosus	Latriidae	Coleoptera	Nationally Scarce
Enicmus testaceus	Latriidae	Coleoptera	
Enicmus transversus	Latriidae	Coleoptera	
Agathidium seminulum	Leiodidae	Coleoptera	
Anisotoma humeralis	Leiodidae	Coleoptera	
Anisotoma orbicularis	Leiodidae	Coleoptera	
Catops fuliginosus	Leiodidae	Coleoptera	
Catops nigricans	Leiodidae	Coleoptera	
Leiodes calcarata	Leiodidae	Coleoptera	
Leptinus testaceus	Leiodidae	Coleoptera	
Nargus wilkinii	Leiodidae	Coleoptera	
Nemadus colonoides	Leiodidae	Coleoptera	
Ptomaphagus subvillosus	Leiodidae	Coleoptera	
Dorcus parallelipipedus	Lucanidae	Coleoptera	
Sinodendron cylindricum	Lucanidae	Coleoptera	
Platycis minutus	Lycidae	Coleoptera	
Hylecoetus dermestoides	Lymexylidae	Coleoptera	
Malachius bipustulatus	Malachiidae	Coleoptera	
Orchesia micans	Melandryidae	Coleoptera	Nationally Scarce
Orchesia minor	Melandryidae	Coleoptera	Nationally Scarce
Orchesia undulata	Melandryidae	Coleoptera	
Tomoxia bucephala	Mordellidae	Coleoptera	Nationally Notable A
Litargus connexus	Mycetophagidae	Coleoptera	

Mycetophagus multipunctatus	Mycetophagidae	Coleoptera	
Mycetophagus piceus	Mycetophagidae	Coleoptera	
Cryptarcha strigata	Nitidulidae	Coleoptera	Nationally Notable B
Epuraea aestiva	Nitidulidae	Coleoptera	
Meligethes aeneus	Nitidulidae	Coleoptera	
Pocadius ferrugineus	Nitidulidae	Coleoptera	
Ischnomera cyanea	Oedemeridae	Coleoptera	
Olibrus aeneus	Phalacridae	Coleoptera	
Ptenidium gressneri	Ptilidae	Coleoptera	Nationally Scarce
Anobium fulvicorne	Ptinidae	Coleoptera	
Anobium punctatum	Ptinidae	Coleoptera	
Dorcatoma dresdensis	Ptinidae	Coleoptera	Nationally Scarce
Grynobius planus	Ptinidae	Coleoptera	
Hedobia imperialis	Ptinidae	Coleoptera	
Ptilinus pectinicornis	Ptinidae	Coleoptera	
Pyrochroa coccinea	Pyrochroidae	Coleoptera	
Pyrochroa serraticornis	Pyrochroidae	Coleoptera	
Rhizophagus bipustulatus	Rhizophagidae	Coleoptera	
Rhizophagus dispar	Rhizophagidae	Coleoptera	
Rhizophagus oblongicollis	Rhizophagidae	Coleoptera	Red Data Book - Endangered
Rhizophagus perforatus	Rhizophagidae	Coleoptera	
Salpingus planirostris	Salpingidae	Coleoptera	
Prionocyphon serricornis	Scirtidae	Coleoptera	
Anaspis costai	Scraptiidae	Coleoptera	Nationally Scarce
Anaspis fasciata	Scraptiidae	Coleoptera	
Anaspis frontalis	Scraptiidae	Coleoptera	
Anaspis garneysi	Scraptiidae	Coleoptera	
Anaspis lurida	Scraptiidae	Coleoptera	
Anaspis maculata	Scraptiidae	Coleoptera	
Anaspis regimbarti	Scraptiidae	Coleoptera	
Anaspis thoracica	Scraptiidae	Coleoptera	Nationally Scarce
Dendroxena quadrimaculata	Silphidae	Coleoptera	Nationally Notable B
Silpha atrata	Silphidae	Coleoptera	
Silvanus unidentatus	Silvanidae	Coleoptera	
Aspidiphorus orbiculatus	Sphindidae	Coleoptera	
Anotylus rugosus	Staphylinidae	Coleoptera	
Atrecus affinis	Staphylinidae	Coleoptera	
Bisnius subuliformis	Staphylinidae	Coleoptera	
Bolitochara lucida	Staphylinidae	Coleoptera	
Dropephylla gracilicornis	Staphylinidae	Coleoptera	Nationally Scarce

Dropephylla ioptera	Staphylinidae	Coleoptera	
Euplectus karstenii	Staphylinidae	Coleoptera	
Euplectus piceus	Staphylinidae	Coleoptera	
Gabrius splendidulus	Staphylinidae	Coleoptera	
Lithocharis ochraceus	Staphylinidae	Coleoptera	
Lordithon lunulatus	Staphylinidae	Coleoptera	
Lordithon trinotatus	Staphylinidae	Coleoptera	
Medon apicalis	Staphylinidae	Coleoptera	
Omalium caesum	Staphylinidae	Coleoptera	
Ontholestes tessellatus	Staphylinidae	Coleoptera	
Othius subuliformis	Staphylinidae	Coleoptera	
Philonthus tenuicornis	Staphylinidae	Coleoptera	
Phloeonomus punctipennis	Staphylinidae	Coleoptera	
Proteinus brachypterus	Staphylinidae	Coleoptera	
Proteinus ovalis	Staphylinidae	Coleoptera	
Quedius cruentus	Staphylinidae	Coleoptera	
Quedius mesomelinus	Staphylinidae	Coleoptera	
Rugilus rufipes	Staphylinidae	Coleoptera	
Sepedophilus bipunctatus	Staphylinidae	Coleoptera	Nationally Notable B
Sepedophilus littoreus	Staphylinidae	Coleoptera	
Sepedophilus lusitanicus	Staphylinidae	Coleoptera	
Stenichnus bicolor	Staphylinidae	Coleoptera	
Stenichnus collaris	Staphylinidae	Coleoptera	
Tachinus rufipes	Staphylinidae	Coleoptera	
Xylota sylvarum	Syrphidae	Coleoptera	
Eledona agricola	Tenebrionidae	Coleoptera	
Prionychus ater	Tenebrionidae	Coleoptera	
Tetratoma desmarestii	Tetratomidae	Coleoptera	Nationally Notable B
Tetratoma fungorum	Tetratomidae	Coleoptera	
Aulonothroscus brevicollis	Throscidae	Coleoptera	Red Data Book - Rare
Trixagus dermestoides	Throscidae	Coleoptera	
Trox scaber	Trogidae	Coleoptera	
Forficula auricularia	Forficulidae	Dermaptera	
Sylvicola punctatus	Anisopodidae	Diptera	
Machimus atricapillus	Asilidae	Diptera	
Clusiodes albimana	Clusiidae	Diptera	
Sciapus contristans	Dolichopodidae	Diptera	
Sciapus platypterus	Dolichopodidae	Diptera	
Camptogramma bilineata	Geometridae	Diptera	
Rhagio scolopacea	Rhagionidae	Diptera	
Scenopinus niger	Scenopinidae	Diptera	Nationally Rare
Brachyopa pilosa	Syrphidae	Diptera	Nationally Scarce
Brachypalpoides lenta	Syrphidae	Diptera	

Brachypalpus laphriformis	Syrphidae	Diptera	Nationally Scarce
Chalcosyrphus nemorum	Syrphidae	Diptera	
Criorhina floccosa	Syrphidae	Diptera	
Episyrphus balteatus	Syrphidae	Diptera	
Ferdinandea cuprea	Syrphidae	Diptera	
Myathropa florea	Syrphidae	Diptera	
Pocota personata	Syrphidae	Diptera	Red Data Book - Vulnerable
Xylota segnis	Syrphidae	Diptera	
Xylota sylvarum	Syrphidae	Coleoptera	
Ctenophora ornata	Tipulidae	Diptera	Red Data Book - Endangered
Dictenidia bimaculata	Tipulidae	Diptera	
Epiphragma ocellaris	Tipulidae	Diptera	
Acanthosoma haemorrhoidale	Acanthosomatidae	Hemiptera	
Elasmostethus interstinctus	Acanthosomatidae	Hemiptera	
Aradus depressus	Aradidae	Hemiptera	
Loricula elegantula	Microphysidae	Hemiptera	
Dryophilocoris quadrimaculatus	Miridae	Hemiptera	
Rhabdomiris striatellus	Miridae	Hemiptera	
Himacerus apterus	Nabidae	Hemiptera	
Pentatoma rufipes	Pentatomidae	Hemiptera	
Andrena thoracica	Andrenidae	Hymenoptera	
Bombus hypnorum	Apidae	Hymenoptera	
Lasius brunneus	Formicidae	Hymenoptera	Nationally Notable A
Leptothorax acervorum	Formicidae	Hymenoptera	
Crossocerus cetratus	Sphecidae	Hymenoptera	
Crossocerus megacephalus	Sphecidae	Hymenoptera	
Crossocerus podagricus	Sphecidae	Hymenoptera	
Crossocerus pusillus	Sphecidae	Hymenoptera	
Ectemnius cavifrons	Sphecidae	Hymenoptera	
Pemphredon lugubris	Sphecidae	Hymenoptera	
Pemphredon morio	Sphecidae	Hymenoptera	Nationally Notable B
Psenulus pallipes	Sphecidae	Hymenoptera	
Stigmus pendulus	Sphecidae	Hymenoptera	Red Data Book - K
Trypoxylon attenuatum	Sphecidae	Hymenoptera	
Vespa crabro	Vespidae	Hymenoptera	
Vespula vulgaris	Vespidae	Hymenoptera	
Oniscus asellus	Oniscidae	Isopoda	
Porcellio scaber	Porcellionidae	Isopoda	
Trichoniscus pusillus	Trichoniscidae	Isopoda	
Agriphila straminella	Crambidae	Lepidoptera	

Agriphila tristella	Crambidae	Lepidoptera	
Pleuroptya ruralis	Crambidae	Lepidoptera	
Drepana falcataria	Drepanidae	Lepidoptera	
Cyclophora linearia	Geometridae	Lepidoptera	
Cyclophora punctaria	Geometridae	Lepidoptera	
Ecliptopera silaceata	Geometridae	Lepidoptera	
Ennomos erosaria	Geometridae	Lepidoptera	
Ennomos fuscantaria	Geometridae	Lepidoptera	
Macaria notata	Geometridae	Lepidoptera	
Opisthograptis luteolata	Geometridae	Lepidoptera	
Xanthorhoe designata	Geometridae	Lepidoptera	
Lymantria monacha	Lymantriidae	Lepidoptera	
Amphipyra pyramidea	Noctuidae	Lepidoptera	
Amphipyra tragopoginis	Noctuidae	Lepidoptera	
Colocasia coryli	Noctuidae	Lepidoptera	
Coenobia rufa	Noctuidae	Lepidoptera	
Cosmia trapezina	Noctuidae	Lepidoptera	
Noctua janthe	Noctuidae	Lepidoptera	
Noctua pronuba	Noctuidae	Lepidoptera	
Ochropleura plecta	Noctuidae	Lepidoptera	
Rivula sericealis	Noctuidae	Lepidoptera	
Thalpophila matura	Noctuidae	Lepidoptera	
Xestia c-nigrum	Noctuidae	Lepidoptera	
Xestia sexstrigata	Noctuidae	Lepidoptera	
Pheosia gnoma	Notodontidae	Lepidoptera	
Argynnis paphia	Nymphalidaed	Lepidoptera	
Endrosis sarcitrella	Oecophoridae	Lepidoptera	
Esperia sulphurella	Oecophoridae	Lepidoptera	
Spuleria flavicaput	Parametriotidae	Lepidoptera	
Carcina quercana	Peleopodidae	Lepidoptera	
Limax marginatus	Limacidae	Mollusca	
Nemastoma bimaculatum	Nemastomatidae	Opiliones	

APPENDIX 4 SPECIES CONSERVATION STATUS CATEGORY DEFINITIONS

VERSION 1

GB RARITY CATEGORIES

The Red Data Book categories were used by Shirt (1987) and the Nationally Notable categories used in various species reviews such as Hyman & Parsons (1992).

Red Data Book category 1 – Endangered (RDB1)

Definition Taxa in danger of extinction and whose survival is unlikely if causal factors continue operating.

Included are those taxa whose numbers have been reduced to a critical level or whose habitats have been so dramatically reduced that they are deemed to be in immediate danger of extinction. Also included are *some* taxa that are *possibly* extinct.

Criteria Species, which are known *or believed to occur* as only a single population within one hectad (10km square)of the National Grid.

Species, which only occur in habitats known to be especially vulnerable.

Species, which have shown a rapid or continuous decline over the last twenty years and are now *estimated* to exist in five or fewer hectads.

Species which are *possibly* extinct *but have been recorded this century* and if rediscovered would need protection.

Red Data Book category 2 – Vulnerable (RDB2)

Definition Taxa *believed* likely to move into the Endangered category in the near future if the causal factors continue operating.

Included are taxa of which most or all of the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously depleted and whose ultimate security is not yet assured; and taxa with populations that are still abundant but are under threat from serious adverse factors throughout their range.

Criteria Species declining throughout their range.

Species in vulnerable habitats.

Red Data Book category 3 – Rare (RDB3)

Definition Taxa with small populations that are not at present Endangered or Vulnerable, but are at risk.

These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range.

Criterion Species which are *estimated to exist* in only fifteen or fewer hectads. *This criterion may be relaxed where populations are likely to exist in over fifteen hectads but occupy small areas of especially vulnerable habitat.*

Red Data Book category I - Indeterminate (RDBi)

Definition Taxa considered to be Endangered, Vulnerable or Rare in Great Britain, but where there is not enough information to say which of the three categories (RDB 1 to 3) is appropriate.

Red Data Book category K - Insufficiently Known (RDBk)

Definition Taxa that are suspected, but not definitely known, to belong to any of the above categories, because of lack of information.

Criteria Taxa recently discovered or recognised in Britain, which may prove to be more widespread in the future.

Taxa with very few or perhaps only a single known locality but which belong to poorly recorded or taxonomically difficult groups.

Species known from very few localities but which occur in inaccessible habitats or habitats which are seldom sampled.

Species with very few or perhaps only a single known locality and of questionable native status, but not clearly falling into the category of recent colonist, vagrant or introduction.

Nationally Notable category A (Na)

Definition Taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and are thought to occur in 30 or fewer hectads of the National Grid or, for less well-recorded groups, within seven or fewer vice-counties.

Nationally Notable category B (Nb)

Definition Taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and are thought to occur in between 31 and 100 hectads of the National Grid or, for less-well recorded groups, between eight and twenty vice-counties.

Nationally Notable (N)

Definition Species, which are estimated, to occur in 16 to 100 hectads in Great Britain. The subdividing of this category into categories A and B has not been attempted for a few species mentioned in this review.

Local

Definition Species which are not sufficiently scarce to include in the above categories, but which are of localised occurrence and often restricted to particular habitats.

Common

Definition Common and usually widely distributed species.

VERSION 2

More recent Species Reviews have employed International Union for Conservation of Nature IUCN Threat Criteria (IUCN, 2001) as well as re-assessing the GB Rarity Categories of species.

IUCN THREAT CATEGORIES

REGIONALLY EXTINCT (RE)
A taxon is Extinct when there is no reasonable doubt that the last individual has died. The last date for a record is set at fifty years before publication.

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when the best available evidence indicates that it is facing an extremely high risk of extinction in the wild. .

ENDANGERED (EN)
A taxon is Endangered when the best available evidence indicates that it is facing a very high risk of extinction in the wild.

VULNERABLE (VU)
A taxon is Vulnerable when the best available evidence indicates that it is facing a high risk of extinction in the wild. .

NEAR THREATENED (NT)
A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)
A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate.

NOT EVALUATED (NE)
A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

NOT APPLICABLE (NA)
Taxa deemed to be ineligible for assessment at a regional level because they are not wild populations or not within their natural range in the region, or non-natives (whether this is the result of accidental or deliberate importation), or because they are vagrants. A taxon may also be NA because it occurs at very low numbers in the region (i.e. when the regional Red List authority has decided to use a “filter” to exclude taxa before the assessment procedure) or the taxon may be classified at a lower taxonomic level (e.g. below the level of species or subspecies) than considered eligible by the regional Red List authority.

REVIEWED GB RARITY CATEGORIES

At the national level, countries are permitted under the IUCN guidelines to refine the definitions for the non-threatened categories and to define additional ones of their own. The Nationally Rare and Nationally Scarce categories adopted by this Review are unique to Britain. Broadly speaking, the

Nationally Rare category is equivalent to the Red Data Book categories used by Hyman (revised Parsons) (1992, 1994), namely: Endangered (RDB1), Vulnerable (RDB2), Rare (RDB3), Insufficiently Known (RDBK), Indeterminate (RDBI) and Extinct. The Nationally Scarce category is directly equivalent to the combined Nationally Notable A (Na) and Nationally Notable B (Nb) categories used in the assessment of various taxonomic groups.

Nationally Rare (NR) A native species recorded from between 1- 15 hectads of the Ordnance Survey national grid in Great Britain since 1990 and: • There is reasonable confidence that exhaustive recording would not find them in more than 15 hectads. • Where it is believed to occur as a breeding species within each of these hectads (i.e. discount those that are known to contain only casual immigrants). This category includes species that are possibly extinct, such as those in the CR (PE) category, but not those where there is confidence that they are regionally extinct (RE).

Nationally Scarce (NS) A native species recorded from between 16 - 100 hectads of the Ordnance Survey national grid in Great Britain since 1990 and: • There is reasonable confidence that exhaustive recording would not find them in more than 100 hectads. Where it is believed to occur as a breeding species within each of these hectads (i.e. discount those that are known to contain only casual immigrants).

Appendix 16: A survey of Saproxylic coleopteran (and other invertebrates) of selected areas of Ashrudge Estate, 2018

A SURVEY OF SAPROXYLIC COLEOPTERA (AND OTHER INVERTEBRATES) OF SELECTED AREAS OF THE ASHRIDGE ESTATE, HERTFORDSHIRE & BUCKINGHAMSHIRE

A report commissioned by the National Trust

A. P. Foster

2018

CONTENTS

1 SUMMARY

This report provides a reassessment of the saproxylic[1] beetle (Coleoptera) assemblages at the National Trust (NT) Ashridge property, based on field work conducted during 2018 that focussed on areas not covered by the 2017 survey. It compares and combines the results of previous studies, provides an updated assessment of the current condition and significance of the saproxylic invertebrate fauna, and considers management that will aid the conservation of wood-decay habitats and their associated fauna in the future.

Brief observations on other saproxylic invertebrates, other arboreal species, and invertebrates from other habitats are also provided.

1.1 Overview

- Ashridge is now shown to be of international significance for saproxylic invertebrates and is in the top 10 sites nationally.
- All tree species sampled supported noteworthy wood-decay invertebrates. Oak and beech appear to be the most important resource by supporting the greatest range of saproxylic invertebrates and notable species, but other species, such as ash, birch and sallow are shown to support significant species.
- Similarly, trees in shade, partial shade, or open sunny situations all supported notable wood-decay insects, although the species composition in each situation can differ.

1.2 Saproxylic beetle assessment

- Following the 2017 survey, which focussed on the veteran trees at Aldbury Common along with some areas of Northchurch, Pitstone & Ivinghoe Commons, and Sallow Copse, this survey focussed on other areas of the Estate – Monument Drive, Prince's Riding and adjoining areas to the south which form part of the historic Ashridge Park, Hudnall & Ivinghoe Commons, and Frithsden Beeches.

- It recorded 157 species of saproxylic beetle, of which 40 are additions to the Ashridge list (Appendix 1) and 57 have national conservation status (Table 3, p. 18), with some having highly restricted distributions in the UK.

- The veteran trees at Ashridge are now shown to be of international significance for their wood-decay beetle fauna based on the combined results of the 2017 & 2018 surveys and previous data.

- Particularly significant species found on the veteran trees in this study include several Red Data Book (RDB) listed species: the silken fungus beetles *Cryptophagus falcozi* (previously only reported from Berkshire) & *C. micaceus*;

[1] Species that are dependent, during some part of their life cycle, upon dead or decaying wood (in living or dead trees, whether standing or fallen), or wood-inhabiting fungi, or on the presence of other saproxylics.

the ant-like stone beetles *Microscydmus minimus* & *Scydmaenus rufus*; the false click beetles *Eucnemis capucina* & *Hylis olexai*, the root-eating beetle *Rhizophagus fenestralis*, and the cylindrical timber beetle *Oxylaemus variolosus*. A further RDB root-eating beetle was found in 2017 - *Rhizophagus oblongicollis*. And a third false click beetle, *Epiphanis cornutus* along with the fungus beetle *Pseudotriphyllus suturalis* are on the European Red List of Saproxylic Coleoptera – Near Threatened category. See Main Table of notable invertebrates (p.55) for further information on these and other notable species.

- Collectively these 2018 discoveries, combined with those of the 2017 and previous surveys across the estate include 1 IUCN (historic record only[2]), 14 RDB/Nationally Rare (NR) and 67 Nationally Notable/Scarce (Na, Nb & NS)[3] saproxylic beetles. As above two species are also listed European Red List-Near Threatened category of saproxylic beetles.

- The saproxylic beetle fauna is assessed using two established methodologies – The Index of Ecological Continuity (IEC) & the Saproxylic Quality Index (SQI). Taking the combined data for the 2018 survey with that of previous studies, 226 beetle species now qualify, resulting in an IEC of 114 – well above the internationally important threshold of 80, and an SQI of 586.2, again of national significance and probably also of international importance.

- Ashridge is now ranked as 10th in the national league table of important saproxylic sites based on the IEC (previously ranked 19th), and 20th based on the SQI (previously ranked 46th). Strong emphasis need not be placed on the 'league' position, as this regularly changes with recording effort. More important is that Ashridge easily qualifies as internationally important and lies within the top 10 sites in the country – the 'Premier League' of UK saproxylic sites.

- Collectively these results show that the NT Ashridge Estate is of highly significant importance for the conservation of saproxylic communities dependent on ancient/veteran trees and is easily among the best sites in NT ownership – only Hatfield Forest in Essex scores higher.

- The overall diversity of saproxylic beetles highlights the significance of several key wood-decay habitats, such as heartrot, sapwood decay, rot holes, loose bark, bracket fungi and decaying aerial branches. With the current survey also highlighting the importance of dead standing trees.

- Further analysis using Pantheon[4] shows that three key Specific Assemblage Types (SATs), which are characterised by ecologically restricted species, are represented at Ashridge: heartwood decay; bark & sapwood decay; and fungal fruiting bodies. All three support notable species here and importantly score as being in Favourable Condition.

[2] European powder-post beetle *Lyctus linearis*
[3] Nationally Scarce or Nationally Notable species are those recorded within 16 to 100 hectads (10 km squares) in GB and hence are of significant nature conservation importance. See p.8 and Appendix 4 for details of conservation status catgories.
[4] A database tool now in widespread use for identifying key habitat features for invertebrates and assessing their condition.

1.3 Other saproxylic interest

- Several notable wood-decay flies have been recorded in the 2017 & 2018 studies including: the RDB Endangered smudge-winged comb-horn cranefly *Ctenophora ornata* in 2017, followed by the RDB Vulnerable wasp-banded comb-horn *C. flaveolata* and the Nationally Notable orange-sided comb-horn *C. pectinicoris* in 2018; the Nationally Rare forest windowfly *Scenopinus niger* in 2017; two Nationally Scarce hoverflies – *Pocota personata* & *Brachyopa pilosa* in both 2017 & 2018; several fungus gnats; tree snipe fly *Chrysopilus cristatus* and the picture-wing fly *Paraclusia tigrina* in 2018. Among the Hymenoptera (ants, bees & wasps) there were also several notable species: the brown tree ant *Lasius brunneus* (Na) occurred widely across the property in 2017 & 2018 (it may no longer warrant Nationally Notable status), and the digger wasps *Pemphredon morio* (Nb) and *Stigmus pendulus* (RDBK) were recorded in 2017.

1.4 Other arboreal invertebrate interest

- Non-saproxylic interest is also represented on the trees – adults of the Nationally Notable great oak beauty moth *Hypomecis roboraria* were recorded in a moth trap operated at the Bunkhouse/Base Cap - it has larvae feeding on oak, adults of red-tipped clearwing moth *Synanthedon formicaeformis*, another Nationally Notable moth were attracted to pheromone lures on the south-side of Monument Drive; and the Nationally Scarce leaf beetle *Orsodacne cerasi* was recorded from Prince's Riding in this survey. The 2017 survey recorded the related the Nationally Scarce leaf beetle *Orsodacne humeralis* and the Silphid beetle *Dendroxena quadrimaculata*, which is a predator of moth larvae, both at Ivinghoe Common.

1.5 Hertfordshire Coleoptera List

Taking all the beetles recorded from the 2017 & 2018 surveys, including non-saproxylic species, 21 appear to be additions to the Hertfordshire list – see Appendix 2. And for other species there have not been any reported sightings for many years, for example *Phloiophilus edwardsii* last seen in 19th century.

1.6 Records/Data

- A full list of invertebrate records (>2000) from the 2018 survey is provided as a separate Excel spreadsheet.
- Species lists from the current study are provided in Appendix 4.

1.7 Suggestions for further study

- Further sampling for heartrot specialists is recommended as the current data set still lacks some of the key species, notably heartrot associated click beetles. Efforts were made to record these in the 2018 survey, and whilst some key species were discovered others remain absent from the overall

dataset - in view of the habitat resource available, at least some could be expected to occur here.
- This and the previous 2017 survey have covered much of the Estate. Remaining areas which may merit further study are the golf course and southern section of Northchurch Common. Open grown veteran trees in open sunny situations, e.g. some those on the golf course, could link in with further heart rot studies as suggested above.

1.8 Key management considerations

The following (modified) points were provided in Foster (2017) and still apply:

- This, and previous surveys have shown that the veteran trees on the estate are of international significance for wood-decay invertebrates – this importance has been recognised in the SSSI designation.
- It is recommended that all the land continues to be managed sympathetically for its tree populations, which are actively conserved – a policy already in place.
- Ensure there is a continual supply of wood-decay habitat within the overall habitat mosaic - all dead and decaying wood should be retained to provide a habitat for dead wood-decay communities, subject to safety concerns.
- It is encouraging that dead wood management at the property is already sympathetic to the preservation of trees and their associated wood-decay habitats. For example, standing dead trees are being left in situ – this is especially important, as visually dead trees are full of life and can retain significant interest for long periods. There is an abundance of wood-decay habitat throughout including complete fallen specimen trees being allowed to decay naturally.
- There may be a need for sensitive tree surgery to prolong the life of some veterans – several of the largest specimens examined in the current study had shed limbs recently. These included beech and oak pollards which had split apart in high winds.
- If tree surgery works are deemed essential, then in such circumstances the possibility of tree bat roosts and nesting birds should be considered before any tree management work is carried out, and felled timber left as close to the tree of origin as possible, where displacement of deadwood is unavoidable then it should be minimal.
- Continue with the programme of haloing veteran trees that are becoming shaded by younger specimens, as excessive shading may affect tree health over the long-term, and proportionally there are relatively few open grown veteran specimens across the Estate.
- An overall aim should be to retain a continuous supply of wood-decay habitat in a variety of situations – including sun-exposed, partial shade/dappled sunlight, and full shade. Distinct invertebrate assemblages may occur in each situation, and whilst partial shade may benefit the widest variety of saproxylics, some specialise in sun-exposed trees (notably, nesting solitary bees & wasps), or shaded dead wood supporting wet rotten habitats and abundant fungi (important for some flies).

- As many areas are becoming shaded out by younger trees, the programme of haloing of veteran specimen trees and the creation of small glades will aid the process diversifying the wooded habitats – historically it is likely that many areas would have been more open structured under a pasture woodland system.
- Ensure provision of nectar sources – this is crucial for the adult stages of many saproxylic insects. Important nectar providing species that are frequent at Ashridge include sallow (for spring insects), hawthorn & holly (for early summer insects) and bramble (for mid-late summer insects). Many veteran hawthorns that will have been open grown in the past are now shaded out and are less-attractive to nectaring insects. In common with haloing of veteran trees it would be beneficial to halo a section of old hawthorns, again this will aid diversification of the overall habitat structure.
- Tree health should be a primary concern and any damaging activities which compromise their health avoided. Activities which are potentially damaging to mature trees include compaction of tree roots by machinery or parking of vehicles in close proximity of trees – the latter especially relevant in the Monument Drive area.
- The tree population dynamics should be investigated across the estate and, if necessary, be used to develop a tree recruitment plan which favours natural regeneration wherever feasible.
- Tree recruitment planning should favour both open-grown trees and some denser wooded areas.
- A programme of educational work should be developed by the Trust to ensure that everyone involved in the management of the estate is aware of the nature conservation issues, including veteran trees and their associated interests, in broad terms at least, to ensure that good practice prevails. Raising wider public awareness would also be of benefit.

Further, more specific, points which arise from the 2018 survey include:

- The importance of **dead standing trees** is emphasised within the overall wood-decay resource by sampling single selected examples of oak & beech on the south side of Prince's Riding - 15 species of beetle with national conservation status were recorded from the oak and 19 from the beech, some occurring at both trees. These were among the most productive trees for saproxylics in the 2017 & 2018 studies and demonstrate the importance of retaining such specimens. Examples in open sun are also going to be important for cavity nesting solitary bees & wasps
- The significance of **birch** within the overall wood-decay resource is confirmed - 2 RDB & 14 Nationally Notable/Scarce saproxylic beetles including red rot specialists and those associated with white rot/wood mould habitats were recorded in the current survey. Whilst birch won't support all the key red and white rot specialists more usually associated with oak, beech & ash, old specimens, whether dead standing, fallen or live with rot cavities, clearly act as a surrogate species for many saproxylics. Birch is also the primarily host for birch polypore fungus, which supports a variety of beetles, including specialist species.
- The 2018 survey has again shown **oak & beech** to be particularly important species – supporting the greatest number of saproxylics, including notable

species, but that **ash & sallow** also hold significant species, the former being especially important for white rot/wood mould species and those associated with King Alfred's Cakes fungus.

- Much of **Berkhamsted Common** is dominated by secondary birch and selective thinning of this species, whilst retaining some individual specimens is suggested. It is noted that some clearing around a group of oaks has already been undertaken and further areas to target would be in the vicinity of post-mature and veteran oaks, and beech – one very large old pollard of the latter was seen and is getting closed in by secondary woodland growth. Such examples may require sensitive haloing and advice from specialists. Some large glades remain on the Common and should be kept largely open – one acid grassland click beetle was recorded suggesting that a limited acid grassland fauna is surviving.
- **Birch woodland south of Princes Riding** (part of former Ashridge Park) is similar in being largely dominated by secondary birch and there are also plantation areas in the eastern sector towards Ashridge College. However, veterans of beech and oak, which presumably date from the original Ashridge Park survive. Again, selective thinning of birch, and plantation trees is suggested, especially in the vicinity of existing veterans as this was previously a more open landscape with a scatter of veteran trees.
- **Frithsden Beeches** supports a large number (>100) of veteran pollard and maiden beeches, an alarming number of which are shedding limbs or completely collapsing, including several during the 2018 survey. Whilst this provides an abundant wood-decay resource now and for several decades to come, it is a concern for the longer-term survival of the veterans and their continued supply of wood-decay habitat. In common with other areas some veteran specimens are becoming engulfed on secondary woodland growth and may require sensitive haloing. Though, conversely, some of these examples may be more sheltered from storm damage and could survive longer than those in the open – expert advice is required to prioritise tree works, such as crown reduction to prolong survival of individual veterans and to consider which specimens are suitable for haloing. There is a need for a schedule of careful crown pruning of veteran trees - Hatfield Forest are experienced in this work (there they focus on trees for which a 50+ year life is expected, so that resources are targeted at trees with good longevity, rather than try to rescue collapsing veterans).

- Overall the Estate supports a huge wood-decay resource, comprising a variety of tree species in different situations (sun, partial shade and shade) and there may be little need for active veteranisation works. Exceptions may be bridging the age gap for species such as oak and beech, notably the latter – detailed assessments were not made, but there appeared to be few developing replacements for ancient beech pollards in particular.

2 BACKGROUND

The Ashridge NT property is located on the Chiltern Hills to the east of Tring and to the north of Berkhamsted in Hertfordshire & Buckinghamshire (ca SP91). It

consists primarily of large areas of wooded common – former pasture woodland, with a few remnants of acid grassland and heath, along with unimproved calcareous and farmland in other outlying areas. The property incorporates one of the largest areas of semi-natural habitat in the Chilterns, and the outstanding nature conservation interests of the estate including considerable importance for invertebrate conservation, notably wood-decay associated species, has been recognised by Natural England in its designation as a Site of Special Scientific Interest (SSSI).

The veteran trees at Ashridge have been recorded for saproxylic invertebrates in the past, particularly the beetles (Coleoptera) and flies (Diptera): The National Trust's in-house Biological Survey Team covered the property in 1996 (Hearn et al., 1997), following this Richard Jones was commissioned to undertake saproxylic beetle surveys in 1998 & 1999 (Jones 1998 & 1999), and Peter Chandler surveyed the Diptera (Chandler, 1997). Last year, a survey was commissioned by the NT that focused on Aldbury Common, northern part of Northchurch Common, part of Ivinghoe Common and Sallow Copse (Foster, 2017). That survey highlighted the importance of the Estate for saproxylic invertebrates and indicated that oak & beech, in particular, were important tree species for saproxylics.

The current survey was commissioned, again by NT, to further investigate the invertebrate fauna associated with the veteran trees, focussing on different areas to those covered in 2017 and to investigate importance of other tree species such as birch and ash. With the key points for investigation as follows.

- Further sampling of heartrot specialists
    - Due to the likelihood of picking up new records for the site of species likely to occur here but not yet recorded.
- Fauna of under-recorded tree species
    - Birch (Including any observations or recommendations for tree veteranisation work that could be used to enhance the decaying wood habitat value of stands of secondary birch woodland)
    - Ash
    - Sallow
- Saproxylic fauna associated with hawthorn nectar sources
- Fauna of less well studied geographical areas
    - To allow an assessment to be made about species distribution and habitat connectivity.
        - Berkhamsted Common
        - Frithsden Beeches (sampled in 1998, but considered by many to be a site of European importance)
        - Ivinghoe Common
        - Aldbury Common adjacent to Monument Drive (subject to a development proposal for new car parking project)
        - Pitstone Common
        - Princes Riding and adjacent birch woodland
- Make recommendations for further survey and/or monitoring that should be carried out on site to allow us to answer the following questions:

- Is there sufficient habitat continuity at all stages and types of decay to allow saproxylic invertebrate populations to disperse throughout the site?
- Are habitat management interventions (such as veteranisation work) required to provide habitat connectivity?

Richard Allen & Peter Brash of the NT in-house Biological Survey Team were also conducting a survey at Ashridge in 2016 & 2017 - their work will provide more descriptive detail of habitats, information on other invertebrates, and cover a wider area of the estate.

Veteran Tree resource

During 2015 & 2016 a team of NT volunteers have documented over 900 trees across the estate. This was part of a Trust-wide ancient tree survey, which is now stored on the NT Intranet Browser. The more notable examples of ash & birch are indicated on Maps 2a & 2b provided by Emily Smith.

Some trees are marked with metal tags – when present, a note was made of these during field survey, though not all trees still had the tags attached. Those tag numbers are included in the species records spreadsheet.

Nomenclature

The nomenclature for the Coleoptera in this study follows Duff (2018) – which has resulted in some changes, including some of the notable species, since the previous 2017 survey when Duff (2012) was in use. Checklists for the other main groups follow: Chandler (1998) for Diptera; Bantock (2012) for Hemiptera; Archer (2004) for Hymenoptera.

Conservation status categories

At the time of earlier surveys, e.g. Hearn et al. (1997), and Jones (1998 &1999) the UK conservation status categories for Coleoptera would have followed Hyman & Parsons (1992 & 1994). For some beetle groups those status categories still apply, but several other beetle, and other invertebrate groups, they have recently been (or are in the process of being) reviewed by various contractors for Natural England within the Species Status Project. Similarly, reviews are under way or have been published for various groups of Diptera, for example the hoverflies (Syrphidae) which has led to changes in status categories and terminology.

These more recent reviews follow International Union for Conservation of Nature (IUCN) threat criteria and result in the use Red List Categories - Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN) and Vulnerable (VU).

These modern reviews also re-assess the national status of species – which affects several species known at Ashridge. This has led to a number of status changes, and there has also been a change in the terminology – essentially the Red Data Book (RDB) categories of the past, of which there were several, are now under one category known as Nationally Rare (NR), and the Nationally

Notable status used previously is now equivalent to Nationally Scarce, although there no longer a distinction between categories Nationally Notable A (Na) & Nationally Notable B (Nb) – all are now Nationally Scarce (NS). The accompanying tables in this report take account of the latest changes.

For details of the various status categories and their definitions – see Appendix 5 at the end of this report.

In addition to the IUCN & national species reviews a European Red List of Saproxylic Beetles has been published (Nieto & Alexander, 2010), with Alexander (2011) highlighting species in the UK. This includes the European Red List - Near Threatened false click beetle *Epiphanis cornutus* and fungus beetle *Pseudotriphyllus suturalis* which are both present at Ashridge. Also, Alexander (2011) has reported that *Pediacus dermestoides* is more widespread in Britain than elsewhere in mainland Europe and that this country may have internationally important populations. It is currently on the European Red List – Data Deficient category.

3 SURVEY METHODS

The timings of visits spanned May to October to maximise recording of species with different emergence peaks. This was made possible as further studies were also being conducted elsewhere on the Estate, notably Ivinghoe Hills, along with a more general invertebrate survey in the Monument Drive area during the summer and autumn of 2018 – this enabled a series of extra visits to be combined with the other sampling elsewhere on the Estate.

Most field sampling (sweep netting & active searching etc.) was undertaken on 17th, 22nd & 23rd May and 6th, 18th, 19th & 20th June. Though other visits were made, usually to empty/reset the various invertebrate traps, when further recording was undertaken albeit for brief periods.

The full list of dates visited are:

17th, 22nd & 23rd May
5th, 6th, 18th, 19th, 20th & 27th June
11th, 12th & 26th July
28th August
and 10th October.

Weather conditions were favourable during the field visits – warm (often exceptionally hot – 30°C or more on several occasions), dry and sunny – it was even 23°C during the final visit in October. The only exception was heavy overnight/early morning rain on 27th/28th August. There was a moderate breeze on some visits which may have limited effectiveness of sampling branches, but it is not anticipated that this will have adversely affected the overall sampling effort.

3.1 Study area

The previous 2017 survey focussed on the veteran trees at Aldbury Common, the adjoining northern sector of Northchurch Common, along with parts of Sallow Copse, Pitstone & Ivinghoe Commons. This survey focussed on other areas of the Estate, especially either side of Monument Drive (which formed part of another study), Prince's Riding – and areas immediately to the south which are located within the former Ashridge Park, Berkhamsted, Hudnall & Ivinghoe Commons and Frithsden Beeches.

3.2 Field survey – active searching

This involves various activities, then main ones including:

- Beating foliage and decaying branches or boughs over a white beating tray.
- Beating of nectar sources, especially flowering shrubs (notably hawthorn), over a beating tray – this can be a highly effective technique for recording many saproxylic beetles and avoids disturbance/damage to wood decay habitats.
- Sweeping ground vegetation under and in the vicinity of veteran trees.
- Direct observation of trunks, logs, rot holes etc. for resting or active invertebrates – this is more useful when recording species that are actively visiting trees, such as bees and wasps, and some flies.
- Lifting loose bark and breaking open dead wood – although minimal use of these techniques was employed in order to avoid lasting damage to wood decay habitats.
- Examination of fungal fruiting bodies, especially bracket fungi on trees, by tapping over a tray. In some cases, samples of bracket fungi were retained, and beetles reared from them. Although, overall only a limited number of bracket fungi were observed or accessible for sampling.
- Collection of heartrot or other sieved material to be extracted using a Winkler extractor – see below.

3.3 Trapping techniques

A variety of trapping techniques have been developed in recent years and are employed to augment active field searching – these trapping methods normally add species which are not otherwise easy to find by field searching. A series of interception traps (vane traps), a few pitfall traps, and one underground pitfall trap were used in this study – trapping periods, locations etc. are summarised in Table 1 below, and their locations indicated on Maps 2 A-G.

As the number of vane traps in this study was almost double that in 2017 (26 in 2018 & 14 in 2017), bottle traps and yellow pan traps were not employed this year, although they were used in a few instances in 2017.

The property is popular with the public and receives heavy use, especially during school holidays. Traps were deliberately located out of reach in areas of high public use, or discretely located out of view. No traps were deliberately damaged

during the sampling periods (unlike 2017), though a few were damaged by falling trees, branches or other debris.

Table 1: Ashridge invertebrate traps.

Trap number Grid ref	Tree type/situation	Location	Dates operated
Vane Traps			
VT1 SP9815312592	Birch (set inside basal hollow) Partial shade	Prince's Riding (south), former Park,	8/5 – 16/5/2018 16/5 – 5/6/2018 5/6 – 12/7/2018 12/7 – 28/8/2018 28/8 – 9/10/2018
VT2 - SP9832112454	Birch (dead standing) Sunny	Prince's Riding (south), former Park,	8/5 – 16/5/2018 16/5 – 23/5/2018 23/5 – 5/6/2018 5/6 – 18/6/2018
VT3 SP9824012528	Birch (fallen) Shade	Prince's Riding (south), former Park,	8/5 – 16/5/2018 16/5 – 23/5/2018
VT4 SP9803912657	Birch (log pile) Partial shade	Wood Yard	8/5 – 16/5/2018
VT5 SP9797112675	Birch (fallen) Partial shade	Prince's Riding (south), former Park,	8/5 – 16/5/2018 16/5 – 23/5/2018 23/5 – 5/6/2018
VT6 SP9798411800	Birch Shade	Berkhamsted Common	8/5 – 16/5/2018 16/5 – 5/6/2018 5/6 – 18/6/2018
VT7 TL0096712884	Ash (part dead standing) Partial shade	Hudnall Common	16/5 – 22/5/2018 22/5 – 18/6/2018 18/6 – 26/7/2018 26/7 – 28/8/2018
VT8 TL0094312874	Ash (fallen)	Hudnall Common	16/5 – 22/5/2018 22/5 – 18/6/2018 18/6 – 26/7/2018 26/7 – 28/8/2018
VT9 SP9991710759	Beech (fallen) Partial shade	Frithsden Beeches	16/5 – 22/5/2018 22/5 – 6/6/2018 6 -18/6/2018 18/6 – 26/7/2018 26/7 – 28/8/2018
VT10 SP9995010661	Cherry Shade	Frithsden Beeches	16/5 – 22/5/2018 22/5 – 6/6/2018
VT11 SP9862911569	Birch (dead standing) Partial shade (tree collapsed and crushed trap)	Berkhamsted Common	17/5 – 5/6/2018
VT12 SP9794813961	Beech (dead standing) Sunny	Ivinghoe Common	17/5 – 6/6/2018 6/6 – 18/6/2018
VT13	Beech (fallen, well-	Ivinghoe Common	17/5 – 23/5/2018

SP9791113944	rotted) Partial shade		23/5 – 6/6/2018
VT14 SP9992910374	Beech (part dead standing), tag 0561 Partial shade	Frithsden Beeches	22/5 – 5/6/2018 5/6 – 18/6/2018
VT15 SP9849712604	Beech (fallen, set in hollow), tag 0042 Shade	Prince's Riding (north)	23/5 – 5/6/2018 5/6 – 18/6/2018 18/6 – 12/7/2018
VT16 SP9827612618	Oak, tags 0450 & 0607 Partial Shade	Prince's Riding (south), former Park	6/6 – 19/6/2018 19/6 – 12/7/2018 12/7 – 29/8/2018 29/8 – 10/10/2018
VT17 SP9876712441	Oak (dead standing) Partial shade	Prince's Riding (south), former Park	6/6 – 19/6/2018 19/6 – 12/7/2018 12/7 - 29/8/2018
VT18 SP9862712491	Beech (dead standing) Sunny	Prince's Riding (south), former Park	6/6 – 19/6/2018 19/6 – 12/7/2018 12/7 – 29/8/2018 29/8 – 10/10/2018
VT19 SP9751112817	Sallow (part dead) Partial shade	Monument Drive (south)	6/6 – 18/6/2018 18/6 – 11/7/2018
VT20 SP9754612745	Oak (decaying bough) Partial shade	Monument Drive (south)	6/6 – 19/6/2018 19/6 – 12/7/2018
VT21 SP9831012441	Beech (recently fallen) Partial shade	Prince's Riding (south), former Park	18/6 – 12/7/2018 12/7 – 28/8/2018
VT22 TL0005510462	Beech Shade (trap broken by falling bough)	Frithsden Beeches	18/6 – 12/7/2018
VT23 SP9802413978	Birch (dead standing) Partial shade	Ivinghoe Common	18/6 - 12/7/2018 12/7/ - 28/8/2018
VT24 SP9852412581	Oak (fallen)	Prince's Riding (north)	19/6 – 12/7/2018 12/7 – 28/8/2018
VT25 SP9723313066	Oak (dead standing) Shade	Monument Drive (north)	12/7 – 29/8/2018 29/8 – 10/10/2018
VT26 TL0010710351	Beech (rotten stump) Shade	Firthsden Beeches	29/8 – 9/10/2018
Pitfall traps			
PFT1 SP9804712552	Beech (base of tree by sap run) Shade	Prince's Riding (south), former Park	8/5/2018 – 16/5/2018 16/5 – 23/5/2018 23/5 – 6/6/2018
PFT2 **SP9820112527**	Beech (wood mould hollow) Shade	Prince's Riding (south), former Park	8/5/2018 – 16/5/2018 16/5 – 23/5/2018 23/5 – 6/6/2018 28/8 – 9/10/2018
PFT3	Birch (rot hole)	Berkhamsted	16/5 – 5/6/2018

SP9867611657	Partial shade	common		
Underground pitfall traps				
UPFT1	Oak (base of tree)	Prince's	Riding	5/6 – 12/7/2018
SP9827612618	Partial shade	(south), former	Park	12/7 -28/8/2018
				28/8 – 9/10/2018

Several pheromone lures were also employed for various clearwing moths and one click beetle – see section 3.3.5 below.

3.3.1 Interception Traps

Various types of interception trap are now widely used in saproxylic invertebrate surveys – suitably placed these can be highly effective in recording species which are otherwise difficult to find, especially taxa that inhabit heartrot deep within trees, or species that are primarily nocturnal. The traps have the added advantage of not damaging the dead wood habitat resource. The success (or failure) of traps in recording significant species is likely to be highly dependent on their location – the most productive locations (pers. obs.) are in close proximity of fissures, rot holes or large cavities of veteran trees.

Vane traps (a type of interception trap) were operated on twenty-five trees over various periods (not all at the same time) across the areas surveyed, though some were only operational for short periods – usually due to damage or ineffectiveness. In common with the 2017 survey some were set on veteran oak & beech, but a deliberate focus was also made to sample other tree species, notably birch and ash. There were also examples on sallow and cherry. In common with 2017, as well as selected different tree species, traps were also located in different situations – sunny, partially shaded or heavily shaded.

The traps consisted of intersecting panels of Perspex 30cm high connected through a funnel 17.5 cm diameter to a screw top collecting bottle that had 50% non-toxic propylene glycol to act as preservative. An example is shown in the following photograph.

Vane trap 21 on a fallen beech

A small quantity of detergent (washing up liquid) is also added to break the surface tension, and chicken wire is placed in the funnel to prevent large twigs and other debris blocking the narrow part of the funnel – this is also used as a precaution to avoid bats or birds falling into the trap. Flying insects hit the vanes of the trap and drop into the collecting bottle. NT Ashridge Estate assisted with the sampling by providing five traps and various staff helping with setting any emptying of traps, especially when use of a ladder was needed.

These were highly effective in recording the saproxylic fauna, especially beetles.

3.3.2 Pitfall traps

Pitfall traps (small cups, beakers, or pots) are sunk into the substrate with the upper rim flush with the surrounding ground – crawling invertebrates fall into the container and are retained. They are most frequently used to sample invertebrates in grassland/agricultural land but can be useful in recording saproxylic invertebrates when placed in rot holes/cavities of veteran trees. A preservative is used to conserve the captured specimens – as with the interception traps, 50% propylene glycol, which is non-toxic. Chicken wire was also placed over the trap to prevent amphibians or small mammals from falling in.

Three pitfall traps (plastic pot 7cm diameter & 8 cm deep) were set inside rot holes, or at the base of veteran trees.

Their effectiveness was rather limited, though the Nationally Notable rove beetle *Quedius microps* was recorded along with wood mould species such as the locally distributed clown beetle *Abraeus perpusillus*.

3.3.3 Subterranean pitfall traps

A pitfall trap for sampling subterranean invertebrates was devised by the late Prof. John Owen (Owen, 1995). This comprises a collecting pot set at the base of mesh tube about 40 cm below the surface of the ground, with same preservative used in surface pitfall traps. One subterranean/underground pitfall trap, originally provided to the author by John Owen, was used at the base of a huge veteran oak on the south side of Prince's Riding (SP9827612618). This was very effective in recording several significant saproxylic beetles, notably the subterranean and Red Data Book listed *Oxylaemus variolosus*. This species is rarely recorded by other methods. Other species captured included the harvestman *Anelasmocephalus cambridgei* – a species not frequently encountered on account of its cryptic appearance and habits, it thought to be a snail predator in the litter layer.

3.3.4 Light trap

A Robinson mercury vapour light trap using a 125-Watt bulb was operated next to the Base Camp on the nights of 18th & 19th June and 28th August and attracted two common wood-decay beetles - lesser stag beetle *Dorcus paralellepipedus* and the click beetle *Melanotus castanipes*. A single leopard moth *Zeuzera pyrina* was also recorded – it has larvae boring into the woody tissue of trees. It is considered common in Hertfordshire (Hart, 2008).

3.3.5 Pheromone lures

Pheromone lures/traps from Anglian Lepidoptera Supplies (ALS) were employed on several occasions – these can be highly effective in attracting male clearwing moths which are otherwise difficult to detect. Several of these were operated in the Monument Drive area as part of a study on the wider invertebrate fauna of that area (Foster, 2018) - one notable species, the red-tipped clearwing moth *Synanthedon formicaeformis* was recorded. Lures for the click beetle *Elater ferrugineus* were also operated in the entrance to a hollow fallen beech hulk on the north side of Prince's Riding (same tree as VT15) which supported a population of lesser stag beetle – possible prey for the click beetle, but *Elater* was not attracted.

Table 2. Pheromone lure types, locations, dates & species recorded

Pheromone lure	*Location Grid ref.*	*Date/time/weather*	*Species recorded*
Large red-belted clearwing	Monument Drive, south, Sunny, SP97541284	19th June 2018, 12-13.20 hrs, warm sunny	None
Currant clearwing & White barred clearwing	Monument Drive, south, Sunny, SP97541284	19th June 2018, 12-13.20 hrs, warm sunny	None

Red-tipped clearwing	Monument Drive, south, partial shade, SP9751112817	12th July 2018, 13.45-15.45 hrs Warm sunny	Red-tipped clearwing
Red-tipped clearwing	Monument Drive, south, partial shade SP9754612745	12th July 2018, 14.00-15.30 hrs Warm sunny	Red-tipped clearwing
Yellow-legged clearwing	Monument Drive, north, Sunny,	26th July 2018, 12.00-15.45 hrs, warm sunny	None
Click beetle *Elater ferrugineus*	Prince's Riding, north, SP9849712604 – same tree as VT15	12th July 2018 09.30-16.00 hrs Warm sunny. Tree was considered suitable as it supported a population of lesser stag beetle – possible prey for *Elater*	None

Example of a pheromone lure trap

3.4 Extraction samples

Samples of heartrot can be sieved and placed in Winkler Extractor – usually an effective alternative to the more familiar Tullgren Funnel method. The sieved sample is placed in small mesh bags hanging within a larger muslin bag which has a collecting bottle at the base. Invertebrates gradually move down through the sieved samples, drop out of the mesh bags and end up in the collecting pot (Owen, 1987). No heat/light source is used (as in Tullgren funnels), so the

process of desiccation of the sample is slower – though two weeks is usually sufficient to extract most invertebrates in dry warm conditions.

Example of a Winkler Extractor

A sample of white heart rot collected on 5th June from a recently split apart beech to the east of the offices (SP981125) was sieved and placed in a Winkler Extractor. The Nationally Notable/Scarce clown beetle *Aeletes atomarius* and the rove Beetle *Quedius xanthopus* were recorded – the latter not found by other methods in this study.

4 SAPROXYLIC INVERTEBRATE FAUNA

4.1 Coleoptera (Beetles)

This survey focussed on the saproxylic beetle fauna. Most beetles were identified to species level, the only exceptions being some examples of the small and 'difficult' groups captured in the traps. These include feather-wing beetles of the family Ptilidae and rove beetles in the subfamily Aleocharinae - most require dissection to confirm identity and many are generalists (eurytopic). Even so, some examples were identified to species level and it is not thought that the lack of comprehensive cover from within these groups would significantly change the overall assessment of the saproxylic beetle fauna.

The saproxylic beetle fauna at Ashridge is now demonstrated to be of international importance – see section 4.2 below for an analysis of this fauna. From the current study 157 species qualified for that analysis, among them are 40 which are additions to the Ashridge saproxylic list (see Appendix 1) and 57 that have national conservation status see Table 3 below. Some are known only from very few sites in the whole of the UK and several appear to be newly recoded Hertfordshire (not listed in James, 2018).

Table 3: Saproxylic beetles with national conservation status recorded from Ashridge in this study

Scientific Name & Conservation Status	Vernacular Name
Red Data Book – Endangered	
Eucnemis capucina	A false click beetle
Red Data Book – Vulnerable	
Scydmaenus rufus	An ant-like stone beetle
Red Data Book Rare	
Hylis olexai	A false click beetle
Microscydmus minimus	An ant-like stone beetle
Oxylaemus variolosus	A cylindrical timber beetle
Rhizophagus fenestralis	A root-eating beetle
Red Data Book – Insufficiently known	
Cryptophagus micaceus	A silken fungus beetle
Red Data Book – Indeterminate	
Cryptophagus falcozi	A silken fungus beetle
Nationally Notable A (Na)	
Hypnopyga angularis	A rove beetle
Stereocorynetes truncorum	A weevil
Stictoleptura scutellata	A longhorn beetle
Taphrorychus bicolor	A bark beetle
Uleiota planata (widely regarded as no longer qualifying for notable status)	A flat timber beetle
Nationally Notable B (Nb)	
Anaglyptus mysticus	A longhorn beetle
Bibloporus minutus	A short-winged mould beetle
Cryptarcha strigata	A sap beetle
Diplocoelus fagi	A small fungus beetle
Magdalis carbonaria	A weevil
Melasis buprestoides	A false click beetle
Phyllodrepoidea crenata	A rove beetle
Platypus cylindrus	Oak pin-hole borer
Platyrhinus resinosus	A fungus weevil
Poecilium alni	A longhorn beetle
Quedius microps	A rove beetle
Quedius scitus	A rove beetle
Quedius truncicola	A rove beetle
Quedius xanthopus	A rove beetle
Rhizophagus nitidulus	A root-eating beetle
Scaphisoma boleti	A shining fungus beetle
Sphindus dubius	A beetle
Symbiotes latus	A handsome fungus beetle
Sepedophilus bipunctatus	A rove beetle
Nationally Notable (N)	
Corticaria alleni	A minute brown scavenger beetle
Cryptophagus ruficornis	A silken fungus beetle
Enicmus brevicornis	A minute brown scavenger beetle
Enicmus fungicola	A minute brown scavenger beetle
Enicmus rugosus	A minute brown scavenger beetle

Euplectus kirbii	A short-winged mould beetle
Neuraphes plicicollis	An ant-like stone beetle
Ptenidium gressneri	A feather-winged beetle
Nationally Scarce (NS)	A false darkling beetle
Abdera quadrifasciata	A clown beetle
Aeletes atomarius	A cylindrical bark beetle
Cicones variegatus	A darkling beetle
Diaperis boleti	A wood-borer beetle
Dorcatoma flavicornis	An ant-like leaf beetle
Euglenes oculatus	A false blister beetle
Ischnomera sanguinicollis	A ship-timber beetle
Lymexylon navale	A hide beetle
Megatoma undata	A false darkling beetle
Orchesia minor	A beetle
Phloiophilus edwardsii	A fungus beetle
Pseudotriphyllus suturalis	A cylindrical timber beetle
Synchita humeralis	A cylindrical timber beetle
Synchita (Cicones) variegatus	A checkered beetle
Tillus elongatus	A tumbling flower beetle
Tomoxia bucephala	A fungus beetle
Triphyllus bicolor	

Further notes on these saproxylic species are provided in the Main Table, page 55. Many other notable saproxylic beetles have been recorded previously and these are included in Appendix 3 and used in the analysis in section 4 below. This includes the European powder-post beelte *Lyctus linearis*, a IUCN Critically Endangered species, although it has not been reported at Ashridge since ca 1900.

Among the particularly significant species found in this study are several Red Data Book (RDB) listed species; the silken fungus beetles *Cryptophagus falcozi* (previously only reported from Berkshire) & *C. micaceus*; the ant-like stone beetles *Microscydmus minimus* & *Scydmaenus rufus*; the false click beetles *Eucnemis capucina* & *Hylis olexai*, the root-eating beetle *Rhizophagus fenestralis*, and the cylindrical timber beetle *Oxylaemus variolosus*. A further RDB root-eating beetle was found in 2017 - *Rhizophagus oblongicollis*. And a third false click beetle, *Epiphanis cornutus,* and the fungus beetle *Pseudotriphyllus suturalis* are on the European Red List of Saproxylic Coleoptera – Near Threatened category.

Previous studies, for example Jones (1998), have recorded several other RDB species such as the false blister beetle *Ischnomera cinerascens*, the rove beetle *Gyrophaena munsteri*, and the tumbling flower beetle *Mordellistena neuwaldegianna*, the latter now downgraded to Nationally Scarce.

Several notable species reported previously, including some from the 2017 study, were not encountered during this survey, and vice versa. This not unexpected as any invertebrate survey cannot be expected to record all species present. Even with detailed sampling effort some species are difficult to locate - due to secretive habits, e.g. confined to inaccessible habitats, such as heart rot deep within veteran trees. Others may be nocturnal and not usually encountered by day sampling, and there are also natural ‘ebb & flows’ in abundance of individual

species. Vane, and other, trapping techniques help to record some of these species, but a complete inventory of the invertebrate fauna is not practical.

In addition, 21 species of beetle recorded in this and the 2017 surveys are not included in James (2018) and would appear to be new to the Hertfordshire list – see Appendix 2 which includes some non-saproxylic species. For several other species this survey provides modern records for species that have not otherwise been reported for long periods, such as *Phloiophilus edwardsii* – last reported 19th century & *Rhizophagus oblongicollis* in 1963.

4.2 Assessment of saproxylic interest based on Coleoptera

Two systems developed for assessing the significance of the saproxylic interest of veteran trees, based on the recorded beetle fauna, are The Index of Ecological Continuity (IEC) and the Saproxylic Quality Index (SQI).

Taking account of all available records, full lists of the qualifying species, their conservation status, rarity & IEC scores are provided in Appendix 3.

4.2.1 Index of Ecological Continuity (IEC)

For many years this scoring system has been used to assess the significance of saproxylic interests at sites, originally using the list of beetles provided in Harding & Rose (1986). These beetles are regarded as being largely restricted to, or collectively indicative of, ancient woodland systems and were divided into three categories (1, 2 or 3) - those in category 1 regarded as the most reliable indicators, whilst those in 3 are most often associated with ancient woodlands but also occur more widely. The majority of these species are scarce and localised in a national context. Alexander (1988) proposed a scoring system whereby category 1 species score 3 points, category 2 score 2, and category 3 score 1.

Alexander (2004) has revised the list of qualifying beetles - 180 species in all are included, which incorporates additions and deletions from the original 1986 list of species, along with changes in scores for various species – this is the current IEC.

Alexander (2004) regards scores of 15-24 as of regional significance, 25-79 of UK importance, and 80 or more of international importance for the saproxylic beetle fauna.

4.2.2 Saproxylic Quality Index (SQI)

Fowles (1997) proposed a scoring system based on a wider range of beetle species. This takes account of common as well as rarer saproxylics and may be applied to a wider range of woodland systems. This has subsequently been refined by Fowles *et al.* (1999) and is based on the national rarity status of each species, here a geometric rarity scoring system (1,2,4,8,16, 24 & 32) is used - the most common species scoring 1 point whilst the rarest scoring 32, thus much greater weight is placed on the occurrence of an assemblage of scarce species.

598 species in all are included. Fowles *et al.* (1999) point out that a threshold of 40 or so qualifying species are required in order to employ this scoring system – easily met from the 2017 & 2018 studies, and by combining those results with previous data there are 226 qualifying species.

Fowles et al (1999) suggest that an SQI of 500 is probably an appropriate threshold for assessing national importance. However, very few sites nationally attain this score, and Alexander (2006) has pointed out that many sites which are nationally famous for their saproxylic beetles have SQI figures in the 300s and 400s, suggesting that this threshold of 500 or more seems to be set too high. A threshold of 400 may be more realistic.

The combined results from the 2017 and earlier studies resulted in an IEC score of 76 – showing that Ashridge was of high national significance and approaching the low end of international significance, and SQI of 554.8 indicating high national importance. Taking the combined data for the 2018 survey with those of previous studies, 226 beetle species now qualify, resulting in an IEC of 114 – well above the internationally important threshold of 80, and an SQI of 583.8, easily of national significance and probably also of international importance.

A summary of the IEC & SQI scores from the 2017 & 2018 studies, and those from combining with previous data for the whole property are presented in Table 4 below.

Table 4: The SQI & IEC scores for Ashridge.

Survey	*No. SQI species**	*SQI*	*No. IEC species*	*IEC***
Ashridge 2017 survey	115	504.4	Grade 1 = 5 Grade 2 = 8 Grade 3 = 21 Total = 34	52
Ashridge 2017 + previous data	183	503.8	Grade 1 = 5 Grade 2 = 12 Grade 3 = 37 Total = 54	76
Ashridge 2018 survey	157	554.8	Grade 1 = 8 Grade 2 = 12 Grade 3 = 34 Total = 54	82
Ashridge All records	226	586.2	Grade 1 = 11 Grade 2 = 16 Grade 3 = 48 Total = 75	114

* qualifying threshold = 40

** ≥15 Regional importance, ≥ 25 National importance, ≥ 80 International Importance

Based on IEC the 2017 survey results alone showed that Ashridge rated as easily within the nationally significant range and combining those results with all other available data the score had risen to 76 – just short of internationally significant. Adding in the results of the current survey the IEC score now stands at 114 well above the internationally significant threshold of 80.

4.3 National rankings based on Coleoptera

National rankings of 209 sites can be viewed at http://khepri.uk/main. Based on the table available there (accessed 25/11/2018), the current rankings for Ashridge have been added to the tables below using the SQI & IEC scores – the updated rankings indicated in red, and previous ranking in blue. The top ten national sites and selected other sites with scores near to those of Ashridge are presented.

Comparing the overall scores with other sites nationally, Ashridge is now ranked as 10th in the national league table of important saproxylic sites based on the IEC (previously ranked 19th), and 20th based on the SQI (previously ranked 46th). Strong emphasis need not be placed on the 'league' position, as this regularly changes with recording effort. More important is that Ashridge easily qualifies as internationally important and lies within the top 10 sites in the country – the 'Premier League' of UK saproxylic sites.

Based on the IEC (Table 5) the ranking for the 2017 survey along with all previously available records was 19th and on a par with other key NT sites such as Wimpole Hall (Cambridgeshire) & Clumber Park (Nottinghamshire), and just above Calke Abbey (Derbyshire) which is designated as an NNR for saproxylic interests. The ranking before the 2017 survey was lower at 68th. Adding data from this 2018 survey the national ranking for Ashridge is now up to 10th with a score of 114. This puts Ashridge in the 'Premier League' of sites national, just ahead of other key sites such as Richmond Park Surrey, a renowned site for saproxylics, and just below Bredon Hill, Worcestershire a site designated as a National Nature Reserve on account if its saproxylic invertebrate fauna.

Based on SQI (Table 6) the score for the 2018 survey combined with earlier data now ranks Ashridge as 20th nationally, up from a ranking of 45th using the 2017 survey and previous data. Scores in excess of 500 (or 300-400, see above) are considered of national significance, though a threshold for international significance is not published. Prior to the 2017 & 2018 studies the ranking was at 94th.

Table 5: National ranking by IEC
Based on table available at http://khepri.uk/main/ on 27 Nov. 2018

Rank	Site	No of qualifying species	SQI	IEC
1	Windsor Forest, Berkshire	364	850.0	251
2	New Forest, Hants	326	857.1	207
3	Richmond Park, Surrey	254	709.4	153
4	Bushy Park & Home Park, Middlesex	255	707.5	152
5	Hatfield Forest, North Essex	232	694.7	147
6	Moccas Park, Herefordshire	240	632.9	137
7	Epping Forest, South Essex	255	599.6	128
8	Bredon Hill, Worcestershire	140	849.3	115
9	Langley Park, Buckinghamshire	153	777.8	115
10	**Ashridge, Hertfordshire (2018 + previous data)**	**226**	**586.2**	**114**

11	Richmond Park, Surrey	205	575.6	110
12	Croome Estate, Worcestershire	175	697.7	109
17	Grimsthorpe Park, South Lincolnshire	149	519.5	77
18	Clumber Park, Nottinghamshire	153	462.7	77
19	Wimpole Hall, Cambs	176	577.8	76
	Ashridge, Hertfordshire (2017 + previous data)		**503.8**	**76**
20	Stanford PTA, West Norfolk	184	487.0	74
21	Calke Abbey, Derbyshire	166	451.8	74
40	Arundel Park, West Sussex	131	543.5	54
41	The Mens, West Sussex	140	475.7	54
42	Staverton Park, Suffolk	106	473.6	51
43	Petworth Park, Sussex	142	437.3	49
209	Melton Wood, Yorkshire	49	193.9	3

Table 6: National ranking by SQI

Based on table available at http://khepri.uk/main/ on 27 Nov. 2018

Rank	Site	Number of qualifying species	SQI	IEC
1	New Forest, Hants	326	857.1	207
2	Windsor Forest, Berkshire	364	850.0	251
3	Bredon Hill, Worcestershire	140	849.3	115
4	Langley Park, Buckinghamshire	153	777.8	115
5	Richmond Park, Surrey	254	709.4	153
6	Bushy Park & Home Park, Middlesex	255	707.5	152
7	Croome Park Estate, Worcestershire	177	699.7	109
8	Hatfield Forest, North Essex	246	694.7	147
8	Silwood Park, Berkshire	159	685.5	90
9	Longdon Marsh, Worcestershire	57	668.4	36
10	Moccas Park, Herefordshire	240	632.9	137
19	Hampton Court Park Middlesex	88	589.8	46
20	**Ashridge, Hertfordshire (2018 + previous data)**	**226**	**586.2**	**114**
21	Ashtead Common, Surrey	221	584.6	89
22	Hanbury Prk, Worcestershire	59	581.4	30
23	Brockhampton Estate, Herefordshire	62	580.6	32
44	Eastnor Park, Herefordshire	93	508.6	57
45	Forest of Bere, Hants	109	505.5	39
	Ashridge, Hertfordshire (2017 + previous data)	**183**	**503.8**	**76**
46	Hatchlands Park, Surrey	165	503.6	73
47	Pamber Forest, Hants	53	498.1	24
209	Melton Wood, Yorkshire	49	193.9	3

4.4 Other saproxylic invertebrate groups

As well as recording Coleoptera observations were made on other invertebrate groups associated with veteran trees. This resulted in recording of several flies (Diptera), including two RDB, and a few Nationally Notable/Scarce species, the Nationally Notable brown tree ant (which occurs widely at the property), and some locally distributed solitary bees which are associated with dead-wood habitats. The Nationally Notable lemon slug *Malacolimax tenellus* was also observed.

4.4.1 Mollusca (slugs & snails)

Hearn et al. (1997) report the lemon slug from Aldbury Common, it was not seen in 2017, but a single example was observed on a fallen beech limb at Frithsden Beeches in the current survey following a night of heavy rain – it is a species of ancient woodland and wood pastures and feeds on bracket fungi on trees.

4.4.2 Diptera (Flies)

A male of the RDB2 (Vulnerable) wasp-banded comb-horn cranefly *Ctenophora flaveolata* was beaten from hawthorn at Ivinghoe Common, whilst the Nationally Notable orange-sided comb-horn cranefly *C. pectinicornis* observed more widely – Berkhamsted & Ivinghoe Commons, Frithsden Beeches and the Monument Drive area. Emily Smith (pers. comm.) also reported it from Monument Drive this year. Last year the RDB1 (Endangered) smudge-winged comb-horn *C. ornata* was recorded from a moth trap at the Bunkhouse and the two-marked comb-horn occurred in several samples and was again present this year. The latter was also spotted ovipositing in a rot hole on sallow by Morgan Ravine. All the comb-horns breed in dead wood - four of six UK species now known from Ashridge.

Wasp-banded *Ctenophora flaveolata* & orange-sided comb-horn cranefliesC. *pectinicornis*

A single example of the RDB2 fly *Paraclusia tigrina* was seen in the shower block of the Bunkhouse and had probably been attracted to the lights of the building or the moth trap which had been operated nearby. It has larvae developing in wood-decay fungi.

In common with the 2017 survey active field searching recorded two Nationally Scarce hoverflies - *Pocota personata*, a bumble bee mimic and *Brachyopa pilosa*. Individuals of the former was seen investigating a huge beech hulk on the north side of Prince's Riding and a recently fallen beech in the woodland just east of the Estate Office. The larvae develop in wet rot holes, and until recently it had RDB status, but was regraded to Nationally Scarce by Ball & Morris (2014), nevertheless it seems to be restricted to ancient woodland and wood-pasture situations. The latter was seen several times – investigating sap run at the base of a beech, a recently fallen beech – both in the woods to the east of the Estate Office, and at a cut birch stump at Northchurch Common. The larvae develop in sap runs.

The hoverfly *Pocota personata*

Other more widespread, but significant, hoverflies were also recorded. *Brachypalpus laphriformis* was only seen on one occasion this year – at Hudnall Common, though it was found several times in the 2017 survey when it was usually seen investigating rot holes or fissures on oaks. Until recently this species had Nationally Notable status but was downgraded by Ball & Morris (2014). Nevertheless, most records are from ancient woodland/pasture woodland sites, and it is frequently associated with high quality sites (pers. observation.). Other locally distributed wood-decay hoverflies observed in the study included *Brachypalpoides lenta* fairly widely - sometimes investigating decaying birch, and three species of *Criorhina*: a single example of *C. asilica* at the base of a beech hulk at Frithsden beeches; *C. ranunculi* fairly widely including some investigating rot holes in birch; and *C. berberina* again fairly widely. In 2017 *C. floccosa* was seen investigating the base of a huge veteran beech at Ivinghoe Common. Hence all four UK species in this genus are recorded from Ashridge.

The hoverfly *Brachypalpoides lenta*

Peter Chandler identified the fungus gnats from the survey and whilst there were only low numbers in the traps, four species are ranked as Nationally Scarce in Falk & Chandler (2005) – *Brevicornu serenum*, *Ditomyia fasciata, Grzegrorzekia collaris* & *Mycomya parva*. *B. serenum* was not found in previous Diptera surveys across the Ashridge Estate (Chandler, 1997 & 1999) but may not be a saproxylic species.

4.4.3 Hemiptera (Bugs)

Very few bugs can be considered truly saproxylic, but there are various species that live under bark: the flat bark bug *Aradus depressus* was recorded from several birches to the east of the Estate Office, and *Xylocoris cursitans* was found under beech bark at Frithsden Beeches. The small predatory bug *Loricula elegantula* occurred several times and is usually found on decaying branches.

4.4.4 Hymenoptera (Ants, bees & wasps)

In common with the 2017 survey the Nationally Notable brown tree ant *Lasius brunneus* was encountered in most areas. Nowadays this species is more widespread and frequently encountered than in the past, so it may no longer warrant Nationally Notable conservation status. However, it requires large old trees with heartrot in which to establish colonies, is certainly locally distributed, and usually occurs at sites of significant nature conservation interest. Colonies of this ant are also known to support a variety of scarce or threatened saproxylic beetles, and whilst none were found in this, or the 2017 survey, their occurrence should not be discounted.

Dead standing trees in open sunny situations are often of value to nesting solitary bees and wasps, and several suitable trees were sampled/examined in this survey. The common digger wasp *Ectemnius cavifrons* was the most frequently encountered species, though species which are more localised included the orange-vented mason bee *Osmia leaiana* and the dull-vented sharp-tail bee *Coelioxys elongata* which is a cleptoparasite[5] on mason bees – both were seen in the Monument Drive area, and the large scissor bee *Chelostoma florisomne* at several locations.

Hornets *Vespa crabro* were seen frequently and often nest in tree cavities.

4.4.5 Lepidoptera

Species of micro-moth seen in the 2018 survey which have larvae associated with saproxylic habitats were *Morophaga choragella* which has larvae in wood-decay fungi – a single adult was seen on Monument Drive (north) and *Esperia sulphurella* at several locations, the larvae occur under bark and in fungi. Both are considered common in the county by Hart (2008).

[5] Cleptoparasite: A species taking the stored provisions of another species. This usually involves the cleptoparasite laying an egg in the nest of the host, (as in the case of various bees where eggs are laid in the nests of solitary bees and the larva hatches and eats the pollen and nectar stores of the host species) but may involve laying eggs on prey being transported by the host.

Several of the day-flying clearwing moths are considered as saproxylics as they have larvae boring in and under bark of various trees. Pheromone lures were set for four of these species (red-belted *Synanthedon myopaeformis*, large red-belted *S. culiciformis*, white-belted *S. spheciformis* and yellow-legged *S. vespiformis* clearwings) in the Monument Drive area, though no adults were recorded. However, adults of another clearwing, the Nationally Scarce red-tipped *S. formicaeformis* were attracted to two lures at Monument Drive south – although this species is not considered a true saproxylic as the larvae bore in the living woody tissue of sallows. Hart (2008) considers it uncommon/scarce in Herts and there do not appear to be any previous records from the Ashridge area. Yellow-legged has been reported from the area historically – Plant (2008) lists records from Ashridge & Northchurch, the latter in 1942, and considers it a local & rare resident in the county.

Goat moth *Cossus cossus* does not appear to have been found at Ashridge, though one of the rove beetles, *Thiamaraea cinnamomea*, recorded in the current survey is reputed to be associated with the larval workings of the moth. It seems likely that the beetle must also occupy other saproxylic situations as goat moth is much rarer than the beetle, and Hart (2008) considers that goat moth may have vanished from the county – the last record being of an affected tree in 1999, though live larvae were not found. Ed Bennett, NT Ranger (pers. comm.) has not recorded goat moth from the moth trap run regularly at the Estate Office.

There are several records for the Nationally Notable waved black moth *Parascotia fuliginosa* from the property, including three adults in 2018 from a moth trap regularly run at the Estate Office by Ed Bennett. The larvae feed on various wood-decay fungi.

4.4.6 Araneae (Spiders)

Whilst not a true saproxylic, the Nationally Notable jumping spider *Marpissa muscosa* is associated with old sun-exposed trees where it is usually recorded on the surface or under gnarled bark where it is an active hunter of other invertebrates. It was found at Hudnall & Ivinghoe Commons and Frithsden Beeches during the current survey.

The jumping spider *Marpissa muscosa* – showing cryptic colouration

In common with the 2017 survey *Nuctenea umbratica* (a relative of the familiar orb-web/garden spiders) was frequently encountered during the current survey and is common and widespread nationally. It lives under bark and is closely associated with decaying timber.

5 PANTHEON ANALYSIS

Pantheon is a database tool developed by Natural England and the Centre for Ecology & Hydrology to analyse invertebrate sample data (Webb et. al., 2017). It is an online tool designed to provide a consistent and standardised approach to the assessment of the conservation importance of a sample or site. Users import lists of invertebrates into Pantheon, which then analyses the species, attaching associated habitats and resources, conservation status and other codings against them. This information can then be used to assign quality to sites, assist in management decisions and augment other ecological study. Not all the macro-invertebrate taxa are currently included in the database - to date it includes about a quarter of the total macro-invertebrate fauna (just under 12,000 species) and focuses on species primarily found in England. However, it is now in widespread use for identifying key habitat features for invertebrates and assessing their condition. More information is provided by Heaver et al. (2017).

Essentially two levels of habitat classification are used: Broad Assemblage Types (BATs) - a comprehensive series of assemblage types that are characterised by more widespread species; and Specific Assemblage Types (SATs) which are characterised by ecologically restricted species and are generally only expressed in lists from sites with conservation value.

Using the data from the current survey, within the Decaying Wood BAT, three SAT types are represented at Ashridge: heartwood decay; bark & sapwood decay; and fungal fruiting bodies. All three support notable species here and a summary of the Pantheon analysis is provided in the table below. Importantly, all

three SATs score as being in Favourable Condition based on data from the 2017 & 2018 surveys.

Table 7: Summary of Pantheon Analysis for Ashridge from 2017 & 2018 surveys

SAT Code	***SAT Name***	***No. species present***	***% of national fauna***	***No. of sp. with Conservation Status****	***Condition*****
2017					
A 211	Heartwood decay	33	19	17	Favourable
A 212	Bark & sapwood decay	67	13	19	Favourable
A 213	Fungal fruiting bodies	19	21	5	Favourable
2018					
A 211	Heartwood decay	49	28	24	Favourable
A 212	Bark & sapwood decay	105	21	25	Favourable
A 213	Fungal fruiting bodies	22	24	7	Favourable
2017 & 2018 combined					
A 211	Heartwood decay	56	32	32	Favourable
A 212	Bark & sapwood decay	125	25	35	Favourable
A 213	Fungal fruiting bodies	30	33	10	Favourable

* Takes account of recent status revisions. Status definitions are provided in Appendix 5 at the end of the report.
**A minimum of 15 species is generally required to provide a reliable assessment – met in all three SATs here.

Lists of the notable species allocated to each of the three SATs in 2017 & 2018 are provided below with comments on some of these, and other, species is included in the following section of the report. Note that some notable species, for example fungus gnats, are not assigned to particular SATs.

A 211 SAT - Heartwood Decay Notable Species

Beetles

Aeletes atomarius	NS	2017	2018
Anaspis thoracica	NS	2017	
Atomaria morio	RDBK	2017	
Aulonothroscus brevicollis	RDB3	2017	
Corticaria alleni	N		2018
Cryptophagus falcozi	RDBi	2017*	2018
Cryptophagus micaceus	RDBK		2018
Dorcatoma flavicornis	NS		2018
Epiphanis cornutus	European NT	2017	2018
Eucnemis capucina	RDB1	2017	2018

Euglenes oculatus	NS	2017	2018
Hylis olexai	RDB3	2017	2018
Hypnogyra angularis	Na		2018
Ischnomera sanguinicollis	NS		2018
Lymexylon navale	NS		2018
Megatoma undata	NS		2018
Microscydmus minimus	RDB3		2018
Ptenidium gressneri	N	2017	2018
Quedius microps	Nb		2018
Quedius scitus	Nb		2018
Quedius truncicola	Nb		2018
Stereocorynes truncorum	Na		2018
Stictopleura scutellata	Na	2017	2018
Tillus elongatus	NS	2017	2018
Tomoxia bucephala	NS	2017	2018

Flies

Chrysopilus laetus	NS		2018
Ctenophora flaveolata	RDB2		2018
Ctenophora ornata	RDB1	2017	
Ctenophora pectinicornis	N		2018
Pocota personata	NS	2017	2018
Scenopinus niger	NR/NT	2017	

Ants

Lasius brunneus	Na	2017	2018

*identity not confirmed until 2018
(another 24 species in the dataset fall into this category)

A 212 SAT – Bark & Sapwood Decay Notable Species

Beetles

Abdera quadrifasciata	NS		2018
Anaglyptus mysticus	Nb		2018
Anaspis costai	NS	2017	
Bibloporus minutus	Nb		2018
Cerylon fagi	Nb	2017	
Cicones variegatus	NS	2017	2018
Cryptarcha strigata	Nb	2017	2018
Diplocoelus fagi	Nb		2018
Dropephylla gracilicornis	N	2017	
Enicmus brevicornis	N	2017	2018
Enicmus fungicola	N		2018
Enicmus rugosus	N	2017	2018
Ernoporicus fagi	Na	2017	
Magdalis carbonaria	Nb	2017	2018
Melasis buprestoides	Nb	2017	2018
Pediacus dermestoides	Data Deficient (DD) (Europe)		2018
Phloiophilus edwardsii	Nb		2018
Platypus cylindrus	Nb		2018
Poecilum alni	Nb	2017	2018
Quedius xanthopus	Nb		2018
Rhizophagus fenestralis	RDB3		2018
Rhizophagus nitidulus	Nb		2018
Rhizophagus oblongicollis	RDB1	2017	
Scaphisoma boleti	Nb		2018
Sphindus dubius	Nb		2018
Symbiotes latus	Nb		2018
Synchita humeralis	NS		2018

Taphrorychus bicolor	Na	2017	2018
Tetratoma desmarestii	NS	2017	
Uleiota planata	Na	2017	2018
Xyleborus dryographus	Nb	2017	
Flies			
Brachyopa pilosa	NS	2017	2018
Solitary wasps			
Pemphredon morio	Nb	2017	
Stigmus pendulus	RDBK	2017	

(another 90 species in the dataset fall into this category)

A 213 SAT – Fungal Fruiting Bodies Notable Species

Beetles			
Cis festivus	Nb	2017	2018
Cryptophagus ruficornis	N		2018
Dacne rufifrons	DD (Europe)	2017	
Diaperis boleti	NS		2018
Dorcatoma dresdensis	NS	2017	
Orchesia micans	NS	2017	
Orchesia minor	NS	2017	2018
Platyrhinus resinosus	Nb		2018
Pseduotriphyllus suturalis	NS/European NT		2018
Triphyllus bicolor	NS		2018

(another 20 in the dataset fall into this category)

6 KEY SAPROXYLIC HABITATS

This section follows that provided in 2017 with key species and observations from 2018 added.

6.1 Heartrot

Heartrot can be broadly divided into three types:

- red (or brown) rot caused by sulphur polypore *Laetiporus sulphureus* and beefsteak fungus *Fistulina hepatica*, and is the familiar cuboid crumbly rot found in veteran oak trees;
- white rot caused by other fungi such as *Ganoderma* species and *Inonotus hispidus* (especially on ash), this type of rot is less common in oak and more familiar in other trees such as beech, ash and lime;
- and wood mould, a term used to describe the material which accumulates in the base of cavities and hollow trunks resulting from fungal decay of the woody tissues.

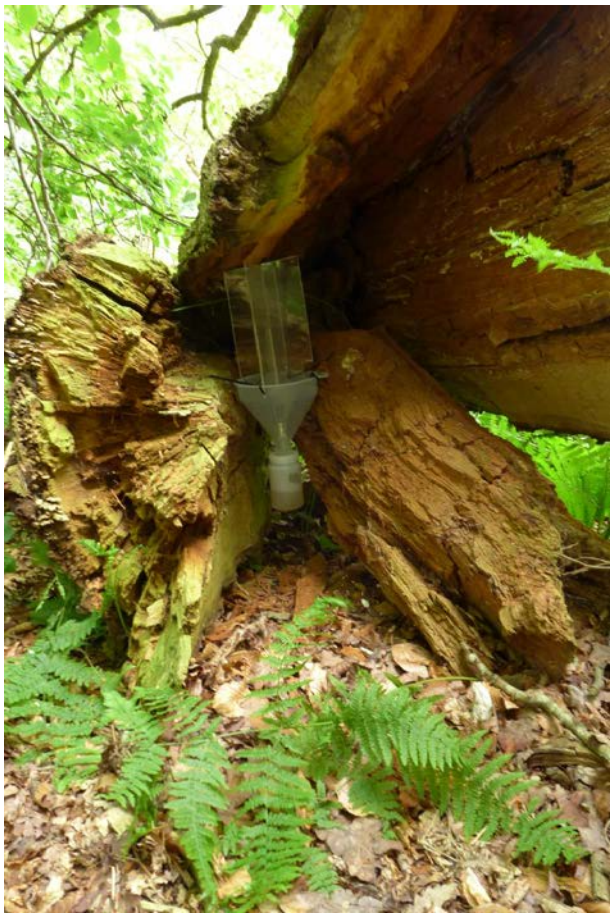
Heart-rotting bracket fungi are highlighted by Alexander (1999b) as keystone species - they are crucial in forming the various types of heartrot in trees. A habitat that supports some of the most threatened and scarce saproxylic invertebrates in the UK, and a habitat resource that cannot be quickly replaced as

it is generally restricted to ancient/veteran trees. Certain invertebrates are also associated with the various bracket fungi fruiting bodies – see section 6.3 below.

Combining the results from 2017 & 2018 Pantheon assigns 56 species in the dataset to the heartwood decay SAT – 32% of the allocated national fauna, with the 32 more notable species are listed above. Some are primarily associated with red rot, some with white rot and others with wood-mould.

6.1.1 Red rot associates

This type of rot is common in veteran oaks and is well represented in the oaks at Ashridge but is not always readily accessible for easy sampling. Nevertheless, adult beetles do disperse and can occasionally be recorded from tree foliage and nearby vegetation; otherwise sampling relies on the red rot being exposed through damage to a tree and sieving searching through the material, or via the use of vane traps. Other trees supporting this habitat at Ashridge include sweet chestnut and birch.



Example of a red rot in split apart oak – the one with vane trap 25

Surprisingly few red rot associates were recorded in the 2017 survey but did include several notable species that are most frequently associated with this habitat. The RDB3 small false click beetle *Aulonothroscus brevicollis* at Aldbury Common – though actually recorded from a veteran beech, the Nationally Scarce ant-like beetle *Euglenes oculatus* from Aldbury Common, and the local fungus

beetle *Mycetophagus piceus* from Ivinghoe Common. Other beetles normally recorded from red rot but highlighted as being absent in 2017 survey included the wood-borer beetles *Dorcatoma chrysomelina* & *D. flavicornis*, the latter is Nationally Scarce. Several oak trees with exposed red rot were deliberately targeted in the 2018 survey in the hope of recording these and other red rot species – both *D. chrysomelina* & *D. flavicornis* were successfully found in old oaks on along Monument Drive and Prince's Riding. Other notable species discovered in 2018 from old oaks included the silken fungus beetle *Cryptophagus micaceus* often associated with hornet nests in hollow trees. However, the apparent absence of scarce heartrot click beetles, for example several species in the genus *Ampedus*, remains surprising.

The Nationally Notable brown tree ant *Lasius brunneus* that nests in hollow trees, often red rot habitats in veteran oaks, was widespread in the current and 2017 surveys.

6.1.2 White rot associates

White rot occurs widely at Ashridge, especially in the veteran beeches - many of these trees support an abundance of *Ganoderma* brackets, and ash will also be an important resource for this habitat, whilst there are relatively few veteran ash overall at Ashridge, Hudnall Common is exceptional in supported several fine veterans – two were sampled in the 2018 survey. The 2017 survey had reported that associated white rot invertebrate fauna was well-represented at Ashridge, with the more notable species recorded at that time including the RDB1 smudge-winged comb-horn cranefly, the RDB1 false click beetle *Eucnemis capucina,* and the RDB3 false click beetle *Hylis olexai*. More widespread and frequent species included lesser stag beetle *Dorcus parallelipipedus,* rhinoceros beetle *Sinodendron cylindricum,* and the small clown beetle *Plagaderus dissectus*, all most frequently found in white rot situations.

Sampling in 2018 has added several more significant species, most notably the silken fungus beetle *Cryptophagus falcozi* – this is a RDB indeterminate species previously reported only from the Windsor Forest & Reading areas of Berkshire. A single example was trapped on a veteran beech hulk at Frithsden Beeches, and its discovery led to the re-examination of similar specimens collected at Aldbury Common in 2017 – which also proved to be *C. falcozi*. Again, from a vane trap on a veteran beech located next to a *Ganoderma* bracket. Whilst it is classified as a heartrot species, the beetle may have a direct association with *Ganoderma* brackets as well as the white rot which the fungi cause. Other significant species included the Nationally Notable weevil *Stereocorynetes truncorum* and the small brown scavenger beetle *Corticaria alleni*.

Whilst beech and ash probably support the more notable white beetles, the current study has also demonstrated that birch can be a significant resource with notable species such as the feather-wing beetle *Ptenidium gressneri* and the rove beetle *Quedius truncicola* occurring.

6.1.3 Wood mould

Wood mould shares some of the invertebrate species with white- rot but can be especially important for Diptera larvae developing in soft rotten substrates. The comb-horn craneflies, four of which are now recorded at Ashridge, are good examples: the orange-sided comb-horn *Ctenophora pectinicornis* was observed fairly widely, usually in association with beech, though it was observed at Berkhamsted Common, a birch dominated area; the two-mark comb-horn *Dictenidia bimaculata* was recorded more frequently in the 2017 survey, but a female was seen ovipositing in a rotten sallow during this survey; and only single examples of the rarer (RDB listed) smudge-winged comb-horn *C. ornata* and wasp-banded comb-horn *C. flaveolata* have been recorded, but undoubtedly breed in soft-rot, or wood-mould habitats here. The discovery of an adult tree snipe fly *Chrysopilus laetus* inside a veteran beech hulk alongside Prince's Riding was a notable addition to the Ashridge fauna, again the larvae have been reared from wood mould habitat. Key hoverfly species include the Nationally Scarce *Pocota personata* and all four UK species of *Criorhina*.

6.2 Sapwood decay

Combining the results from 2017 & 2018 Pantheon assigns 125 species in the dataset to the Sapwood decay SAT, 25% of the allocated national fauna - the 34 more notable species are listed in Section 5 above. They inhabit a variety of situations - some are wood-borers, some feed on encrusting fungoid growth, on or under bark, and some are predators of other invertebrates, they may also be associated either with smaller branches or main trunks. Sapwood often forms the hard dead wood, familiar on dead standing oaks especially when loose bark has fallen away, and some beetles bore into this sapwood, and for some species there is a link between the bark being attached and intact on the sapwood.

Species that boring into the sap wood and highlighted in the 2017 survey included the Nationally Notable bark beetles *Ernoporicus fagi, Taphrorychus bicolor* and *Xyleborus dryographus.* The former two most frequently associated with beech, the latter on oak and sweet chestnut. The 2018 survey has added several more significant beetles, among them the false darkling beetle *Abdera quadrifasciata*, the slime-mould beetle *Sphindus dubius*, the handsome fungus beetle *Symbiotes latus* and the first modern Hertfordshire records of *Phloiophilus edwardsii*. One curious addition is the Nationally Scarce root-eating beetle *Rhizophagus fenestralis* that is primarily a Scottish species, though several records for the south of England have been reported recently.

Local species living under bark include *Pediacus dermestoides* which has a localised, but widespread, distribution in Britain and is most often recorded from the west. Alexander (2011) has reported that this beetle is more widespread in Britain than elsewhere in mainland Europe and that this country may have internationally important populations. Other species living under bark include the flat timber beetle *Uleiota planata* whilst currently graded at Na it is unlikely to qualify in view of an apparent spread and increase in records recently, and *Silvanus unidentatus*. The black-headed cardinal beetle *Pyrochroa coccinea* was also noted widely and has undoubtedly become more common and widespread

recently – the large larvae were found under bark on several trees, where they feed on other invertebrates.

6.3 Fungal fruiting bodies

Bracket fungi are important in forming various types of heartrot in trees (See 6.1 above), a habitat that supports a large variety of specialist invertebrates, but certain invertebrates are also associated with the various bracket fungi fruiting bodies.

Pantheon assigns 30 species in the dataset to the heartwood decay SAT from the 2017 & 2018 surveys combined – 33% of the allocated national fauna, the 10 notable species are listed in Section 5 above.

Other than *Ganoderma* brackets that were frequent on the veteran beeches and birch polypore *Piptoporus betulinus* that was frequent on birch in both surveys, relatively few bracket fungi were encountered during the survey even during the 2018 October visit. Although a few examples of the following were seen - beef steak fungus on oak, shaggy bracket *Inonotus hispidus* on a few ash, King Alfred's Cakes or cramp balls fungus *Daldinia concentrica* more frequently on ash, dryads saddle *Polyporus squamosus* on beech, and sulphur polypore on oak and dead cherry.

sulphur polypore *Laetiporus sulphureus*

Some beetles have an association with certain bracket fungi, and among those recorded in 2018 were the darkling beetle *Diaperis boleti* on birch polypore, the silken fungus beetle *Cryptophagus ruficornis* and the fungus weevil *Platyrhinus resinosus* both primarily associated with King Alfred's Cakes fungus, and *Pseudotriphyllus suturalis* on sulphur polypore. All are Nationally Scarce/Notable, with the latter also on the European Red List as Near Threatened. Other species highlighted in the 2018 survey were – the Nationally Scarce false darkling beetle *Orchesia micans*, that has larvae in shaggy bracket, the Nationally Scarce wood-borer beetle *Dorcatoma dresdensis* and the small fungus beetle *Cis castaneus (=*

nitidus) in *Ganoderma* species, and the locally distributed darkling beetle *Eledona agricola* on sulphur polypore (formerly Nationally Notable but removed from that list (Alexander et al., 2014). It is also worth mentioning here the RDB silken fungus beetle *C. falcozi* which may have a direct association with *Ganoderma* brackets – it is also mentioned in the heartrot section above.

Various locally distributed species are also recorded including *Dacne rufifrons* – whilst this species has no conservation status in the UK (it is fairly widespread and not uncommon) it has been included on the European Red List as Data Deficient, so UK populations may have some European significance.

6.4 Other habitats – sap runs, bird nests in cavities, rot holes/hollows, and subterranean root decay

These habitats fall within the heartrot decay and sapwood decay SATs of Pantheon but are worth mentioning separately as they can support distinctive invertebrate assemblages.

Only a few active sap runs were encountered during the 2017 & 2018 surveys, though the bark on a few oaks appeared to be stained from previously active sap runs. Sap runs can support a distinctive fauna, including scarce or threatened species, notably Diptera and certain Coleoptera, especially in the family Nitidulidae (sap beetles). Adults of the Nationally Scarce hoverfly *Brachyopa pilosa* were seen at a sap run at the base of a beech in 2018 and were also seen on a cut birch stump exuding sap in 2017, and Nationally Scarce sap beetle *Cryptarcha strigata* was also recorded in both surveys.

Bird nests in trees can support a distinctive invertebrate fauna and several species were recorded in 2017 survey. Most notable was the silken fungus beetle *Atomaria morio* that was present in vane trap 9 set high up in a red rot cavity on huge old oak by the Aldbury Road (SP97141192). There was clear evidence of an old bird nest within the cavity and two other locally distributed beetles frequently associated with this habitat were also present – the scarab *Trox scaber* and the clown beetle *Dendrophilus punctatus*. A further species, the local rove beetle *Bisnius subuliformis*, has been found in both surveys.

Rot Holes, especially those with wet substrates, can be especially important to saproxylic Diptera (flies) with a variety of hoverflies associated with this habitat. The RDB1 smudge-winged comb-horn cranefly has been reared from porridge-like wet wood mould in decaying beech. Whilst hoverflies associated with rot holes include the Nationally Scarce bumble bee mimic hoverfly *Pocota personata*, and all four UK species of *Criorhina* (also mentioned under the wood mould section above) and *Brachypalpoides lenta*. Water-filled rot holes and hollows, often those in root buttresses of beech, provide larval habitat for the locally occurring marsh beetle *Prionocyphon serricornis*.

The subterranean root-decay fauna is difficult to sample, usually requiring the use of underground pitfall traps. A single underground pitfall trap was operated at the base of veteran oak alongside Prince's Riding in 2018 and recorded large numbers of the RDB cylindrical bark beetle *Oxylaemus variolosus*. This beetle is

rarely recorded by other means and appears to be a subterranean saproxylic. Another particularly notable beetle - the RDB Endangered root-eating *Rhizophagus oblongicollis* was found at the base of a veteran oak at Aldbury Common in 2017.

6.5 Dead standing trees

This is a rather broad category, which may encompass most, if not all, of the above habitats, but is perhaps most relevant to some non-beetle groups, such as solitary bees & wasps – which may nest in fissures and old vacated beetle exit holes favouring open, sun-exposed trees in relatively warm situations.

Among the solitary wasps recorded in 2017 were *Stigmus pendulus* and *Pemphredon morio* both from the same tree – a dead standing beech. The latter is Nationally Notable, whilst the former, although given RDBK status, may no longer qualify in view of an apparent spread following its discovery in the UK in 1986. More widespread species found in 2018 included the digger wasp *Ectemnius cavifrons* and the spider-hunting wasp *Dipogon subintermedius*. An adult orange-vented mason bee *Osmia leaiana* was observed nectaring at herb Robert, and the dull-vented sharp-tailed bee *Coelioxys elongata* a known cleptoparasite on other mason bee species was seen basking on a dead beech.

Vane traps were set on two dead standing trees on the south side of Prince's Riding in 2018, a beech and an oak, and proved to be among the most productive in the survey as they captured some of the most notable beetles, added several species to the Ashridge and Hertfordshire lists. 15 species of beetle with national conservation status were recorded from the oak and 19 from the beech (some occurred at both trees), along with the brown tree ant. Some of the beetles are mentioned in the various habitat types above, others were unique to these trees in the present survey, they include the small brown scavenger beetle *Enicmus fungicola* and the fungus beetle *Triphyllus bicolor* on the oak, and the tumbling-flower beetle *Tomoxia bucephala*, the ant-like stone beetle *Bibloplectus minutus* and the short-winged mould beetle *Euplectus kirbii* on the beech.

7 TREE SPECIES

All tree species examined or trapped in 2017 were found to support locally distributed or scarce saproxylic species, though oak and beech supported the greatest number of both common and notable taxa within that study. This was perhaps inevitable as these species were the most frequent trees as veterans within the study area and received more sampling effort than other species. Further species included in that previous study were sweet chestnut (several examples), sallow and birch.

The current study continued with the sampling of oak and beech, especially veteran specimens with accessible heartrot, but also focussed on recording from further species, particularly ash and birch. One cherry was sampled, but was relatively unproductive, and no sweet chestnut were included in the 2018 samples. Selected examples of significant species are mentioned below.

7.1 Ash

Relatively few veteran ash trees were present in the areas studied in 2017 - only three were encountered in that survey, two in the northern sector of Northchurch Common and one at Aldbury Common, the latter was sampled with a vane trap and recorded RDB1 false click beetle *Eucnemis capucina* and the Nationally Scarce false darkling beetle *Orchesia micans* that has larvae in shaggy bracket fungus that is most frequently associated with ash.

The ancient tree database documents 58 examples across the whole estate, with one concentration of specimens at Hudnall Common, an outlying area to the east of the main estate – see Map 3A. Two examples were selected here for vane trap sampling in order to investigate the significance of this tree species further. One was a partly dead standing mature, but not veteran, specimen, the other a long-fallen, well-rotted hulk. These vane trap locations are indicated on Map 2C.

Brown tree ant was present at both trees. Two notable beetles were recorded from the standing specimen – the checkered beetle *Tillus elongatus* and the ship-timber beetle *Lymexylon navale*. The latter is more usually associated with oak. Six Nationally Scarce/Notable beetles were recorded from the fallen hulk – the silken fungus beetle *Cryptophagus ruficornis* that is associated with King Alfred's Cake fungus on ash, the small brown scavenger beetle *Enicmus rugosus* (thought to feed on slime moulds), the ant-like stone beetle *Neuraphes plicicollis,* the feather-wing beetle *Ptenidium gressneri*, the slime mould beetle *Sphindus dubius* and the beetle *Scaphisoma boleti*.

Ash is also the primary host for King Alfred's Cakes and shaggy bracket fungi which support various beetles – see section 6.3 above.

Along with initial findings in 2017, the 2018 sampling would indicate that ash, especially specimens containing soft rot/wood-mould - as the fallen specimen at Hudnall, did support significant saproxylic interest at Ashridge. Moreover, ash is known to support key heart rot beetles in other parts of the country such as the Cotswolds (for example, Alexander, 1999c).

7.2 Beech

Veteran beech are present throughout much of the estate and, along with oak, support some of the most significant saproxylic interest. Trees with white rot and brackets of *Ganoderma*, well-rotted hulks in shade and dead standing trees in sunny situations are probably among the most important examples.

The 2017 survey recorded a variety of key invertebrates from beech. Among the beetles were the false click beetles *Hylis olexai* (RDB3) and *Epiphanis cornutus* (European Red List). Several Nationally Notable/Scarce species that are most frequent reported from beech include the longhorn *Stictoleptura scutellata*, the tumbling flower beetle *Tomoxia bucephala*, the checkered beetle *Tillus elongatus*, the bark beetles *Taphrorychus bicolor* & *Ernoporicus fagi*, and the wood borer beetle *Dorcatoma dresdensis* which breeds in *Ganoderma* bracket fungi. With saproxylics from other group including the Nationally Rare forest window fly

Scenopinus niger and the Nationally Scarce hoverfly *Pocota personata*. Two notable solitary wasps were also found on a dead standing beech in an open sunny glade at Aldbury Common – the Nationally Notable *Pemphredon morio* & RDBK *Stigmus pendulus*. Although both may be downgraded in the future.

The 2018 survey again recorded several of the key species above (*H. olexai, S. scutellata, T. bucephala, T. elongatus, T. bicolor* & *P. personata*) and has added more beetles of significance. Among them: the RDB ant-like stone beetles *Microscydmus minimus* & *Scydmaenus rufus*, the Nationally Scarce/Notable false darkling beetle *Abdera quadrifasciata*, the small brown scavenger beetle *Corticaria alleni*, the handsome fungus beetle *Symbiotes latus*, the cylindrical timber beetle *Synchita humeralis* and the weevil *Stereocorynetes truncorum*, most from a dead standing beech in open sun alongside Prince's Riding. Whilst beeches in more shaded situations added the Nationally Scarce tree snipe fly *Chrysopilus laetus*, and the RDB silken fungus beetle *Cryptophagus falcozi* – present in the 2017 samples too, though identity not confirmed until 2018.

7.3 Birch

Birch (silver & downy not distinguished) was relatively under-recorded in the 2017 study but was deliberately targeted in 2018 with several trees in different situations and locations sampled with vane traps. Map 3B shows the key areas for birch and some of the larger more notable specimens. Seven examples were selected for vane trapping; a dead standing example at Ivinghoe Common; four in the red shaded area to the south of Prince's Riding on Map 2G, including live and dead specimens, also standing & fallen; and two at Berkhamsted Common (blue shaded area) one of which was supported red rot and was among the largest examples seen. Regrettably the latter tree collapsed during the sample period, crushing the trap, though a partial catch was 'rescued' from the collecting pot.

The 2017 survey did record two notable species through active searching - the Nationally Scarce weevil *Magdalis carbonaria* (from a young decaying oak though it is more usually associated with birch) and the Nationally Scarce hoverfly *Brachyopa pilosa* on a birch stump exuding sap, both species were recorded again in 2018.

Vane trapping the birch trees in 2018 has added a variety of significant beetles: the RDB false click beetle *Hylis olexai* (2 separate trapping periods from same tree suggesting it was breeding) and root-feeding beetle *Rhizophagus fenestralis* - primarily a Scottish species; and 14 Nationally Notable/Scarce species, among them the feather-wing beetle *Ptenidium gressneri* (several trees), the rove beetles *Quedius microps* & *Q. truncicola*, the false blister beetle *Ischnomera sanguinicollis*, the slime mould beetle *Sphindus dubius* and the ant-like beetle *Euglenes oculatus* – a red rot specialist. A further red rot species, the locally distributed fungus beetle *Mycetophagus piceus*, was also recorded from a different tree. Two locally distributed hoverflies were also observed investigating rot holes in birch – *Criorhina ranunculi* and *Brachypalpoides lenta.*

Birch is also the primary host for birch polypore fungus, which supports a variety of beetles, notably the darkling beetle *Diaperis boleti*.

These results clearly show that birch supports a significant saproxylic fauna at Ashridge.

7.4 Hawthorn

Hawthorn is a key nectar source to a wide variety of saproxylic insects in early summer. Young and veteran specimens are scattered across the Estate and many were sampled with a beating tray during 2018. Whilst a limited number of notable saproxylics were recorded in this way, the RDB2 wasp-banded comb-horn cranefly *Ctenophora flaveolata* was seen once, and two beetles were new to Ashridge and not recorded by other means – the Nationally Scarce longhorn *Anaglyptus mysticus* and the local tumbling-flower beetle *Mordellechroa abdominalis*. Other species of note included the locally distributed false blister beetle *Ischnomera cyanea*. Despite the fact that relatively few notables were found on hawthorn blossom, it remains the key early summer nectar source and should be highly valued in this respect.

Some saproxylics are specific to hawthorn, including the locally distributed hawthorn jewel beetle *Agrilus sinuatus* – old larva workings were found on the veteran hawthorn in the middle of Medleys Meadow to the south of the visitor centre, and on similar hawthorns at Hudnall & Pitstone Commons.

7.5 Oak

Veteran oaks occurred throughout most of the 2017 study area, with concentrations of the largest specimens at Aldbury and Ivinghoe Commons where several examples were vane trapped. In 2018 five specimens were selected for further vane trapping alongside Monument Drive and Prince's Riding, primarily with a view to recording specialist red rot invertebrates. An underground pitfall was also operated at the base of one of the trees.

Ten scarce or threatened saproxylic beetle species were recorded from oak in 2017 and more have been added in this 2018 study. The most significant in 2017 being the RDB1 root-eating beetle *Rhizophagus oblongicollis* - on one of the largest oaks at Aldbury Common, and among the Nationally Notable/Scarce species were the polypore beetle *Tetratoma desmarestii* and the ant like leaf beetle *Euglenes oculatus*, the latter a heart rot specialist.

Additions from 2018 included the RDB1 false click beetle *Eucnemis capucina*, the RDB3 root-eating beetle *Rhizophagus fenestralis* (also on birch) and the RDB3 cylindrical timber beetle *Oxylaemus variolosus* – a subterranean saproxylic recorded in the underground pitfall. Red rot species included the Nationally Scarce *Dorcatoma flavicornis* and the locally distributed *D. chrysomelina* - both from several trees, and among the other Nationally Notable/Scarce beetles were the false click beetle *Melasis buprestoides*, the ship-timber beetle *Lymexylon navale*, the fungus beetles *Triphyllus bicolor*, *Psudotriphyllus suturalis* (also European Near Threatened) and *Phloiophilus edwardsii*, and the rove beetles *Quedius scitus* & *Q. xanthopus*. The brown tree ant was also present in most oaks examined.

7.6 Sallow

A vane trap was set on a split sallow in 2017 captured the European Red Listed false click beetle *Epiphanis cornutus* on two separate trapping periods suggesting that it may have been breeding in the tree, and the Nationally Notable brown tree ant *Lasius brunneus* was also present.

Another sallow was selected for vane trapping in 2018, just south of Monument Drive. Again, this resulted in notable species being recorded: the longhorn beetle *Stictoleptura scutellata,* the feather-wing beetle *Ptenidium gressneri* and the false darkling beetle *Orchesia minor*. An adult of the locally distributed two-marked comb-horn cranefly *Dictenidia bimaculata* was also observed ovipositing in a rot hole on the tree.

Whilst not a true saproxylic the Nationally Notable red-tipped clearwing moth *Synanthedon formicaeformis* also occurred here – adults attracted to a pheromone lure place on the sallow. It has larvae boring into the woody tissue of sallows.

7.7 Sweet chestnut

Sweet chestnut was not sampled in 2018 but was the dominant tree in several areas investigated in 2017, notably Sallow Copse and Old Copse (treated as part of Aldbury Common in that survey). Three vane traps were operated in those areas, and whilst these did pick up few notable species, there were fewer than on oak and beech, even though there was abundant dead wood within the areas sampled. Two factors may be significant. Firstly, whilst there were plenty of examples of post-mature trees, most are probably not as old as many of the oak and beech in nearby areas and might lack suitable heart rot habitat. And secondly, sweet chestnut tends to have very hard sapwood which may not be suitable for various species.

The vane traps recorded four notable species: the false click beetle *Melasis buprestoides* that is known to occur on variety of tree species; the minute brown scavenger beetle *Enicmus rugosus*; the false flower beetle *Anaspis costai*; and the brown tree ant.

Active searching was also undertaken and recorded significant species as the local hoverfly *Brachypalpus laphriformis*.

7.8 Other

Several other tree species have been examined or had traps set on them. These included a pitfall trap set in a rot hole of a veteran crab apple at Northchurch Common in 2017 which recorded the Nationally Notable beetle *Enicmus brevicornis*, along with several locally distributed saproxylics, such as the comb-horn cranefly *Dictenidia bimaculata*.

A vane trap was also set on an old decaying cherry at Frithsden Beeches in 2018. This trap recorded very few saproxylic beetles, none of which were notable, though it did record the Nationally Scarce fungus gnat *Brevicornu serenum* that is not thought to be a saproxylic. The trap was taken in after two short trapping periods. Field sampling of a large dead standing cherry on Aldbury Common in 2017 with a withered specimen of sulphur polypore fungus recorded the darkling beetle *Eledona agricola* – a local species most frequently associated with this fungus; and some old hazels supported the Nationally Notable small fungus beetle *Cis festivus*.

8 DEAD WOOD SITUATION/POSITION - FULL SUN, PARTIAL OR DENSE SHADE

All decaying timber is valuable and, depending on its situation/position, the saproxylic assemblages may differ, and indeed be distinct. Wood-decay habitats in partial shade are generally thought support the richest invertebrate fauna, though sun-exposed timber can be of particular value to certain groups such as solitary bees & wasps nesting in old beetle borings or other cavities. However, decaying wood in full sun may become too hot, baked and desiccated and for many species, this may be particularly acute for dead standing trees or fallen timber, though live veteran trees in open sun probably retain diverse saproxylic interest for longer. Decaying wood in dense shade may favour various flies which have larvae in we rotten wood or fungi, but conversely may be too cold and damp for other species. Kirby (1992) indicates that overall dappled shade provides the ideal compromise.

Several studies have investigated the saproxylic fauna of decaying timber in sunny, partially or densely shaded situations:

Alexander (1999a), in a study undertaken near Bristol, albeit with a small sample size, reports that there was no degree of overlap between the fauna of decaying wood from unshaded, transition zone and shaded situations, with each situation having its own specialists, including scarce species.

Ranius & Jansson (2000) sampled the saproxylic beetles on old oaks in three situations in Sweden - original free-standing specimens, half-open pasture woodland and closed pasture woodland, and showed that for beetles, species richness was greatest in stands of large free-standing oaks, and that forest regrowth, causing shading, was detrimental for many beetle species. Although beetles associated with fruiting bodies of saproxylic fungi preferred large trees with dense canopy cover. However, the study was undertaken near the northern limit of distribution for some of the beetles, and such species in hollow trees near the northern limits of their distribution may prefer sun-exposed trees and might occupy shadier habitats further south. It was also shown that large girth trees also increased the frequency of several species.

A further study, also from Sweden (Lindhe et al., 2005), investigated the saproxylic beetles associated with cut trees over a seven-year period, sampling in

full sun or semi- exposed, and shaded trees. Two thirds of species favoured fully or semi-exposed situations, and one third shaded.

It is important to note that neither of the Scandinavian studies investigated saproxylic fly (Diptera) fauna – a group more likely to utilise dead wood in shade.

In common with the Scandinavian studies, the survey 2017 & 2018 Ashridge surveys, although not quantitative, focussed on beetles and showed that all tree species, whether in full-sun, partial shade or full shade supported saproxylics and in most instances, notable examples. A summary is provided in Table 7 below.

For a site as large and varied as Ashridge, the overall message is clear – all dead wood has value and that in order to conserve the full spectrum of saproxylic invertebrates, a continual supply of wood-decay habitat, of various species, in full-sun, partial shade/dappled sunlight and full shade should be retained across the site.

Table 8: Notable saproxylic species by situation and tree species recorded in 2017 & 2018 surveys

*Group/Scientific Name**	*Conservation Status*	*Sunny*	*Partial shade*	*Shade*
Araneae (spiders)				
Marpissa muscosa	Nationally Notable B	Beech Oak		
Coleoptera (Beetles)				
Abdera quadrifasciata	Nationally Scarce	Beech	Beech	
Aeletes atomarius	Nationally Scarce	Beech	Beech	
Anaspis costai	Nationally Scarce		Sweet chestnut	
Anaspis thoracica	Nationally Scarce		Oak	Ash
Atomaria morio	Red Data Book - K		Oak	
Aulonothroscus brevicollis	Red Data Book - Rare	Beech		
Bibloporus minutus	Nationally Notable B	Beech		
Cerylon fagi	Nationally Notable B		Oak	Oak
Cis festivus	Nationally Notable B	Beech Oak	Beech	Beech Birch Hazel Oak
Corticaria alleni	Nationally Notable	Beech		
Cryptarcha strigata	Nationally Notable B		Oak	
Cryptophagus falcozi	Red Data Book - Indeterminate	Beech		Beech
Cryptocephalus micaceus	Red Data Book – Insufficiently Known		Oak	
Cryptophagus ruficornis	Nationally Notable		Beech	Ash
Diaperis boleti	Nationally Scarce			Birch
Diplocoelus fagi	Nationally Notable B		Beech	Beech Birch
Dorcatoma dresdensis	Nationally Scarce	Beech		
Dorcatoma flavicornis	Nationally Scarce		Oak	Oak
Dropephylla gracilicornis	Nationally Scarce		Oak	

Enicmus brevicornis	Nationally Notable	Beech	Beech Oak	Beech, Crab apple
Enicmus fungicola	Nationally Notable		Oak	
Enicmus rugosus	Nationally Notable	Beech Birch	Beech Birch Oak	Ash, Oak Sweet chestnut
Epiphanis cornutus	European Red List - Near Threatened	Beech	Beech Sallow	
Ernoporicus fagi	Nationally Notable A	Beech		
Eucnemis capucina	Red Data Book - Endangered		Oak	Ash
Euglenes oculatus	Nationally Scarce	Beech	Birch Oak	Oak
Euplectus kirbii	Nationally Notable	Beech		
Hylis olexai	Red Data Book - Rare	Beech	Beech Birch Oak	
Hypnogyra angularis	Nationally Notable A	Beech		
Ischnomera sanguinicollis	Nationally Scarce			Birch
Lymexylon navale	Nationally Scarce	Beech	Ash Oak	
Magdalis carbonaria	Nationally Notable B	Oak		
Melasis buprestoides	Nationally Notable B		Oak	Sweet chestnut
Megatoma undata	Nationally Scarce	Beech	Oak	
Microscydmus rufus	Red Data Book - Rare		Beech	
Neuraphes plicicollis	Nationally Notable		Birch	Ash
Orchesia micans	Nationally Scarce			Ash
Orchesia minor	Nationally Scarce	Beech	Sallow	
Oxylaemus variolosus	Red Data Book - Rare		Oak	
Phoiophilus edwardsii	Nationally Scarce	Oak		Oak
Phyllodrepoidea crenata	Nationally Notable B		Beech	
Platypus cylindrus	Nationally Notable B		Oak	
Platyrhinus resinosus	Nationally Notable B	Beech	Beech	
Poecilium alni	Nationally Notable B	Oak	Oak	
Pseudotriphyllus suturalis	Nationally Scarce			Oak
Ptenidium gressneri	Nationally Notable	Beech Birch	Beech Birch Oak Sallow	Ash
Quedius microps	Nationally Notable B		Birch	Beech
Quedius scitus	Nationally Notable B		Oak	
Quedius truncicola	Nationally Notable B		Birch	
Quedius xanthopus	Nationally Notable B		Beech Oak	
Rhizophagus fenestralis	Red Data Book - Rare	Birch	Oak	
Rhizophagus oblongicollis	Red Data Book - Endangered		Oak	
Rhizophagus nitidulus	Nationally Notable B		Birch	
Scaphisoma boleti	Nationally Notable B		Beech	Ash
Scydmaenus rufus	Red Data Book - Vulnerable	Beech		
Sepedophilus bipunctatus	Nationally Notable B			Beech

Sphindus dubius	Nationally Notable B	Birch	Beech Birch Oak	Ash
Stereocorynes truncorum	Nationally Notable A	Beech		
Stictoleptura scutellata	Nationally Notable A	Beech	Sallow	
Symbiotes latus	Nationally Notable B	Beech		
Synchita humeralis	Nationally Scarce	Beech		
Synchita (Cicones) variegatus	Nationally Scarce	Beech	Beech	Beech, Oak
Taphrorychus bicolor	Nationally Notable B	Beech	Beech	
Tetratoma desmarestii	Nationally Scarce			Oak
Tillus elongatus	Nationally Scarce	Beech	Ash Beech Birch	
Tomoxia bucephala	Nationally Scarce	Beech	Beech	
Triphyllus bicolor	Nationally Scarce		Oak	
Uleiota planata	Nationally Notable A	Beech Oak		
Diptera (Flies)				
Brachyopa pilosa	Nationally Scarce	Birch	Beech	Beech
Ctenophora pectinicornis	Nationally Notable	Beech	Beech	
Pocota personata	Nationally Scarce		Beech	Beech
Scenopinus niger	Nationally Scarce	Beech		Beech
Hymnoptera (Ants, bees & wasps)				
Lasius brunneus	Nationally Notable A	Ash Beech Oak Sallow	Ash Beech Birch Holly Oak Sallow Sweet chestnut	Beech oak
Pemphredon morio	Nationally Notable B	Beech		
Stigmus pendulus	Red Data Book - K	Beech		
Mollusca				
Malacolimax tenellus	Nationally Notable A			Beech

*Non-saproxylics and species not found on particular trees omitted.

9 AREAS SAMPLED IN 2018

The area locations are indicated on Map 1 and species lists for the individual areas below are provided in Appendix 4. A full list of individual records is also provided in a separate Excel spreadsheet.

9.1 Basecamp/Bunkhouse

Accommodation was provided by NT at the Bunkhouse on several occasions and the opportunity was taken to run a 125W. mercury vapour Skinner light trap in the hope of recording some saproxylic species. Only a few common wood-decay beetles were recorded, e.g. the click beetle *Melanotus castanipes*, though trapping here in the 2017 study did attract a male of the Red Data Book smudge-

winged comb-horn cranefly *Ctenophora ornata*. The moth list from 2018 did include the Nationally Notable great oak beauty moth *Hypomecis roboraria* along with some locally distributed woodland species such as orange footman *Eilema sororcula* and clay-triple lines *Cyclophora linearia*.

Several other species were recorded by casual observation in and around the buildings, including a single example of the Red Data Book picture-wing fly *Paraclusia tigrina* from the shower block. This is a saproxylic with larvae developing in rotting wood and fungi – Chandler (1997) recorded it from Frithsden Beeches and The Coombe.

9.2 Berkhamsted Common

Berkhamsted was highlighted as a relatively under-recorded area. Much of it is dominated by fairly uniform age, secondary birch woodland, though there are also some very old examples of this species present. Veterans of other species also occur, including oak and beech - one very large old example of the latter seen in the current survey, and there are some large glades.

Two vane traps were set on birch trees, including one on a huge old dead example with red rot habitat, though unfortunately the tree collapsed during the first phase of sampling crushing the trap. A pitfall as also set in a rot hole on another birch.

Key species recorded from the birch vane traps included some Nationally Notable/Scarce taxa: the false blister beetle *Ischnomera sanginicollis* that has not been reported elsewhere at Ashridge and usually breeds in soft rot habitats; the feather-wing beetle *Ptenidium gressneri,* present in several tree species with white rot in this survey; and the slime mould beetle *Sphindus dubius*. The Nationally Notable orange-sided comb-horn cranefly was seen on several occasions and the red rot associated fungus beetle *Mycetophagus piceus* was in the partial sample on the veteran birch supporting that habitat. Active field searching revealed other notable species; the darkling beetle *Diaperis boleti* in birch polypore brackets; and the Nationally Scarce *Phloiophilus edwardsii* from oak branches & *Pseudotripyllus suturalis* from a sulphur polypore bracket – this beetle is also on the European Red list under Near Threatened.

James (2018) adds the Nationally Scarce false darkling beetle *Abdera biflexuosa* in 2012 which has not been recorded elsewhere at Ashridge.

The local and scarce click beetle *Ctenicera cuprea* was swept along one of the rides and may indicate a remnant acid grassland fauna surviving here. This click beetle is widespread on upland acid grasslands in the north & west but much rarer in the south of England.

9.3 Frithsden Beeches

This site supports a large number veteran beech pollards (ca 114 - Emily Smith pers. comm.), many of which are collapsing or shedding limbs. Hence the wood-

decay resource is abundant – there are many partly decayed, standing and or recently or well-rotted fallen trees.

Saproxylic invertebrate surveys have been undertaken here previously – Jones (1999) covering the beetles and Chandler (1997) the Diptera.

Chandler (1997) had reported that the site appeared to be poor in Syrphidae (hoverflies), though the Nationally Scarce *Brachyopa pilosa* had been reported from an entomology field meeting June 1994. The current survey recorded several species with restricted distributions, including *Criorhina asilica, C. berberina* and *Brachypalpoides lenta* showing that the site does support significant hoverfly interest.

However, Chandler (1997) did report that Frithsden was productive for craneflies and fungus gnats – the best area for the latter in his survey of various areas of the Estate. Overall his survey found: the possible second British record of the Platypezid fly *Agathomyia cinerea*; three RDB species – the picture-wing fly *Paraclusia tigrina* (RDB2), the fungus gnat *Sciophila quadriterga* (RDB3) & the Anthomyid fly *Eustalomyia hilaris* (RDB3). Also present were nine Nationally Scarce/Notable species, including the orange-sided comb-horn cranefly (also seen in current survey), another cranefly *Atypophthalmus inustus*, five fungus gnats, the Hybotid fly *Oedalea apicalis* (found by Jones (1997)) and the snail-killing fly *Pherbellia annulipes.*

Jones (1997) surveyed the saproxylic beetle and recorded seven[6] Nationally Notable/Scarce species: the false click beetle *Melasis buprestoides*, the root-eating beetle *Rhizophagus nitidulus*, the slime mould beetle *Sphindus dubius*, the cylindrical timber beetle *Synchita* (*Cicones*) *variegatus*, the tumbling flower beetle *Tomoxia bucephala,* and the bark or ambrosia beetles *Taphrorychus bicolor* & *Xyleborus dryographus*. *S. dubius*, *S. variegatus* and *T. biguttata* were recorded here again in the 2018 survey, and whilst the other of these species were not captured at Frithsden, they were all seen in other areas of the Estate during the current survey.

The current survey recorded two RDB beetles – the silken fungus beetle *Cryptophagus falcozi* (RDB Indeterminate) and the ant-like stone beetle *Microscydmus minimus* (RDB2), along with 16 Nationally Scarce/Notable species – 12 beetles, lemon slug *Malacolimax tenellus* (not seen elsewhere in the survey), the orange-sided comb-horn cranefly, the jumping spider *Marpissa muscosa* and brown tree ant. Of the 12 beetles two were not recorded elsewhere in the 2018 sampling – the rove beetles *Phyllodrepoidea crenata* a primarily northern & western species new to Ashridge & Hertfordshire, and *Spedophilus bipunctatus* (though recorded from Aldbury Common in 2017). The discovery of *C. falcozi* is especially significant as, along with its occurrence at Aldbury Common in 2017, these represent the first records outside of Berkshire – most of which are from Windsor Forest.

[6] Some additional notable species listed in Jones (1997) have subsequently been removed from national conservation status categories

9.4 Hudnall Common

Hudnall was selected for some sampling as it supports a concentration of veteran ash trees, which are less frequent in other areas of the estate. Two vane traps were set on separate ash trees, and examples of other veterans, including oak, were examined during field searches when emptying/resetting traps.

The vane traps recorded eight Nationally Scarce beetles along with the brown tree ant, and field searching added the Nationally Notable jumping spider *Marpissa muscosa* on a veteran oak – it is a species usually recorded from old trees in the south-east. The notable beetles were: the checkered beetle *Tillus elongatus* & ship-timber beetle *Lymexylon navale*, the latter usually associated with oak, from a decaying standing ash; and the silken fungus beetle *Cyptophagus ruficornis*, the slime mould beetle *Sphindus dubius*, the beetle *Saphisoma boleti*, the small brown scavenger beetle *Enicmus rugosus*, the feather-wing beetle *Ptenidium gressneri* and the ant-like stone beetle *Neuraphes plicicollis* from a fallen ash hulk with white rot/wood mould habitat.

9.5 Ivinghoe Common

Some sampling was undertaken here in 2017 and resulted in several notable saproxylics being recorded. These included the Nationally Scarce hoverflies *Pocota personata* and *Brachyopa pilosa*, the long horn beetle *Poecilium alni* and the weevil *Magdalis carbonaria.*

Further sampling in the current survey has added a variety of further saproxylics. Among the most significant are: the RDB2 wasp-banded comb-horn cranefly - a male at hawthorn blossom, the related and Nationally Notable orange-sided comb-horn was also observed; the RDB3 false click beetle *Hylis olexai* was present in two different vane trap samples from a dead standing birch suggesting that it was breeding in this tree; with other notable beetles from the same birch including the Nationally Notable/Scarce root-eating beetle *Rhizophagus nitidulus*, the ant-like beetle *Euglenes oculatus* a red rot specialist, and the ant-like stone beetle *Neuraphes plicicollis*.

9.6 Monument Drive

This area was the subject of a separate study investigating the wider invertebrate fauna, including ground flora and grassland associated species, as part of project investigating proposals/options for future car parking. More details are provided in Foster (2018). But with regard to the saproxylic fauna the following key points are relevant:

- Sixteen species of wood-decay invertebrates were recorded that have national conservation status, including the RDB false click beetle *Eucnemis capucina*, with another false click beetle, *Epiphanis conruntus* on the European Red List of Saproxylic beetles, though it currently has no national conservation status.
- Among the Nationally Scarce species were several that are reliant on red rot habitat, examples include *Dorcatoma flavicornis* & *Euglenes oculatus*,

with other red rot specialists including the locally distributed *Dorcatoma chrysomelina.*

- These are supplemented by a variety of other wood-decay invertebrates with restricted distributions, such as several hoverflies.
- Also recorded was the Nationally Notable red-tipped clearwing moth *Synanthedon formicaeformis* with larvae feeding within sallow branches and trunks, though not considered a true saproxylic.

9.7 Northchurch Common

The western sector of Northchurch Common was walked in search of suitable veteran ash trees to undertake vane trapping. In the event no trees with accessible rot and out of the public view could be located - Hudnall Common was selected to study this tree species instead. However, during this initial investigation the Nationally Scarce hoverfly *Brachyopa pilosa* was observed – several on a cut birch stump exuding sap.

9.8 Pitstone Common

This area remains fairly under-recorded – a single afternoon was spent beating hawthorn blossom and investigating suitable trees for setting vane traps. This section of the property receives heavy pubic use, and whilst several trees were considered suitable for trapping it would have been difficult to set traps out of the public view. Coupled with the fact that several trees at the nearby Monument Drive & Ivinghoe Common sections of the property were being sampled, and that the number of available traps was limited, it was decided not to include Pitstone within the vane trapping programme. However, the wood-decay resource at Pitstone is just as plentiful and of high quality as the neighbouring areas, hence the saproxylic invertebrate fauna can expected to be just as significant.

Sampling of the hawthorn added the Nationally Scarce longhorn beetle *Anaglyptus mysticus* to the Ashridge list, and other locally distributed beetles such as *Mordellochroa abdominalis* were also recorded.

9.9 Prince's Riding & woodland to south (former Ashridge Park)

This proved to be one of the most interesting areas sampled in 2018, though more vane traps were employed here than elsewhere, so there may be a degree of bias in sampling effort. Nevertheless, the veteran oak and beech trees lining either side of Prince's Riding are of especial note, with dead standing examples of both among the most productive for notable saproxylics in this survey.

To the south of Prince's Riding there is an extensive wooded area, much of it dominated by secondary birch, though veteran trees are present here too and are presumed to be remnants of the former Ashridge Park – which is likely to have been more open with individually well-spaced trees.

Trees on the northern side, bordering the golf course, included a huge fallen, well-rotted and hollow beech. An adult Nationally Scarce hoverfly *Pocota personata* was seen investigating this tree and the tree snipe fly was captured in a vane trap set inside the hollow trunk – this species has not been reported from Ashridge before and was not encountered elsewhere in the survey. A nearby fallen oak with exposed red rot supported several red rot specialists including the Nationally Scarce ant-like beetle *Euglenes oculatus* and the local wood-borer beetle *Dorcatoma chrysomelina*, the RDB Insufficiently known silken fungus beetle *Cryptophagus micaceus* was also recorded here – it is often found in hornet nests.

Further veteran trees on the south side support highly significant saproxylic interest – dead standing specimens of oak & beech have already been highlighted in section 6.5. A further huge, live, maiden and veteran oak was also of significant importance and supported the RDB3 cylindrical timber beetle *Oxylaemus variolosus* a subterranean saproxylic, along with Nationally Scarce species such as the ship-timber beetle *Lymexylon navale*, the wood-borer beetle *Dorcatoma flavicornis* a red rot specialist and the rove beetle *Quedius scitus*.

The wooded area to the south, part of the former more open Ashridge Park, was targeted for sampling of birch. This revealed a variety of notable saproxylics on this species of tree – on dead standing, fallen or live specimens with rot habitats. Whilst few of the saproxylics are likely to be specific to birch this has highlighted the importance of this tree species in the overall wood-decay resource at Ashridge. One exception is the darkling beetle *Diaperis boleti* which feeds on birch polypore fungus – that is largely restricted to this tree. Among the more notable saproxylics recorded on birch were: the RDB3 root-eating beetle *Rhizophagus fenestratus* (also recorded on oak), the feather-wing beetle *Ptenidium gressneri*, and the rove beetles *Quedius microps* & *Q. truncicola*.

10 NON-SAPROXYLIC INVERTERBATE FAUNA

General sampling/beating of trees & shrubs, along with sweeping of ground vegetation resulted in several non-saproxylic notable species being found, these are included in the species list at the end of this report and in the separate Excel spreadsheet of all individual records.

Species worthy of specific mention include the Nationally Scarce leaf beetle *Orsodacne cerasi* found by beating hawthorn on the southern edge of Prince's Riding, adults are usually associated with this shrub, though larval biology is unclear. A single example of the Nationally Notable snail-killing fly *Pherbellia annulipes* was captured in a vane trap on birch in the shaded birch woodland south of Prince's Riding – this a shaded woodland species with larvae feeding on small snails such as the common *Discus rotundatus* which inhabits dead wood.

Several species of solitary bees and wasps were present along the open grassland stretch of Prince's Riding and may have been nesting in the open or sparsely vegetated ground. These included the Nationally Scarce big-headed mining bee *Andrena bucephala* – two females were seen.

A mercury vapour light trap was operated at the Bunkhouse/Base Camp on 18th June 2018 when several adults of the Nationally Notable great oak beauty moth *Hypomecis roboraria* was recorded - it has larvae feeding on oak. There are several other records for the area (data from Buckinghamshire (BMERC) & Hertfordshire (HERC)) Environmental Records Centres) indicating that the species is well established here. Plant (2008) regards it as a local & uncommon resident in the county. The also BMERC & HERC datasets contain long lists of moths, several of which are locally distributed, for example White-marked moth *Cerastis leucographa* – another oak feeding species which is considered as extremely local & uncommon in the county by Plant (2008).

Adults of purple hairstreak butterfly *Favonius quercus* were seen around the canopy of some of the oaks along Monument Drive in the current survey and it probably occurs widely on the oaks on the estate. Ed Bennett observed a purple emperor butterfly *Apatura iris* along Monument Drive in the summer of 2018, the larvae feed on sallows of which there are plenty of suitable examples in the area and this charismatic butterfly probably breeds here – there are also several previous records held by BMERC & HERC.

The red-tipped clearwing moth *Synanthedon formicaeformis* was recorded from Monument Drive (see section 4.4.5), it is ranked as Nationally Notable category B and regarded by Plant (2008) as a local & uncommon resident in the county, and there do not appear to have been any previous records from the Ashridge area. In addition, a single raspberry clearwing moth *Pennisetia hyaeiformis* was attracted to a rucksack containing a series of clearwing pheromone lures at Ivinghoe Common. This is a non-native moth, probably spreading, and known from the area – the larvae feed in the stems of raspberry which grows in the woods here.

A single example of the click beetle *Ctenicera cuprea* was swept along a grassy ride at Berkhamsted Common. Whilst this species is frequent and widespread in northern & western Britain, especially upland acid grasslands, it is scarce and localised in the south, and this record may indicate that a relic acid grassland invertebrate community is hanging on in this predominantly secondary woodland area.

11 AMENDMENTS TO 2017 SURVEY

Since production of the 2017 survey report several corrections have come to light.

Most significant is the confirmed identity of the Red Data Book silken fungus beetle *Cryptophagus falcozi*, which breeds in *Ganoderma* brackets. This species was previously listed as *C. simplex. C. falcozi* occurred in some numbers in a vane trap within a split veteran beech set close to a *Ganoderma* bracket at Aldbury Common. Prior to this record it had only been reported from Berkshire, primarily Windsor Forest. It has occurred again in the 2018 samples - a single example at Frithsden Beeches, which prompted a re-examination of the 2017 specimens.

Trevor James (County Beetle Recorder) also queried records of some of the smallest beetles, which necessitated further scrutiny (usually microscopic

dissection of genitalia) - this has been undertaken and resulted in several changes.

All records of the minute fungus beetle previously listed as *Sericoderus lateralis* are the closely related *S. brevicornis* – the latter was only recognised in the UK a few years ago but appears to be far more common than *S. lateralis*. A second minute fungus beetle previously listed as *Orthoperus mundus* has proved to be the Nationally Notable B *O. nigrescens* which, despite the current conservation status, is the most frequently recorded member of the genus.

There were several records for the short-winged mould beetle *Euplectus piceus*. Whilst that species was present in the samples there were also several over-looked records of *Bibloplectus bicolor* under the name *E. piceus*.

The small fungus beetle previously listed at *Cis micans* is in fact the closely related *C. submicans* – this is as a result of confusion in nomenclature.

An updated spreadsheet of records including the various corrections will be circulated to NT, BMERC & HERC.

12 ACKNOWLEDGEMENTS

Thanks go to various members of the NT Ashridge Team, but especially: Emily Smith for commissioning the survey, data on veteran trees and invertebrates, providing some vane traps, and for giving support throughout the study; Ed Bennett for helping with trap emptying and resetting and providing observations of notable species; Morgan Ravine & Ilona Livarski also for helping with trap setting & emptying; and Stephanie Hodges for sorting accommodation and being a key point of contact at the Estate office. I'm grateful to Trevor James (Hertfordshire County Coleoptera Recorder) who has helped with species taxonomy, sorting the identity of closely similar species, corrected some errors in the 2017 species spreadsheet and provided additional records. Alex Waechter (HERC) and Claudia Bernardini (BMERC) were very helpful in sorting and providing invertebrate data (primarily for another project at the property) and dealing with various queries. Finally, thanks to Peter Chandler who identified the fungus gnats and Mark Parsons for the loan of a copy of Plant (2008).

MAIN TABLE: SCARCE & THREATENED INVERTEBRATES FROM 2017 & 2018 SURVEYS

Species are arranged alphabetically within group.
*Includes updates from recent status reviews.

Species & National Status*	Date, Source & Location	Ecological Notes
Spiders Araneae		
A jumping spider *Marpissa muscosa* Nationally Scarce-category B	2018, A.P. Foster • Frithsden Beeches, SP99631051 & SP99921075, on dead beeches • Hudnall Common, TL00971293, on fallen oak bough • Ivinghoe Common, SP97971400, on dead beech	Frequents trees and posts with loose bark where it actively hunts prey, also occurs on log piles and on dry stone walls. Restricted to the southern half of England and most frequently recorded in the south-east.
Beetles Coleoptera		
A false darkling beetle *Abdera quadrifasciata* Nationally Scarce	2018, A.P. Foster • Prince's Riding (south), SP98631249, dead standing beech, vane trap 18; SP98311244, fallen beech, vane trap 21	Associated with decaying timber, especially oak and hornbeam but recorded from other trees such as beech and birch. Widely distributed, though very localised in occurrence in southern England. Adults recorded from June to September.
A clown beetle *Aeletes atomarius* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96851209, vane trap 7, beech 2018, A.P. Foster • Prnce's Riding (south), SP981125, in white rot of beech; SP98631249, dead standing beech, vane trap 18	Usually in burrows of lesser stag beetle in moist crumbly decaying heartwood, although also recorded with rhinoceros beetle and brown tree ant; in beech, ash, willow, alder. Ancient wood pastures; mostly central England, to Yorkshire in north, and Hampshire and Kent in south-east.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A longhorn beetle *Anaglyptus mysticus* Nationally Scarce-category B	2018, A.P. Foster • Pitstone Common, SP97401328, beating hawthorn	A longhorn beetle of woodland, scrub and hedgerows. The larvae develop in dead wood in very dry dead branches and boles. Fire damaged trees seems particularly prone to attack. Recorded from ash, aspen, hawthorn, holly, field maple, oak, wild pear, rowan, elm, beech, lime and apple. Adults visit umbellifer flowers and hawthorn blossom. Life cycle appears to take two to three years, adults on the wing from April to July. Widespread but local in central England and Wales with a single record from the Scottish Highlands.
A false flower beetle *Anaspis costai* Nationally Scarce	2017, A.P. Foster • Sallow Copse, SP97801326, vane trap 2b, sweet chestnut	A small yellow beetle, scarce and very local in Britain, with most records from the south-west, south-east, west Midlands and south-east wales. Larvae thought to develop in decaying wood.
A false flower beetle *Anaspis thoracica* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97571188, vane trap 6, fallen oak • Aldbury Common, SP97551193, vane trap 11, ash	A small yellow beetle found on hawthorn blossom. Larvae thought to develop in dead wood. Adults recorded from May to July. Widely scattered records from southern England to Scottish Borders with perhaps an easterly bias.
A silken fungus beetle *Atomaria morio* Red Data Book – Insufficiently Known	2017, A.P. Foster • Aldbury Common, SP97141192, vane trap 9, oak red rot hollow with old bird nest	A small beetle primarily associated with bird nests in tree cavities, but also reported from squirrel dreys, a mole nest and a cut stump. Recorded from southern England, the Midlands and Yorkshire.
A small false click beetle *Aulonothroscus brevicollis* Red Data Book – Rare	2017, A.P. Foster • Aldbury Common, SP97591198, bottle trap 1, beech	Recorded from pasture-woodland and rarely from closed broad-leaved woodland, associated with oak. Larvae probably develop in dead wood. Very local and scattered in southern England. Adults recorded from April to August.
An ant-like beetle *Bibloporus minutus* Nationally Scarce-category B	2018, A.P. Foster • Prince's Riding, (south), SP98631249, dead stading beech, vane trap 18	Restricted to south-east England where it occurs in ancient woodland and pasture-woodland. Usually found under the bark of broad-leaved trees, but also cedar and manure heaps. Adults recorded in most months.
A minute bark beetle *Cerylon fagi* Nationally Notable–category B	2017, A.P. Foster • Aldbury Common, SP96871198, fallen oak, vane trap5 • Aldbury Common, SP97571188, fallen oak, vane trap 6	Associated with pasture woodland and ancient broad-leaved woodland where it lives under fungus infected bark and heartwood in advanced stages of decay, usually oak, ash or beech. Most frequently recorded from southern and south-eastern England, though its range extends to Wales and southern Scotland. Adults recorded from March to October.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A small fungus beetle *Cis festivus* Nationally Notable-category B	2017, A.P. Foster • Aldbury Common, widely, oak, beech & hazel 2018, A.P. Foster • Prince's Riding (south), SP974111328, birch, vane trap 3; SP98771244, oak, vane trap 17; SP98631249, dead beech, vane trap 18	Associated with fungi on decaying timber, especially on old trees, recorded from *Piptoporus betulinus* and *Stereum* on hazel, but a wider range of fungi are probably eaten. Widely distributed but localised in occurrence.
A minute scavenger beetle *Corticaria alleni* Nationally Notable	2018, A.P. Foster • Prince's Riding (south), SP98631249, dead standing beech, vane trap 18	A small brown beetle found under bark, mainly oak and beech but also sycamore and birch. Recorded from ancient woodlands and parks in England, north to Notts but also NE Scotland. Adults recorded in most months.
A sap beetle *Cryptarcha strigata* Nationally Notable-category B	2018, A.P. Foster • Monument Drive (south), SP 97551275, oak, vane trap 20	Associated with sap and occurs under bark of various broadleaved trees but is usually found in or near the larval burrows of the goat moth where there is exuding sap. Widespread but local in England.
A silken fungus beetle *Cryptophagus falcozi* Red Data Book – Indeterminate (omitted from 2017 report, as not identified until 2018)	2017, A.P. Foster • Aldbury Common, SP96851209, beech, vane trap7 2018, A.P. Foster • Frirthsden Beeches, SP99921037, beech hulk, vane trap 14	A small beetle considered to be an old forest relic and associated with *Ganoderma* bracket fungi. Usually recorded from the fungi on veteran beeches. Formerly only reported from the Windsor Forest and Reading areas of Berkshire. These Ashridge records represent an extension to the known range.
A silken fungus beetle *Cryptophagus micaceus* Red Data Book – Insufficiently Known	2018, A.P. Foster • Prince's Riding (north), SP98521258, fallen oak, vane trap 24 • Prince's Riding (south), SP98771244, dead standing oak, vane trap 17	A small beetle usually recorded from hornet or wasp nests, though also reported from dead wood, fungi, sap and nest debris in trees. Most records are from the south of England, though reported north to Derbyshire.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A silken fungus beetle *Cryptophagus ruficornis* Nationally Notable	2018, A.P. Foster • Frithsden Beeches, SP99921076, fallen beech, vane trap 9 • Hudnall Common, TL00941287, fallen ash, vane trap 8	Widley distributed in England, Wales & Scotland, though very localised in occurrence. Breeds in *Daldinia* fungi on trees, usually ash.
A silphid beetle *Dendroxena quadrimaculata* Nationally Notable-category B	2017, A.P. Foster • Ivinghoe Common, SP975143, beating hawthorn	An active predator of geometrid moth caterpillars feeding on tree foliage in ancient woodlands. Primarily a western oceanic species, occurring across the oakwoods of northern and western Britain as well as in the Weald.
A darkling beetle *Diaperis boleti* Nationally Scarce	2018, A.P. Foster • Berkhamsted Common, SP98031187, in *Piptoporus* • Prince's Riding (south), SP983125, in *Piptoporus*	A black and red beetle associated with bracket fungi on trees, principally *Piptoporus betulinus* on birch. Though it has also been reported from *Polyporus* squamosus. Adults and larvae feed on the fungi. Formerly regarded as very rare though it has been recorded more frequently in recent years, especially in East Anglia. Range extends from Dorset north to Cumbria.
A beetle *Diplocoelus fagi* Nationally Notable-category B	2018, A.P. Foster • Monument Drive (south), SP972128, beating dead beech • Prince's Riding (south), SP98311244, fallen beech, vane trap 21 • Ivinghoe Common, SP98021398, dead birch, vane trap23	Associated with beech in ancient broad-leaved and pasture woodland, occurring under bark of dead wood, usually beech though also reported from sycamore with sooty bark disease. Local in southern and central England, seemingly no records further west than Somerset or north of the Mersey to Humber line. Adults recorded in most months.
A wood-borer beetle *Dorcatoma dresdensis* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96851209, beech, vane trap7	Larvae develop in hard, woody bracket fungi, e.g. *Ganoderma*, *Fomes* and *Phellinus*, growing on old trees usually in areas of ancient woodland or pasture woodland. Very locally distributed in southern England. Adults recorded from May to August.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A wood-borer beetle *Dorcatoma flavicornis* Nationally Scarce	2018, A.P. Foster • Monument Drive (north), SP97231307, dead standing oak, vane trap 25 • Prince's Riding (south), SP98281262, oak, vane trap 16 & SP98771244, dead standing oak, vane trap 17	Adults and larvae live mainly in red rotten oak though may also occur on other trees such as alder and willows. Widely distributed from southern England to west Yorkshire with an old record from south Wales, very local across range. Adults recorded from April to October.
A rove beetle *Dropephylla gracilicornis* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97141192, oak, vane trap 9	A small rove beetle occurring under bark or in decaying wood, especially oak. Widespread but very local in England and southern Scotland.
A minute brown scavenger beetle *Enicmus brevicornis* Nationally Notable	2017, A.P. Foster • Aldbury Common, SP96991198, beech, vane trap 4 • Aldbury Common, SP97571188, fallen oak, vane trap 6 • Northchurch Common, SP96941180, crab apple 2018, A.P. Foster • Frithsden Beeches, SP99911076, fallen beech, vane trap 9 • Ivinghoe Common, SP97951361, dead standing beech, vane trap 12 • Princes Riding, south, SP98281262, veteran oak, vane trap 16; SP98771244, dead standing oak, vane trap 17; SP98631249, dead standing beech, vane trap 18	Most often associated with ancient broad-leaved and pasture woodland habitats, though has recently been discovered in suburban gardens and may have spread in recent years. Found under bark and in dead wood. Widespread but local in southern England, also reported from the north west.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A minute brown scavenger beetle *Enicmus fungicola* Nationally Notable	2018, A.P. Foster • Prince's Riding (south), SP98771244, dead standing oak, vane trap 17	A small beetle associated with slime moulds on trees. Very widespread but local most records from northern and western Britain but also as far south as Hampshire. Adults recorded from May to August.
A minute brown scavenger beetle *Enicmus rugosus* Nationally Notable	2017, A.P. Foster • Aldbury Common, widely, oak, beech, ash & sweet chestnut 2018, A.P. Foster • Widley: Firthsden Beeches, Hudnall Common, Ivinghoe Common, Monument Drive, and Prince's Riding, north & south	A widely distributed but very scarce and localised species associated with encrusting fungi on decaying timber. Previously recorded from *Corticium quercinum* on oak, and *Collybia radicata*.
A fasle click beetle *Epiphanis cornutus* European Red List – Near Threatened	2017, A.P. Foster • Aldbury Common, SP96991209, sallow, vane trap 2018, A.P. Foster • Monument Drive (south), SP97401281, old fallen beech hulk, several adults flying in vicinity	A wood-decay associated beetle. Its UK origins are unclear as it was first discovered in Glos. in the 1960s in association with Norway Spruce, and it has subsequently been reported from other non-native trees, leading to the belief that it is a non-native. However, it also occurs in old pasture woodland sites and is sometimes associated with veteran trees. It is regarded as native in other parts of northern Europe and has recently been given Near Threatened Conservation status in a European context (Nieto & Alexander, 2010). There have been an increasing number of UK records in recent years.
A bark beetle *Ernoporicus fagi* Nationally Notable–category A	2017, A.P. Foster • Aldbury Common, SP97011197 & SP97701205, dead beeches • Sallow Copse, SP98281383, dead standing beech	A small bark beetle occurring in ancient woodland and parkland, with the larvae boring in the smaller branches and twigs of beech. Widespread, though very localised, in southern England occurring as far north as Yorkshire. Adults recorded in most months.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A false click beetle *Eucnemis capucina* Red Data Book - Endangered	2017, A. P. Foster • Aldbury Common, SP97551193, ash, vane trap11 2018, A.P. Foster • Monument Drive (south), SP975511274, oak, vane trap 20	A false click beetle with larvae developing in decaying hard wood and under bark. Usually recorded from beech or ash, though several recent records from old orchard trees. Recorded more frequently with the use of vane traps, but still regarded as rare. Restricted to southern half of England and found in ancient pasture woodlands and orchards.
An ant-like leaf beetle *Euglenes oculatus* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96991196, oak, vane trap10 • Aldbury Common, SP97591198, beech, bottle trap 1 2018, A.P. Foster • Ivinghoe Common, SP98021398, dead standing birch, vane trap 23 • Monument Drive (north), SP97231307, dead standing oak, vane trap 25 • Prince's Riding (north), SP98521258, fallen oak, vane trap 24 • Prince's Riding (south), SP98231262, oak, vane trap 16 & SP98771244, vane trap 17	Found in broad-leaved woodland and pasture woodland. Recorded from the stumps and boughs of oak, it is thought to have a preference for the tops of stag-horn oaks. Also found on lime, hawthorn, beech, birch and chestnut. Adults have been recorded from elder blossom. Larvae develop in dead wood. Widespread but local in England.
A beetle *Euplectus kirbii* Nationally Notable	2018, A.P. Foster • Prince's Riding (south), SP98631249, dead standing beech, vane trap 18	Adults are probably predatory on mites under the bark of broad-leaved trees. Recorded from scattered sites in southern England as far north as Cheshire.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A false click beetle *Hylis olexai* Red Data Book - Rare	2017, A.P. Foster • Aldbury Common, SP97591198, beech, bottle trap 1 2018, A.P. Foster • Ivinghoe Common, SP98021398, dead standing birch, vane trap 23 • Prince's Riding (south), SP98771244, oak vane trap 17; SP98621249, dead standing beech, vane trap 18 & SP98311244, fallen beech, vane trap 21	A little-known dead-wood beetle. Usually associated with broad-leaved trees especially beech, though also reported from spruce. Restricted to southern England New to Britain in 1951, and seemingly recorded with increasing frequency in recent years, possibly expanding or becoming commoner. Adults recorded from July to September.
A rove beetle *Hypnogyra angularis* Nationally Notable-category A	2018, A.P. Foster • Prince's Riding (south), SP98631249, dead standing beech, vane trap 18	A rove beetle which is a predator of other invertebrates. Inhabits bird nests in old trees, wet rot within trees and ant nests. Restricted to southern England with most records from the south east and most frequently recorded from ancient woodlands and pasture woodlands.
A false blister beetle *Ischnomera sanguinicollis* Nationally Scarce	2018, A.P. Foster • Berkhamsted Common, SP97981180, birch, vane trap6	Larvae develop in decaying wood of various trees with the adults most frequently encountered at the flowers of hawthorn and other shrubs. Widely distributed but very localised in southern England as far north as Yorkshire. Also scattered records from Wales including the Conwy Valley. Adults recorded from April to July.
A ship-timber beetle *Lymexylon navale* Nationally Scarce	2018, A.P. Foster • Hudnall Common, TL00971288, ash, vane trap 7 • Prince's Riding (south), SP98281262, oak, vane trap 16; SP98771244, dead standing oak, vane trap 17 & SP98631249, dead standing beech, vane trap 18;	Restricted to ancient broad-leaved and pasture woodland localities where it breeds in well-seasoned dead oak. The larvae bore deep into the trunks of dead standing trees, feeding on cellulose not fungi. Very local and known from only a few sites ranging from Surrey and Hants northwards to Lancashire. A spate recent records suggests that it is less rare than in the past.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A weevil *Magdalis carbonaria* Nationally Notable-category B	2017, A.P. Foster • Ivinghoe Common, SP97801442, young oak with die-back, beating branches 2018, A.P. Foster • Monument Drive (south), SP974128, sweeping	A black weevil with larvae that feed internally in the twigs and branches of birch. Adults recorded between April and July. Scattered distribution in England and Scotland with a northerly bias.
A hide beetle *Megatoma undata* Nationally Scarce	2018, A.P. Foster • Prince's Riding (south), SP98771244, dead standing oak, vane trap 17 & SP98631249, dead standing beech, vane trap 18;	Most frequently recorded from beneath loose fitting bark of large old trees where it feeds on the decaying, dried remains of other invertebrates. Widespread though local in England and south Wales and is most often associated with ancient woodland localities
A false click beetle *Melasis buprestoides* Nationally Notable-category B	2017, A.P. Foster • Aldbury Common, SP97101213, sweet chestnut, vane trap 3 2018, A.P. Foster • Prince's Riding (south), SP98771244, dead standing oak, vane trap 17	Larvae bore galleries in hard dead branches of various broad-leaved trees e.g. oak, ash, beech and birch. Widespread though local in England and south Wales, but apparently absent from the far south west.
An ant-like beetle *Microscydmus minimus* Red Data Book - Rare	2018, A.P. Foster • Frithsden Beeches, SPSP99921076, fallen beech, vane trap 9	Recorded from southern England north to Nottinghamshire with most records in East Midlands. Adults thought to be predatory on mites. A woodland species usually found in red heartrot of veteran oaks, and in France has been found in association with the Nationally Scarce brown tree ant. Aslo record in leaf litter, moss, and fern roots. The Red Data Book status may no longer be appropriate. Adults recorded from April to September.
An ant-like beetle *Neuraphes plicicollis* Nationally Notable	2018, A.P. Foster • Hudnall Common, TL00941287, fallen ash, vane trap 8 • Ivinghoe Common, SP98021398, dead standing birch, vane trap 23	A small beetle usually found in rotten wood, under bark or in beech leaf litter, though also recorded from *Sphagnum* moss. Locally distributed in southern England and Wales.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A false darkling beetle *Orchesia micans* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97551193, ash, vane trap 11	Associated with large bracket fungi on trees in woodland and pasture woodland, but especially *Inonotus hispidus* on ash. Also recorded from fungi on alder and beech. A widespread but very local species. Adults recorded from March to October.
A false darkling beetle *Orchesia minor* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97011197, beech, on dead branches 2018, A.P. Foster • Frithsden Beeches, SP99871060, beating beech • Monument Drive (south), SP974127, beating sallow	Associated with fungi on trees, particularly *Polyporus* and dead wood from a variety of tree species. Widespread but very local in Great Britain and is most frequently reported from ancient woodland or pasture woodland sites, often in damp shady situations. Adults recorded in most months.
A leaf beetle *Orsodacne cerasi* Nationally Scarce	2018, A.P. Foster • Prince's Riding (south), SP98281262, beating hawthorn	A leaf beetle recently elevated to Nationally Scarce status. Adults are most frequently recorded from rosaceous shrubs, such as hawthorn.
A leaf beetle *Orsodacne humeralis* Nationally Scarce	2017, A.P. Foster • Ivinghoe Common, SP975143, beating hawthorn	Larvae feed on roots of various rosaceous shrubs, especially hawthorn; adults attracted to blossom. Broadleaved woods, parks and scrub. Widespread but very localised.
A minute fungus beetle *Orthoperus nigrescens* Nationally Notable-category B (identity not confirmed until 2018)	2017, A.P. Foster • Aldbury Common, SP97591190, dead beech, vane trap 12	A very small beetle usually found in damp situations in woodland, such as wood mould, red rot or fungi. Recorded widley in southern half of England, also south Wales. Despite current national conservation status, it appears to be the commonest member of the genus.
A cylindrical bark beetle *Oxylaemus variolosus* Red Data Book - Rare	2018, A.P. Foster • Prince's Riding (south), SP98281262, oak, underground pitfall 1	A small beetle of ancient broad-leaved woodland. Probably predatory on other beetles in dead wood. The beetle has most frequently been recorded by using under-ground pitfall traps. Otherwise found in litter and wood mould at the bases of veteran trees and at the base of a tree stump, also recorded in the fungus *Collybia fusipes* growing at the base of a large American red oak. Adults have been noted in May and June. Only known from a few localities in southern England, ranging from Hampshire and Kent as far north as Huntingdonshire and Herefordshire.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A small beetle *Phoiophilus edwardsii* Nationally Scarce	2018, A.P. Foster • Berkhamsted Common, SP98021187, beating oak • Monument Drive (west), SP97061307, beating oak	An autumn species, breeding in fungus *Corticium quercina* which grows on the bark of dead boughs and branches of oak. It may also occur on other encrusting fungi on hazel and birch. Very localised in occurrence though widely distributed across England, Wales and Scotland. Adults emerge in Autumn but have been found in most months.
A rove beetle *Phylodrepoidea crenata* Nationally Notable-category B	2018, A.P. Foster • Frithsden Beeches, TL00151030, under beech bark	Adults and larvae under bark feeding on fungal decay, usually associated with broad-leaved trees in England, though also known from relict pine forest in Scotland. Has also been found in association with dung and carcasses. Widely distributed in northern England, Scotland and mid-Wales. This may represent the first record for south-eastern England.
Oak pin-hole borer *Platypus cylindrus* Nationally Notable-category B	2018, A.P. Foster • Prince's Riding (south), SP98281262, veteran oak, vane trap 16	Bores deep into wood, particularly that of oak though other broad-leaved species are attacked. The larvae feed on small fragments of wood on which fungal growth occurs, deep within the tunnels. Development usually takes one year. Adults recorded from May to October and are frequently attracted to freshly fallen or felled timber and bore out fresh galleries prior to egg laying. Until relatively recently (pre-great storm) considered to be a rarity but has undergone a marked increase in abundance and possibly range in the last ten years. Even so, restricted to southern England. Nationally Notable status may no longer be appropriate.
A fungus weevil *Platyrhinus resinosus* Nationally Notable-category B	2018, A.P. Foster • Frithsden Beehes, SP99921076, fallen beech, vane trap 9 • Ivinghoe Common, SP97951396, dead standing beech, vane trap 12	Associated with decaying wood, especially ash but also beech, birch and sycamore. In ancient broad-leaved woodland, also isolated trees and hedgerows. Also found in areas of burnt birch. The larvae have been found in the fungus *Daldinea concentrica* usually on ash in May/June, adults overwinter and have been recorded from December through to July. A widespread but scattered distribution apparently centred on the Midlands.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A longhorn beetle *Poecilum alni* Nationally Notable-category B	2017, A.P. Foster • Ivinghoe Common, SP97801442, beating young dying oak 2018, A.P. Foster • Monument Drive (south), SP979113, beating fallen oak bough	A small longhorn beetle with larvae probably developing in dead wood of small boughs and possibly also in twigs. It has been found on dead hedgerow shrubs and recently fallen boughs of trees. Recorded from alder, aspen, elm, hazel, oak, hawthorn and willows. Adults have been found from April to July. Continental literature states that the life cycle lasts one year. Widespread but very local in England and Wales.
A fungus beetle *Pseudotryphyllus suturalis* Nationally Scarce European Red List – Near Threatened	2018, A.P. Foster • Berkhamsted Common, SP98141180, in dried *Laetiporus* bracket	A small fungus beetle found in decaying heartwood and bracket fungi on veteran trees. Widely scattered records in England and Wales north to Cumbria. Until recently this species had no national status but has recently been included on the European Red List as Near Threatened and added to the Nationally Scarce listing. It breeds in bracket fungi, especially sulphur polypore and dryads saddle. Adults recorded from March to November.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A feather-winged beetle *Ptenidium gressneri* Nationally Notable	2017, A.P. Foster • Thunderdell Wood, SP98881214, in white rot 2018, A.P. Foster • Berkhamsted Common, SP98631157, birch, vane trap 11 • Frithsden Beeches, SP99911076, fallen beech, vane trap 9 • Hudnall Common, TL00941287, fallen ash, vane trap 8 • Ivinghoe Common, SP97951396, dead standing beech vane trap 12 • Monument Drive (south), SP97511282, sallow, vane trap19 • Prince's Riding (south), SP98151159, inside hollow birch, vane trap 1; SP98321245, dead standing birch, vane trap 2; SP98281262, veteran oak, under ground pitfall; SP98631249, dead standing beech, vane trap 18	Only found in ancient deciduous forests, generally in moist crumbly wood mould in hollow trunks & rot holes; also in nests of hornet, bird nests and squirrel dreys in hollow trees; most records from beech. Widespread in England, but very localised, also reported from south-west Scotland.
A rove beetle *Quedius microps* Nationally Scarce-category B	2018, A.P. Foster • Prince's Riding (south), SP98151159, birch, vane trap 1; SP982011253, beech, pitfall 2	Recorded from a wide variety of broad-leaved trees, living in wet, well rotted timber and rot holes. Widely distributed though local in southern England, also reported from Co. Durham.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A rove beetle *Quedius scitus* Nationally Scarce-category B	2018, A.P. Foster • Prince's Riding (south), SP98281262, oak, underground pitfall 1	Associated with ancient broad-leaved woodland and pasture woodland where it lives under bark and in rotten wood, especially red rot. Predatory on other invertebrates. Widespread though local in England and reported from south west Scotland.
A rove beetle *Quedius truncicola* Nationally Scarce-category B	2018, A.P. Foster • Prince's Riding (south), SP98151159, birch, vane trap 1	A large predatory red and black beetle found under bark and in wet rotten timber, or below bird nests in decaying trees broad-leaved trees of various species. Most often found in old woodland and wood-pasture, widespread south of the Scottish border but very local.
A rove beetle *Quedius xanthopus* Nationally Scarce-category B	2018, A.P. Foster • Prince's Riding (south), SP98281262, oak, underground pitfall 1; SP981125, in white rot of beech	Under bark and in fungi; various tree species; widespread. Under bark on deadwood and in fungi; various tree species; usually moist well-rotted timber; widespread in England, Wales & Scotland. Adults recorded in most months.
A root-eating beetle *Rhizophagus fenestralis* Red Data Book - Rare	2018, A.P. Foster • Prince's Riding (south), SP98321245, dead standing birch	Formerly restricted to the Scottish Highlands where it is associated with birch. Though recently reported from several areas in southern England in recent years: Holme Fen, Cambs. (birch woodland), Richmond Park, Surrey (ancient parkland) and here at Ashridge. It is not clear if it has been previously overlooked in the south, or recently colonised.
A root-eating beetle *Rhizophagus nitidulus*	2018, A.P. Foster • Ivinghoe Common, SP98021398, dead standing birch, vane trap 23 • Prince's Riding (south), SP 98771244, dead standing oak, vane trap 17	Adults live under bark of various broad-leaved trees including oak, beech, hornbeam, ash, rowan and birch. Larvae are thought to develop in dead wood, also recorded from sap. Widespread, though very local in Great Britain, with most records from ancient woodland or pasture woodland. Adults recorded from April to October.
A root-feeding beetle *Rhizophagus oblongicollis* Red Data Book - Endangered	2017, A.P. Foster • Aldbury Common, SP97351203, oak, pitfall trap 5	Probably develops underground at the roots of old oaks, though above ground is attracted to sap associated with damaged bark. Widely scattered records from southern England t Yorks, though rarely recorded – probably in part due to its subterranean habitat.
A shining fungus beetle *Scaphisoma boleti* Nationally Scarce-category B	2018, A.P. Foster • Hudnall Common, TL00941287, fallen ash, vane trap 8 • Prince's Riding (south), SP98291245, in fungus on beech	Breeds in fruiting bodies of various wood-decaying bracket fungi, in ancient woodlands and pasture-woodlands. Widespread in Britain but very localised.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
An ant-like stone beetle *Scydmaenus rufus* Red Data Book - Vulnerable	2018, A.P. Foster • Prince's Riding (south), SP 98631249, dead standing beech, vane trap 18	Restricted to south-east England where it occurs in ancient woodland and pasture-woodland. Usually found under the bark of broad-leaved trees, but also cedar and manure heaps. Adults recorded in most months.
A rove beetle *Sepedophius bipunctatus* Nationally Notable-category B	2017, A.P. Foster • Aldbury Common, SP96991198, beech, vane trap 4 2018, A.P. Foster • Frithsden Beeches, SP99921037, beech hulk, vane trap14	A rove beetle occurring in moist rotten wood or under bark, most records are from willow, though it has also been recorded from other tree species. Only known from the southern half of England.
A small beetle *Sphindus dubius* Nationally Scarce-category B	2018, A.P. Foster • Berkhamsted Common, SP98621157, birch, vane trap 11 • Frithsden Beeches, SP99921076, fallen beech, vane trap 9 • Hudnall Common, TL00941287, fallen ash, vane trap 8 • Prince's Riding (north), SP98521258; fallen oak, vane trap24 • Prince's Riding (south), SP98321245, dead birch, vae trap 2; SP98771244, dead oak, vane trap 17;	A small beetle of woodland and pasture woodland feeding on powdery myxomycete fungi (slime moulds) on trees and occasionally found under bark. Adults recorded from May to September. Widespread but local in England and Wales north to Yorkshire, also recorded from north-east Scotland.
A weevil *Stereocorynetes truncorum* Nationally Notable–category A	2018, A.P. Foster • Prince's Riding (south), SP98631249, dead beech, vane trap 18	A weevil living in hard damp timber inside oak, beech and poplar. Apparently confined to ancient wood pastures, primarily in the south and south-east of England, though also recorded from Herefordshire.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A longhorn beetle *Stictoleptura scutellata* Nationally Notable–category A	2017, A.P. Foster • Aldbury Common, SP97011197, beech, observed 2018, A.P. Foster • Monument Drive (south), SP974127, on dead beech; SP97511282, sallow, vane trap 19 • Prince's Riding (south), SP98631249, dead beech, vane trap 18	A moderately sized, black longhorn beetle strongly associated with broad-leaved woodland. Larvae develop in dead wood, particularly beech but also hornbeam, birch and oak. Southern England north to Nottinghamshire. Adults on the wing from March to August, most frequently in July.
A handsome fungus beetle *Symbiotes latus* Nationally Notable–category B	2018, A.P. Foster • Prince's Riding (south), SP98631249, dead standing beech, vane trap 18	Recorded under bark, in rotten wood and fungi on various trees including elm, poplar, ash & beech. Widely distributed though local in occurrence in the southern half of England.
A cylindrical bark beetle *Synchita humeralis* Nationally Scarce	2018, A.P. Foster • Prince's Riding (south), SP98631249, dead standing beech, vane trap 18	Found in broad-leaved and pasture woodland, also records from a wooded fen and a sand dune. Under and in fungus infected bark or wood of various species, also recorded from the fungus *Daldinia concentrica* growing on birch and occasionally beech and in fallen pine cones. Widespread but very local from southern England to north-east Scotland.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A cylindrical bark beetle *Synchita* (*Cicones*) *variegatus* Nationally Scarce	2017, A.P. Foster • Ivinghoe Common, SP97851443, beech hollow, yellow pan trap • Aldbury Common, SP96991198, beech, vane trap 4 • Aldbury Common, SP96871198, fallen oak, vane trap5 • Aldbury Common, East, SP97261260, beech, on bark 2018, A.P. Foster • Frithsden Beeches, SP99921076, fallen beech, vane trap 9 • Ivinghoe Common, SP97951396, ded standing beech, vane trap 12 • Prince's Riding (north), SP98501260, hollow fallen beech, vane trap 15	Small beetle associated with decayed bark or wood, often infected with the fungus *Ustulina vulgaris*. Usually found on beech, hornbeam or sycamore. Restricted to southern England.
A bark beetles *Taphrorychus bicolor* Nationally Notable–category B	2017, A.P. Foster • Aldbury Common, SP97591198, beech, under bark 2018, A.P. Foster • Prince's Riding (south), SP98631249, dead beech, vane trap 18; SP98311244, fallen beech, vane trap 21	Bores in the bark of dead beech, and occasionally other trees. Restricted to southern and south-eastern England and only recently recorded from a few counties. Adults from April to October.
A polypore fungus beetle *Tetratoma desmarestii* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96871198, fallen oak, beating branches	Most often found in fungi or under bark of oak. Occurs in England as far north as Northumberland. Adults recorded from September to January.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A checkered beetle *Tillus elongatus* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP97591198, dead standing beech, bottle trap 1 • Aldbury Common, SP96851209, beech, vane trap 7 • Sallow Copse, SP98281383, dead standing beech, observed 2018, A.P. Foster • Frithsden Beeches, SP99931037, beech, vane trap 14 • Ivinghoe Common, SP97941391, dead standing beech, vane trap12 & SP98021398, dead standing birch, vane trap 23	A red and black beetle predatory on wood-boring Anobiid beetles, particularly *Ptilinus pectinicornis.* Widespread but scattered records in England and Wales, especially in the south where it is most often recorded from old woodland sites. Adults from April to September.
A tumbling flower beetle *Tomoxia bucephala* Nationally Scarce	2017, A.P. Foster • Aldbury Common, SP96851209, beech, vane trap 7 2018, A.P. Foster • Frithsden Beeches, SP99921076, fallen beech, vane trap 9 • Prince's Riding (south), SP98631249 dead standing beech, vane trap 18	Restricted to ancient broad-leaved woodland and pasture woodland where the larvae develop in rotten wood, particularly the stumps and trunks of beech. Most records are from the south and east of Severn to Wash line, though it has been noted as far north as Durham. Adults recorded from June to August.
A fungus beetle *Triphyllus bicolor* Nationally Scarce	2018, A.P. Foster • Prince's Riding (south), SP98771244, dead standing oak, vane trap 17	A fungus beetle usually found on fresh fruiting bodies of beef steak fungus, sulphur polypore on oak, also reported from other fungi on beech. Largely restricted to ancient woodlands and wood pastures in the south of England.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A flat timber beetle *Uleiota planata* Nationally Notable–category A (now unlikely to qualify for this status in view of recent increase in distribution/occurrence)	2017, A.P. Foster • Aldbury Common SP96901187, fallen beech, under bark	A species most frequently recorded from ancient broad-leaved woodland in the south of England, though its range extends Lancs and south Wales. Lives under the bark of various broad-leaved trees where adults and larvae are believed to feed on fungal hyphae. Formerly given Red Data Book status, then Nationally Notable, and now unlikely to qualify in view of further spread.
Flies **Diptera**		
A hoverfly *Brachyopa pilosa* Nationally Scare	2017, A.P. Foster • Ivinghoe Common, SP97781449, cut birch stump with sap 2018, A.P. Foster • Aldbury Common/Rail Copse, SP967116 • Prince's Riding (south), SP98051255 & SP980127, on beeches	Occurs in ancient broad-leaved woodland and there seems to be a particular association with beech. Most records are from southern England, particularly the New Forest and Windsor Forest, though it has also been reported from Northants and Scotland. Larvae develop under the bark of dying or recently dead large beech trees.
A fungus gnat *Brevicornu serenum* Nationally Scarce	2018, A.P. Foster (det. P.J. Chandler) • Frithsden Beeches, SP99951066, cherry, vane trap 10 • Monument Drive (south), SP97551275, oak, vane trap 20	Records widely scattered throughout Britain. Old broad-leaved woodland in England and Wales; the Scottish sites include *Betula a*nd mixed *Betula* and *Pinus* woodland. Biology unknown; the larvae probably develop in soft terrestrial fungi. Adults recorded from May to July and in September. First recorded in Britain in 1974 and occurrence possibly under-recorded, as reflected by the wide distribution.
Tree snipe fly *Chrysopilus laetus* Nationally Scarce	2018, A.P. Foster • Prince's Riding (north), SP98501260, hollow fallen beech, vane trap 15	Until recently only recorded from Windsor Forest. Recent records from Kent, Bucks and Cambs. suggest a more widespread distribution, at least in south-east England. Larvae have been reared most often from wet, porridge-like wood mould in beech stumps. Other dead wood situations and tree species are known. Field records of adults from July, reared adults appear from April to June.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
Wasp-banded Comb-horn cranefly *Ctenophora flaveolata* Red Data Book - Vulnerable	2018, A.P. Foster • Ivinghoe Common, SP97901393, male at hawthorn	A spectacular black and yellow striped species. The larval habits are not known but it is assumed to develop in decaying wood; associated with old beeches in south and east England but also in oak woods in south-west. A relict old forest species best known from Windsor Forest, New Forest, Savernake Forest, Chilterns and Cotswolds.
Smudge-winged comb-horn cranefly *Ctenophora ornata* Red Data Book - Endangered	2017, A. P. Foster • Aldbury Common, Base Camp, SP974118, male at m.v. light	A large yellow and reddish brown cranefly, reminiscent of a hornet. Larvae develop in wood mould and have been reared from wet porridge-like wet wood mould from beech. Adults are sometimes recorded at m.v. light (as here at Ashridge. Largely restricted to the New Forest, Windsor, Forest, Ashridge area, also known from N. Wales.
Orange-sided Comb-horn cranefly *Ctenophora pectinicornis* Nationally Notable	2018, E. Smith • Monument Drive (west end), SP97061303 2018, A.P. Foster • Berkhamsted Common, SP982117 & SP984177, sweeping rides • Frithsden Beeches, SP99861060 & SP99671035, on fallen beeches • Monument Drive (north), SP97401300, on fallen beech • Monument Drive, (south), SP976128 • Ivinghoe Common, SP979139	A large black and yellow cranefly which has larvae inhabiting decaying timber, especially beech. A very localised species with most records from southern England, though its range extends northwards to Scotland. Adults recorded from April to July.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A fungus gnat *Ditomyia fasciata* Nationally Scarce	2018, A.P. Foster (det. P.J. Chandler) • Prince's Riding (south), SP98211248, beech, in white rot	Restricted to south & south-east England where it occurs in old broad-leaved woodlands, mainly Beech woods with a requirement for old trees or dead wood bearing bracket fungi. The larvae develop in many species of tough, mainly polypore and chiefly lignicolous fungi, including *Inonotus radiatus, Trametes versicolor, Daedalea, Meripilus, Bjerkandera, Polyporus, Leptoporus, Stereum* and *Hydnellum*. Adults recorded from April to October. A rather restricted species, but locally frequent in the Chilterns, Cambridgeshire and Norfolk. It is particularly distinct (having banded wings) and unlikely to be as under-recorded as many other fungus gnats.
A fungus gnat *Grzegorzekia collaris* Nationally Scarce	2018, A.P. Foster (det. P.J. Chandler) • Monument Drive (south), SP97511281, sallow, vane trap 19	A very local species though records widely dispersed throughout Britain. Occupies damp broad-leaved woodland with a good supply of rotten wood. The larvae have been found on damp rotten wood either on the surface or suspended in a web onto which they rapidly retreat when disturbed. Webs may be close together and pupation takes place on the wood, without a cocoon. Adults recorded from May to September. Status
A fungus gnat *Mycomya parva* Nationally Scarce	2018, A.P. Foster (det. P.J. Chandler) • Berkhamsted Common, SP97981180, birch, vane trap 6	Most records are from the south but there are records from northern England, Wales and Scotland. Mainly dry broad-leaved woodland and older mature hedges. Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded from June to October.
A picture-wing fly *Paraclusia tigrina* Red Data Book - Vulnerable	2018, A.P. Foster • Bunkhouse/Base Camp, Aldbury Common, SP97441184	A rare fly associated with old trees in parkland/hedgerow situations, rarely in larger woods and is one of the few scarce dead-wood Diptera known to prefer parkland or otherwise isolated large trees. Believed to be univoltine with the adults flying mainly in August. Larvae develop in decaying wood of broad-leaved trees; females oviposit in cracks and crevices at broken branch ends, on smooth bark and among encrusting fungi. The larvae occur just below the surface in soft, decayed sapwood. Highly scattered across southern Britain but always in ancient woodlands and wood pastures. The adults are usually found on the surface of dead wood on live tree trunks, mainly beech but also elm.

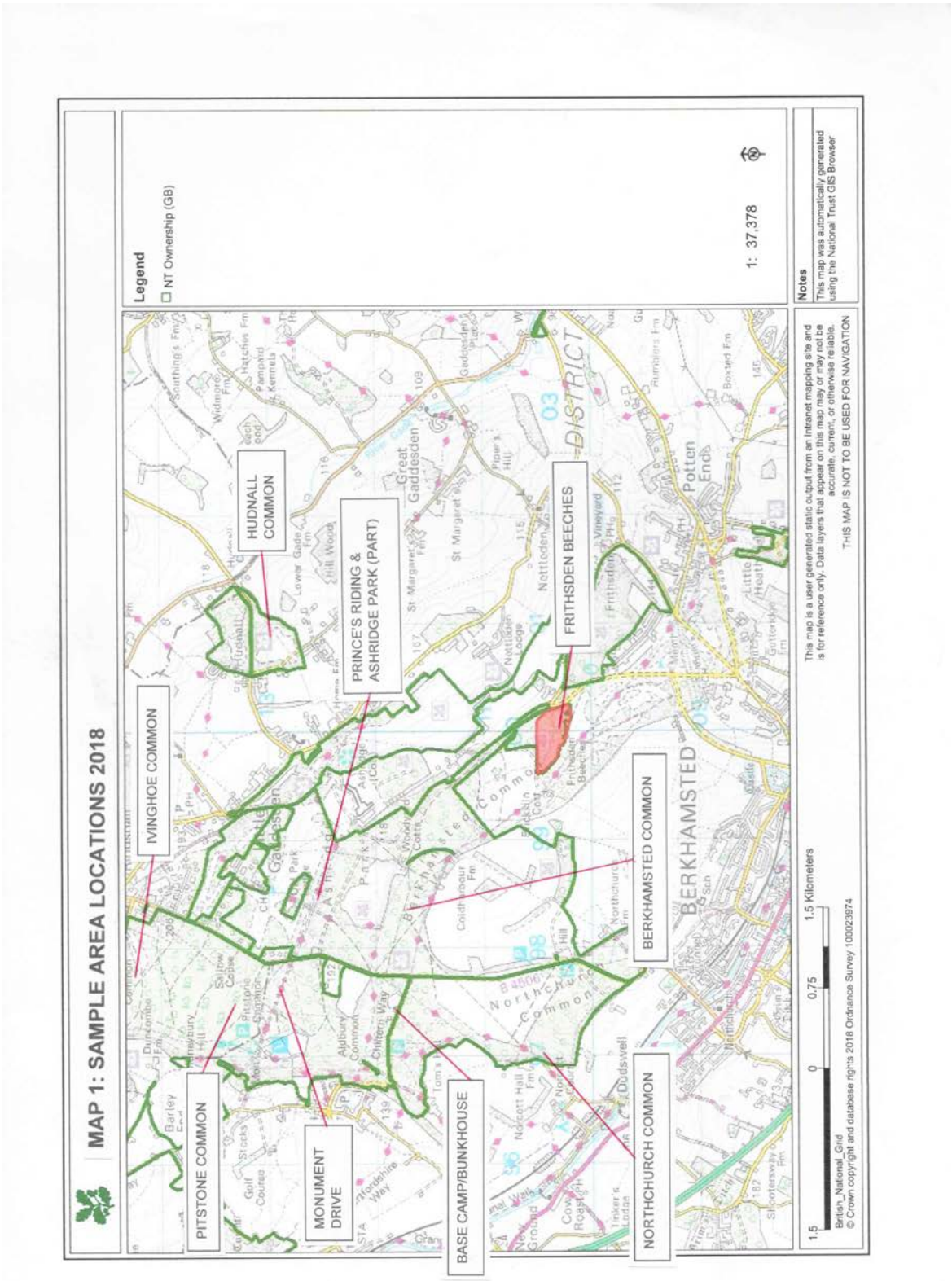
Species & National Status*	**Date, Source & Location**	**Ecological Notes**
A snail-killing fly *Pherbellia annulipes* Nationally Notable-category B	2018, A.P. Foster • Prince's Riding (south), SP98151159, birch, vane trap 1	A small fly which has larvae developing as parasitoids in snails, with one recorded host being the common *Discus rotundatus* that lives in decaying wood and leaf litter. Associated with old shaded woodlands on calcareous soils and is restricted to southern England and Wales.
A hoverfly *Pocota personata* Nationally Scarce	2017, A.P. Foster • Ivinghoe Common, SP97851443, beech, visiting rot hole 2018, A.P. Foster • Prince's Riding (north), SP98501260, investingating dead veteran beech • Prince's Riding (south), SP98211248, investigating recently fallen beech	A bumblebee mimic with larvae that develop in rot-holes in veteran trees, especially beech. An old forest species with records mainly from the south-east. Also recorded from ancient woodland sites as far north as Yorkshire. Adults recorded from April to June.
Forest window fly *Scenopinus niger* Nationally Scarce	2017, A.P. Foster • Ivinghoe Common, SP97851443, beech, yellow pan trap • Aldbury Common, SP96991218, dead standing beech	Larvae predatory on dermestid & probably other beetle larvae in dry rotting heartwood of various broadleaves in ancient pasture-woodlands. Very few modern records, though they are widely distributed in England, with a few from Wales and one in Ireland. Adults normally found inside or close to large hollow trees.
Ants **Hymenoptera**		
Big-headed mining bee *Andrena bucephala* Nationally Notable-category B	2018, A.P. Foster • Princes Riding, SP980126, 2 females	Closely associated with spring flowering shrubs and trees which provide pollen and nectar; also requires warm sunny situations with light soils for nesting. Nest entrances are often under the sunny side of bushes. Widespread but very local.

Species & National Status*	**Date, Source & Location**	**Ecological Notes**
Brown tree ant *Lasius brunneus* Nationally Notable-category A	2017, A.P. Foster • Aldbury Common, several trees, including oak, beech and sallow • Sallow Copse, SP97801326, sweet chestnut, vane trap 2b 2018, A. P. Foster • Widely in all areas sampled: Berkhamsted, Hudnall and Ivinghoe Commons, Fithsden Beeches, Monumet Drive north & south, and Prince's Riding north & south.	Nests within decaying heartwood of broad-leaved trees, usually open-grown individuals with well-lit trunks. Forage over canopy. Restricted distribution based on Severn Basin and Thames Basin extending south westwards. Appears to be expanding in range and more frequently recorded than in the past – may no longer qualify for Nationally Notable status.
Lathbury's Nomad Bee *Nomada lathburiana* Nationally Notable-category B	2018, A.P. Foster • Frithsden Beches, SP99871060	A cleptoparasite of the locally distributed grey banded mining bee *Andrena cineraria*. Until recently the nomad bee was rare and may have declined, especially in the south-west. However, in recent years it appears to have increased in abundance, though still very localised. The host nest in open warm sunny situations in various habitats such as hedge banks, grasslands and landslips.
A digger wasp *Pemphredon morio* Nationally Notable-category B	2017, A.P. Foster • Aldbury Common, dead standing beech hulk in open glade SP97591198, bottle trap	A small solitary wasp nesting in dead wood (often old beetle borings) including fence posts and stumps. Nests are stocked with aphids. Recorded mostly south of a line from Thames to Solent but also as far north as Yorkshire. This species has been lumped together with *P. clypealis*. Adults on the wing from May to August.
A digger wasp *Stigmus pendulus* Red Data Book – Insufficiently known	2017, A.P. Foster • Aldbury Common, dead standing beech hulk in open glade SP97591198, bottle trap	Only discovered in 1986 and has been recorded from Essex and Kent. Nests in abandoned tunnels of wood-boring beetles in timber exposed to full sunlight, stocks nests with aphids.
Butterflies & moths Lepidoptera		
Great oak beauty moth *Hypomecis roboraria* Nationally Notable-category B	2018, A.P. Foster • Bunkhouse/Base Camp, Aldbury Common, m.v.light, several	One of the larger Geometrid moths. Local in southern England with strongholds in Hants, Sussex, Surrey & Berks and scattered colonies elsewhere. Outlying populations in Sherwood Forest, Wye Valley & Wales. Larvae feed on oak foliage and overwinter. Adults on the wing in June and July.

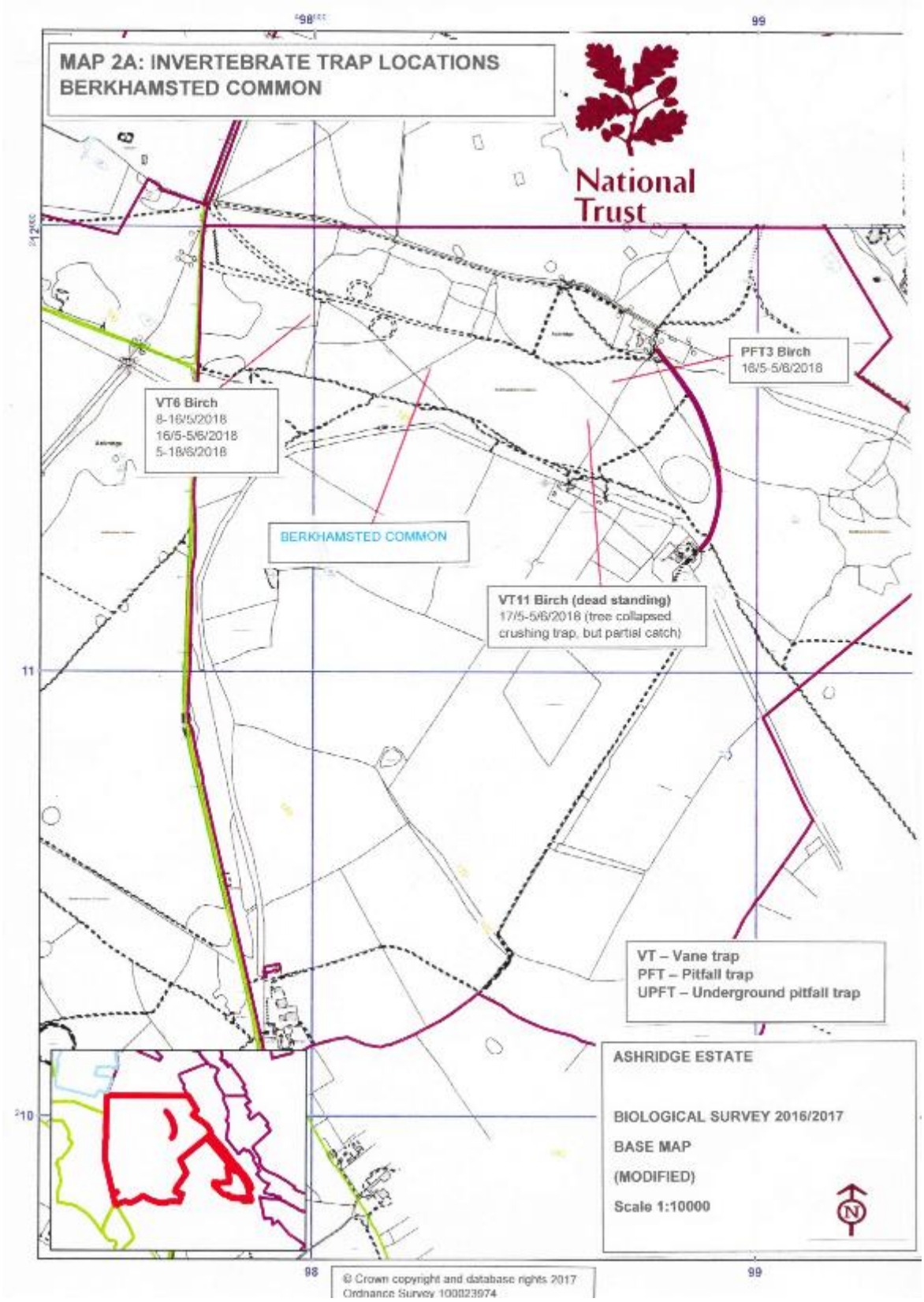
Species & National Status*	**Date, Source & Location**	**Ecological Notes**
Red-tipped clearwing moth *Synanthedon formicaeformis* Nationally Notable - Nb	A.P. Foster • 12/7/2018, Monument Drive (south), SP9754612745, pheromone lure on oak bough • 12/7/2018, Monument Drive (south), SP9751112817, pheromone lure on sallow	A red and black day flying moth which is an ichneumon wasp mimic with distinctive red tips to the forewings. The larvae bore in the stems and trunks of osier and other species of willow and sallow. Locally distributed in southern England, though less frequent in Wales and northern England. The moths are recorded from late May to August.
Slugs & snails Mollusca		
Lemon slug Malacolimax tenellus Nationally Notable	2018, A.P. Foster • Frithsden Beeches, SP99791034, one on fallen beech limb following overnight rain	A rare species of ancient wood pastures, feeding on fruiting fungi, especially those on decaying wood. Widespread in Britain but very localised.

Further information on the above species is also provided in Alexander (2002)

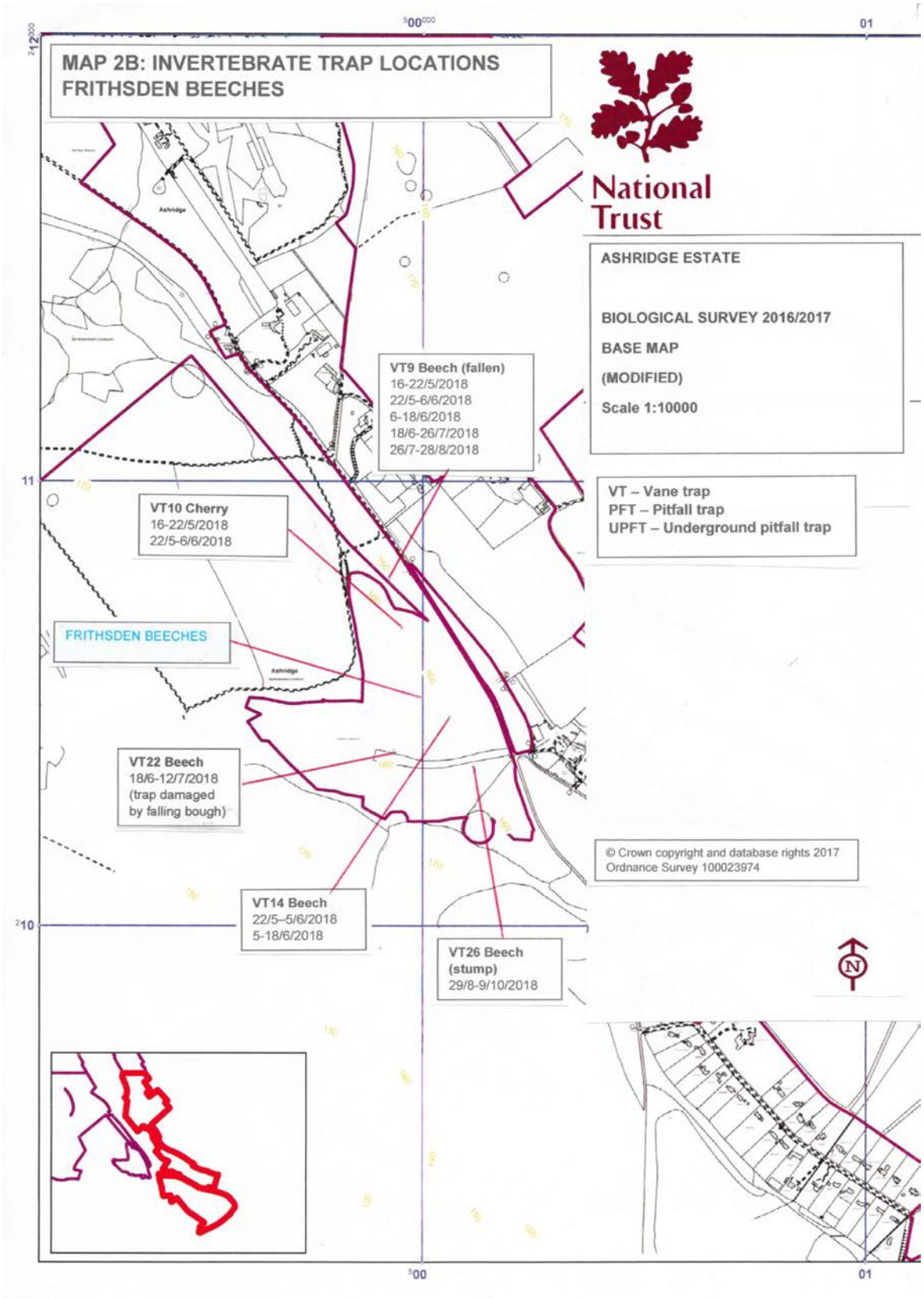
MAP 1: SAMPLE AREA LOCATIONS



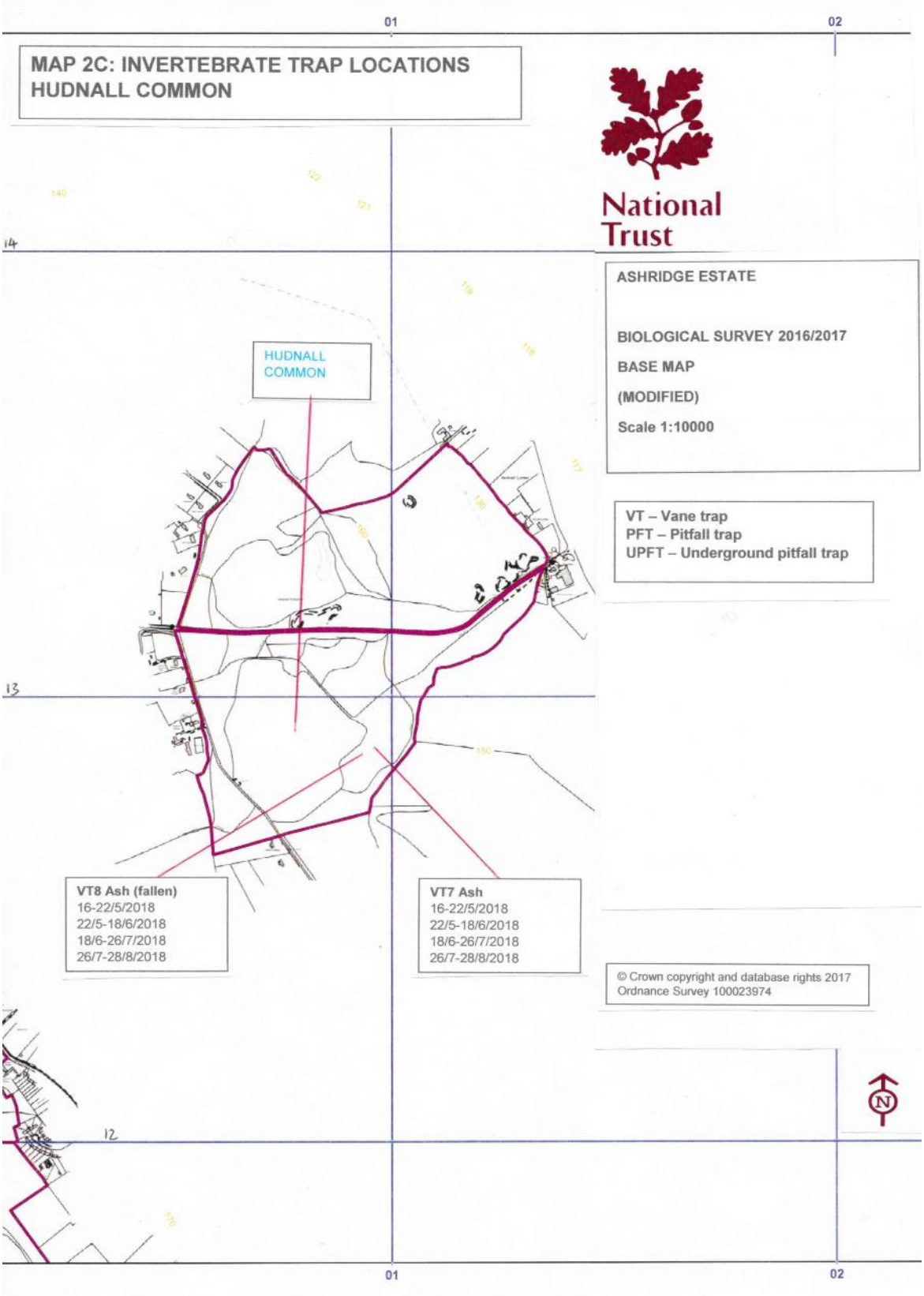
MAP 2A: INVERTEBRATE TRAP LOCATIONS - BERKHAMSTED COMMON



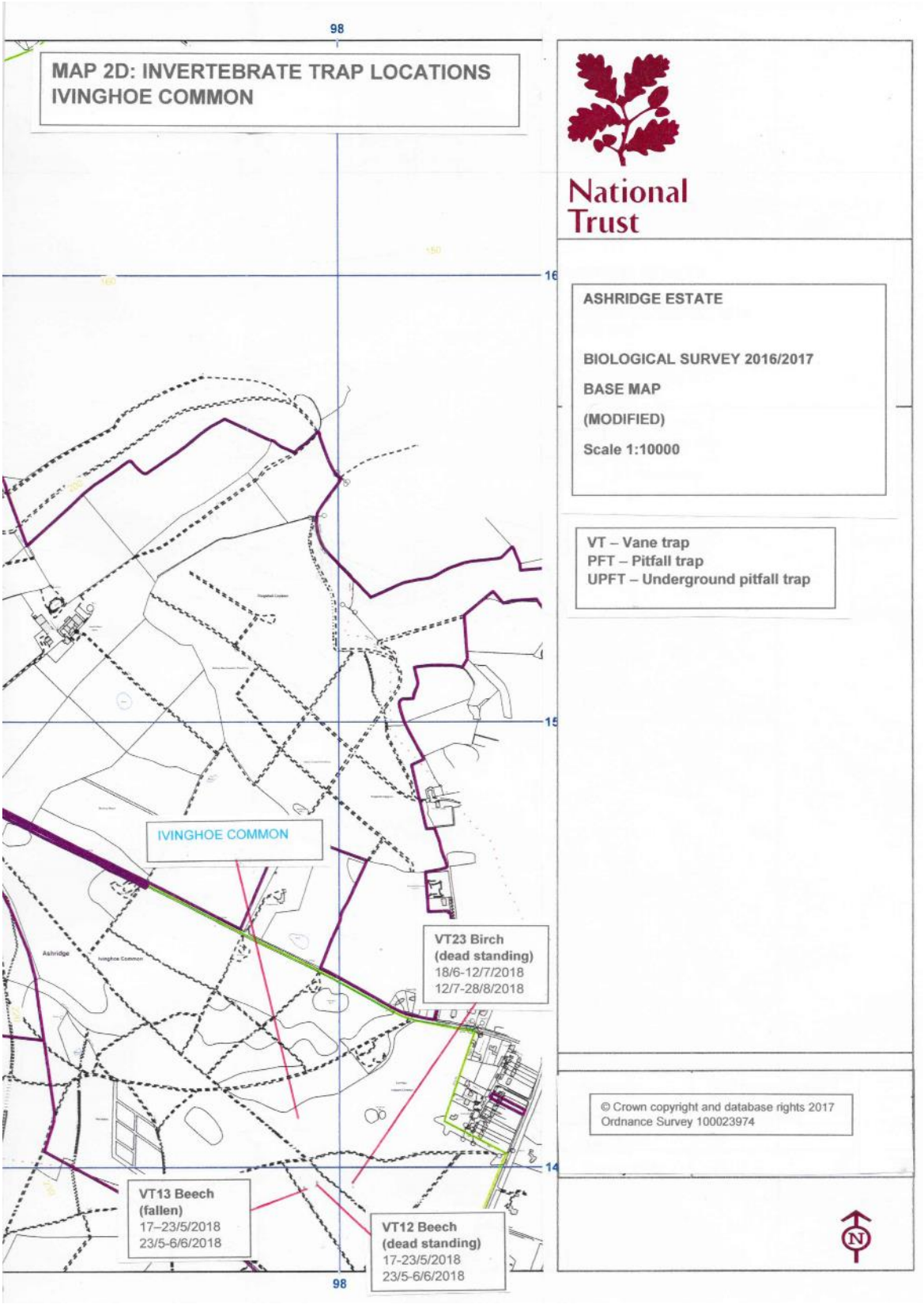
MAP 2B: INVERTEBRATE TRAP LOCATIONS - FRITHSDEN BEECHES



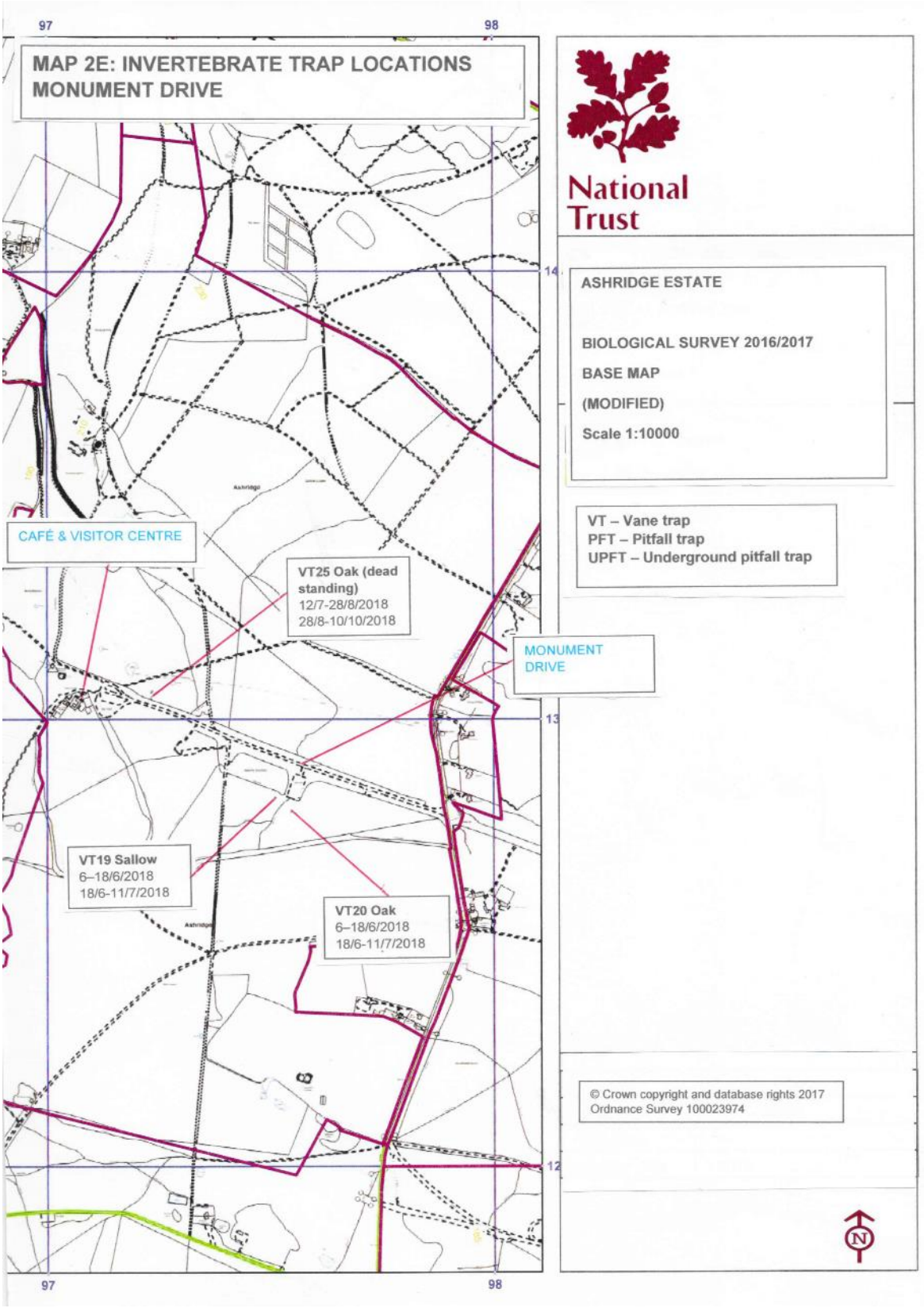
MAP 2C: INVERTEBRATE TRAP LOCATIONS – HUDNALL COMMON



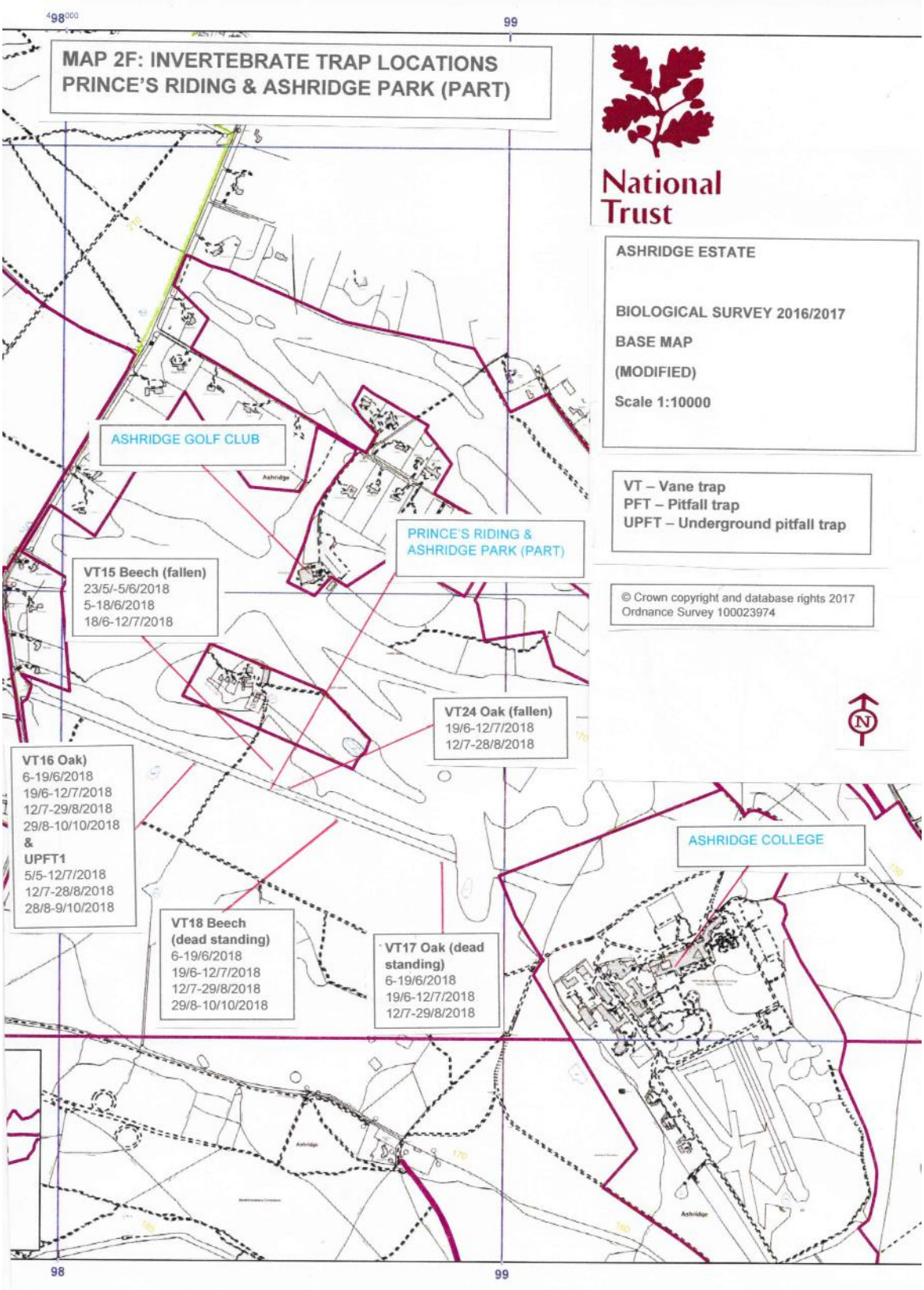
MAP 2D: INVERTEBRATE TRAP LOCATIONS – IVINGHOE COMMON



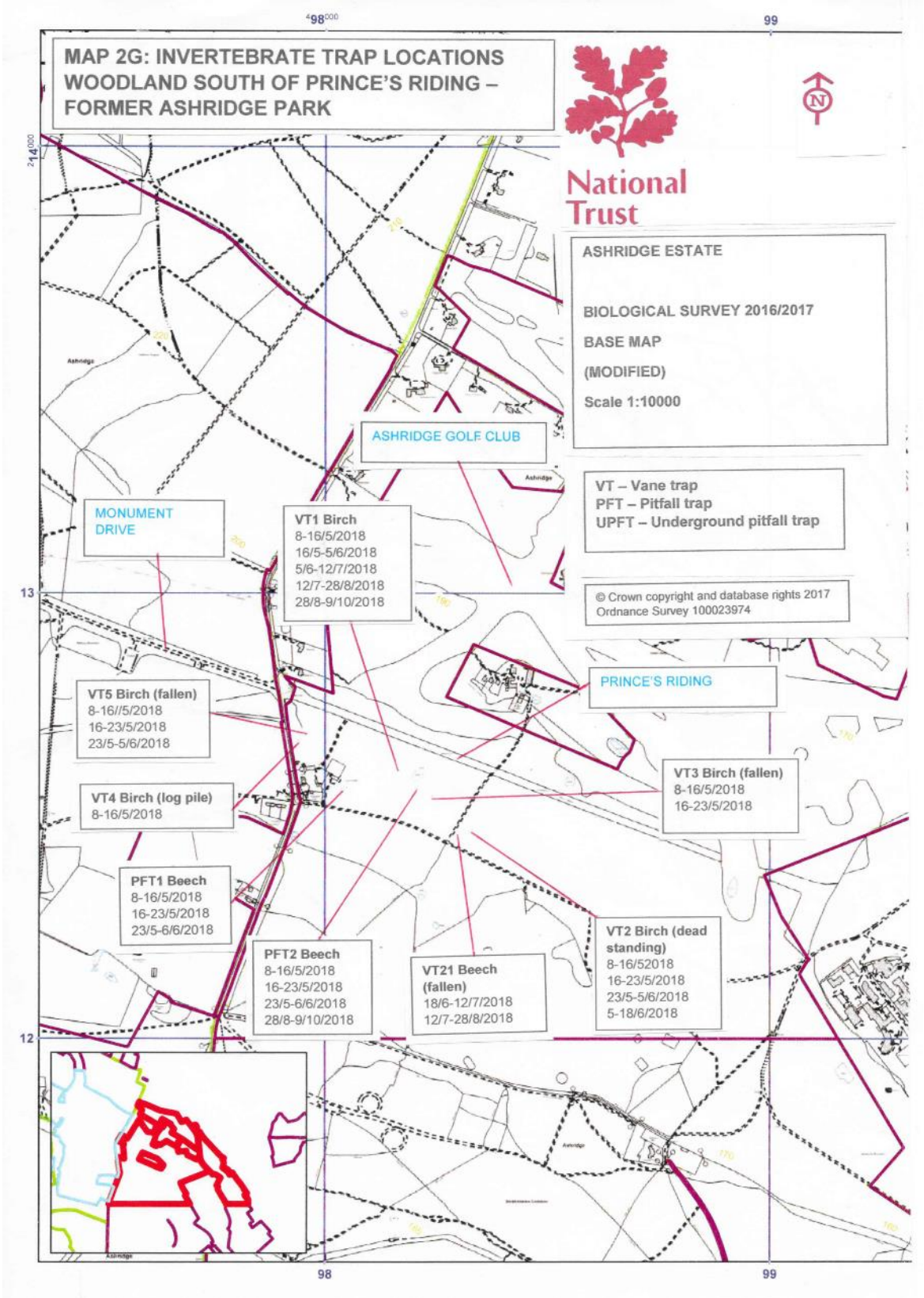
MAP 2E: INVERTEBRATE TRAP LOCATIONS – MONUMENT DRIVE



MAP 2F: INVERTEBRATE TRAP LOCATIONS – PRINCE'S RIDING & ASHRIDGE PARK (PART)

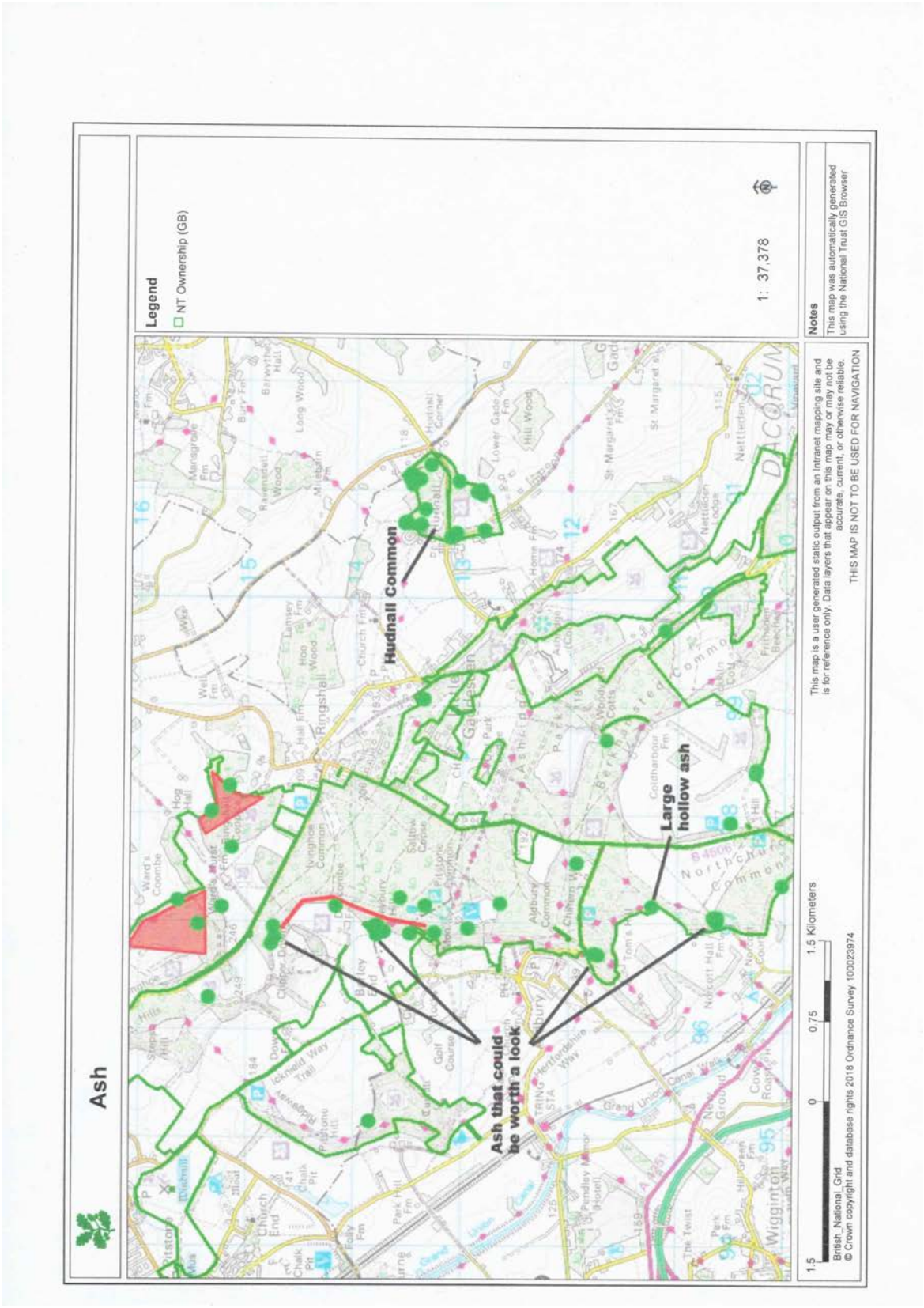


MAP 2G – INVERTEBRATE TRAP LOCATIONS – WOODLAND SOUTH OF PRINCE'S RIDING FORMER ASHRIDGE PARK



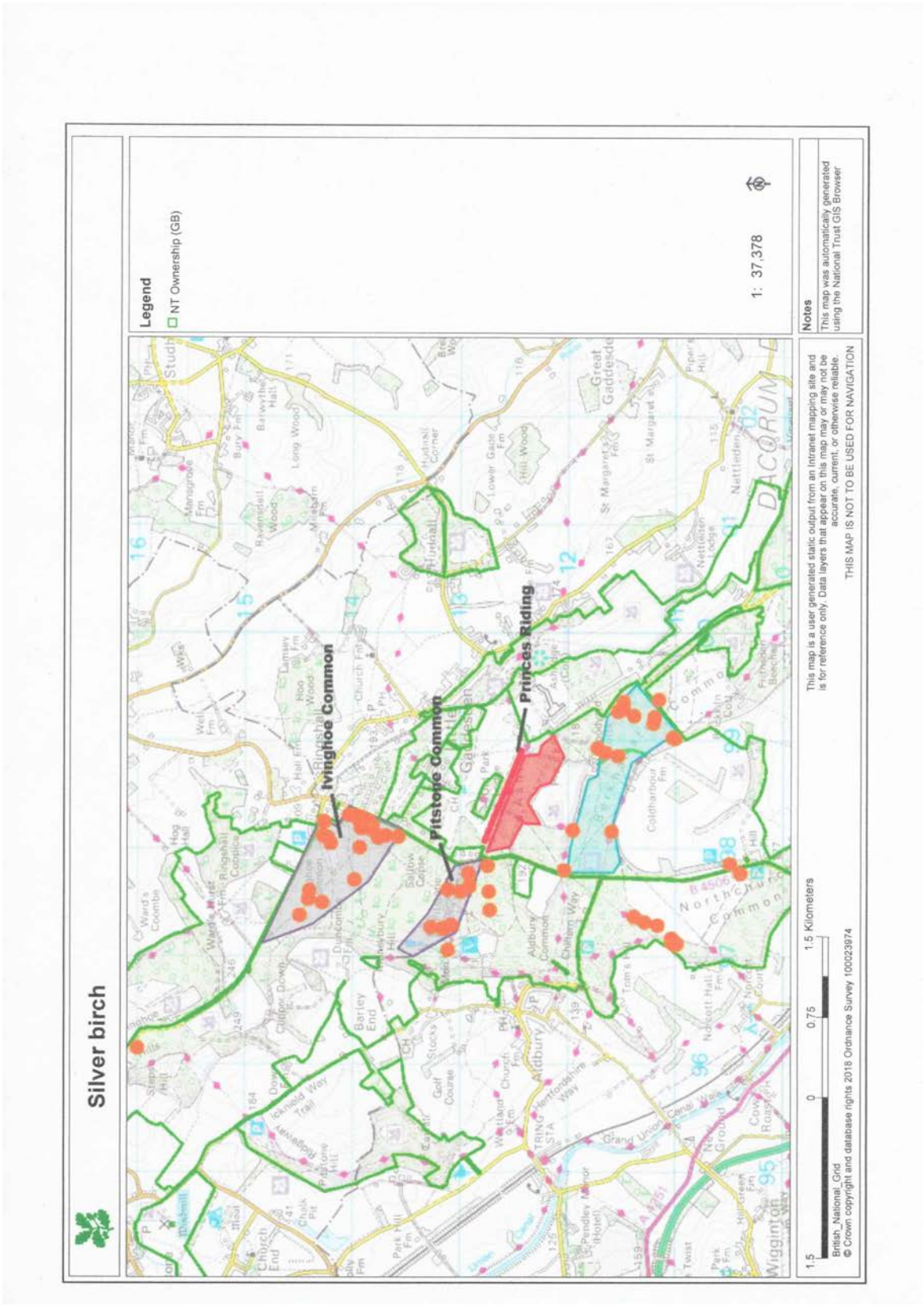
MAP 3A – ANCIENT ASH TREES

Supplied by Emily Smith (NT) – suggested examples for sampling



MAP 3B – ANCIENT BIRCH TREES

Supplied by Emily Smith (NT) – suggested examples and areas to sample



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APPENDIX 1: ADDITIONS TO THE ASHRIDGE SAPROXYLIC COLEOPTERA LIST RESULTING FROM 2018 SURVEY

Additions to Ashridge saproxylic Coleoptera resulting from 2017 survey are provided on Foster (2017)

Arranged alphabetically

Scientific Name	Vernacular Name	Conservation Status
Abdera quadrifasciata	A false darkling beetle	Nationally Scarce
Agrilus laticornis	A jewel beetle	
Anaglyptus mysticus	A longhorn beetle	Nationally Notable B
Anomognathus cuspidatus	A rove beetle	
Bibloporus minutus	An ant-like stone beetle	Nationally Notable B
Conopalpus testaceus	A false darkling beetle	
Corticaria alleni	A minute brown scavenger beetle	Nationally Notable B
**Cryptophagus falcozi*	A silken fungus beetle	Red Data Book - Indeterminate
Cryptophagus micaceus	A silken fungus beetle	
Cryptophagus ruficornis	A silken fungus beetle	Nationally Notable
Diaperis boleti	A darkling beetle	Nationally Scarce
Dorcatoma chrysomelina	A wood-borer beetle	
Dorcatoma flavicornis	A wood-borer beetle	Nationally Scarce
Enicmus fungicola	A minute brown scavenger beetle	Nationally Notable B
Euplectus infirmus	A short-winged mould beetle	
Euplectus kirbii	A short-winged mould beetle	Nationally Notable
Gyrophaena bihamata	A rove beetle	
Ischnomera sanguinicollis	A false blister beetle	Nationally Scarce
Lymexylon navale	A ship-timber beetle	Nationally Scarce
Malthinus seriepunctatus	A soldier beetle	
Megatoma undata	A hide beetle	Nationally Scarce
Microscydmus minimus	An ant-like stone beetle	Red Data Book - Rare
Mordellochroa abdominalis	A tumbling-flower beetle	
Neuraphes plicicollis	An ant-like stone beetle	Nationally Notable
Phyllodrepoidea crenata	A rove beetle	Nationally Notable B
Oxylaemus variolosus	A cylindrical timber beetle	Red Data Book - Rare
Quedius microps	A rove beetle	Nationally Notable B
Quedius scitus	A rove beetle	Nationally Notable B
Quedius truncicola	A rove beetle	Nationally Notable B
Quedius xanthopus	A rove beetle	Nationally Notable B
Rhagium bifasciatum	A longhorn beetle	
Rhizophagus fenestralis	A root-eating beetle	Red Data Book - Rare
Rhizophagus ferrugineus	A root-eating beetle	
Scolytus rugulosus	A bark beetle	

Scydmaenus rufus	An ant-like stone beetle	Red Data Book - Vulnerable
Symbiotes latus	A beetle	Nationally Notable B
Stereocorynetes truncorum	A weevil	Nationally Notable A
Synchita humeralis	A cylindrical timber beetle	Nationally Scarce
Thamiaraea cinnomomea	A rove beetle	
Xyleborinus saxasenii	A bark beetle	

*Also present in 2017 samples, but identity not confirmed until 2018

Arranged by status

Scientific Name	Vernacular Name	Conservation Status
Scydmaenus rufus	An ant-like stone beetle	Red Data Book - Vulnerable
Microscydmus minimus	An ant-like stone beetle	Red Data Book - Rare
Oxylaemus variolosus	A cylindrical timber beetle	Red Data Book - Rare
**Cryptophagus falcozi*	A silken fungus beetle	Red Data Book - Indeterminate
Abdera quadrifasciata	A false darkling beetle	Nationally Scarce
Diaperis boleti	A darkling beetle	Nationally Scarce
Dorcatoma flavicornis	A wood-borer beetle	Nationally Scarce
Ischnomera sanguinicollis	A false blister beetle	Nationally Scarce
Lymexylon navale	A ship-timber beetle	Nationally Scarce
Megatoma undata	A hide beetle	Nationally Scarce
Synchita humeralis	A cylindrical timber beetle	Nationally Scarce
Stereocorynetes truncorum	A weevil	Nationally Notable A
Anaglyptus mysticus	A longhorn beetle	Nationally Notable B
Bibloporus minutus	An ant-like stone beetle	Nationally Notable B
Corticaria alleni	A minute brown scavenger beetle	Nationally Notable B
Enicmus fungicola	A minute brown scavenger beetle	Nationally Notable B
Phyllodrepoidea crenata	A rove beetle	Nationally Notable B
Quedius microps	A rove beetle	Nationally Notable B
Quedius scitus	A rove beetle	Nationally Notable B
Quedius truncicola	A rove beetle	Nationally Notable B
Quedius xanthopus	A rove beetle	Nationally Notable B
Symbiotes latus	A beetle	Nationally Notable B
Cryptophagus ruficornis	A silken fungus beetle	Nationally Notable
Euplectus kirbii	A short-winged mould beetle	Nationally Notable
Neuraphes plicicollis	An ant-like stone beetle	Nationally Notable
Agrilus laticornis	A jewel beetle	
Anomognathus cuspidatus	A rove beetle	
Conopalpus testaceus	A false darkling beetle	
Cryptophagus micaceus	A silken fungus beetle	
Dorcatoma chrysomelina	A wood-borer beetle	
Euplectus infirmus	A short-winged mould beetle	
Gyrophaena bihamata	A rove beetle	
Malthinus seriepunctatus	A soldier beetle	
Mordellochroa abdominalis	A tumbling-flower beetle	

Rhagium bifasciatum	A longhorn beetle	
Rhizophagus ferrugineus	A root-eating beetle	
Scolytus rugulosus	A bark beetle	
Thamiaraea cinnomomea	A rove beetle	
Xyleborinus saxasenii	A bark beetle	

*Also present in 2017 samples, but identity not confirmed until 2018

APPENDIX 2: ADDITIONS TO THE HERTFORDSHIRE COLEOPTERA LIST RESULTING FROM 2017 & 2018 SURVEYS

The following 21 species are not included in James (2018) and appear to be additions to the county list of Coleoptera. It includes non-saproxylic species which do not feature in Appendix 1.

Arranged alphabetically

Scientific Name	Year	Vernacular Name	Conservation Status
Aeletes atomarius	2017 & 2018	A clown beetle	Nationally Scarce
Atomaria morio	2017	A silken fungus beetle	Red Data Book – insufficiently known
Atomaria nigrirostris	2018	A silken fungus beetle	
Bibloporus minutus	2018	A short-winged mould beetle	Nationally Notable B
Clambus gibbulus	2018	A fringe-winged beetle	
Clambus nigrellus	2017	A fringe-winged beetle	
**Corticaria alleni*	2018	A minute brown scavenger beetle	Nationally Notable B
Cryptophagus falcozi	2017 & 2018	A silken fungus beetle	Red Data Book - Indeterminate
Dorcatoma dresdensis	2018	A wood-borer beetle	Nationally Scarce
Enicmus fungicola	2018	A minute brown scavenger beetle	Nationally Notable B
Eucnemis capucina	2017 & 2018	A false-click beetle	Red Data Book - Endangered
Euplectus infirmus	2018	A short-winged mould beetle	
Euplectus kirbii	2018	A short-winged mould beetle	Nationally Notable
Hylis olexai	2017 & 2018	A false-click beetle	Red Data Book - Rare
Microscydmus minimus	2018	An ant-like stone beetle	Red Data Book - Rare
Mycetoporus longulus	2018	A rove beetle	
***Neuraphes plicicollis*	2018	An ant-like stone beetle	Nationally Notable
Orthoperus aequalis	2018	A minute fungus beetle	
Oxylaemus variolosus	2018	A cylindrical timber beetle	Red Data Book - Rare
Phyllodrepoidea crenata	2018	A rove beetle	Nationally Notable B
Rhizophagus fenestralis	2018	A root-eating beetle	Red Data Book - Rare

*also reported elsewhere T. James (pers. comm.)
** recorded from Hudanll Common – in modern administrative boundary of Herts, but Vice County of Bucks

APPENDIX 3: COLEOPTERA QUALIFYING FOR SQS OR IEC SCORES FOR WHOLE OF ASHRIDGE ESTATE

The species National Conservation Status quoted in column 2 below follow those in Hyman (1992 & 1994) and have been used to inform the SQS Rarity Scores – the latter of which have not yet been updated with the more recent status changes in column3. IEC scores are unaffected by these changes.

*Recently updated status changes - note this only applies to some families. Where species have been removed from RDB or Na/Nb they have been assigned to Local for the purposes of this table.
**Rarity Score based on original status categories - likely to be amended to reflect Reviewed Status in future.
***Includes records recently provided by Trevor James (Herts County Coleoptera Recorder)

List of saproxylic Coleoptera from trees at Ashridge qualifying for SQS or IEC

SPECIES	National Status	Reviewed National Status changes*	SQS Rarity score**	IEC Score (2004)	2017 Survey	2018 Survey	Previous data***
HISTERIDAE							
Reviewed by Lane (2017)							
Abraeus perpusillus	Local		4		✔	✔	✔
Plegaderus dissectus	Nb	Local	8	2	✔	✔	✔
Aeletes atomarius	RDB3	NS	16	3	✔	✔	
Paromalus flavicornis	Local		2		✔	✔	✔
PTILIIDAE							
Ptenidium gressneri	Nb		8	2	✔	✔	
Ptenidium turgidum	RDBK		16	2			✔
Pteryx suturalis	Local		2			✔	✔
LEIODIDAE							
Anisotoma humeralis	Local		2		✔	✔	✔
Anisotoma orbicularis	Local		2		✔	✔	
Agathidium nigripenne	Local		2			✔	✔
Agathidium seminulum	Local		2		✔	✔	✔
Agathidium varians	Local		2			✔	✔
Nemadus colonoides	Local		2		✔	✔	
STAPHYLINIDAE: Scydmaininae							
Microscydmus minimus	RDB3		24	3		✔	
Neuraphes plicicollis	Nb		8			✔	
Stenichnus bicolor	Local		4			✔	
Scydmaenus rufus	RDB2		24	1		✔	
STAPHYLINIDAE: Omaliinae							
Phyllodrepoidea crenata	Nb		8			✔	✔
Dropephylla ioptera	Common		1		✔	✔	✔
Dropephylla koltzei/ vilis	Common		1				✔
Phloeonomus punctipennis	Local		2		✔	✔	✔
Phloeostilba plana	Local		2				✔
STAPHYLINIDAE: Pselaphinae							
Euplectus infirmus	Local		1			✔	
Euplectus karstenii	Local		2		✔	✔	
Euplectus kirbii	Nb		8			✔	
Euplectus piceus	Common		2		✔	✔	
Bibloplectus bicolor	Local		2			✔	

SPECIES	National Status	Reviewed National Status changes*	SQS Rarity score**	IEC Score (2004)	2017 Survey	2018 Survey	Previous data***
Bibloporus minutus	Nb		8	2		✔	
STAPHYLINIDAE: Tachyporinae							
Sepedophilus bipunctatus	Nb		8		✔	✔	
Sepedophilus littoreus	Local		2		✔		
Sepedophilus lusitanicus	Local		2		✔	✔	
STAPHYLINIDAE: Aleocharinae							
Dinaraea aequata	Common		1				✔
Thamiaraea cinnamomea	Local		2			✔	
Bolitochara lucida	Local		2		✔	✔	✔
Leptusa fumida	Common		1			✔	✔
Leptusa ruficollis	Common		1				✔
Agaricochara latissima	Local		2				✔
Gyrophaena bihamata	Local		2			✔	
Gyrophaena munsteri	RDBK		16				✔
Anomognathus cuspidatus	Common		2			✔	
Haploglossa gentilis	Local		2				✔
Placusa pumilio	Local		2				✔
Placusa tachyporoides	Nb		8				✔
STAPHYLINIDAE: Scaphidiinae							
Scaphidium quadrimaculatum	Local		2			✔	✔
Scaphisoma agaricinum	Local		2			✔	✔
Scaphisoma boleti	Nb		8			✔	✔
STAPHYLINIDAE: Staphylininae							
Atrecus affinis	Common		1		✔	✔	✔
Bisnius subuliformis	Local		2		✔	✔	
Gabrius splendidulus	Common		1		✔	✔	✔
Quedius brevicornis	Nb		8				✔
Quedius maurus	Local		4	1			✔
Quedius microps	Nb		8			✔	
Quedus scitus	Nb		8	2		✔	
Quedius truncicola	Nb		8	1		✔	
Quedius xanthopus	Nb		4	1			
Hypnogyra angularis	Na		16	2		✔	✔
LUCANIDAE							
Sinodendron cylindricum	Common		2		✔	✔	✔
Dorcus parallelipipedus	Local		2		✔	✔	✔
SCIRTIDAE **Reviewed by Foster (2010)**							
Prionocyphon serricornis	Nb	Local	8	1	✔	✔	✔
BUPRESTIDAE **Reviewed by Alexander (2014)**							
Agrilus biguttatus	Na	Local	8		✔		✔
Agrilus laticornis	Nb	Local	8			✔	
Agrilus sinuatus	Na	Local	4			✔	✔
EUCNEMIDAE							
Melasis buprestoides	Nb		4	1	✔	✔	✔
Hylis olexai	RDB3		24		✔	✔	
Epiphanis cornutus	Local		8		✔	✔	
Eucnemis capucina	RDB1		32	3	✔	✔	
THROSCIDAE							
Aulonothroscus brevicollis	RDB3		24	3	✔		

SPECIES	National Status	Reviewed National Status changes*	SQS Rarity score**	IEC Score (2004)	2017 Survey	2018 Survey	Previous data***
ELATERIDAE							
Denticollis linearis	Common		1		✔	✔	✔
Stenagostus rhombeus	Local		4	1	✔	✔	✔
Melanotus castanipes/ villosus	Common		1		✔	✔	✔
LYCIDAE **Reviewed by Alexander (2014)**							
Platycis minutus	Nb	Local	8	1	✔	✔	✔
CANTHARIDAE **Reviewed by Alexander (2014)**							
Malthinus balteatus	Nb	Local	8				✔
Malthinus flaveolus	Common		1				✔
Malthinus sereipunctatus	Local		2			✔	
Malthodes fibulatus	Nb	NS	8				✔
Malthodes marginatus	Common		1		✔	✔	✔
Malthodes minimus	Common		1			✔	✔
DERMESTIDAE **Reviewed by Alexander (2017)**							
Ctesias serra	Nb	Local	4		✔		✔
Megatoma undata	Nb	NS	8			✔	
BOSTRICHIDAE **Reviewed by Alexander (2017)**							
Lyctus linearis	Nb	IUCN-CR & NR	8				✔ historic only
ANOBIIDAE **Reviewed by Alexander (2017)**							
Hedobia imperialis	Nb	Local	8		✔		✔
Grynobius planus	Local		2		✔	✔	✔
Xestobium rufovillosum	Common		4	1			✔
Anobium fulvicorne	Common		1		✔	✔	
Anobium punctatum	Common		1		✔	✔	
Ptilinus pectinicornis	Common		1		✔	✔	✔
Dorcatoma chrysomeina	Local		4	1		✔	
Dorcatoma dresdensis	Na	NS	16	2	✔		
Dorcatoma flavicornis	Nb	NS	8	1		✔	
LYMEXYLIDAE **Reviewed by Alexander (2014)**							
Hylecoetus dermestoides	Nb	Local	4	1	✔	✔	✔
Lymexylon navale	RDB2	NS	32	2		✔	
PHLOIOPHILIDAE **Reviewed by Alexander (2014)**							
Phloiophilus edwardsii	Nb	NS	8	1		✔	✔
CLERIDAE **Reviewed by Alexander (2014)**							
Tillus elongatus	Nb	NS	8	1	✔	✔	✔
Thanasimus formicarius	Local		4	1		✔	✔
DASYTIDAE							
Dasytes aeratus	Local		2		✔	✔	✔
MALACHIIDAE							
Malachius bipustulatus	Common		1		✔	✔	✔
Sphingius lobatus	Nb		8				✔
SPHINDIDAE							
Sphindus dubius	Nb		8			✔	✔
Aspidiphorus orbiculatus	Local		2		✔	✔	✔
NITIDULIDAE							

SPECIES	National Status	Reviewed National Status changes*	SQS Rarity score**	IEC Score (2004)	2017 Survey	2018 Survey	Previous data***
Epuraea biguttata	Local		2				✔
Epuraea pallescens	Local		2				✔
Cryptarcha strigata	Nb		8		✔	✔	
Glischrochilus quadriguttatus	Local		2				✔
MONOTOMIDAE							
Rhizophagus bipustulatus	Common		1		✔	✔	✔
Rhizophagus dispar	Common		1		✔	✔	✔
Rhizophagus ferrugineus	Local		2			✔	
Rhizophagus nitidulus	Nb		4	1		✔	✔
Rhizophagus oblongicollis	RDB1		24	3	✔		
Rhizophagus perforatus	Local		2		✔	✔	
SILVANIDAE							
Uleiota planata	Na		16	2	✔	✔	
Silvanus bidentatus	Nb		8	2			✔
Silvanus unidentatus	Local		4	1	✔		✔
CUCUJIDAE							
Pediacus dermestoides	Local		4	1		✔	✔
LAEMOPHLOEIDAE							
Cryptolestes ferrugineus	Common		2		✔		
CRYPTOPHAGIDAE							
Cryptophagus dentatus	Common		1		✔	✔	
Cryptophagus falcozi	RDBi		24		✔	✔	
Cryptophagus labilis	N		8				✔
Cryptophagus micaceus	RDBk		16	3		✔	
Atomaria vespertina	Local		2				✔
Atomaria morio	RDBK		16		✔		
EROTYLIDAE							
Dacne bipustulata	Local		2			✔	✔
Dacne rufifrons	Local		2		✔		✔
Triplax aenea	Local		2			✔	
BIPHYLLIDAE							
Biphyllus lunatus	Local		4	1			✔
Diplocoelus fagi	Nb		8	1		✔	✔
BOTHRIDERIDAE							
Oxylaemus variolosus	RDB3		24	2		✔	
CERYLONIDAE							
Cerylon fagi	Nb		8	2	✔		✔
Cerylon ferrugineum	Local		2		✔	✔	✔
Cerylon histeroides	Local		4		✔	✔	✔
ENDOMYCHIDAE							
Endomychus coccineus	Local		2		✔		✔
Symbiotes latus	Nb		8	1		✔	
CORYLOPHIDAE							
Orthoperus aequalis	~~RDBK~~		16				✔
LATRIDIIDAE							
Cartodere constricta	Local		4				✔
Enicmus brevicornis	Nb		8	1	✔	✔	
Enicmus fungicola	Nb		8			✔	
Enicmus rugosus	Nb		8	2	✔	✔	
Enicmus testaceus	Local		2		✔	✔	

SPECIES	National Status	Reviewed National Status changes*	SQS Rarity score**	IEC Score (2004)	2017 Survey	2018 Survey	Previous data***
Corticaria alleni	Nb		8	3		✔	
MYCETOPHAGIDAE Reviewed by Alexander et al. (2015)							
Pseudotriphyllus suturalis	Local		4	1		✔	✔
Triphyllus bicolor	Local		4	2		✔	✔
Litargus connexus	Local		2		✔	✔	✔
Mycetophagus atomarius	Local		2	1		✔	✔
Mycetophagus multipunctatus	Local		2		✔		
Mycetophagus piceus	Nb	Local	4	2	✔	✔	✔
Mycetophagus quadripustulatus	Local		2			✔	✔
CIIDAE							
Octotemnus glabriculus	Common		1			✔	✔
Orthocis alni	Local		2		✔	✔	✔
Cis bidentatus	Local		2		✔	✔	✔
Cis boleti	Common		1		✔	✔	✔
Cis fagi	Local		2				✔
Cis festivus	Nb		2		✔	✔	
Cis micans (was hispidus)	Local		4				
Cis submicans (was micans)	Local		4		✔	✔	✔
Cis castaneus (was nitidus)	Local		2		✔	✔	✔
Cis pygmaeus	Local		2		✔		✔
Cis vestitus	Local		2		✔	✔	
Cis villosulus	Local		2		✔		
Ennearthron cornutum	Local		2		✔	✔	
TETRATOMIDAE Reviewed by Alexander et al. (2015)							
Tetratoma desmarestii	Na	NS	16	1	✔		✔
Tetratoma fungorum	Local		2		✔		✔
MELANDRYIDAE Reviewed by Alexander et al. (2015)							
Orchesia micans	Nb	NS	4		✔		
Orchesia minor	Nb	NS	8		✔	✔	✔
Orchesia undulata	Local		4	1	✔	✔	✔
Abdera quadrifasciata	Na	NS	16	3		✔	
Melandrya caraboides	Nb	NS	4	1		✔	✔
Conopalpus testaceus	Nb	Local	8			✔	
MORDELLIDAE Reviewed by Alexander et al. (2015)							
Tomoxia bucephala	Na	NS	16	1	✔	✔	✔
Variimorda villosa	Nb	NS					✔
Mordellochroa abdominalis	Local		4			✔	
Mordellistena neuwaldeggiana	RDBK	NS	16	1			✔
COLYDIIDAE (ZOPHERIDAE) Reviewed by Alexander et al. (2015)							
Synchita humeralis	Nb	NS	8	1		✔	
Synchita (Cicones) variegatus	Na	NS	8	2	✔	✔	✔
Bitoma crenata	Local		4	1		✔	✔
TENEBRIONIDAE Reviewed by Alexander et al. (2015)							

SPECIES	National Status	Reviewed National Status changes*	SQS Rarity score**	IEC Score (2004)	2017 Survey	2018 Survey	Previous data***
Eledona agricola	Nb	Local	4	1	✔	✔	✔
Diaperis boleti	RDB2	NS	24			✔	
Prionychus ater	Nb	Local	8	1	✔	✔	✔
Gonodera luperus	Local	NS	2				✔
OEDEMERIDAE Reviewed by Alexander et al. (2015)							
Ischnomera cinerascens	RDB2	NR	32	1			✔
Ischnomera cyanea	Nb	Local	4	1	✔	✔	✔
Ischnomera sanguinicollis	Nb	NS	8	3			
PYROCHROIDAE Reviewed by Alexander et al. (2015)							
Pyrochroa coccinea	Nb	Local	4	1	✔	✔	✔
Pyrochroa serraticornis	Common		1		✔	✔	✔
SALPINGIDAE Reviewed by Alexander et al. (2015)							
Lissodema denticolle	Nb	NS	8				✔
Vincenzellus ruficollis	Local		2				✔
Salpingus planirostris	Common		1		✔	✔	✔
Salpingus ruficollis	Common		1			✔	✔
ADERIDAE Reviewed by Alexander et al. (2015)							
Euglenes oculatus	Nb	NS	8	1	✔	✔	
SCRAPTIIDAE Reviewed by Alexander et al. (2015)							
Anaspis costai	Common		2		✔		
Anaspis fasciata	Common		2		✔	✔	✔
Anaspis frontalis	Common		1		✔	✔	✔
Anaspis lurida	Local		2		✔	✔	
Anaspis rufilabris	Common		1			✔	✔
Anaspis thoracica	Na	NS	8		✔		
CERAMBYCIDAE							
Rhagium bifsciatum	Common		1			✔	
Rhagium mordax	Common		1		✔		✔
Stenocorus meridianus	Local		2		✔	✔	✔
Grammoptera ruficornis	Common		1		✔	✔	✔
Stictoleptura scutellata	Na		16	3	✔	✔	✔
Alosterna tabacicolor	Local		2		✔	✔	✔
Rutpela maculata	Common		1			✔	✔
Stenurella melanura	Local		2			✔	✔
Phymatodes testaceus	Local		4	1	✔		
Poecilium alni	Nb		16		✔	✔	
Clytus arietis	Common		1		✔	✔	✔
Anaglyptus mysticus	Nb		4			✔	
Pogonocherus hispidus	Local		2				✔
Leiopus linnei/ nebulosus	Local		2			✔	✔
ANTHRIBIDAE							
Platyrhinus resinosus	Nb		4	1		✔	✔
Platystomos albinus	Nb		8	1			✔
CURCULIONIDAE							

SPECIES	National Status	Reviewed National Status changes*	SQS Rarity score**	IEC Score (2004)	2017 Survey	2018 Survey	Previous data***
Stereocorynetes truncorum	Na		16	3		✔	
Phloeophagus lignarius	Local		2		✔	✔	
Acalles misellus	Local		2		✔		✔
Kyklioacalles roboris	Nb		8				
Magdalis carbonaria	Nb		4		✔	✔	
Magdalis ruficornis	Local		2			✔	
CURCULIONIDAE: Scolytinae							
Scolytus intricatus	Local		2		✔		
Scolytus rugulosus	Local		2			✔	
Ernoporicus fagi	Na		8	1	✔		✔
Dryocoetes villosus	Local		2		✔	✔	✔
Taphrorychus bicolor	Na		8		✔	✔	✔
Xyleborinus saxasenii	Local		4	1		✔	
Xyleborus dryographus	Nb		8	1	✔		✔
Trypodendron domesticum	Local		2	1	✔	✔	✔
PLATYPODIDAE							
Platypus cylindrus	Nb		8	1		✔	✔

APPENDIX 4: SPECIES LISTS FROM 2018 SURVEY

Species arranged alphabetically by Group, Family & Species for each the following areas of search – Basecamp, Berkhamsted Common, Hudnall Common, Ivinghoe Common, Monument Drive, Pitstone Common and Princes Riding area – including the former Ashridge Park

Basecamp/Bunkhouse – species list

Species	Family	Order/Group	National Conservation Status
Halyzia sedecimguttata	Coccinellidae	Coleoptera	
Harmonia axyridis	Coccinellidae	Coleoptera	
Melanotus castanipes	Elateridae	Coleoptera	
Dorcus parallelipipedus	Lucanidae	Coleoptera	
Paraclusia tigrina	Clusiidae	Diptera	Red Data Book - Vulnerable
Vespa crabro	Vespidae	Hymenoptera	
Eilema sororcula	Arctiidae	Lepidoptera	
Phragmatobia fuliginosa	Arctiidae	Lepidoptera	
Spilosoma lubricipeda	Arctiidae	Lepidoptera	
Spilosoma luteum	Arctiidae	Lepidoptera	
Zeuzera pyrina	Cossidae	Lepidoptera	
Agriphila geniculea	Crambidae	Lepidoptera	
Chrysoteuchia culmella	Crambidae	Lepidoptera	
Drepana falcataria	Drepanidae	Lepidoptera	
Aplocera plagiata	Geometridae	Lepidoptera	
Biston betularia	Geometridae	Lepidoptera	
Cyclophora linearia	Geometridae	Lepidoptera	
Deileptenia ribeata	Geometridae	Lepidoptera	
Ennomos fuscantaria	Geometridae	Lepidoptera	
Horisme tersata	Geometridae	Lepidoptera	
Hypomecis roboraria	Geometridae	Lepidoptera	Nationally Notable B
Idaea aversata	Geometridae	Lepidoptera	
Idaea trigeminata	Geometridae	Lepidoptera	
Lomographa temerata	Geometridae	Lepidoptera	
Opisthograptis luteolata	Geometridae	Lepidoptera	
Peribatodes rhomboidaria	Geometridae	Lepidoptera	
Plagodis dolabraria	Geometridae	Lepidoptera	
Timandra comae	Geometridae	Lepidoptera	
Hepialus lupulinus	Hepialidae	Lepidoptera	
Abrostola tripartita	Noctuidae	Lepidoptera	
Agrotis exclamationis	Noctuidae	Lepidoptera	
Apamea crenata	Noctuidae	Lepidoptera	
Apamea epomidion	Noctuidae	Lepidoptera	
Apamea lithoxylaea	Noctuidae	Lepidoptera	
Apamea monoglypha	Noctuidae	Lepidoptera	
Atethmia centrago	Noctuidae	Lepidoptera	
Autographa pulchrina	Noctuidae	Lepidoptera	

Axylia putris	Noctuidae	Lepidoptera
Craniophora ligustri	Noctuidae	Lepidoptera
Euplexia lucipara	Noctuidae	Lepidoptera
Hypena proboscidalis	Noctuidae	Lepidoptera
Luperina testacea	Noctuidae	Lepidoptera
Mythimna pallens	Noctuidae	Lepidoptera
Noctua janthe	Noctuidae	Lepidoptera
Noctua pronuba	Noctuidae	Lepidoptera
Oligia fasciuncula	Noctuidae	Lepidoptera
Oligia latruncula	Noctuidae	Lepidoptera
Oligia strigilis	Noctuidae	Lepidoptera
Photedes minima	Noctuidae	Lepidoptera
Protodeltote pygarga	Noctuidae	Lepidoptera
Rivula sericealis	Noctuidae	Lepidoptera
Tholera decimalis	Noctuidae	Lepidoptera
Xestia c-nigrum	Noctuidae	Lepidoptera
Xestia xanthographa	Noctuidae	Lepidoptera
Zanclognatha tarsipennalis	Noctuidae	Lepidoptera
Phalera bucephala	Notodontidae	Lepidoptera
Pheosia gnoma	Notodontidae	Lepidoptera
Stauropus fagi	Notodontidae	Lepidoptera
Carcina quercana	Peleopodidae	Lepidoptera
Anania hortulata	Pyralidae	Lepidoptera
Deilephila elpenor	Sphingidae	Lepidoptera
Deilephila porcellus	Sphingidae	Lepidoptera
Sphinx ligustri	Sphingidae	Lepidoptera
Agapeta hamana	Tortricidae	Lepidoptera
Agapeta zoegana	Tortricidae	Lepidoptera
Tortrix viridana	Tortricidae	Lepidoptera

Berkhamsted Common – species list

Species	Family	Order/Group	National Conservation Status
Ischnopterapion loti	Apionidae	Coleoptera	
Cantharis decipiens	Cantharidae	Coleoptera	
Malthodes marginatus	Cantharidae	Coleoptera	
Malthodes minimus	Cantharidae	Coleoptera	
Podabrus alpinus	Cantharidae	Coleoptera	
Amara communis	Carabidae	Coleoptera	
Carabus problematicus	Carabidae	Coleoptera	
Cerylon histeroides	Cerylonidae	Coleoptera	
Gastrophysa viridula	Chrysomelidae	Coleoptera	
Cis bidentatus	Ciidae	Coleoptera	
Cis bilamellatus	Ciidae	Coleoptera	
Cis boleti	Ciidae	Coleoptera	
Cis castaneus	Ciidae	Coleoptera	
Cis vestitus	Ciidae	Coleoptera	

Octotemnus glabriculus	Ciidae	Coleoptera	
Orthocis alni	Ciidae	Coleoptera	
Sericoderus brevicornis	Corylophidae	Coleoptera	
Euophryum confine	Curculionidae	Coleoptera	
Phyllobius argentatus	Curculionidae	Coleoptera	
Agriotes pallidulus	Elateridae	Coleoptera	
Ctenicera cuprea	Elateridae	Coleoptera	
Dalopius marginatus	Elateridae	Coleoptera	
Denticollis linearis	Elateridae	Coleoptera	
Melanotus castanipes	Elateridae	Coleoptera	
Paromalus flavicornis	Histeridae	Coleoptera	
Plegaderus dissectus	Histeridae	Coleoptera	
Enicmus testaceus	Latridiidae	Coleoptera	
Anisotoma humeralis	Leiodidae	Coleoptera	
Orchesia undulata	Melandryidae	Coleoptera	
Dasytes aeratus	Melyridae	Coleoptera	
Eulagius filiformis	Mycetophagidae	Coleoptera	
Mycetophagus piceus	Mycetophagidae	Coleoptera	
Mycetophagus quadripustulatus	Mycetophagidae	Coleoptera	
Pseudotriphyllus suturalis	Mycetophagidae	Coleoptera	Nationally Scarce
Ischnomera sanguinicollis	Oedemeridae	Coleoptera	Nationally Scarce
Phloiophilus edwardsii	Phloiophilidae	Coleoptera	Nationally Scarce
Ptenidium gressneri	Ptilidae	Coleoptera	Nationally Notable
Salpingus planirostris	Salpingidae	Coleoptera	
Sphindus dubius	Sphindidae	Coleoptera	Nationally Notable B
Gabrius splendidulus	Staphylinidae	Coleoptera	
Ocypus aeneocephalus	Staphylinidae	Coleoptera	
Stenichnus collaris	Staphylinidae	Coleoptera	
Diaperis boleti	Tenebrionidae	Coleoptera	Nationally Scarce
Eledona agricola	Tenebrionidae	Coleoptera	
Trixagus dermestoides	Throscidae	Coleoptera	
Forficula auricularia	Forficulidae	Dermaptera	
Dioctria linearis	Asilidae	Diptera	
Bombylius major	Bombyliidae	Diptera	
Clusoides albimanus	Clusiidae	Diptera	
Symmerus annulatus	Ditomyiidae	Diptera	
Neurigona quadrifasciata	Dolichopodidae	Diptera	
Mycomya parva	Mycetophilidae	Diptera	Nationally Scarce
Tetragoneura sylvatica	Mycetophilidae	Diptera	
Ptychoptera albimana	Ptychopteridae	Diptera	
Austrolimnophila ochracea	Tipulidae	Diptera	
Ctenophora pectinicornis	Tipulidae	Diptera	Nationally Notable
Epiphragma ocellaris	Tipulidae	Diptera	
Limonia nubeculosa	Tipulidae	Diptera	
Dryophilocoris flavoquadrimaculatus	Miridae	Hemiptera	
Andrena haemorrhoa	Andrenidae	Hymenoptera	
Myrmica ruginodis	Formicidae	Hymenoptera	
Oniscus asellus	Oniscidae	Isopoda	

Porcellio scaber	Porcellionidae	Isopoda
Adela reamurella	Adelidae	Lepidoptera
Esperia sulphurella	Oecophoridae	Lepidoptera
Lehmannia (Limax) marginatus	Limacidae	Mollusca

Frithsden Beeches – species list

Species	Family	Order/Group	National Conservation Status
Marpissa muscosa	Salticidae	Araneae	Nationally Notable B
Platyrhinus resinosus	Anthribidae	Coleoptera	Nationally Notable B
Byturus aestivus	Byturidae	Coleoptera	
Byturus tomentosus	Byturidae	Coleoptera	
Cantharis pellucida	Cantharidae	Coleoptera	
Malthodes marginatus	Cantharidae	Coleoptera	
Carabus problematicus	Carabidae	Coleoptera	
Leistus spinibarbis	Carabidae	Coleoptera	
Grammoptera ruficornis	Cerambycidae	Coleoptera	
Cerylon ferrugineum	Cerylonidae	Coleoptera	
Lochmaea crataegi	Chrysomelidae	Coleoptera	
Longitarsus parvulus	Chrysomelidae	Coleoptera	
Cis bidentatus	Ciidae	Coleoptera	
Cis castaneus	Ciidae	Coleoptera	
Ennearthron cornutum	Ciidae	Coleoptera	
Tillus elongatus	Cleridae	Coleoptera	Nationally Scarce
Cryptophagus falcozi	Cryptophagidae	Coleoptera	Red Bata Dook – Insufficiently known
Cryptophagus ruficornis	Cryptophagidae	Coleoptera	Nationally Notable
Cryptophagus scanicus	Cryptophagidae	Coleoptera	
Anthonomus pedicularius	Curculionidae	Coleoptera	
Euophryum confine	Curculionidae	Coleoptera	
Exomias pellucidus	Curculionidae	Coleoptera	
Strophosoma melanogrammum	Curculionidae	Coleoptera	
Agriotes pallidulus	Elateridae	Coleoptera	
Agriotes sputator	Elateridae	Coleoptera	
Athous haemorrhoidalis	Elateridae	Coleoptera	
Denticollis linearis	Elateridae	Coleoptera	
Melanotus castanipes	Elateridae	Coleoptera	
Dacne bipustulata	Erotylidae	Coleoptera	
Triplax aenea	Erotylidae	Coleoptera	
Abraeus perpusillus	Histeridae	Coleoptera	
Plegaderus dissectus	Histeridae	Coleoptera	
Cartodere nodifer	Latridiidae	Coleoptera	
Cortinicara gibbosa	Latridiidae	Coleoptera	
Enicmus brevicornis	Latridiidae	Coleoptera	Nationally Notable
Enicmus rugosus	Latridiidae	Coleoptera	Nationally Notable
Enicmus testaceus	Latridiidae	Coleoptera	
Agathidium nigripenne	Leiodidae	Coleoptera	
Agathidium seminulum	Leiodidae	Coleoptera	

Anisotoma humeralis	Leiodidae	Coleoptera	
Dorcus parallelipipedus	Lucanidae	Coleoptera	
Sinodendron cylindricum	Lucanidae	Coleoptera	
Platycis minutus	Lycidae	Coleoptera	
Melandrya caraboides	Melandryidae	Coleoptera	
Orchesia minor	Melandryidae	Coleoptera	Nationally Scarce
Orchesia undulata	Melandryidae	Coleoptera	
Malachius bipustulatus	Melyridae	Coleoptera	
Tomoxia bucephala	Mordellidae	Coleoptera	Nationally Scarce
Mycetophagus atomarius	Mycetophagidae	Coleoptera	
Mycetophagus quadripustulatus	Mycetophagidae	Coleoptera	
Brachypterus urticae	Nitidulidae	Coleoptera	
Meligethes aeneus	Nitidulidae	Coleoptera	
Ischnomera cyanea	Oedemeridae	Coleoptera	
Ptenidium formicetorum	Ptilidae	Coleoptera	
Ptenidium gressneri	Ptilidae	Coleoptera	Nationally Notable
Grynobius planus	Ptinidae	Coleoptera	
Ptilinus pectinicornis	Ptinidae	Coleoptera	
Pyrochroa coccinea	Pyrochroidae	Coleoptera	
Pyrochroa serraticornis	Pyrochroidae	Coleoptera	
Tatianerhynchites aequatus	Rhynchitidae	Coleoptera	
Salpingus planirostris	Salpingidae	Coleoptera	
Salpingus ruficollis	Salpingidae	Coleoptera	
Planolinoides (Aphodius) borealis	Scarabaeidae	Coleoptera	
Anaspis fasciata	Scraptiidae	Coleoptera	
Anaspis garneysi	Scraptiidae	Coleoptera	
Anaspis maculata	Scraptiidae	Coleoptera	
Anaspis regimbarti	Scraptiidae	Coleoptera	
Phosphuga atrata	Silphidae	Coleoptera	
Uleiota planatus	Silvanidae	Coleoptera	
Aspidiphorus orbiculatus	Sphindidae	Coleoptera	
Sphindus dubius	Sphindidae	Coleoptera	Nationally Notable B
Anotylus rugosus	Staphylinidae	Coleoptera	
Anotylus sculpturatus	Staphylinidae	Coleoptera	
Anotylus tetracarinatus	Staphylinidae	Coleoptera	
Atrecus affinis	Staphylinidae	Coleoptera	
Bolitobius castaneus	Staphylinidae	Coleoptera	
Lordithon lunulatus	Staphylinidae	Coleoptera	
Lordithon trinotatus	Staphylinidae	Coleoptera	
Microscydmus minimus	Staphylinidae	Coleoptera	Red Data Book - Rare
Oxytelus laqueatus	Staphylinidae	Coleoptera	
Philonthus decorus	Staphylinidae	Coleoptera	
Phyllodrepoidea crenata	Staphylinidae	Coleoptera	Nationally Notable B
Quedius cruentus	Staphylinidae	Coleoptera	
Scaphidium quadrimaculatum	Staphylinidae	Coleoptera	
Scaphisoma agaricinum	Staphylinidae	Coleoptera	
Sepedophilus bipunctatus	Staphylinidae	Coleoptera	Nationally Notable B
Tachyporus pusillus	Staphylinidae	Coleoptera	

Trixagus dermestoides	Throscidae	Coleoptera	
Synchita variegata	Zopheridae	Coleoptera	Nationally Scarce
Forficula auricularia	Forficulidae	Dermaptera	
Ctenophora pectinicornis	Tipulidae	Dermaptera	Nationally Notable
Sylvicola cinctus/fenestralis	Anisopodidae	Diptera	
Bombylius major	Bombyliidae	Diptera	
Drosophila suzukii	Drosophilidae	Diptera	
Neuroctena anilis	Dryomyzidae	Diptera	
Suillia bicolor	Heleomyzidae	Diptera	
Neolimonia dumetorum	Limoniidae	Diptera	
Rhagio tringarius	Rhagionidae	Diptera	
Pelidnoptera fuscipennis	Sciomyzidae	Diptera	
Beris chalybeata	Stratiomyidae	Diptera	
Brachypalpoides lenta	Syrphidae	Diptera	
Criorhina asilica	Syrphidae	Diptera	
Criorhina berberina	Syrphidae	Diptera	
Leucozona lucorum	Syrphidae	Diptera	
Myathropa florea	Syrphidae	Diptera	
Epiphragma ocellaris	Tipulidae	Diptera	
Xylocoris cursitans	Anthocoridae	Hemiptera	
Ditropis pteridis	Delphacidae	Hemiptera	
Issus coleoptratus	Issidae	Hemiptera	
Loricula elegantula	Microphysidae	Hemiptera	
Dicyphus pallicornis	Miridae	Hemiptera	
Dryophilocoris flavoquadrimaculatus	Miridae	Hemiptera	
Liocoris tripustulatus	Miridae	Hemiptera	
Miris striatus	Miridae	Hemiptera	
Andrena haemorrhoa	Andrenidae	Hymenoptera	
Andrena minutula	Andrenidae	Hymenoptera	
Andrena wilkella	Andrenidae	Hymenoptera	
Nomada fabriciana	Anthophoridae	Hymenoptera	
Nomada lathburiana	Anthophoridae	Hymenoptera	Nationally Notable B
Nomada panzeri	Anthophoridae	Hymenoptera	
Apis mellifera	Apidae	Hymenoptera	
Bombus lapidarius	Apidae	Hymenoptera	
Bombus pratorum	Apidae	Hymenoptera	
Trichrysis cyanea	Chrysidae	Hymenoptera	
Formica fusca	Formicidae	Hymenoptera	
Lasius brunneus	Formicidae	Hymenoptera	Na
Myrmica ruginodis	Formicidae	Hymenoptera	
Lasioglossum albipes	Halictidae	Hymenoptera	
Lasioglossum fulvicorne	Halictidae	Hymenoptera	
Osmia bicornis	Megachilidae	Hymenoptera	
Crossocerus annulipes	Sphecidae	Hymenoptera	
Ectemnius cavifrons	Sphecidae	Hymenoptera	
Pemphredon lugubris	Sphecidae	Hymenoptera	
Spilomena beata	Sphecidae	Hymenoptera	
Vespa crabro	Vespidae	Hymenoptera	

Oniscus asellus	Oniscidae	Isopoda	
Philoscia muscorum	Philosciidae	Isopoda	
Porcellio scaber	Porcellionidae	Isopoda	
Xanthorhoe montanata	Geometridae	Lepidoptera	
Dryobotodes eremita	Noctuidae	Lepidoptera	
Vanessa cardui	Nymphalidae	Lepidoptera	
Panorpa communis	Panopridae	Mecoptera	
Lehmannia (Limax) marginatus	Limacidae	Mollusca	
Malacolimax tenellus	Limacidae	Mollusca	N

Hudnall Common – species list

Species	Family	Order/Group	National Conservation Status
Marpissa muscosa	Salticidae	Araneae	Nationally Notable B
Agrilus sinuatus	Buprestidae	Coleoptera	
Cantharis decipiens	Cantharidae	Coleoptera	
Cantharis rustica	Cantharidae	Coleoptera	
Malthodes marginatus	Cantharidae	Coleoptera	
Podabrus alpinus	Cantharidae	Coleoptera	
Rhagonycha testacea	Cantharidae	Coleoptera	
Dromius quadrimaculatus	Carabidae	Coleoptera	
Harpalus rufipes	Carabidae	Coleoptera	
Alosterna tabacicolor	Cerambycidae	Coleoptera	
Grammoptera ruficornis	Cerambycidae	Coleoptera	
Rhagium mordax	Cerambycidae	Coleoptera	
Cerylon ferrugineum	Cerylonidae	Coleoptera	
Cerylon histeroides	Cerylonidae	Coleoptera	
Aphthona euphorbiae	Chrysomelidae	Coleoptera	
Hermeophaga mercurialis	Chrysomelidae	Coleoptera	
Longitarsus parvulus	Chrysomelidae	Coleoptera	
Cis bidentatus	Ciidae	Coleoptera	
Tillus elongatus	Cleridae	Coleoptera	Nationally Scarce
Halyzia sedecimguttata	Coccinellidae	Coleoptera	
Harmonia axyridis	Coccinellidae	Coleoptera	
Sericoderus brevicornis	Corylophidae	Coleoptera	
Cryptophagus dentatus	Cryptophagidae	Coleoptera	
Cryptophagus ruficornis	Cryptophagidae	Coleoptera	Nationally Notable
Anthonomus pedicularius	Curculionidae	Coleoptera	
Archarius pyrrhoceras	Curculionidae	Coleoptera	
Curculio glandium	Curculionidae	Coleoptera	
Euophryum confine	Curculionidae	Coleoptera	
Exomias araneiformis	Curculionidae	Coleoptera	
Magdalis ruficornis	Curculionidae	Coleoptera	
Nedyus quadrimaculatus	Curculionidae	Coleoptera	
Phyllobius argentatus	Curculionidae	Coleoptera	
Sitona lineatus	Curculionidae	Coleoptera	
Agriotes pallidulus	Elateridae	Coleoptera	

Athous haemorrhoidalis	Elateridae	Coleoptera	
Denticollis linearis	Elateridae	Coleoptera	
Melanotus castanipes	Elateridae	Coleoptera	
Abraeus perpusillus	Histeridae	Coleoptera	
Cartodere nodifer	Latridiidae	Coleoptera	
Enicmus rugosus	Latridiidae	Coleoptera	Nationally Notable
Enicmus testaceus	Latridiidae	Coleoptera	
Anisotoma humeralis	Leiodidae	Coleoptera	
Anisotoma orbicularis	Leiodidae	Coleoptera	
Catops fuliginosus	Leiodidae	Coleoptera	
Dorcus parallelipipedus	Lucanidae	Coleoptera	
Sinodendron cylindricum	Lucanidae	Coleoptera	
Lymexylon navale	Lymexylidae	Coleoptera	Nationally Scarce
Melandrya caraboides	Melandryidae	Coleoptera	
Dasytes aeratus	Melyridae	Coleoptera	
Malachius bipustulatus	Melyridae	Coleoptera	
Ptenidium gressneri	Ptilidae	Coleoptera	Nationally Notable
Anobium punctatum	Ptinidae	Coleoptera	
Grynobius planus	Ptinidae	Coleoptera	
Pyrochroa serraticornis	Pyrochroidae	Coleoptera	
Tatianaerhynchites aequatus	Rhynchitidae	Coleoptera	
Salpingus ruficollis	Salpingidae	Coleoptera	
Hoplia philanthus	Scarabaeidae	Coleoptera	
Anaspis fasciata	Scraptiidae	Coleoptera	
Anaspis frontalis	Scraptiidae	Coleoptera	
Anaspis garneysi	Scraptiidae	Coleoptera	
Anaspis maculata	Scraptiidae	Coleoptera	
Aspidiphorus orbiculatus	Sphindidae	Coleoptera	
Sphindus dubius	Sphindidae	Coleoptera	Nationally Notable B
Anotylus sculpturatus	Staphylinidae	Coleoptera	
Atrecus affinis	Staphylinidae	Coleoptera	
Bibloporus bicolor	Staphylinidae	Coleoptera	
Bolitochara lucida	Staphylinidae	Coleoptera	
Euplectus piceus	Staphylinidae	Coleoptera	
Neuraphes plicicollis	Staphylinidae	Coleoptera	Nationally Notable
Scaphisoma agaricinum	Staphylinidae	Coleoptera	
Scaphisoma boleti	Staphylinidae	Coleoptera	Nationally Notable B
Sepedophilus lusitanicus	Staphylinidae	Coleoptera	
Stenichnus collaris	Staphylinidae	Coleoptera	
Trixagus dermestoides	Throscidae	Coleoptera	
Forficula auricularia	Forficulidae	Dermaptera	
Clusiodes albimanus	Clusiidae	Diptera	
Neurigona quadrifasciata	Dolichopodidae	Diptera	
Sciapus platypterus	Dolichopodidae	Diptera	
Neoplatyura modesta	Keroplatidae	Diptera	
Neolimonia dumetorum	Limoniidae	Diptera	
Beris chalybeata	Stratiomyidae	Diptera	
Brachypalpus laphriformis	Syrphidae	Diptera	

Ferdinandea cuprea	Syrphidae	Diptera	
Limonia nubeculosa	Tipulidae	Diptera	
Limonia phragmitidis	Tipulidae	Diptera	
Anthocoris nemorum	Anthocoridae	Hemiptera	
Orius laticollis	Anthocoridae	Hemiptera	
Temnostethus pusillus	Anthocoridae	Hemiptera	
Heterogaster urticae	Lygaeidae	Hemiptera	
Loricula elegantula	Microphysidae	Hemiptera	
Dryophilocoris flavoquadrimaculatus	Miridae	Hemiptera	
Grypocoris sytsi	Miridae	Hemiptera	
Liocoris tripustulatus	Miridae	Hemiptera	
Plagiognathus arbustorum	Miridae	Hemiptera	
Rhabdomiris striatellus	Miridae	Hemiptera	
Pentatoma rufipes	Pentatomidae	Hemiptera	
Derephysia foliacea	Tingidae	Hemiptera	
Physatocheila dumetorum	Tingidae	Hemiptera	
Andrena wilkella	Andrenidae	Hymenoptera	
Bombus lucorum	Apidae	Hymenoptera	
Lasius brunneus	Formicidae	Hymenoptera	Nationally Notable A
Ectemnius cavifrons	Sphecidae	Hymenoptera	
Ectemnius cephalotes	Sphecidae	Hymenoptera	
Vespa crabro	Vespidae	Hymenoptera	
Vespula germanica	Vespidae	Hymenoptera	
Oniscus asellus	Oniscidae	Isopoda	
Philoscia muscorum	Philosciidae	Isopoda	
Porcellio scaber	Porcellionidae	Isopoda	
Petrophora chlorosata	Geometridae	Lepidoptera	
Pararge aegeria	Nymphalidae	Lepidoptera	
Esperia sulphurella	Oecophoridae	Lepidoptera	
Anthocharis cardamines	Pieridae	Lepidoptera	
Opilio canestrinii	Phalangidae	Opiliones	
Raphidia notata	Raphidiidae	Raphidioptera	

Ivinghoe Common – species list

Species	**Family**	**Order/Group**	**National Conservation Status**
Marpissa muscosa	Salticidae	Araneae	Nationally Notable B
Euglenes oculatus	Aderidae	Coleoptera	Nationally Scarce
Platyrhinus resinosus	Anthribidae	Coleoptera	Nationally Notable B
Diplocoelus fagi	Biphyllidae	Coleoptera	Nationally Notable B
Byturus tomentosus	Byturidae	Coleoptera	
Cantharis decipiens	Cantharidae	Coleoptera	
Cantharis nigra	Cantharidae	Coleoptera	
Cantharis pellucida	Cantharidae	Coleoptera	
Podabrus alpinus	Cantharidae	Coleoptera	
Bembidion aeneum	Carabidae	Coleoptera	
Grammoptera ruficornis	Cerambycidae	Coleoptera	
Rhagium mordax	Cerambycidae	Coleoptera	

Stenurella (Strangalia) melanura	Cerambycidae	Coleoptera	
Cerylon ferrugineum	Cerylonidae	Coleoptera	
Cerylon histeroides	Cerylonidae	Coleoptera	
Cis bidentatus	Ciidae	Coleoptera	
Cis bilamellatus	Ciidae	Coleoptera	
Cis castaneus	Ciidae	Coleoptera	
Thanasimus formicarius	Cleridae	Coleoptera	
Tillus elongatus	Cleridae	Coleoptera	Nationally Scarce
Orthoperus atomus	Corylophidae	Coleoptera	
Cryptophagus dentatus	Cryptophagidae	Coleoptera	
Cryptophagus laticollis	Cryptophagidae	Coleoptera	
Euophryum confine	Curculionidae	Coleoptera	
Exomias pellucidus	Curculionidae	Coleoptera	
Trypodendron domesticum	Curculionidae	Coleoptera	
Agriotes acuminatus	Elateridae	Coleoptera	
Agriotes pallidulus	Elateridae	Coleoptera	
Athous haemorrhoidalis	Elateridae	Coleoptera	
Dalopius marginatus	Elateridae	Coleoptera	
Denticollis linearis	Elateridae	Coleoptera	
Melanotus castanipes	Elateridae	Coleoptera	
Hylis olexai	Eucnemidae	Coleoptera	Red Data Book - Rare
Abraeus perpusillus	Histeridae	Coleoptera	
Paromalus flavicornis	Histeridae	Coleoptera	
Plegaderus dissectus	Histeridae	Coleoptera	
Enicmus brevicornis	Latridiidae	Coleoptera	Nationally Notable
Enicmus rugosus	Latridiidae	Coleoptera	Nationally Notable
Enicmus testaceus	Latridiidae	Coleoptera	
Agathidium nigripenne	Leiodidae	Coleoptera	
Anisotoma humeralis	Leiodidae	Coleoptera	
Catops chrysomeloides	Leiodidae	Coleoptera	
Choleva angustata	Leiodidae	Coleoptera	
Dorcus parallelipipedus	Lucanidae	Coleoptera	
Dasytes aeratus	Melyridae	Coleoptera	
Rhizophagus ferrugineus	Monotomidae	Coleoptera	
Rhizophagus nitidulus	Monotomidae	Coleoptera	Nationally Notable B
Mycetophagus piceus	Mycetophagidae	Coleoptera	
Epuraea aestiva	Nitidulidae	Coleoptera	
Ptenidium gressneri	Ptilidae	Coleoptera	Nationally Notable
Pteryx suturalis	Ptilidae	Coleoptera	
Hemicoelus fulvicorne	Ptinidae	Coleoptera	
Ptilinus pectinicornis	Ptinidae	Coleoptera	
Pyrochroa coccinea	Pyrochroidae	Coleoptera	
Anaspis fasciata	Scraptiidae	Coleoptera	
Anaspis garneysi	Scraptiidae	Coleoptera	
Anaspis maculata	Scraptiidae	Coleoptera	
Anaspis rufilabris	Scraptiidae	Coleoptera	
Uleiota planatus	Silvanidae	Coleoptera	
Aspidiphorus orbiculatus	Sphindidae	Coleoptera	

Anomognathus cuspidatus	Staphylinidae	Coleoptera	
Atrecus affinis	Staphylinidae	Coleoptera	
Autalia impressa	Staphylinidae	Coleoptera	
Bibloporus bicolor/mintus	Staphylinidae	Coleoptera	
Dropephylla ioptera	Staphylinidae	Coleoptera	
Euplectus karstenii	Staphylinidae	Coleoptera	
Gabrius splendidulus	Staphylinidae	Coleoptera	
Lordithon lunulatus	Staphylinidae	Coleoptera	
Lordithon trinotatus	Staphylinidae	Coleoptera	
Neuraphes plicicollis	Staphylinidae	Coleoptera	Nationally Notable
Quedius mesomelinus	Staphylinidae	Coleoptera	
Trixagus dermestoides	Throscidae	Coleoptera	
Synchita variegata	Zopheridae	Coleoptera	Nationally Scarce
Forficula auricularia	Forficulidae	Dermaptera	
Bombylius major	Bombyliidae	Diptera	
Dolichopus popularis	Dolichopodidae	Diptera	
Mycetophila ocellus	Mycetophilidae	Diptera	
Criorhina berberina	Syrphidae	Diptera	
Criorhina berberina var. oxyacanthae	Syrphidae	Diptera	
Epistrophe eligans	Syrphidae	Diptera	
Eristalis pertinax	Syrphidae	Diptera	
Leucozona lucorum	Syrphidae	Diptera	
Myathropa florea	Syrphidae	Diptera	
Platycheirus albimanus	Syrphidae	Diptera	
Portevinia maculata	Syrphidae	Diptera	
Hybomitra distinguenda	Tabanidae	Diptera	
Tabanus bromius	Tabanidae	Diptera	
Achyrolimonia decemmaculata	Tipulidae	Diptera	
Ctenophora flaveolata	Tipulidae	Diptera	Red Data Book - Vulbnerable
Ctenophora pectinicornis	Tipulidae	Diptera	Nationally Notable
Dictenidia bimaculata	Tipulidae	Diptera	
Limonia nubeculosa	Tipulidae	Diptera	
Limonia phragmitidis	Tipulidae	Diptera	
Capsus ater	Miridae	Hemiptera	
Dryophilocoris flavoquadrimaculatus	Miridae	Hemiptera	
Rhabdomiris striatellus	Miridae	Hemiptera	
Dolycoris baccarum	Pentatomidae	Hemiptera	
Andrena haemorrhoa	Andrenidae	Hymenoptera	
Bombus hypnorum	Apidae	Hymenoptera	
Bombus lapidarius	Apidae	Hymenoptera	
Lasius brunneus	Formicidae	Hymenoptera	Na
Myrmica ruginodis	Formicidae	Hymenoptera	
Chelostoma florisomne	Megachilidae	Hymenoptera	
Osmia bicornis	Megachilidae	Hymenoptera	
Dipogon subintermedius	Pompilidae	Hymenoptera	
Crossocerus annulipes	Sphecidae	Hymenoptera	
Crossocerus nigritus	Sphecidae	Hymenoptera	
Ectemnius cavifrons	Sphecidae	Hymenoptera	

Pemphredon lugubris	Sphecidae	Hymenoptera
Strongylogaster multifasciata	Tenthredinidae	Hymenoptera
Vespa crabro	Vespidae	Hymenoptera
Oniscus asellus	Oniscidae	Isopoda
Philoscia muscorum	Philosciidae	Isopoda
Porcellio scaber	Porcellionidae	Isopoda
Adela reamurella	Adelidae	Lepidoptera
Celastrina argiolus	Lycaenidae	Lepidoptera
Polia nebulosa	Noctuidae	Lepidoptera
Pararge aegeria	Nymphalidae	Lepidoptera
Esperia sulphurella	Oecophoridae	Lepidoptera
Pieris brassicae	Pieridae	Lepidoptera
Pennisetia hylaeiformis	Sesiidae	Lepidoptera
Lehmannia (Limax) marginatus	Limacidae	Mollusca

Monument Drive – species list

Species	Family	Order/Group	National Conservation Status
Nuctenea umbratica	Araneidae	Araneae	
Euglenes oculatus	Aderidae	Coleoptera	Nationally Scarce
Ischnopterapion loti	Apionidae	Coleoptera	
Protapion fulvipes	Apionidae	Coleoptera	
Protapion nigritarse	Apionidae	Coleoptera	
Diplocoelus fagi	Biphyllidae	Coleoptera	Nationally Notable B
Agrilus laticornis	Buprestidae	Coleoptera	
Agrilus sinuatus	Buprestidae	Coleoptera	
Byturus tomentosus	Byturidae	Coleoptera	
Cantharis cryptica	Cantharidae	Coleoptera	
Cantharis decipiens	Cantharidae	Coleoptera	
Cantharis lateralis	Cantharidae	Coleoptera	
Cantharis livida	Cantharidae	Coleoptera	
Cantharis nigra	Cantharidae	Coleoptera	
Cantharis pallida	Cantharidae	Coleoptera	
Cantharis pellucida	Cantharidae	Coleoptera	
Cantharis rustica	Cantharidae	Coleoptera	
Malthinus seriepunctatus	Cantharidae	Coleoptera	
Malthodes marginatus	Cantharidae	Coleoptera	
Malthodes minimus	Cantharidae	Coleoptera	
Podabrus alpinus	Cantharidae	Coleoptera	
Rhagonycha fulva	Cantharidae	Coleoptera	
Dromius quadrimaculatus	Carabidae	Coleoptera	
Clytus arietis	Cerambycidae	Coleoptera	
Grammoptera ruficornis	Cerambycidae	Coleoptera	
Leiopus nebulosus	Cerambycidae	Coleoptera	
Poecilium alni	Cerambycidae	Coleoptera	Nationally Notable B
Rhagium bifasciatum	Cerambycidae	Coleoptera	
Rhagium mordax	Cerambycidae	Coleoptera	

Rutpela maculata	Cerambycidae	Coleoptera	
Stenocorus meridianus	Cerambycidae	Coleoptera	
Stictoleptura scutellata	Cerambycidae	Coleoptera	Nationally Notable A
Cerylon ferrugineum	Cerylonidae	Coleoptera	
Crepidodera aurata	Chrysomelidae	Coleoptera	
Crepidodera plutus	Chrysomelidae	Coleoptera	
Lochmaea crataegi	Chrysomelidae	Coleoptera	
Cis bidentatus	Ciidae	Coleoptera	
Cis boleti	Ciidae	Coleoptera	
Cis castaneus	Ciidae	Coleoptera	
Cis submicans	Ciidae	Coleoptera	
Orthocis alni	Ciidae	Coleoptera	
Adalia bipunctata	Coccinellidae	Coleoptera	
Adalia decempunctata	Coccinellidae	Coleoptera	
Coccinella septempunctata	Coccinellidae	Coleoptera	
Halyzia sedecimguttata	Coccinellidae	Coleoptera	
Harmonia axyridis	Coccinellidae	Coleoptera	
Propylea quattuordecimpunctata	Coccinellidae	Coleoptera	
Orthoperus aequalis	Corylophidae	Coleoptera	
Pediacus dermestoides	Cucujidae	Coleoptera	
Anthonomus pedicularius	Curculionidae	Coleoptera	
Archarius pyrrhoceras	Curculionidae	Coleoptera	
Curculio glandium	Curculionidae	Coleoptera	
Dryocoetes villosus	Curculionidae	Coleoptera	
Euophryum confine	Curculionidae	Coleoptera	
Gymnetron pascuorum	Curculionidae	Coleoptera	
Hypera plantaginis	Curculionidae	Coleoptera	
Magdalis carbonaria	Curculionidae	Coleoptera	Nationally Notable B
Phyllobius argentatus	Curculionidae	Coleoptera	
Phyllobius pyri	Curculionidae	Coleoptera	
Polydrusus cervinus	Curculionidae	Coleoptera	
Rhamphus pulicarius	Curculionidae	Coleoptera	
Sciaphilus asperatus	Curculionidae	Coleoptera	
Scolytus intricatus	Curculionidae	Coleoptera	
Scolytus rugulosus	Curculionidae	Coleoptera	
Strophosoma melanogrammum	Curculionidae	Coleoptera	
Tychius picirostris	Curculionidae	Coleoptera	
Agriotes acuminatus	Elateridae	Coleoptera	
Agriotes pallidulus	Elateridae	Coleoptera	
Agriotes sputator	Elateridae	Coleoptera	
Athous haemorrhoidalis	Elateridae	Coleoptera	
Dalopius marginatus	Elateridae	Coleoptera	
Denticollis linearis	Elateridae	Coleoptera	
Melanotus castanipes	Elateridae	Coleoptera	
Epiphanis cornutus	Eucnemidae	Coleoptera	
Eucnemis capucina	Eucnemidae	Coleoptera	Red Data Book - Endangered
Paromalus flavicornis	Histeridae	Coleoptera	
Plegaderus dissectus	Histeridae	Coleoptera	

Megasternum concinnum	Hydrophilidae	Coleoptera	
Cartodere nodifer	Latridiidae	Coleoptera	
Cortinicara gibbosa	Latridiidae	Coleoptera	
Enicmus rugosus	Latridiidae	Coleoptera	Nationally Notable
Enicmus testaceus	Latridiidae	Coleoptera	
Anisotoma humeralis	Leiodidae	Coleoptera	
Dorcus parallelipipedus	Lucanidae	Coleoptera	
Sinodendron cylindricum	Lucanidae	Coleoptera	
Orchesia minor	Melandryidae	Coleoptera	Nationally Scarce
Axinotarsus marginalis	Melyridae	Coleoptera	
Dasytes aeratus	Melyridae	Coleoptera	
Malachius bipustulatus	Melyridae	Coleoptera	
Litargus connexus	Mycetophagidae	Coleoptera	
Mycetophagus quadripustulatus	Mycetophagidae	Coleoptera	
Cryptarcha strigata	Nitidulidae	Coleoptera	Nationally Notable B
Epuraea aestiva	Nitidulidae	Coleoptera	
Meligethes aeneus	Nitidulidae	Coleoptera	
Meligethes atratus	Nitidulidae	Coleoptera	
Pocadius adustus	Nitidulidae	Coleoptera	
Ischnomera cyanea	Oedemeridae	Coleoptera	
Phloiophilus edwardsii	Phloiophilidae	Coleoptera	Nationally Scarce
Ptenidium gressneri	Ptilidae	Coleoptera	Nationally Notable
Anobium fulvicorne	Ptinidae	Coleoptera	
Dorcatoma flavicornis	Ptinidae	Coleoptera	Nationally Scarce
Grynobius planus	Ptinidae	Coleoptera	
Ptilinus pectinicornis	Ptinidae	Coleoptera	
Pyrochroa coccinea	Pyrochroidae	Coleoptera	
Pyrochroa serraticornis	Pyrochroidae	Coleoptera	
Salpingus planirostris	Salpingidae	Coleoptera	
Salpingus ruficollis	Salpingidae	Coleoptera	
Hoplia philanthus	Scarabaeidae	Coleoptera	
Phyllopertha horticola	Scarabaeidae	Coleoptera	
Cyphon coarctatus	Scirtidae	Coleoptera	
Anaspis fasciata	Scraptiidae	Coleoptera	
Anaspis frontalis	Scraptiidae	Coleoptera	
Anaspis garneysi	Scraptiidae	Coleoptera	
Anaspis maculata	Scraptiidae	Coleoptera	
Anaspis regimbarti	Scraptiidae	Coleoptera	
Anaspis rufilabris	Scraptiidae	Coleoptera	
Uleiota planatus	Silvanidae	Coleoptera	
Bibloporus bicolor	Staphylinidae	Coleoptera	
Euplectus karstenii	Staphylinidae	Coleoptera	
Gyrophaena bihamata	Staphylinidae	Coleoptera	
Gyrophaena gentilis	Staphylinidae	Coleoptera	
Lordithon lunulatus	Staphylinidae	Coleoptera	
Lordithon trinotatus	Staphylinidae	Coleoptera	
Tachyporus hypnorum	Staphylinidae	Coleoptera	
Eledona agricola	Tenebrionidae	Coleoptera	

Trixagus dermestoides	Throscidae	Coleoptera	
Forficula auricularia	Forficulidae	Dermaptera	
Sylvicola cinctus	Anisopodidae	Diptera	
Dioctria rufipes	Asilidae	Diptera	
Neoitamus cyanurus	Asilidae	Diptera	
Bombylius major	Bombyliidae	Diptera	
Sciapus platypterus	Dolichopodidae	Diptera	
Suilla variegata	Heleomyzidae	Diptera	
Austrolimnophila ochracea	Limoniidae	Diptera	
Neolimonia dumetorum	Limoniidae	Diptera	
Brevicornu serenum	Mycetophilidae	Diptera	Nationally Scarce
Grzegorzekia collaris	Mycetophilidae	Diptera	Nationally Scarce
Opomyza germinationis	Opomyzidae	Diptera	
Rhagio scolopacea	Rhagionidae	Diptera	
Limnia unguicornis	Sciomyzidae	Diptera	
Brachypalpoides lenta	Syrphidae	Diptera	
Chalcosyrphus nemorum	Syrphidae	Diptera	
Criorhina berberina	Syrphidae	Diptera	
Criorhina ranunculi	Syrphidae	Diptera	
Ferdinandea cuprea	Syrphidae	Diptera	
Myathropa florea	Syrphidae	Diptera	
Rhingia campestris	Syrphidae	Diptera	
Xylota segnis	Syrphidae	Diptera	
Tabanus bromius	Tabanidae	Diptera	
Ctenophora pectinicornis	Tipulidae	Diptera	Nationally Notable
Dictenidia bimaculata	Tipulidae	Diptera	
Epiphragma ocellaris	Tipulidae	Diptera	
Metatropis rufescens	Berytinidae	Hemiptera	
Alebra albostriella	Cicadellidae	Hemiptera	
Eurhadina pulchella	Cicadellidae	Hemiptera	
Iassus lanio	Cicadellidae	Hemiptera	
Cixius nervosus	Cixiidae	Hemiptera	
Ditropis pteridis	Delphacidae	Hemiptera	
Drymus sylvaticus	Lygaeidae	Hemiptera	
Calocoris stysi	Miridae	Hemiptera	
Capsus ater	Miridae	Hemiptera	
Deraeocoris flavilinea	Miridae	Hemiptera	
Deraeocoris lutescens	Miridae	Hemiptera	
Dryophilocoris flavoquadrimaculatus	Miridae	Hemiptera	
Leptopterna dolabrata	Miridae	Hemiptera	
Liocoris tripustulatus	Miridae	Hemiptera	
Phylus melanocephalus	Miridae	Hemiptera	
Pilophorus cinnamopterus	Miridae	Hemiptera	
Psallus ambiguus	Miridae	Hemiptera	
Psallus perrisi	Miridae	Hemiptera	
Psallus varians	Miridae	Hemiptera	
Rhabdomiris striatellus	Miridae	Hemiptera	
Stenodema calcaratum	Miridae	Hemiptera	

Stenodema holsatum	Miridae	Hemiptera	
Pentatoma rufipes	Pentatomidae	Hemiptera	
Troilus luridus	Pentatomidae	Hemiptera	
Eurygaster testudinaria	Scutelleridae	Hemiptera	
Andrena haemorrhoa	Andrenidae	Hymenoptera	
Andrena nigroaenea	Andrenidae	Hymenoptera	
Andrena wilkella	Andrenidae	Hymenoptera	
Nomada flavoguttata	Anthophoridae	Hymenoptera	
Bombus lapidarius	Apidae	Hymenoptera	
Bombus lucorum	Apidae	Hymenoptera	
Bombus pascuorum	Apidae	Hymenoptera	
Bombus pratorum	Apidae	Hymenoptera	
Chrysis angustula	Chrysidae	Hymenoptera	
Andricus quercuscalicis	Cynipidae	Hymenoptera	
Formica fusca	Formicidae	Hymenoptera	
Lasius brunneus	Formicidae	Hymenoptera	Nationally Scarce A
Lasius niger	Formicidae	Hymenoptera	
Myrmica scabrinodis	Formicidae	Hymenoptera	
Lasioglossum albipes	Halictidae	Hymenoptera	
Coelioxys elongata	Megachilidae	Hymenoptera	
Osmia leaiana	Megachilidae	Hymenoptera	
Argogorytes mystaceus	Sphecidae	Hymenoptera	
Crossocerus annulipes	Sphecidae	Hymenoptera	
Crossocerus cetratus	Sphecidae	Hymenoptera	
Ectemnius cavifrons	Sphecidae	Hymenoptera	
Pemphredon lugubris	Sphecidae	Hymenoptera	
Vespa crabro	Vespidae	Hymenoptera	
Porcellio scaber	Porcellionidae	Isopoda	
Adela reamurella	Adelidae	Lepidoptera	
Agriphila straminella	Crambidae	Lepidoptera	
Chrysoteuchia culmella	Crambidae	Lepidoptera	
Erannis defoliaria	Geometridae	Lepidoptera	
Petrophora chlorosata	Geometridae	Lepidoptera	
Xanthorhoe montanata	Geometridae	Lepidoptera	
Ochlodes sylvanus	Hesperiidae	Lepidoptera	
Favonius quercus	Lycaenidae	Lepidoptera	
Polyommatus icarus	Lycaenidae	Lepidoptera	
Amphipyra pyramidea	Noctuidae	Lepidoptera	
Euclidia glyphica	Noctuidae	Lepidoptera	
Euplexia lucipara	Noctuidae	Lepidoptera	
Phalera bucephala	Notodontidae	Lepidoptera	
Aphantopus hyperantus	Nymphalidae	Lepidoptera	
Argynnis paphia	Nymphalidae	Lepidoptera	
Maniola jurtina	Nymphalidae	Lepidoptera	
Pararge aegeria	Nymphalidae	Lepidoptera	
Carcina quercana	Peleopodidae	Lepidoptera	
Acrobasis repandana	Pyralidae	Lepidoptera	
Scoparia ambigualis	Pyralidae	Lepidoptera	

Synanthedon formicaeformis	Sesiidae	Lepidoptera	Nationally Notable B
Morophaga choragella	Tineidae	Lepidoptera	
Celypha lacunana	Tortricidae	Lepidoptera	
Tortrix viridana	Tortricidae	Lepidoptera	
Lehmannia (Limax) marginatus	Limacidae	Mollusca	
Vertigo pygmaea	Vertiginidae	Mollusca	
Chorthippus parallelus	Acrididae	Orthoptera	
Raphidia maculicollis	Raphidiidae	Raphidioptera	

Pitstone Common – species list

Species	Family	Order/Group	National Conservation Status
Betulapion simile	Apionidae	Coleoptera	
Agrilus sinuatus	Buprestidae	Coleoptera	
Byturus tomentosus	Byturidae	Coleoptera	
Cantharis decipiens	Cantharidae	Coleoptera	
Malthodes marginatus	Cantharidae	Coleoptera	
Anaglyptus mysticus	Cerambycidae	Coleoptera	Nationally Notable B
Grammoptera ruficornis	Cerambycidae	Coleoptera	
Rhagium mordax	Cerambycidae	Coleoptera	
Agriotes pallidulus	Elateridae	Coleoptera	
Athous haemorrhoidalis	Elateridae	Coleoptera	
Dorcus parallelipipedus	Lucanidae	Coleoptera	
Dasytes aeratus	Melyridae	Coleoptera	
Malachius bipustulatus	Melyridae	Coleoptera	
Mordellistena abdominalis	Mordellidae	Coleoptera	
Pyrochroa coccinea	Pyrochroidae	Coleoptera	
Anaspis frontalis	Scraptiidae	Coleoptera	
Anaspis garneysi	Scraptiidae	Coleoptera	
Anaspis maculata	Scraptiidae	Coleoptera	
Forficula auricularia	Forficulidae	Dermaptera	
Bombylius major	Bombyliidae	Diptera	
Myathropa florea	Syrphidae	Diptera	
Palomena prasina	Pentatomidae	Hemiptera	
Andrena haemorrhoa	Andrenidae	Hymenoptera	
Strongylogaster multifasciata	Tenthredinidae	Hymenoptera	
Vespa crabro	Vespidae	Hymenoptera	
Petrophora chlorosata	Geometridae	Lepidoptera	
Pieris rapae	Pieridae	Lepidoptera	
Libellula depressa	Libellulidae	Odonata	

Prince's Riding (including birch woodland - part of former Ashridge Park) – species list

Species	Family	Order/Group	National Conservation Status
Diplocoelus fagi	Biphyllidae	Coleoptera	Nationally Notable B

Oxylaemus variolosus	Bothrideridae	Coleoptera	Red Data Book - Rare
Agrilus sulcicollis	Buprestidae	Coleoptera	
Cantharis nigra	Cantharidae	Coleoptera	
Cantharis rustica	Cantharidae	Coleoptera	
Malthodes minimus	Cantharidae	Coleoptera	
Podabrus alpinus	Cantharidae	Coleoptera	
Abax paralellepipedus	Carabidae	Coleoptera	
Abax parallelepipedus	Carabidae	Coleoptera	
Calathus rotundicollis	Carabidae	Coleoptera	
Carabus problematicus	Carabidae	Coleoptera	
Carabus violaceus	Carabidae	Coleoptera	
Dromius quadrimaculatus	Carabidae	Coleoptera	
Nebria brevicollis	Carabidae	Coleoptera	
Nebria salina	Carabidae	Coleoptera	
Pterostichus madidus	Carabidae	Coleoptera	
Pterostichus melanarius	Carabidae	Coleoptera	
Clytus arietis	Cerambycidae	Coleoptera	
Grammoptera ruficornis	Cerambycidae	Coleoptera	
Rhagium mordax	Cerambycidae	Coleoptera	
Rutpela maculata	Cerambycidae	Coleoptera	
Stictoleptura scutellata	Cerambycidae	Coleoptera	Nationally Notable A
Cerylon ferrugineum	Cerylonidae	Coleoptera	
Cerylon histeroides	Cerylonidae	Coleoptera	
Aphthona euphorbiae	Chrysomelidae	Coleoptera	
Bruchus rufimanus	Chrysomelidae	Coleoptera	
Longitarsus parvulus	Chrysomelidae	Coleoptera	
Cis bidentatus	Ciidae	Coleoptera	
Cis bilamellatus	Ciidae	Coleoptera	
Cis boleti	Ciidae	Coleoptera	
Cis castaneus	Ciidae	Coleoptera	
Cis festivus	Ciidae	Coleoptera	Nationally Notable B
Cis micans (hispidus)	Ciidae	Coleoptera	
Cis submicans	Ciidae	Coleoptera	
Cis vestitus	Ciidae	Coleoptera	
Ennearthron cornutum	Ciidae	Coleoptera	
Clambus gibbulus	Clambidae	Coleoptera	
Clambus punctulum	Clambidae	Coleoptera	
Tillus elongatus	Cleridae	Coleoptera	Nationally Scarce
Coccinella septempunctata	Coccinellidae	Coleoptera	
Halyzia sedecimguttata	Coccinellidae	Coleoptera	
Harmonia axyridis	Coccinellidae	Coleoptera	
Atomaria nigrirostris	Cryptophagidae	Coleoptera	
Cryptophagus dentatus	Cryptophagidae	Coleoptera	
Cryptophagus distinguendus	Cryptophagidae	Coleoptera	
Cryptophagus micaceus	Cryptophagidae	Coleoptera	Red Data Book - Insufficiently known
Anthonomus pedicularius	Curculionidae	Coleoptera	
Archarius pyrrhoceras	Curculionidae	Coleoptera	
Dryocoetes villosus	Curculionidae	Coleoptera	

Euophryum confine	Curculionidae	Coleoptera	
Exomias araneiformis	Curculionidae	Coleoptera	
Exomias pellucidus	Curculionidae	Coleoptera	
Nedyus quadrimaculatus	Curculionidae	Coleoptera	
Orchestes fagi	Curculionidae	Coleoptera	
Orchestes rusci	Curculionidae	Coleoptera	
Phloeophagus lignarius	Curculionidae	Coleoptera	
Platypus cylindrus	Curculionidae	Coleoptera	Nationally Notable B
Polydrusus cervinus	Curculionidae	Coleoptera	
Scolytus intricatus	Curculionidae	Coleoptera	
Stereocorynes truncorum	Curculionidae	Coleoptera	Nationally Notable A
Strophosoma melanogrammum	Curculionidae	Coleoptera	
Taphrorychus bicolor	Curculionidae	Coleoptera	Nationally Notable A
Xyleborinus saxesenii	Curculionidae	Coleoptera	
Xyleborus monographus	Curculionidae	Coleoptera	
Anthrenus fuscus	Dermestidae	Coleoptera	
Megatoma undata	Dermestidae	Coleoptera	Nationally Scarce
Agriotes acuminatus	Elateridae	Coleoptera	
Agriotes obscurus	Elateridae	Coleoptera	
Agriotes pallidulus	Elateridae	Coleoptera	
Athous haemorrhoidalis	Elateridae	Coleoptera	
Athous villosus	Elateridae	Coleoptera	
Athous vittatus	Elateridae	Coleoptera	
Dalopius marginatus	Elateridae	Coleoptera	
Denticollis linearis	Elateridae	Coleoptera	
Hemicrepidius hirtus	Elateridae	Coleoptera	
Melanotus castanipes	Elateridae	Coleoptera	
Stenagostus rhombeus	Elateridae	Coleoptera	
Symbiotes latus	Endomychidae	Coleoptera	Nationally Notable B
Dacne bipustulata	Erotylidae	Coleoptera	
Triplax aenea	Erotylidae	Coleoptera	
Hylis olexai	Eucnemidae	Coleoptera	Red Data Book - Rare
Melasis buprestoides	Eucnemidae	Coleoptera	Nationally Notable B
Geotrupes stercorarius	Geotrupidae	Coleoptera	
Abraeus perpusillus	Histeridae	Coleoptera	
Aeletes atomarius	Histeridae	Coleoptera	Nationally Scarce
Carcinops pumilio	Histeridae	Coleoptera	
Dendrophilus punctatus	Histeridae	Coleoptera	
Margarinotus merdarius	Histeridae	Coleoptera	
Paromalus flavicornis	Histeridae	Coleoptera	
Plegaderus dissectus	Histeridae	Coleoptera	
Lampyris noctiluca	Lampyridae	Coleoptera	
Cartodere bifasciata	Latridiidae	Coleoptera	
Cartodere nodifer	Latridiidae	Coleoptera	
Corticaria alleni	Latridiidae	Coleoptera	Nationally Notable
Cortinicara gibbosa	Latridiidae	Coleoptera	
Dienerella clathrata	Latridiidae	Coleoptera	
Enicmus brevicornis	Latridiidae	Coleoptera	Nationally Notable

Enicmus fungicola	Latridiidae	Coleoptera	Nationally Notable
Enicmus histrio	Latridiidae	Coleoptera	
Enicmus rugosus	Latridiidae	Coleoptera	Nationally Notable
Enicmus testaceus	Latridiidae	Coleoptera	
Agathidium seminulum	Leiodidae	Coleoptera	
Agathidium varians	Leiodidae	Coleoptera	
Anisotoma humeralis	Leiodidae	Coleoptera	
Anisotoma orbicularis	Leiodidae	Coleoptera	
Apocatops nigrita	Leiodidae	Coleoptera	
Catops fuscus	Leiodidae	Coleoptera	
Nargus velox	Leiodidae	Coleoptera	
Nargus wilkinii	Leiodidae	Coleoptera	
Nemadus colonoides	Leiodidae	Coleoptera	
Dorcus parallelipipedus	Lucanidae	Coleoptera	
Sinodendron cylindricum	Lucanidae	Coleoptera	
Lymexylon navale	Lymexylidae	Coleoptera	Nationally Scarce
Abdera quadrifasciata	Melandryidae	Coleoptera	Nationally Scarce
Conopalpus testaceus	Melandryidae	Coleoptera	
Dasytes aeratus	Melyridae	Coleoptera	
Malachius bipustulatus	Melyridae	Coleoptera	
Rhizophagus bipustulatus	Monotomidae	Coleoptera	
Rhizophagus dispar	Monotomidae	Coleoptera	
Rhizophagus fenestralis (parvulus)	Monotomidae	Coleoptera	Red Data Book - Rare
Rhizophagus ferrugineus	Monotomidae	Coleoptera	
Rhizophagus perforatus	Monotomidae	Coleoptera	
Tomoxia bucephala	Mordellidae	Coleoptera	Nationally Scarce
Litargus connexus	Mycetophagidae	Coleoptera	
Mycetophagus atomarius	Mycetophagidae	Coleoptera	
Mycetophagus piceus	Mycetophagidae	Coleoptera	
Mycetophagus quadripustulatus	Mycetophagidae	Coleoptera	
Triphyllus bicolor	Mycetophagidae	Coleoptera	Nationally Scarce
Epuraea aestiva	Nitidulidae	Coleoptera	
Meligethes aeneus	Nitidulidae	Coleoptera	
Meligethes nigrescens	Nitidulidae	Coleoptera	
Pocadius adustus	Nitidulidae	Coleoptera	
Ischnomera cyanea	Oedemeridae	Coleoptera	
Oedemera lurida	Oedemeridae	Coleoptera	
Orsodacne cerasi	Orsodacnidae	Coleoptera	Nationally Scarce
Ptenidium gressneri	Ptilidae	Coleoptera	Nationally Notable
Pteryx suturalis	Ptilidae	Coleoptera	
Dorcatoma chrysomelina	Ptinidae	Coleoptera	
Dorcatoma flavicornis	Ptinidae	Coleoptera	Nationally Scarce
Grynobius planus	Ptinidae	Coleoptera	
Ptilinus pectinicornis	Ptinidae	Coleoptera	
Pyrochroa coccinea	Pyrochroidae	Coleoptera	
Salpingus ruficollis	Salpingidae	Coleoptera	
Melolontha melolontha	Scarabaeidae	Coleoptera	
Prionocyphon serricornis	Scirtidae	Coleoptera	

Anaspis fasciata	Scraptiidae	Coleoptera	
Anaspis frontalis	Scraptiidae	Coleoptera	
Anaspis garneysi	Scraptiidae	Coleoptera	
Anaspis lurida	Scraptiidae	Coleoptera	
Anaspis maculata	Scraptiidae	Coleoptera	
Silpha atrata	Silphidae	Coleoptera	
Aspidiphorus orbiculatus	Sphindidae	Coleoptera	
Sphindus dubius	Sphindidae	Coleoptera	Nationally Notable B
Anomognathus cuspidatus	Staphylinidae	Coleoptera	
Anotylus sculpturatus	Staphylinidae	Coleoptera	
Atrecus affinis	Staphylinidae	Coleoptera	
Bibloporus minutus	Staphylinidae	Coleoptera	Nationally Notable B
Bisnius subuliformis	Staphylinidae	Coleoptera	
Bryaxis puncticollis	Staphylinidae	Coleoptera	
Cephennium gallicum	Staphylinidae	Coleoptera	
Dropephylla ioptera	Staphylinidae	Coleoptera	
Euplectus infirmus	Staphylinidae	Coleoptera	
Euplectus karstenii	Staphylinidae	Coleoptera	
Euplectus kirbii	Staphylinidae	Coleoptera	Nationally Notable
Euplectus piceus	Staphylinidae	Coleoptera	
Gabrius splendidulus	Staphylinidae	Coleoptera	
Hypnogyra angularis	Staphylinidae	Coleoptera	Nationally Notable A
Ischnosoma splendidum	Staphylinidae	Coleoptera	
Leptusa fumida	Staphylinidae	Coleoptera	
Lordithon lunulatus	Staphylinidae	Coleoptera	
Lordithon trinotatus	Staphylinidae	Coleoptera	
Micropeplus staphylinoides	Staphylinidae	Coleoptera	
Mycetoporus longulus	Staphylinidae	Coleoptera	
Ocypus olens	Staphylinidae	Coleoptera	
Othius subuliformis	Staphylinidae	Coleoptera	
Philonthus decorus	Staphylinidae	Coleoptera	
Phloeonomus punctipennis	Staphylinidae	Coleoptera	
Proteinus brachypterus	Staphylinidae	Coleoptera	
Quedius cruentus	Staphylinidae	Coleoptera	
Quedius fumatus	Staphylinidae	Coleoptera	
Quedius mesomelinus/maurus	Staphylinidae	Coleoptera	
Quedius microps	Staphylinidae	Coleoptera	Nationally Notable B
Quedius scitus	Staphylinidae	Coleoptera	Nationally Notable B
Quedius truncicola	Staphylinidae	Coleoptera	Nationally Notable B
Quedius xanthopus	Staphylinidae	Coleoptera	Nationally Notable B
Scaphisoma agaricinum	Staphylinidae	Coleoptera	
Scaphisoma boleti	Staphylinidae	Coleoptera	Nationally Notable B
Scydmaenus rufus	Staphylinidae	Coleoptera	Red Data Book - Vulnerable
Sepedophilus lusitanicus	Staphylinidae	Coleoptera	
Stenichnus bicolor	Staphylinidae	Coleoptera	
Stenichnus collaris	Staphylinidae	Coleoptera	
Stenus clavicornis	Staphylinidae	Coleoptera	
Tachinus laticollis	Staphylinidae	Coleoptera	

Tachinus rufipes	Staphylinidae	Coleoptera	
Tachyporus chrysomelinus	Staphylinidae	Coleoptera	
Tasgius melanarius	Staphylinidae	Coleoptera	
Tasgius morsitans	Staphylinidae	Coleoptera	
Thamiaraea cinnamomea	Staphylinidae	Coleoptera	
Diaperis boleti	Tenebrionidae	Coleoptera	Nationally Scarce
Nalassus laevioctostriatus	Tenebrionidae	Coleoptera	
Prionychus ater	Tenebrionidae	Coleoptera	
Trixagus dermestoides	Throscidae	Coleoptera	
Bitoma crenata	Zopheridae	Coleoptera	
Synchita humeralis	Zopheridae	Coleoptera	Nationally Scarce
Synchita variegata	Zopheridae	Coleoptera	Nationally Scarce
Forficula auricularia	Forficulidae	Dermaptera	
Glomeris marginata	Glomeridae	Diplopoda	
Sylvicola cinctus/fenestralis	Anisopodidae	Diptera	
Sylvicola fenestralis	Anisopodidae	Diptera	
Dioctria linearis	Asilidae	Diptera	
Dioctria rufipes	Asilidae	Diptera	
Bombylius major	Bombylidae	Diptera	
Ditomyia fasciata	Ditomyiidae	Diptera	Nationally Scarce
Neurigona quadrifasciata	Dolichopodidae	Diptera	
Cerotelion striatum	Keroplatidae	Diptera	
Macrocera fasciata	Keroplatidae	Diptera	
Orfelia fasciata	Keroplatidae	Diptera	
Platyura marginata	Keroplatidae	Diptera	
Austrolimnophila ochracea	Limoniidae	Diptera	
Neolimonia dumetorum	Limoniidae	Diptera	
Mycetophila marginata	Mycetophilidae	Diptera	
Stigmatomeria crassicornis	Mycetophilidae	Diptera	
Tetragoneura sylvatica	Mycetophilidae	Diptera	
Ula mollissima	Pediciidae	Diptera	
Chrysopilus laetus	Rhagionidae	Diptera	Nationally Scarce
Rhagio lineola	Rhagionidae	Diptera	
Rhagio scolopacea	Rhagionidae	Diptera	
Pherbellia annulipes	Sciomyzidae	Diptera	Nationally Notable B
Brachyopa pilosa	Syrphidae	Diptera	Nationally Scarce
Brachypalpoides lenta	Syrphidae	Diptera	
Chalcosyrphus nemorum	Syrphidae	Diptera	
Criorhina berberina	Syrphidae	Diptera	
Criorhina ranunculi	Syrphidae	Diptera	
Helophilus pendulus	Syrphidae	Diptera	
Myathropa florea	Syrphidae	Diptera	
Pocota personata	Syrphidae	Diptera	Nationally Scarce
Pyrophaena rosarum	Syrphidae	Diptera	
Sericomyia silentis	Syrphidae	Diptera	
Xylota segnis	Syrphidae	Diptera	
Xylota sylvarum	Syrphidae	Diptera	
Tabanus bromius	Tabanidae	Diptera	

Limonia nubeculosa	Tipulidae	Diptera	
Tipula maxima	Tipulidae	Diptera	
Aradus depressus	Aradidae	Hemiptera	
Cixius nervosus	Cixiidae	Hemiptera	
Ditropis pteridis	Delphacidae	Hemiptera	
Drymus brunneus	Lygaeidae	Hemiptera	
Drymus sylvaticus	Lygaeidae	Hemiptera	
Peritrechus geniculatus	Lygaeidae	Hemiptera	
Loricula elegantula	Microphysidae	Hemiptera	
Capsus ater	Miridae	Hemiptera	
Dryophilocoris flavoquadrimaculatus	Miridae	Hemiptera	
Kleidocerys resedae	Miridae	Hemiptera	
Leptopterna dolabrata	Miridae	Hemiptera	
Phylus melanocephalus	Miridae	Hemiptera	
Rhabdomiris striatellus	Miridae	Hemiptera	
Himacerus apterus	Nabidae	Hemiptera	
Elasmostethus interstinctus	Pentatomidae	Hemiptera	
Elasmucha grisea	Pentatomidae	Hemiptera	
Pentatoma rufipes	Pentatomidae	Hemiptera	
Andrena bucephala	Andrenidae	Hymenoptera	Nationally Notable B
Andrena cineraria	Andrenidae	Hymenoptera	
Andrena haemorrhoa	Andrenidae	Hymenoptera	
Bombus hypnorum	Apidae	Hymenoptera	
Bombus lucorum	Apidae	Hymenoptera	
Bombus pratorum	Apidae	Hymenoptera	
Chrysis impressa	Chrysidae	Hymenoptera	
Formica fusca	Formicidae	Hymenoptera	
Lasius brunneus	Formicidae	Hymenoptera	Nationally Notable A
Myrmecina graminicola	Formicidae	Hymenoptera	
Myrmica ruginodis	Formicidae	Hymenoptera	
Lasioglossum villosulum	Halictidae	Hymenoptera	
Chelostoma florisomne	Megachilidae	Hymenoptera	
Dipogon subintermedius	Pompilidae	Hymenoptera	
Crossocerus annulipes	Sphecidae	Hymenoptera	
Crossocerus cetratus	Sphecidae	Hymenoptera	
Crossocerus pusillus	Sphecidae	Hymenoptera	
Ectemnius cavifrons	Sphecidae	Hymenoptera	
Lindenius panzeri	Sphecidae	Hymenoptera	
Pemphredon lugubris	Sphecidae	Hymenoptera	
Spilomena troglodytes	Sphecidae	Hymenoptera	
Trypoxylon attenuatum	Sphecidae	Hymenoptera	
Strongylogaster multifasciata	Tenthredinidae	Hymenoptera	
Vespa crabro	Vespidae	Hymenoptera	
Vespula germanica	Vespidae	Hymenoptera	
Vespula vulgaris	Vespidae	Hymenoptera	
Xiphydria camelus	Xiphydridae	Hymenoptera	
Oniscus asellus	Oniscidae	Isopoda	
Philoscia muscorum	Philosciidae	Isopoda	

Porcellio scaber	Porcellionidae	Isopoda
Adela reamurella	Adelidae	Lepidoptera
Chrysoteuchia culmella	Crambidae	Lepidoptera
Ochlodes sylvanus	Hesperiidae	Lepidoptera
Amphipyra berbera svenssoni	Noctuidae	Lepidoptera
Amphipyra pyramidea	Noctuidae	Lepidoptera
Cosmia trapezina	Noctuidae	Lepidoptera
Noctua pronuba	Noctuidae	Lepidoptera
Argynnis paphia	Nymphalidae	Lepidoptera
Maniola jurtina	Nymphalidae	Lepidoptera
Pararge aegeria	Nymphalidae	Lepidoptera
Polygonia c-album	Nymphalidae	Lepidoptera
Esperia sulphurella	Oecophoridae	Lepidoptera
Panorpa cognata	Panorpidae	Mecoptera
Lehmannia (Limax) marginatus	Limacidae	Mollusca
Anelasmocephalus cambridgei	Trogulidae	Opiliones

APPENDIX 5 SPECIES CONSERVATION STATUS CATEGORY DEFINITIONS

VERSION 1

GB RARITY CATEGORIES

The Red Data Book categories were used by Shirt (1987) and the Nationally Notable categories used in various species reviews such as Hyman & Parsons (1992).

Red Data Book category 1 – Endangered (RDB1)

Definition Taxa in danger of extinction and whose survival is unlikely if causal factors continue operating.

Included are those taxa whose numbers have been reduced to a critical level or whose habitats have been so dramatically reduced that they are deemed to be in immediate danger of extinction. Also included are *some* taxa that are *possibly* extinct.

Criteria Species, which are known *or believed to occur* as only a single population within one hectad (10km square)of the National Grid.

Species, which only occur in habitats known to be especially vulnerable.

Species, which have shown a rapid or continuous decline over the last twenty years and are now *estimated* to exist in five or fewer hectads.

Species which are *possibly* extinct *but have been recorded this century* and if rediscovered would need protection.

Red Data Book category 2 – Vulnerable (RDB2)

Definition Taxa *believed* likely to move into the Endangered category in the near future if the causal factors continue operating.

Included are taxa of which most or all of the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously depleted and whose ultimate security is not yet assured; and taxa with populations that are still abundant but are under threat from serious adverse factors throughout their range.

Criteria Species declining throughout their range.

Species in vulnerable habitats.

Red Data Book category 3 – Rare (RDB3)

Definition Taxa with small populations that are not at present Endangered or Vulnerable, but are at risk.

These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range.

Criterion Species which are *estimated to exist* in only fifteen or fewer hectads. *This criterion may be relaxed where populations are likely to exist in over fifteen hectads but occupy small areas of especially vulnerable habitat.*

Red Data Book category I - Indeterminate (RDBi)

Definition Taxa considered to be Endangered, Vulnerable or Rare in Great Britain, but where there is not enough information to say which of the three categories (RDB 1 to 3) is appropriate.

Red Data Book category K - Insufficiently Known (RDBk)

Definition Taxa that are suspected, but not definitely known, to belong to any of the above categories, because of lack of information.

Criteria Taxa recently discovered or recognised in Britain, which may prove to be more widespread in the future.

Taxa with very few or perhaps only a single known locality but which belong to poorly recorded or taxonomically difficult groups.

Species known from very few localities but which occur in inaccessible habitats or habitats which are seldom sampled.

Species with very few or perhaps only a single known locality and of questionable native status, but not clearly falling into the category of recent colonist, vagrant or introduction.

Nationally Notable category A (Na)

Definition Taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and are thought to occur in 30 or fewer hectads of the National Grid or, for less well-recorded groups, within seven or fewer vice-counties.

Nationally Notable category B (Nb)

Definition Taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and are thought to occur in between 31 and 100 hectads of the National Grid or, for less-well recorded groups, between eight and twenty vice-counties.

Nationally Notable (N)

Definition Species, which are estimated, to occur in 16 to 100 hectads in Great Britain. The subdividing of this category into categories A and B has not been attempted for a few species mentioned in this review.

Local

Definition Species which are not sufficiently scarce to include in the above categories, but which are of localised occurrence and often restricted to particular habitats.

Common

Definition Common and usually widely distributed species.

VERSION 2

More recent Species Reviews have employed International Union for Conservation of Nature IUCN Threat Criteria (IUCN, 2001) as well as re-assessing the GB Rarity Categories of species.

IUCN THREAT CATEGORIES

REGIONALLY EXTINCT (RE)
A taxon is Extinct when there is no reasonable doubt that the last individual has died. The last date for a record is set at fifty years before publication.

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when the best available evidence indicates that it is facing an extremely high risk of extinction in the wild. .

ENDANGERED (EN)
A taxon is Endangered when the best available evidence indicates that it is facing a very high risk of extinction in the wild.

VULNERABLE (VU)
A taxon is Vulnerable when the best available evidence indicates that it is facing a high risk of extinction in the wild. .

NEAR THREATENED (NT)
A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)
A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate.

NOT EVALUATED (NE)
A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

NOT APPLICABLE (NA)
Taxa deemed to be ineligible for assessment at a regional level because they are not wild populations or not within their natural range in the region, or non-natives (whether this is the result of accidental or deliberate importation), or because they are vagrants. A taxon may also be NA because it occurs at very low numbers in the region (i.e. when the regional Red List authority has decided to use a “filter” to exclude taxa before the assessment procedure) or the taxon may be classified at a lower taxonomic level (e.g. below the level of species or subspecies) than considered eligible by the regional Red List authority.

REVIEWED GB RARITY CATEGORIES

At the national level, countries are permitted under the IUCN guidelines to refine the definitions for the non-threatened categories and to define additional ones of their own. The Nationally Rare and Nationally Scarce categories adopted by this Review are unique to Britain. Broadly speaking, the

Nationally Rare category is equivalent to the Red Data Book categories used by Hyman (revised Parsons) (1992, 1994), namely: Endangered (RDB1), Vulnerable (RDB2), Rare (RDB3), Insufficiently Known (RDBK), Indeterminate (RDBI) and Extinct. The Nationally Scarce category is directly equivalent to the combined Nationally Notable A (Na) and Nationally Notable B (Nb) categories used in the assessment of various taxonomic groups.

Nationally Rare (NR) A native species recorded from between 1- 15 hectads of the Ordnance Survey national grid in Great Britain since 1990 and: • There is reasonable confidence that exhaustive recording would not find them in more than 15 hectads. • Where it is believed to occur as a breeding species within each of these hectads (i.e. discount those that are known to contain only casual immigrants). This category includes species that are possibly extinct, such as those in the CR (PE) category, but not those where there is confidence that they are regionally extinct (RE).

Nationally Scarce (NS) A native species recorded from between 16 - 100 hectads of the Ordnance Survey national grid in Great Britain since 1990 and: • There is reasonable confidence that exhaustive recording would not find them in more than 100 hectads. Where it is believed to occur as a breeding species within each of these hectads (i.e. discount those that are known to contain only casual immigrants).