

**The saproxylic invertebrate fauna of
selected Wye Gorge sites with
Cosnard's Net-winged Beetle
Erotides cosnardi (Coleoptera:
Lycidae)**

**Flight interception trapping surveys
during 2021**

**A contract survey commissioned by Buglife
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Cosnard's net-winged beetle at Little Doward in 2018

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SUMMARY

Continuing research into the status, ecology and conservation of Cosnard's net-winged beetle *Erotides cosnardi* in the Wye Gorge has provided an opportunity to assess the overall quality of the saproxylic invertebrate fauna of the old growth beech habitat of the Little Doward and neighbouring sites. Little Doward has now been shown to be of special national significance for both saproxylic Coleoptera and Diptera. The Index of Ecological Continuity (IEC) is now a minimum figure of 45, placing Little Doward amongst the top 50 British sites for saproxylic beetles. Two Species of Principal Importance - under Section 41 of the 2006 NERC Act - are now known to be present: the Giant wood-gnat *Neoempheria lineola* as well as Cosnard's net-winged beetle. The beetle has Endangered status in Britain and the wood-gnat is one of a remarkable six species of Diptera with Vulnerable status found here in 2021.

Cosnard's net-winged beetle is only currently known in Britain from two areas: the Wye Gorge (Monmouthshire, Gloucestershire & Herefordshire) and the South Downs (West Sussex & Hampshire). A project to establish improved understanding of its ecology and conservation management requirements has been initiated by the Species Recovery Trust (SRT) in the Wye Gorge and has received additional funding from Buglife as part of the 'Back from the Brink' Heritage Lottery Fund project.

Until recently the species was known from just a very few casual observations of individual beetles at rest amongst ground vegetation. The SRT project has now shown that males gather at selected lekking arenas to attract females for mating. Two such arenas have been observed. The first was a freshly sawn stump of goat willow on the edge of Highbury Wood NNR and was observed over a period of three weeks. The second was an older sawn section of a large beech trunk in a glade on Little Doward but was only in use for a single day.

The Woodland Trust property at Little Doward (Herefordshire) is the only British site where the beetle has been observed over a period of years. It was therefore selected as the main focus for a study with two key aims: (i) learning more about the saproxylic (wood-decay) habitat being used by the beetle larvae, and (ii) trying to find a reliable means of monitoring population levels.

A transect of ten flight interception traps was operated across the old beech areas of Little Doward throughout the 2021 field season and including the area where the beetle has been observed on three occasions in recent years. Two traps each were also operated at four other locations including the three where *cosnardi* has been observed in the past: Cadora Woods (Woodland Trust), Rodge Wood (Forestry England) and Highbury Wood NNR (Natural England) in Gloucestershire and Reddings Inclosure (FE) in Monmouthshire. Rodge Wood is the only one of these where *cosnardi* has not been reported but lies closely adjacent to Reddings Inclosure.

Despite this extensive survey effort only a single *cosnardi* was found in 2021. It was observed close to a large dead beech trunk in a glade in an area of Little Doward where the species has not previously been found. This trunk had a flight interception trap in place but the beetle was observed on beech leaf litter close by. This observation demonstrates that the beetle was active in the study area but that 10 flight interception traps were insufficient on this occasion to detect that activity.

The failure to catch any *cosnardi* in the traps was unexpected – it has previously been found by flight interception trapping in Piercefield Woods, Monmouthshire and at two sites in France. It may be that a larger scale trapping exercise is necessary to guarantee catches and a trapping scale of the order of 50 -100 traps is suggested. This would be a substantial undertaking.

Overall saproxylic invertebrate fauna

The trapping exercise has found a remarkably rich and varied saproxylic fauna associated with the old growth beech of Little Doward including a remarkably broad range of British Red List and Nationally Scarce species. The flight traps resulted in the capture of 11 British Red List species and 35 species with Nationally Rare or Scarce status. Little Doward has now been shown to be amongst the richest British sites for saproxylics. The outstanding discoveries have been amongst the saproxylic Diptera, with Giant wood-gnat the greatest surprise – it is best-known from the New Forest and has only ever been confirmed once elsewhere, at a site in the Cotswolds. The other Red List Vulnerable species found are *Madiza britannica* (Milichiidae), *Neoplatyura biumbrata* (Mycetophilidae), *Odinia hendeli* (Odiniidae), *Periscelis winnertzi* (Periscelididae) and *Rhipidia ctenophora* (Limoniidae). This is the only presently confirmed British locality for the *Periscelis*.

The other four sites were found to be less rich in saproxylics overall. Cadora Woods were already known to be relatively species rich in saproxylic beetles and the IEC value has now reached 23 – of regional West Midlands significance - in comparison with Little Doward's 45. All four of the other study sites produced a small number of saproxylic species with conservation status and including a few species not yet known from Little Doward. The Nationally Rare beetle *Stenichnus godarti* is an important find in Rodge Wood as is *Aulonothroscus brevicollis* in Highbury Wood NNR and Reddings Inclosure.

Recommendations – Cosnard's net-winged beetle

Options for the future include: i) expanding the trapping project, if sufficient funding can be achieved, and ii) returning to a focus on the lek arena sites.

The project has been approached by Bristol Zoo who are interested in developing a captive breeding programme for this endangered beetle. This would have the potential to improve our understanding of the larval ecology and enable investigation of the pheromones. The lekking behaviour appears to be the most promising way forwards, enabling the taking of mated females into captivity. It has been suggested that volunteers could be recruited to monitor potential lekking sites across the Wye Gorge area and to transfer any mated females found into the zoo collections for establishing a breeding colony.

Recommendations – Saproxylic invertebrates in general

The key factors for the conservation management of saproxylic invertebrates are: i) the age structure of the host trees, ii) the total number of host trees, and iii) the spatial arrangement of those trees. For *Erotides cosnardi* and many other rare and threatened

saproxylic invertebrates mosaic conditions are important – open sunny areas, scrubby areas, and shady areas - and a certain level dynamism of this vegetation structure is also thought to be important. A key influence on this dynamic is the presence of large herbivores – wild or domesticated - which selectively graze and browse and influence the species composition of the trees and shrubs.

Little Doward has had a long history of common grazing and this is thought to be key to its current saproxylic interests. The relatively short period of partial afforestation may have caused no significant damage and may even have contributed to the overall ecological dynamic. Restoration of some sort of grazing regime is considered to be vital to the long-term conservation of the saproxylic invertebrate fauna and the Woodland Trust are to be commended for their recognition of this factor in site management.

The other four sites may be of lesser importance individually but form part of the overall habitat mosaic provided by the Wye Valley Woodlands and the Forest of Dean landscape. It is not therefore suggested that they adopt the same approach to conservation management as Little Doward. It may be that targeting boundary areas and/or selected internal features may be an adequate contribution to the overall saproxylic landscape. Of course, grazing restoration or establishment would be beneficial at Cadora, Rodge and Reddings, but it is recognised that this option is most unlikely to be viewed favourably at these sites at the present time. Protection of boundary trees and the old pollards and veteran beeches at these sites may be adequate especially where reinforced by selection and conservation of next generation trees.

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1 INTRODUCTION

1.1 Distribution of *Erotides cosnardi*

Cosnard's net-winged beetle *Erotides cosnardi* (syn. *Platycis cosnardi*) is currently known in Britain from just two areas: the Wye Gorge and the South Downs (Alexander, 2003). Its' conservation status has been assessed as Endangered in Britain (Alexander, 2014a). The focus of its global range is Central Europe, and it appears to be rare or at least very localised throughout this range and confined to areas of ancient forest. It has not yet been assessed for the European Red List of Saproxylic Beetles but features in the Red List of all European countries known to support local populations.

Alexander (2017) provides an up-to-date review of what was then know about Cosnard's net-winged beetle *Erotides cosnardi* in the Wye Gorge. New information has subsequently been revealed about the location of the original discovery of *cosnardi* in the Wye Gorge area. Cooter (2018) reports that in correspondence with H.K. Airy Shaw in 1970 he was told that the Staunton Road property, where HKAS had found the first British specimens in 1944 (Airy Shaw, 1944), backed onto Reddings Inclosure. This fits with the York Cottage location identified as one of two potential localities in Alexander (2017). Reddings Inclosure forms the western block of Highmeadow Woods on the western edge of the Forest of Dean and which straddles the Wales/England border, with York Cottage within the Monmouthshire section.

1.2 Habitat and ecology

“Confined to old forests where it is found in trunk cavities of ancient *Fagus*” (Speight, 1990); it is almost certainly a native species of old growth beech in Britain (Alexander, 2014a). Koch (1989) says it has a montane distribution within its central European range and this is also suggested by its British strongholds being in the deep gorge of the river Wye and the high ground of the South Downs, and its absence from the more typical lowland old growth beech of the New Forest, Savernake Forest and Windsor Forest.

The larvae are said to develop in the white-rotten heartwood within trunk cavities of old beech hulks (Speight, 1990); Koch (1989) says ‘especially beech’. No information is available on tree size or girth class. The larvae are either carnivorous or omnivorous - food is digested externally by means of enzymes secreted via the mouthparts and they only ingest liquid food (Crowson, 1981). In France (Calmont et al, 2017) the beetle has been reported as follows:

- Obtenue de cavités basses de hêtre (beech) en Forêt de Compiègne en avril et mai 2008 (N. Gouix)
- De cavité haute de frêne (ash) en Aubrac le 21 mai 2005 (H. Brustel).

This suggests that larvae develop in tree cavities, both basal and in rot-holes high up the trunk. Ash forms similar white-rotten heartwood to beech and so an ash record is not inconsistent with beech old growth.

The adults are short-lived and have been reported in the Wye Gorge active from 9th May to 14th June, possibly as late as 25th June. Lycidae are not known to feed during their short adult lives, although some seem to graze on fungal spores and a few

species with elongated mouthparts are regular flower visitors adapted to imbibing nectar (Marshall, 2018). *Erotides cosnardi* have very rarely been reported from blossom in Britain – e.g., one photographed at a flowerhead of ramsons *Allium ursinum* in Sussex but without documentation of actual feeding being observed.

The apparent five- to six-week activity period may vary from year to year, according to local weather conditions, and may be shorter in any one season. It seems likely that males emerge first, enabling some population mixing to take place prior to the emergence of the females. They are reported to fly in hot sunshine, especially in late afternoon, and have also been taken at rest amongst the field layer in shady woodland – mosaics of sun and shade may be important.

Observations made in the Wye Gorge during 2017 and 2018 have suggested that the male beetles tend to accumulate at selected deadwood features and wait for flying females to come to them for mating – a lek type of behaviour not previously described for Coleoptera other than the Timberman longhorn *Acanthocinus aedilis*, an old growth pine forest species. The males are presumably releasing pheromones into the air to attract the females. One freshly cut goat willow stump on the edge of Highbury Wood NNR was used by between 2 and 7 male beetles for an extended period in 2017 and mating was observed in late afternoon/early evening. In contrast, three males were found on a cut beech trunk section at Little Doward on one occasion only in 2018. Provision of new cut stumps and inspection of freshly cut stumps arising from H & S works (WT) as well as forestry operations (FE) across a number of sites in the Wye Gorge area in 2018 appeared not to attract any males.

Observations at Little Doward suggest that flight is weak and low. One male was seen to fly from a short-term lek stump into nearby nettles. It seemed poorly directed, poorly powered and low. However, one of the French flight trap records came from a high rot-hole but perhaps reflects the activity of the larvae prior to pupation rather than adult flight.

It is assumed to be essentially a species of ancient wood pasture conditions, although only one of the sites where it has been found is currently open to grazing other than by wild deer and wild boar (Little Doward) - possibly a key reason for its current rarity - the few surviving populations suppressed by conversion of the habitat to high forest land management structures – trees die relatively young, even shade-tolerant species, as natural retrenchment with age effectively becomes suicide under closed canopy conditions.

The Wyastone Leys Deer Park site (Little Doward) is very obviously former wood pasture and the Woodland Trust have had grazing by White Park Cattle on the main hill-fort area and part of the main old growth beech slopes. Cadora Woods are also notable for their ancient pollard trees (although scattered amongst what appears to be coppice) and the Church Grove section in particular has open-grown oaks suggestive of formerly open conditions; the historical development of this area remains unclear, but the Woodland Trust appear to be promoting high forest style management here - which is not conducive to creating the suspected habitat requirements of rot-holes formed by loss of large lateral limbs.

It may be that sites such as Cadora Woods and Highbury Wood NNR provide very sparse habitat, with just a few suitable trees with heartwood-decay amongst large areas of unsuitably young and dense woodland. The beetles would need to be able to assemble somehow for mating, hence their attraction to recently cut stumps as arenas. But Little Doward potentially provides more suitable habitat conditions, with large old beeches relatively frequent across the steep slopes.

1.3 Objectives

Alexander (2014a) identified an urgent need for: i) targeted survey of remaining old beech stands in the Wye Valley & the old Arundel Forest area of the South Downs; ii) assessment of the extent and condition of old beech stands in these areas; iii) identification of the key conservation management requirements; and iv) establishment of monitoring protocols for old beech trees, to identify population trends in known sites.

The current Species Recovery Trust led project has been tackling these topics (Alexander, 2017). The HLS funded ‘Back from the Brink’ project organised by Plantlife and Buglife has provided additional funding and the 2021 work in the Wye Gorge has focused on the use of flight interception trapping to identify potential host trees and their important saproxylic features while at the same time field trialling of trapping as a potential monitoring methodology.

2 METHODOLOGY & SITE DETAILS

2.1 Sampling

The aim of the 2021 survey work was to target potential larval habitat by placing a series of flight interception traps on trees which appeared to offer potentially suitable larval habitat with the aim of capturing a sample of the emerging adult beetles. If sufficient adults were captured, then the methodology might prove useful for long-term monitoring of adult abundance.

The flight interception traps used are of a standardised construction:

- four 2l plastic drinks bottles, with windows cut in sides, and bases bolted onto a plastic base, the windows facing outwards.
- the base is then hung either within hollow tree trunks or by trunk cavities and/or decay using baler twine, with bottles hanging upside down beneath.
- The upside-down bottle tops are filled with preservative solution (propylene glycol 50/50 with tap-water, plus a little washing up liquid to reduce surface tension) which can then be drained through the plastic cap for sample collection.

The traps were placed on trees showing a range of different saproxylic situations:

- Standing dead beech hulks in sunny glades.
- Standing dead beech in shade.
- Rot holes formed where lateral branches had been lost.
- Recent tear from loss of lateral branch exposing hollow cavity.
- Basal rot arising from physical damage to trunk bases.

- Top rot where the high canopy or major boughs had been lost and decay was progressing in the top of the trunk.
- Hollow standing trunks or stumps.

The height at which the traps were placed to target the rot features was also noted. The recorded measurement was the distance between the ground surface below and the bottle cap.

Five sites were selected for trapping. The emphasis of the work was targeted on Little Doward (SO5315; 10 traps) as this is the only British site where *E. cosnardi* has been found on more than one occasion (2004, 2015 and 2019). Samples were also taken from the following sites (two traps each):

- Cadora Woods (SO5307), where single specimens were found in two separate locations in 2002 (Kirby, 2002)
- Highbury Wood NNR (SO5408), where the long-term lek of male beetles was found in 2016 (Alexander, 2016)
- Reddings Inclosure (SO5313), close to where the original discovery of *E. cosnardi* was made in 1944 (Airy Shaw, 1944)
- Rodge Wood (SO5412), which is a beech site close to the original Reddings Inclosure locality.

The traps were placed in April (19, 20 & 21) and checked and emptied in May (26 & 27), June (16, 17 & 18), July (6 & 7), August (8, 9 & 10), September (17, 18 & 19) and October (18 & 19)/November (12 & 14) - each run during the flight period was of 3 weeks only. The relatively short duration was primarily to ensure that should large numbers of beetles be caught in any one trap that trap could be closed to avoid unnecessary mortality of such a rare beetle.

The catches were rough sorted under a microscope to check for *E. cosnardi* and some preliminary identification made of the more obvious amongst the other species present. The bulk of the samples were then identified during the autumn and winter months. Diptera were identified by Peter Chandler and the rest by the writer.

2.2 Little Doward

The Doward is a special place for its intricate landscape comprising networks of old lanes and pathways, small fields, traditional orchards and woodland. It forms an expanse of high limestone geology in a large loop of the river Wye. Little Doward is an isolated hillock on the east side, rising to 221m. Originally used as common wood pasture it was enclosed as a deer park by the owner of Wyastone Leys. Peterken (2008) says it was common land until 1833. Sanderson (1999) states that deer were introduced between 1855 and 1860; he comments that the picture emerging of the creation of the park is of its purchase by a wealthy self-made industrialist with the intention of turning an already attractive pasture woodland into an ornamental park in the picturesque style. Conversion to commercial forestry plantations took place in the 1950s and 1960s. It was subsequently acquired by the Woodland Trust who have been actively managing it, including clearance of the conifer plantations and restoration of cattle grazing on the hill fort and adjacent areas.

For most of its documented history therefore Little Doward has primarily been an area of old growth beech wood pasture - with areas of oak and some ash and other native trees and shrubs. The short period of afforestation can be considered part of its fluctuating dynamic and not necessarily a bad thing for saproxylic conservation – fluctuating dynamics are thought to be an important part of a site’s ecology and are preferable to aiming for long-term stability of land management. Little Doward is of considerable botanical interest for its rare whitebeam species and its limestone ground flora and it is for this reason that part of the site was designated as the Little Doward Cliffs SSSI by the Nature Conservancy Council. A larger part of the site was later incorporated into the Upper Wye Gorge SSSI after 1986 (Sanderson, 1999). The area was eventually acquired by the Woodland Trust and conservation management initiated.

The Woodland Trust have mapped most of the veteran trees on Little Doward and have documented a total of 142 trees. The beech comprise 95 of these veteran trees and include examples classified as maidens, pollards, natural pollards, multi-stems, old coppice stools, etc. The maidens range from girths of 2.58m to 6.13m of which 16 have girths greater than 4.5m. Six beech pollards range from 2.74 to 6.95m including 2 greater than 4.5m girth. Six more beech were regarded as having natural pollard form and these range from 3.52 to 7.85m including 5 in the larger category. This makes a total of 23 beech trunks greater than 4.5m girth. Eight of the trees were assessed to be ancient, including 4 beech, 2 hawthorn, 1 field maple and one hazel. The lane network of The Doward also has old beeches along the hedge banks and so extends the old growth beech habitat to landscape scale. The tree population therefore readily meets JNCC’s currently requirements for SSSI designation in its own right.

The original intention had been to set out a transect of traps across the upper southern slopes, from the area where there had been a cluster of observations of *cosnardi* towards the south-eastern end of the hill fort, and then westwards. However, the reality of the erratic availability of veteran beech trees suitable for trapping made this impossible. Four traps were therefore placed around the area where the beetle had been seen in the past and six in an area with a large concentration of veteran beech on the slopes to the SW of the hill fort. The two groupings of traps were about 250m apart.

Table 1 Details of the various veteran beeches selected for trapping

Trap Number	Height of trap (m)	GPS reading	Girth (m)	Description
1	1.9	53662 15851	4.53	live beech with large cavity on west side caused by ripped out major branch
2	2.45	53609 15975	2.84	live beech with top mostly collapsed; crown with decaying leaves & other debris
3	2.7	53645 15950	3.79	standing dead hulk with <i>Ganoderma australe</i>
4	0.67	53659 15917	2.32	hollow stump with collapsed top in situ; <i>Ganoderma australe</i> brackets; original, undecayed, trunk would have been about 4m girth

Trap Number	Height of trap (m)	GPS reading	Girth (m)	Description
5	2.55	53680 15899	2.86	branch scar rot-hole in live trunk; dry but hollow interior beyond
6	2.2	53736 15890	3.68	large lateral branch ripped out live tree, so tears, cavity and some wood mould
7	0.96	53962 15855	3.48	standing dead hulk in open sunny area; <i>E cosnardi</i> close by in 2015
8	0.55	54071 15811	1.84	standing dead hulk in deep shade; <i>Ustulina deusta</i> in base
9	0.37	54082 15746	2.31	live beech with vertical low break in bark on north side, with shallow cavity leading upwards into a large hollow cavity
10	0.34	54060 15750	2.17	much as above but more advanced decay stage and old <i>Polyporus squamosus</i> bracket

Limited observations were possible on the wood-decay fungi of Little Doward but it appeared that species-richness is not great. Only two common and widespread species of conventional bracket fungus were noted: *Ganoderma australe* and *Polyporus squamosus*. *Ustulina deusta* was also present on many of the veteran beeches. These three species are all important contributors to saproxylic habitat for the invertebrates.

2.3 Cadora Woods

The history of what the Woodland Trust refer to as Cadora Woods appears to be poorly documented. The predominance of ‘grove’ names to the various sections suggests recent establishment of enclosed woodland. An obvious drove road links Coxbury Farm with the steep slopes, fanning out somewhat towards the woods, implying that livestock were driven out onto the slopes in the past which implies a wood pasture style of management. By the time they were acquired by the Woodland Trust they had been established as plantation woodlands although some sections retain mature oak trees of open-grown form. Peterken (2008) refers to ‘coppices’ in Cadora Woods between 1709 and 1738, and also refers to them as ‘ancient coppices’, although converted to conifer plantation about 1970. The land-use history is therefore complex and perhaps a mosaic of temporarily enclosed coppices within rough wood pasture may be presumed, varying over time and space.

Veteran beech trees are currently notably scarce throughout and only three with suitable habitat features could readily be found, even with the help provided by the Ancient Tree Inventory record. The northernmost selected for trapping is within the area shown by the Ordnance Survey mapping as within Upper Great Grove, the southernmost in Bowen’s Grove. The third veteran beech (Ancient Tree Inventory number 113531) was not trapped as a blackbird was found to be nesting in it.

Table 2 Details of the veteran beeches selected for trapping

Trap code	Height of trap	GPS reading	Girth (m)	Description
north	1.55	53435 08020	3.36	vertical slit in live trunk with small hole giving access to hollow interior; higher cavity colonised by wild honey bees later in season
south	1.4	53752 07509	3.51	low split on upper east side (trap location) & basal decay cavity on west side; Lachbacher tag 03803; aluminium oval tag 6962

2.4 Highbury Wood NNR

Highbury Wood is a typical example of an ancient woodland with a long history of management as coppice. An unusual feature is a strip of ancient beech and yew along the central ridge and a few large beech trees were noted scattered elsewhere at the margins. The coppice is dominated by small-leaved lime, ash and hazel and superficially appears completely unsuitable for *cosnardi*, based on current understanding of its ecology – however the discovery of the permanent lek site in 2018 has shown how little we do understand this species. Ridges of ancient beech are a feature of the Wye Valley area, such as along the ridge of Fiddler’s Elbow to the north.

Offa’s Dyke Path long-distance trail runs along the central ridge and so most of the beeches appearing suitable for trapping were not used due to concerns about the high potential for interference by passing visitors. Fortunately, the trail is diverted away from the ridge towards the southern end which meant that a trap could be safely positioned here. No other suitable beech trees could be found and so a sycamore was selected as an alternative. It stands at the lower wood edge and alongside a cut-over wayleave for overhead telephone cables. This sycamore is a multi-stemmed tree which has had one of three main stems sawn off and removed in the recent past, leaving a hollow, horizontal sawn platform similar in general appearance to that used by *cosnardi* as a gathering place in 2017. It was therefore identified as a potential attraction to *cosnardi*. The trap was suspended in the hollow cavity of the sawn stump, to limit the potential for attracted *cosnardi* to be trapped in damaging numbers.

Table 3 Details of the veteran trees selected for trapping

Trap code	Height of trap	GPS reading	Girth (m)	Description
beech	1.65	53751 08347	2.17	standing dead hulk in semi-shade; trunk in very advanced stage of decay
sycamore	<0.1	54160 09210		hollow stump; larger live branch of 1.43m girth

2.5 Rodge Wood

Rodge Wood lies on the western edge of the Forest of Dean and is managed by Forestry England. It occupies an area of gentle north-facing slope above the Staunton Road, between Staunton village and York Cottage – the location of the 1944 discovery of *Erotides cosnardi*. The lower slopes appear to be largely semi-natural in character and include old beech coppice stools and singled beech with old coppice stool features as well as large mature beech. The upper slopes have been clear-felled and planted up with conifers in the recent past but are currently open.

Table 4 Details of the veteran beeches selected for trapping

Trap code	Height of trap	GPS reading	Girth (m)	Description
east	0.93	54272 12575	1.72	single coppice with at least 3 decayed stubs
west	1.25	54018 12388	3.49	maiden with vertical slit to white-rotten interior

2.6 Reddings Inclosure

Reddings Inclosure is of a high forest nature today although Peterken (2008) says that the Highmeadow Woods area was formerly open farmland that was extensively planted up. It is unclear to what extent Highmeadow Woods incorporated existing stands of woodland or wood pasture. The area south of the Staunton Road and adjacent to York Cottage was mature beech and oak when felled in the 1940s (Airy Shaw, 1944) and is today a maturing stand of almost pure beech, presumably planted and subsequently thinned. The strip immediately on the north side of the road includes stands of mature oak with a few beech, presumably also the result of planting but much older. The ground flora and shrub layer suggest the native woodland on these soils would have been of an ash, field maple, wych elm and hazel composition rather than beech.

Only a single large veteran beech suitable for trapping could be found. A second trap was therefore placed on a veteran field maple, as an example of another native broad-leaved tree which is likely to be developing similar white-rot habitats.

Table 5 Details of the veteran trees selected for trapping

Trap code	Height of trap	GPS reading	Girth (m)	Description
beech	1.65	52998 13350	4.48	very gnarled base & fruiting <i>Ganoderma australe</i> ; trap placed over scar of lost lateral branch
field maple	1.95	53003 13436	1.47	small trunk cavities and dead branches

2.7 Analysis using IEC and SQI

Two systems currently exist for assessing site quality and site condition for saproxylic invertebrates. Both rely entirely on saproxylic beetles as knowledge of other saproxylic groups is currently insufficient for parallel schemes to have been developed.

The **Index of Ecological Continuity** has been used to identify Britain's most important sites for the saproxylic invertebrates of ancient and veteran trees at wood-pasture and parkland type habitats – Britain's equivalent of 'old growth' - and a hierarchical site table has been developed. The Index calculation is based on the presence or absence of a select list of beetle species (revised by Alexander, 2004). The species are graded according to their degree of association with Britain's remaining areas of old growth – mainly the ancient wood pastures and historic parklands - and these grades are used as the basis for a scoring system. The total of these scores provides the Index.

The species in the qualifying list include many which are difficult to find on demand and so the Index is best built up over a number of years. Records from earlier recording therefore contribute to the Index. A control on old records is however imposed, with only post-1950 records being used in the calculation. Experience has suggested that sites of national importance have an IEC in the range of 25-80 while IEC values of 15-24 are of regional importance (Alexander, 2004). Sites in excess of 80 are considered to be of European significance.

The cumulative nature of the IEC means that the figure at any one time is a minimum figure and the Index can only increase as previously overlooked species are revealed. This means that, while it is a strong system for identifying site quality, it is not suitable for long-term site condition monitoring.

The **Saproxylic Quality Index** (Fowles et al, 1999) is designed to take the whole saproxylic beetle fauna into account and to include some control of recording effort. The species are scored according to the level of their national status and on a geometric scale – from 1 point for common species through to 32 points for the rarest. The total of these scores is termed the Saproxylic Quality Score and the Saproxylic Quality Index is calculated by dividing this score by the number of qualifying saproxylic species recorded and then multiplying the result by one hundred. The species list of qualifying beetles omits non-native species; it was based on a provisional listing available at the time which was incomplete and so a few native species have also been left unscored.

The SQI calculation has certain provisos:

- a threshold of 40 qualifying species have been recorded from the site.
- the list should be complete, i.e., include all qualifying species recorded during surveys.
- the same attention should have been applied to recording common species as rare ones.

The SQI approach is of particular use in comparing a series of datasets from a single site (Alexander, 2014). This makes it the best option of the two schemes for site condition monitoring. In contrast, the IEC provides the better guide to continuity of old growth conditions.

3 RESULTS

3.1 Weather impacts

Although most field seasons have features which are judged exceptional, unusual or difficult by field entomologists, 2021 was certainly outstanding in this respect. A cold dry April was followed by a cold wet and stormy May. The May storms caused some loss of samples, especially from traps 7-10 on Little Doward but also at Cadora and possibly elsewhere through flooding of the samples. May was unseasonably cool and wet and will have resulted in depressed catches irrespective. Windstorms have been unusual during the summer months in the past but are becoming increasingly a feature and increasingly strong and wet due to human-induced climate change. One impact has been the increasing need to develop stronger ways of attaching and stabilising flight interception traps. Despite the difficult conditions, a single *E. cosnardi* was observed during the first sample gathering visit on May 26th which is within the normal flight period of the species in the Wye Gorge.

3.2 *Erotides cosnardi* recording in 2021

No *Erotides cosnardi* were taken by any of the 18 traps across the five study sites but a single specimen was observed on beech leaf litter close to Trap 3 at Little Doward, a standing dead beech hulk in a sunny glade. Trap 3 is in a very different area of Little Doward, well away from the area where the three previous observations have been made. Both areas where *cosnardi* has now been found are relatively open to sunshine and well-sheltered. Both include a standing dead beech hulk.

Sunshine and shelter both appear to be important features for adult activity and adult congregation but the significance of standing dead beech hulks remains unknown. It is feasible that such trees provide favourable habitat for the beetle larvae but that remains speculation at this stage – the evidence from France suggest that larvae develop in live standing trees with trunk cavities.

3.3 Other saproxylic invertebrates trapped

With the new 2021 surveys plus the earlier Kirby surveys, a total of 147 saproxylic beetle species have been found across the five sites. The total for Little Doward alone has now reached 98 saproxylic beetle species.

Forty-three of these beetle species have conservation status, comprising two Endangered species, four Nationally Rare and 37 Nationally Scarce. These are broken down for each site in Table 6. However, it should be borne in mind that Little Doward has received the most survey attention, closely followed by Cadora Woods. It seems likely therefore that the other three sites could be much richer than the current data suggests – Rodge Wood and Reddings Inclosure both produced key rarities not yet known from the other three sites.

Table 6 Relative abundance of saproxylic beetle species with conservation status from the five study sites

Site name	Endangered	Vulnerable	Nationally Rare	Nationally Scarce
Little Doward	2	0	0	27
Cadora Woods	1	0	1	17
Highbury Wood	1	0	1	5
Rodge Wood	0	0	1	3
Reddings Inclosure	0	0	1	2
Total species	2	0	4	37

One additional Nationally Scarce beetle species found on Little Doward in 2021 is not saproxylic but breeds in truffles: *Leiodes cinnamomea*.

The 23 Diptera species with conservation status found during 2021 are broken down by site and status in Table 6. The pattern is very different to that of the beetles, with greater emphasis on Red List species but this almost certainly reflects the relatively poorer understanding of the British Diptera fauna – the ecology and conservation of saproxylic species are particularly poorly understood.

Table 7 Relative abundance of saproxylic Diptera species with conservation status from the five study sites during the 2021 field season

Site name	Vulnerable	Data Deficient	Near Threatened	Nationally Rare	Nationally Scarce
Little Doward	6	2	0	0	10
Cadora Woods	1	0	0	1	3
Highbury Wood	0	0	0	1	2
Rodge Wood	0	0	0	0	2
Reddings Inclosure	1	0	1	0	2
Total species	6	2	1	1	13

Little Doward (SO5315) (Woodland Trust)

Little Doward received the most attention during the 2021 field season – with ten flight traps - and so the results here should be the fullest and most reliable. The calculated Index of Ecological Continuity for this single area has now reached a minimum of 45. This Index is of national significance and places Little Doward amongst the top 50 saproxylic beetle sites in Britain, as rich in old growth species as such well-known important sites as Petworth Park (West Sussex), Donington Park (Leicestershire) and Staverton Park (Suffolk).

Little Doward appears to be the richest section of the Wye Valley Woodlands SAC for saproxylic beetles. The highest quality beetle species found here so far are *Erotides cosnardi* (Lycidae) *Eucnemis capucina* (Eucnemidae) and *Ischnomera sanguinicollis*

(Oedmeridae), the moderate quality species including *Plegaderus dissectus* (Histeridae), *Dorcatoma dresdensis* and *D. substriata* (Ptinidae), *Enicmus rugosus* (Latridiidae), *Triphyllus bicolor* (Mycetophagidae), *Synchita variegata* (Zopheridae) and *Pseudocistela ceramboides*, (Tenebrionidae) - all found in 2021 – plus *Mesosa nebulosa* (Cerambycidae) which was reported by Kirby (2004) but not re-found in 2021.

Overall, 96 species of beetle were taken by the traps of which 66 are saproxylic species; 25 of these have current conservation status, comprising two species which have Endangered status and 23 with Nationally Scarce status. Three of these were originally found here by Kirby (2004) but most of the species with conservation status at the time of the Kirby survey have since been downgraded by modern reviews. Taking into account more recent recording the total of Nationally Scarce saproxylic beetles now known from Little Doward is 29 species.

The other beetle currently with Endangered status – other than *Erotides cosnardi* – is the false click beetle *Eucnemis capucina*. Its status is however long overdue for review and is likely to be downgraded to Nationally Scarce in due course. The Endangered status was based on the species only being known at the time (Hyman, 1992) from Windsor Forest and the New Forest, but a third population has recently been discovered in the Severn catchment area where the beetle has been found at about ten different localities. The beetle develops in white-rotten heartwood in large old open-grown broad-leaved trees and it was found at three of the ten trees with traps on Little Doward. This site clearly supports a large population of this rare and elusive species.

The records for beetle species with conservation status are detailed in Table 8.

Table 8 Saproxylic beetle species with conservation status known from Little Doward

Beetle species	GB status	Date & Source	2021 Locations
<i>Erotides cosnardi</i> (Lycidae)	Endangered (Alexander, 2014a)	2021 2018 KNAA 2015 M Telfer 2004 P Kirby	one alongside trap 3
<i>Eucnemis capucina</i> (Eucnemidae)	Endangered (Hyman, 1992)	2021	Traps 2, 9 & 10
<i>Diplocoelus fagi</i> (Biphyllidae)	Nationally Scarce (Alexander, in press)	2021	Trap 2
<i>Dorcatoma dresdensis</i> (Ptinidae)	Nationally Scarce (Alexander 2016)	2021	Trap 1 also developing in bracket fungus on tree with trap 3
<i>D. substriata</i> (Ptinidae)	Nationally Scarce (Alexander 2016)	2021	Trap 10

Beetle species	GB status	Date & Source	2021 Locations
<i>Dropephylla gracilicornis</i> (Staphylinidae)	Nationally Scarce (Hyman 1992)	2021	Traps 1 & 7
<i>Enicmus brevicornis</i> (Latridiidae)	Nationally Scarce (Hyman 1992)	2021	Trap 2
<i>E. rugosus</i> (Latridiidae)	Nationally Scarce (Hyman 1992)	2021	Trap 2
<i>Ernoporicus fagi</i> (Scolytinae)	Nationally Scarce (Hyman 1992)	2018 KNAA	
<i>Euglenes oculatus</i> (Aderidae)	Nationally Scarce (Alexander et al 2014)	2021	Trap 7
<i>Euplectus mutator</i> (Pselaphiinae)	Nationally Scarce (Hyman 1992)	2021	Traps 1 & 9
<i>Gnathoncus buyssoni</i> (Histeridae)	Nationally Scarce (Lane, 2017)	2021	Trap 6
<i>Gonodera luperus</i> (Tenebrionidae) – possibly not saproxylic	Nationally Scarce (Alexander et al 2014)	2021	Trap 4
<i>Ischnomera sanguinicollis</i> (Oedemeridae)	Nationally Scarce (Alexander et al 2014)	2021	Trap 10
<i>Kyklioacalles roboris</i> (Curculionidae)	Nationally Scarce (Hyman 1992)	2004 P Kirby	
<i>Malthodes fibulatus</i> (Cantharidae)	Nationally Scarce (Alexander, 2014a)	2004 P Kirby	
<i>M. pumilus</i>	Nationally Scarce (Alexander, 2014a)	2021	Trap 8
<i>Megatoma undata</i> (Dermeestidae)	Nationally Scarce (Alexander 2016)	2021	Trap 7
<i>Mesosa nebulosa</i> (Cerambycidae)	Nationally Scarce (Alexander 2019)	2004 P Kirby	
<i>Microrhagus pygmaeus</i> (Eucnemidae)	Nationally Scarce (Hyman 1992)	2021	Traps 2, 7 & 9
<i>Mordellistena neuwaldeggiana</i> (Mordellidae)	Nationally Scarce (Alexander et al 2014)	2021	Trap 6
<i>Oedemera femoralis</i> (Oedemeridae)	Nationally Scarce (Alexander et al 2014)	2021	Traps 2, 5, 6, 9 & 10
<i>Orchesia micans</i> (Melandryidae)	Nationally Scarce (Alexander et al 2014)	2018	
<i>Platyrhinus resinosus</i> (Anthribidae)	Nationally Scarce (Hyman 1992)	2018 & 2021	Trap 2

Beetle species	GB status	Date & Source	2021 Locations
<i>Prionocyphon serricornis</i> (Scirtidae)	Nationally Scarce (Hyman 1992)	2021 2004 P Kirby	Traps 2, 4, 5, 6, 9 & 10
<i>Pseudocistela ceramboides</i> (Tenebrionidae)	Nationally Scarce (Alexander et al 2014)	2021	Traps 1, 2, 3 & 7
<i>Quedius truncicola</i> (Staphylinidae)	Nationally Scarce (Hyman 1992)	2021	Traps 4, 5, 6, 9 & 10
<i>Sphindus dubius</i> (Sphindidae)	Nationally Scarce (Alexander, in press)	2004 P Kirby	
<i>Synchita variegata</i> (Zopheridae)	Nationally Scarce (Alexander et al 2014)	2021	Trap 2
<i>Tillus elongatus</i> (Cleridae)	Nationally Scarce (Alexander, 2014a)	2021 2004 P Kirby	Trap 4
<i>Triphyllus bicolor</i> (Mycetophagidae)	Nationally Scarce (Alexander et al 2014)	2021	Trap 5

The very wide range of Nationally Scarce species is striking and includes some which are characteristic of old growth beech such as *Synchita variegata*, *Diplocoelus fagi*, *Tillus elongatus* and *Dorcatoma dresdensis*. Species of hollowing old trees and accumulations of wood mould are also prominent with the rare and very localised *Pseudocistela ceramboides* notably plentiful here.

A total of 215 species of Diptera were taken in the traps and these include a remarkable number of rare and threatened species as well as another long list of Nationally Scarce species (see Table 9). At least 101 of the Diptera species are known to be saproxylic in part at least – this compares with 66 of the Coleoptera. All species with conservation status are detailed in the table as Diptera have not been studied in such detail here before and the biology of some is inadequately known and so it is not possible to state with certainty which are saproxylic and/or which are not.

A remarkable six species were found which have been assessed as Vulnerable in Britain. Two further species have been assessed as Data Deficient. To this can be added one Nationally Rare and ten Nationally Scarce species making a grand total of 21 Diptera with conservation status now known from Little Doward. As with the beetles, up-dating of species statuses since Kirby (2004) has meant that none of the species he recorded then now has conservation status.

The six Vulnerable species include outstanding finds just as significant as *Erotides cosnardi* amongst the beetles. The most outstanding find is the Giant wood-gnat *Neoempheria lineola*, like *cosnardi* a Species of Principal Importance under Section 41 of the NERC Act. This relatively large and distinctive fungus gnat (Mycetophilidae) has been known from a small area of the New Forest since 1907 and the only other confirmed site had been Oakley Wood, Cirencester, in 1986. A male and a female were

taken by trap 5, a mature beech with the trap placed at the entrance to a rot-hole cavity. It is thought to develop in large fallen hollow trunks and old stumps of beech.

Odinia hendeli (Odiniidae) has otherwise only recently been found at a site in the Oxford area but there are also older records from Coombe Dingle (Bristol), the Cambridgeshire fens and a site on the North Downs in Kent. It appears to have an association with *Ischnomera* beetles (Oedemeridae) which develop in white-rotten heartwood in veteran trees – two species of *Ischnomera* were found at Little Doward in 2021. A single female fly was taken in trap 9.

Periscelis winnertzi (Periscelididae): a single female fly taken in trap 1 appears to be the first confirmed British record of this species. Most British records under this name – just five sites are known - have very recently been shown to actually be a closely related species *P. fugax*. The two closest records for ‘*winnertzi*’ - from Moccas Park and the Wyre Forest - have both been shown to refer to *fugax*. Its discovery at Little Doward therefore confirms that both species are represented in Britain. The larvae develop in sap runs on veteran trees – *fugax* is associated more with oak trees and so it may be that *winnertzi* is a beech associate in Britain at least.

Madiza britannica is a freeloader fly (Milichiidae) and a relatively widespread species, with about 15 modern records across lowland England, including Moccas Park. Western sites tend to be historic parklands and so the beech old growth of Little Doward appears unusual. The fly is dependent on open-grown veteran trees which have had enough space to develop large lateral branching and hence have the potential to form rot-holes when branches break off (Alexander & Perry, 2013). Single female flies were taken in traps 7 and 10.

The crane fly *Rhipidia ctenophora* has been reared from rot-holes and sap-runs. Three females were taken by trap 6.

Neoplatyura biumbrata (Mycetophilidae) is a particularly poorly known species confined in Britain to the South-West where it has been found from Cornwall to the New Forest and into south Wales. It has been speculated that the larvae may be web-forming predators on terrestrial substrates rather than saproxylic. It was found in trap 3.

The full list of Diptera with conservation status is detailed in Table 8.

Table 9 Diptera species with conservation status known trapped on Little Doward during 2021
species thought to be saproxylic at least in part

Diptera species	GB status	2021 Location
<i>Madiza britannica</i> # (Milichiidae)	VU (Falk, Ismay & Chandler, 2016)	Traps 7 & 10
<i>Neoempheria lineola</i> # (Mycetophilidae)	VU (Falk & Chandler, 2005)	Trap 5
<i>Neoplatyura biumbrata</i> (Keroplastidae)	VU (Falk & Chandler, 2005)	Trap 3

Diptera species	GB status	2021 Location
<i>Odinia hendeli</i> # (Odiniidae)	VU (Falk, Ismay & Chandler, 2016)	Trap 9
<i>Periscelis winnertzi</i> # (Periscelididae)	VU (Falk, Ismay & Chandler, 2016)	Trap 1
<i>Rhipidia ctenophora</i> # (Limoniidae)	VU (Falk, 1991)	Trap 6
<i>Mycetobia gemella</i> # (Mycetobiidae)	DD (Falk & Chandler, 2005)	Traps 2, 4 & 9
<i>Mycetobia obscura</i> # (Mycetobiidae)	DD (Falk & Chandler, 2005)	Trap 5
<i>Systemus bipartitus</i> # (Dolichopodidae)	DD (Drake, 2018)	Traps 1, 4, 5, 8 & 9
<i>Rhipidia uniseriata</i> # (Limoniidae)	NR (Falk, 1991)	Trap 9
<i>Azana anomala</i> (Mycetophilidae)	NS (Falk & Chandler, 2005)	Trap 4
<i>Ctenophora pectinicornis</i> # (Tipulidae)	NS (Falk, 1991)	Traps 4, 6, 7 & 9
<i>Eupachygaster tarsalis</i> # (Stratiomyiidae)	NS (Falk, 1991)	Traps 1, 5, 6, 9 & 10
<i>Helina consimilis</i> # (Muscidae)	NS (Falk & Pont, 2017)	Trap 1
<i>Lasiambia brevibuca</i> # (Chloropidae)	NS (Falk, Ismay & Chandler, 2016)	Traps, 1, 2, 4, 5, 6, 7, 8, 9 & 10
<i>Madiza pachymera</i> # (Milichiidae)	NS (Falk, Ismay & Chandler, 2016)	Trap 5
<i>Oedalea apicalis</i> # (Hybotidae)	NS (Falk & Crossley, 2005)	Trap 10
<i>Phaonia laeta</i> # (Muscidae)	NS (Falk & Pont, 2017)	Traps 5, 6, 8, 9 & 10
<i>Phaonia pratensis</i> #	NS (Falk & Pont, 2017)	Trap 2
<i>Sciophila buxtoni</i> # (Mycetophilidae)	NS (Falk & Chandler, 2005)	Trap 7

One additional fungus gnat *Macrobrachius kowarzii* (Mycetophilidae) trapped on Little Doward is only the 5th British record but this is a species which is increasing on the Continent and so assumed to be gradually colonising Britain.

One further saproxylic invertebrate of note taken at Little Doward in 2021 is the uncommon snakefly *Atlantoraphidia maculicollis*. The larvae develop beneath bark on relatively freshly dead timber and are general predators of other invertebrates. The species was only trapped at Little Doward and not detected at any of the other four sites.

Cadora Woods (SO5307) (Woodland Trust)

Cadora Woods have been more thoroughly investigated by Kirby (2000 & 2002) and so the two traps operated in the area of Bowen's Grove in 2021 as part of the *cosnardi*

study are much less significant. Four Nationally Scarce beetle species were taken in the traps: *Acalles ptinoides*, *Diplocoelus fagi*, *Dropephylla gracilicornis*, and *Prionocyphon serricornis*. The last three were also found on Little Doward. Intriguingly the *Acalles* was also found by Kirby (2000 & 2002) but the other three species are additions to the site list. Kirby (2002) calculated the Index of Ecological Continuity to be 24 but a few of his species no longer qualify and - with the new flight trapping records – the revised IEC is a minimum figure of 23 which is of regional West Midlands significance.

The catch of Diptera in the two flight traps was 64 species of which 33 are at least partly saproxylic. The list is very much a subset of that found on Little Doward, with one of the Vulnerable species (the cranefly *Rhipidia ctenophora*), one Nationally Rare (*R. uniseriata*), and three Nationally Scarce (the cranefly *Ctenophora pectinicornis*, *Lasiambia brevibucca* and *Helina abdominalis*). Only the *Helina* is additional to the Little Doward list of saproxylic Diptera.

Highbury Wood NNR (SO5408) (Natural England)

Highbury Wood NNR appears never to have been investigated in detail for its saproxylic invertebrate fauna. The two traps operated during 2021 should be regarded as an exploratory sampler only. While *Erotides cosnardi* was observed here in unusually large numbers in 2017 very little else was noted.

The 2021 trapping found 20 species of saproxylic beetles including the Nationally Rare *Aulonthroscus brevicollis* (Throscidae) and four Nationally Scarce species (*Ischnomera sanguinicollis*, *Dorcatoma dresdensis*, *Kissophagus vicinus* and *Quedius truncicola*). The *Aulonthroscus* and the *Kissophagus* (Scolytinae) were not recorded on Little Doward. The Index of Ecological Continuity has now been raised to a minimum value of 14.

The catch of Diptera in the two flight traps was 42 species of which 16 are at least partly saproxylic. These included the Nationally Rare *Rhipidia uniseriata* and the Nationally Scarce *Lasiambia brevibucca* and *Macrocera pusilla*. The *Macrocera* was not recorded on Little Doward; its ecology is not known and so it may not be a saproxylic species.

Rodge Wood (SO5412) (Forestry England)

Rodge Wood was also an unknown quantity prior to the 2021 sampling. Preliminary exploration had suggested it might have significant interest for saproxylics and this has now been shown to be the case. The rarest beetle known from the area under sampling – after *Erotides cosnardi* – was found here: the Nationally Rare and almost certainly Vulnerable scydmaenid *Stenichnus godarti*. This beetle is known from just 6 hectads in Britain post 1999 and so is clearly Nationally Rare and there has been a lack of recent reports from a further 14 hectads where it has been found in the past suggesting a significant decline. Its' status was assessed by Hyman (1992) as RDB3 (Rare) but this needed up-dating. The habitat is moist crumbly decayed wood within old hollow broad-leaved trees. One was taken by the flight trap on the large veteran beech with a vertical split in the trunk.

Four Nationally Scarce saproxylic beetles were also found: *Kyklioacalles roboris*, *Oedemera femoralis*, *Prionocyphon serricornis* and *Quedius maurus*. The last is also not known from Little Doward and so there is a hint that the fauna here may be of a different character – this site is on the edge of the Forest of Dean as well as being on the edge of the Wye Gorge.

The catch of Diptera in the two flight traps was 76 species of which 42 are at least partly saproxylic. This site appears significantly richer in species than Highbury Wood for Diptera and for saproxylics. However, these included fewer species with conservation status – just two were trapped, the Nationally Scarce crane fly *Ctenophora pectinicornis* and the hoverfly *Brachyopa bicolor*.

Reddings Inclosure, Highmeadow Woods (SO5313) (Forestry England)

Reddings Inclosure is the site of the original discovery of *Erotides cosnardi* in Britain, although the specific area of the find was on the far west side and the trees there were being harvested at the time. The stand is now about 75 years old and considered to be too young to support this rarity. The 2021 samples were taken a little farther east, deeper into a mature stand of oak with some beech and field maple. Saproxylic beetles trapped include the Nationally Rare *Aulonothroscus brevicollis* – otherwise only taken in 2021 in Highbury Wood – and the Nationally Scarce *Oedemera femoralis*, *Opilo mollis* and *Prionocyphon serricornis*. Neither the *Aulonothroscus* nor the *Opilo* were found in Little Doward

The catch of Diptera in the two flight traps was 56 species of which 27 are at least partly saproxylic. This is richer than Highbury Wood but poorer than Rodge Wood. Four of the species have conservation status: the Vulnerable *Rhipidia ctenophora*, the Near Threatened *Acnemia amoena* and the Nationally Scarce *Lasiambia brevibucca* and *Phaenonia laeta*. The fungus gnat *Acnemia amoena* (Mycetophilidae) is the only one of these not also found on Little Doward.

4 DISCUSSION AND CONCLUSIONS

4.1 Cosnard's net-winged beetle *Erotides cosnardi*

Although it is very disappointing that the trapping failed to yield any *E. cosnardi* beetles on this occasion, the discovery of a beetle in a new area is encouraging. Both areas where it has now been found are glades within the beech stands, where good sun penetration is possible and where the surrounding trees shelter the areas from wind and rain. The area between the two sites is extensive dense and shady beech woodland. This does suggest that warmth and shelter may be key features required for beetle activity.

4.2 Saproxylic invertebrates more generally

Continuing research into the status, ecology and conservation of Cosnard's net-winged beetle *Erotides cosnardi* in the Wye Gorge has provided an opportunity to assess the overall quality of the saproxylic invertebrate fauna of the old growth beech habitat of the Little Doward and neighbouring sites. Little Doward has now been shown to be of special national significance for both saproxylic Coleoptera and Diptera. The Index of Ecological Continuity (IEC) is now a minimum figure of 45, placing Little Doward amongst the top 50 British sites for saproxylic beetles. Two Species of Principal Importance - under Section 41 of the 2006 NERC Act - are now known to be present: the Giant wood-gnat *Neoempheria lineola* as well as Cosnard's net-winged beetle. The beetle has Endangered status in Britain and the wood-gnat is one of a remarkable six species of Diptera with Vulnerable status found here in 2021.

The trapping exercise has found a remarkably rich and varied saproxylic fauna associated with the old growth beech of Little Doward including a remarkably broad range of British Red List and Nationally Scarce species. The flight traps resulted in the capture of 11 British Red List species and 35 species with Nationally Rare or Scarce status. Little Doward has now been shown to be amongst the richest British sites for saproxylics. The outstanding discoveries have been amongst the saproxylic Diptera, with Giant wood-gnat the greatest surprise – it is best-known from the New Forest and has only ever been confirmed once elsewhere, at a site in the Cotswolds. The other Red List Vulnerable species found are *Madiza britannica* (Milichiidae), *Neoplatyura biumbrata* (Mycetophilidae), *Odinia hendeli* (Odiniidae), *Periscelis winnertzi* (Periscelididae) and *Rhipidia ctenophora* (Limoniidae). This is the only presently confirmed British locality for the *Periscelis*.

The other four sites were found to be less rich in saproxylics overall. Cadora Woods were already known to be relatively species rich in saproxylic beetles and the IEC value has now reached 23 – of regional West Midlands significance - in comparison with Little Doward's 45. All four of the other study sites produced a small number of saproxylic species with conservation status and including a few species not yet known from Little Doward. The Nationally Rare beetle *Stenichnus godarti* is an important find in Rodge Wood as is *Aulonothroscus brevicollis* in Highbury Wood NNR and Reddings Inclosure.

Only Little Doward appears to support old growth beech, the other sites being of a more mixed species nature or else dramatically altered by forestry plantings. This may explain why Little Doward has had more observations of *cosnardi* than elsewhere although does not explain the best lek site having been observed in the ancient coppice of Highbury Wood NNR. There is much still to be learnt about this elusive species.

4.3 Index of Ecological Continuity and Saproxylic Quality Index

As explained in section 2.7, the Index of Ecological Continuity provides a minimum assessment of site quality for the specialist saproxylic beetle fauna of old growth habitat and ideally needs to be built up over a period of years. Of the five sites under study only Little Doward and Cadora Woods have received sufficient survey effort for the IEC

values to be at all reliable. Little Doward has been found to be of outstanding quality, having reached an Index of 45. The Kirby (2004) survey found a good number of these species but the 2021 survey has made a very significant advance – just two surveys have demonstrated a high level of national significance. Further investigation of this fauna will undoubtedly result in the discovery of additional species which have until now remained elusive. The additional species found on the other four sites – but not yet on Little Doward - provide a guide to the potential. [NB IEC species representation has been adjusted to allow for developing knowledge and so the current analysis of the Kirby survey data is somewhat different to that presented in his reports].

The top beech sites in Britain are Windsor Forest and the New Forest, followed by Burnham Beeches, Ashridge Common, Epping Forest and Savernake Forest. These sites also have old growth oak and other tree species and so direct comparisons of IEC values are not meaningful. However, Savernake Forest has both beech and oak and yet its IEC is only currently at 59 which is not very much greater than the 45 of Little Doward. The Diptera discoveries at Little Doward in 2021 add further evidence that Little Doward is a nationally important beech old growth site and perhaps at least as important as Savernake Forest.

Table 10 Index of Ecological Continuity and Saproxyllic Quality Index values for the five study sites

Statistics	Little Doward		Cadora Woods		Highbury Wood	Rodge Wood	Reddings Inclosure
	2004	2021	2000-2	2021			
SQS	162	329	283	52	111	72	63
SPP	47	66	83	13	20	15	18
SQI	345	498	341	250	555	480	394
IEC	10	45	20	23	14	6	5

SQS Site Quality Score; SPP total of qualifying species recorded; SQI Saproxyllic Quality Index

The Saproxyllic Quality Index provides another indicator of site quality but requires the list of saproxyllic beetles to exceed 40 qualifying species. At present there is insufficient data to reliably assess the data for the Highbury, Rodge and Reddings sites. Fowles et al (1999) suggest that an SQI of 500 is probably an appropriate threshold for assessing national importance. Neither Little Doward nor Cadora Woods achieve this value although the 2021 survey on Little Doward is near enough at 498 and this result is consistent with the conclusions drawn from the IEC values. The IEC and SQI values for Cadora Woods suggest a site of regional - West Midlands - significance rather than one of national importance. Both indices indicate national importance for saproxyllic beetles at Little Doward.

As the calculation of the SQI is independent of recording effort it makes this Index of interest for site condition monitoring (Alexander, 2014c). Kirby (2004) surveyed Little Doward soon after acquisition by the Woodland Trust and before significant change in management. The increase in SQI from 345 in 2004 to 498 in 2021 may therefore act as an indication of the value of the management changes established by the Woodland Trust. Site condition appears to have improved considerably.

Similarly, Kirby's (2000 & 2002) surveys at Cadora Woods preceded the Woodland Trust's work to gradually remove the dense conifer plantations established by the Forestry Commission and to re-establish native tree cover. Unfortunately, the 2021 survey only detected 13 qualifying species of saproxylic beetle and so no reliable comparison can be made. However, the SQI value calculated by Kirby was 341 which is very close to that found by him for Little Doward (345) and so it seems reasonable to assume that the improvements in conservation management will have enhanced conditions for saproxylic beetles here too.

5 RECOMMENDATIONS

5.1 Expansion of the flight trapping exercise

Although flight interception trapping has failed to provide the information sought on this occasion, it remains a key technique for the study of saproxylic invertebrate assemblages. *Erotides cosnardi* has been taken in flight interception traps elsewhere in the Wye Gorge and at two old forest sites in France. It would be instructive to collate the full data from those and other studies to generate some guidance on the number of traps required to provide statistically useful data. It seems likely that trapping on a scale of 50-100 traps per site may be required. The current project was costed at around £8000 and so scaling upwards would potentially require approximately £50 000.

A key result from the 2021 project has been the demonstration on the overall species-richness of the saproxylic invertebrate fauna at Little Doward, something only suspected previously. Continued flight interception trapping would help to build up the understanding of site quality and the habitat management issues.

5.2 Exploration of a captive breeding programme

The project has been approached by Nicola Cook, Invertebrate Keeper at Bristol Zoo, about exploring the potential for a captive breeding programme for *Erotides cosnardi*. The current site of Bristol Zoo will be shutting and moving up to their South Gloucestershire site, so they are currently reviewing their collection plan. Nicola is hoping that with the expanded space available at the new location they will be able to get involved with more native species conservation projects. She was able to join Paul Rutter and Keith Alexander on the July trap-emptying run at Little Doward where discussed current knowledge of the beetle and debated the best options for achieving a captive breeding population.

Establishment of a captive breeding population would have the potential to improve our understanding of the larval ecology and enable investigation of the pheromones produced by the adults for congregation.

The beetle continues to be difficult to work with but the lek arena observations of previous years may provide the best opportunities for capturing live mated females.

Larvae are still unknown in the wild and the 2021 studies have failed to clarify the type of decaying wood being exploited by the beetle.

Previous surveys have found males congregating on a freshly sawn stump of goat willow *Salix caprea* on the edge of Highbury Wood NNR over a period of about three weeks, and also temporarily on a sawn trunk section of beech at Little Doward. The implications are that the beetles may be preferentially attracted to the clear and flat, horizontal arenas provided by large items of sawn wood, especially where located in sheltered and sunny situations. Field trials to replicate these conditions have so far failed – trees were selectively felled by FE teams at one site, but recent cutting elsewhere as part of normal site management was also explored at Little Doward and elsewhere in the Wye Gorge. An expansion of these observations might improve their success potential. In particular it had been hoped that re-cutting of the goat willow stump at Highbury Wood NNR to remove the regrowth might once again provide an attractive site for the beetles. Unfortunately, this proved impossible due to changes in staff and resources within Natural England but is being actively pursued for the coming winter period.

5.3 Conservation management implications

The key factors for the conservation management of saproxylic invertebrates are: i) the age structure of the host trees, ii) the total number of host trees, and iii) the spatial arrangement of those trees (Alexander & Green, 2018). For *Erotides cosnardi* and many other rare and threatened saproxylic invertebrates mosaic conditions are important – open sunny areas, scrubby areas, and shady areas - and a certain level dynamism of this vegetation structure is also thought to be important. A key influence on this dynamic is the presence of large herbivores – wild or domesticated - which selectively graze and browse and influence the species composition of the trees and shrubs.

Little Doward has had a long history of common grazing and this is thought to be key to its current saproxylic interests. The relatively short period of partial afforestation may have caused no significant damage and may even have contributed to the overall ecological dynamic. Restoration of some sort of grazing regime is considered to be vital to the long-term conservation of the saproxylic invertebrate fauna and the Woodland Trust are to be commended for their recognition of this factor in site management.

The other four sites may be of lesser importance individually but form part of the overall habitat mosaic provided by the Wye Valley Woodlands and the Forest of Dean landscape. It is not therefore suggested that they adopt the same approach to conservation management as Little Doward. It may be that targeting boundary areas and/or selected internal features may be an adequate contribution to the overall saproxylic landscape. Of course, grazing restoration or establishment would be beneficial at Cadora, Rodge and Reddings, but it is recognised that this option is most unlikely to be viewed favourably at these sites at the present time. Protection of boundary trees and the old pollards and veteran beeches at these sites may be adequate especially where reinforced by selection and conservation of next generation trees.

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SPECIES LISTS

LITTLE DOWARD

Group	Family	Species Identification	British status		
Coleoptera	Aderidae	<i>Euglenes oculatus</i> #	Nationally Scarce		
	Anthribidae	<i>Platyrhinus resinosus</i> #	Nationally Scarce		
	Biphyllidae	<i>Diplocoelus fagi</i> #	Nationally Scarce		
	Buprestidae	<i>Agrilus sinuatus</i> #			
	Cantharidae		<i>Malthinus balteatus</i> #		
			<i>Malthinus flaveolus</i> #		
			<i>Malthodes marginatus</i> #		
			<i>Malthodes pumilus</i> #	Nationally Scarce	
		Carabidae		<i>Calodromius spilotus</i>	
				<i>Dromius quadrimaculatus</i>	
				<i>Pterostichus madidus</i>	
	Cerambycidae	<i>Rutpela maculata</i> #			
	Cerylonidae	<i>Cerylon histeroides</i> #			
	Ciidae		<i>Cis bilamellatus</i> #		
			<i>Cis boleti</i> #		
			<i>Cis castaneus</i> #		
			<i>Cis fagi</i> #		
			<i>Tillus elongatus</i> #	Nationally Scarce	
	Cleridae	<i>Adalia decempunctata</i>			
	Coccinellidae	<i>Cryptophagus dentatus</i>			
	Cryptophagidae		<i>Cryptophagus scanicus</i>		
			<i>Pediacus dermestoides</i> #		
	Cucujidae	<i>Acalles misellus</i> #			
	Curculionidae		<i>Euophryum confine</i> #		
			<i>Otiorhynchus singularis</i>		
			<i>Phyllobius argentatus</i>		
			<i>Ctesias serra</i> #		
			<i>Megatoma undata</i> #	Nationally Scarce	
	Elateridae		<i>Agriotes pallidulus</i>		
			<i>Athous haemorrhoidalis</i>		
			<i>Denticollis linearis</i> #		
			<i>Melanotus castanipes</i> #		
Erotyliidae	<i>Dacne rufifrons</i> #				
Eucnemidae		<i>Eucnemis capucina</i> #	Endangered		
		<i>Microrhagus pygmaeus</i> #	Nationally Rare		
Histeridae		<i>Gnathoncus buyssoni</i>			
		<i>Gnathoncus nannetensis</i>			
		<i>Paromalus flavicornis</i> #			
		<i>Plegaderus dissectus</i> #	Nationally Scarce		
Latridiidae		<i>Cartodere nodifer</i>			
		<i>Enicmus brevicornis</i> #	Nationally Scarce		
		<i>Enicmus rugosus</i> #	Nationally Scarce		
		<i>Enicmus testaceus</i> #			
Leiodidae		<i>Latridius minutus</i>			
		<i>Anisotoma humeralis</i> #			
Lucanidae		<i>Leiodes cinnamomea</i>	NS		
		<i>Dorcus parallelepipedus</i> #			

Group	Family	Species Identification	British status
Coleoptera	Lucanidae	<i>Sinodendron cylindricum</i> #	Endangered
	Lycidae	<i>Erotides cosnardi</i> #	
	Monotomidae	<i>Rhizophagus bipustulatus</i> #	Nationally Scarce
	Mordellidae	<i>Mordellistena neuwaldeggiana</i> #	
	Mycetophagidae	<i>Mycetophagus atomarius</i> #	Nationally Scarce
		<i>Mycetophagus quadripustulatus</i> #	
	Nitidulidae	<i>Triphyllus bicolor</i> #	Nationally Scarce
		<i>Epuraea pallescens</i> #	
		<i>Epuraea silacea</i> #	
	Oedemeridae	<i>Glischrochilus hortensis</i> #	Nationally Scarce
		<i>Pocadius ferrugineus</i>	
		<i>Ischnomera cyanea</i> #	
	Pselaphinae	<i>Ischnomera sanguinicollis</i> #	Nationally Scarce
		<i>Oedemera femoralis</i> #	
	Ptinidae	<i>Oedemera femoralis</i> #	Nationally Scarce
		<i>Euplectus mutator</i> #	
	Pyrochroidae	<i>Anobium punctatum</i> #	Nationally Scarce
		<i>Dorcatoma dresdensis</i> #	
		<i>Dorcatoma substriata</i> #	
		<i>Grynobius planus</i> #	
	Salpingidae	<i>Ptilinus pectinicornis</i> #	Nationally Scarce
		<i>Pyrochroa coccinea</i> #	
	Scaphidiinae	<i>Pyrochroa serraticornis</i> #	Nationally Scarce
		<i>Salpingus planirostris</i> #	
	Scirtidae	<i>Salpingus ruficollis</i> #	Nationally Scarce
		<i>Scaphisoma agaricinum</i> #	
	Scolytinae	<i>Prionocyphon serricornis</i> #	Nationally Scarce
		<i>Hylesinus crenatus</i> #	
	Scraptiidae	<i>Xyleborus monographus</i> #	Nationally Scarce
		<i>Anaspis frontalis</i> #	
		<i>Anaspis garneys</i> #	
		<i>Anaspis lurida</i> #	
<i>Anaspis maculata</i> #			
<i>Anaspis pulicaria</i> #			
<i>Anaspis regimbarti</i> #			
<i>Stenichnus bicolor</i> #			
<i>Aspidiphorus orbiculatus</i> #			
<i>Atrecus affinis</i> #			
Staphylinidae	<i>Dropephylla gracilicornis</i> #	Nationally Scarce	
	<i>Hapalaraea pygmaea</i> #		
	<i>Micropeplus staphylinoides</i>		
	<i>Ocypus olens</i>		
	<i>Quedius cruentus</i>		
	<i>Quedius mesomelinus</i>		
	<i>Quedius truncicola</i> #		
	<i>Gonodera luperus</i>		
	<i>Prionychus ater</i> #		
	<i>Pseudocistela ceramboides</i> #		
Zopheridae	<i>Synchita variegata</i> #	Nationally Scarce	
Diptera	See next table		

Group	Family	Species Identification	British status	
Hemiptera	Aradidae	<i>Aradus depressus</i> #		
	Cicadellidae	<i>Ledra aurita</i>		
	Issidae	<i>Issus coleoptratus</i>		
Hymenoptera	Formicidae	<i>Formica fusca</i> <i>Lasius brunneus</i> #		
	Pompilidae	<i>Dipogon subintermedius</i> #		
	Sphecidae	<i>Crabro cribrarius</i>		
	Neuroptera	<i>Conwentzia psociformis</i>		
Orthoptera	Tettigoniidae	<i>Pholidoptera griseoptera</i>		
Psocoptera	Caeciliusidae	<i>Valenzuela burmeisteri</i>		
		<i>Valenzuela flavidus</i>		
		<i>Ectopsocidae</i>	<i>Ectopsocus briggsi</i>	
	<i>Elipsocidae</i>	<i>Elipsocus hyalinus</i>		
	<i>Peripsocidae</i>	<i>Peripsocus milleri</i>		
	Philotarsidae	<i>Philotarsus parviceps</i>		
		<i>Philotarsus picicornis</i>		
		<i>Pseudocaeciliidae</i>	<i>Chilenoecaecilius ornatipennis</i>	
	Psocidae	<i>Loensia sexpunctatum</i>		
		<i>Trichadenotecnum sexpunctatum</i>		
		<i>Stenopsocidae</i>	<i>Graphopsocus cruciatus</i>	
			<i>Stenopsocus immaculatus</i>	
	Trichopsocidae	<i>Trichopsocus clarus</i>		
		<i>Atlantoraphidia maculicollis</i> #		
	Raphidioptera		<i>Dilta Hibernica</i>	
Thysanura		<i>Chthonius ischnocheles</i>		
Pseudoscorpiones		<i>Ashfordia granulate</i>		
Mollusca		<i>Clausilia bidentata</i>		
		<i>Cochlodina laminate</i>		
		<i>Discus rotundatus</i>		
		<i>Euconulus fulvus</i>		
		<i>Zenobiella subrufescens</i>		

Diptera Family	Species	British status	
Tipulidae	<i>Ctenophora pectinicornis</i> #	Nationally Scarce	
Limoniidae	<i>Epiphragma ocellare</i> #		
	<i>Ilisia maculata</i>		
	<i>Limonia nubeculosa</i>		
	<i>Neolimonia dumetorum</i> #		
	<i>Ormosia nodulosa</i>		
	<i>Rhipidia ctenophora</i> #	Vulnerable	
	<i>Rhipidia uniseriata</i> #	Nationally Rare	
	<i>Tasiocera fuscescens</i>		
	Bibionidae	<i>Dilophus febrilis</i>	
	Ditomyiidae	<i>Symmerus annulatus</i> #	
Diadocidiidae	<i>Diadocidia ferruginosa</i> #		
Keroplastidae	<i>Antlemon servulum</i>		
	<i>Cerotelion striatum</i> #		
	<i>Macrocera anglica</i> #		

	<i>Macrocera centralis</i> #	
	<i>Macrocera fasciata</i> #	
	<i>Macrocera vittata</i> #	
	<i>Neoplatyura biumbrata</i>	Vulnerable
	<i>Neoplatyura modesta</i>	
	<i>Orfelia nemoralis</i> #	
	<i>Orfelia ochracea</i> #	
Mycetophilidae	<i>Acnemia nitidicollis</i> #	
	<i>Apolephthisa subincana</i> #	
	<i>Azana anomala</i>	Nationally Scarce
	<i>Boletina nitida</i>	
	<i>Boletina pallidula</i>	
	<i>Brachycampta grata</i> #	
	<i>Brevicornu griseicolle</i>	
	<i>Brevicornu sericoma</i> #	
	<i>Cordyla brevicornis</i> #	
	<i>Cordyla crassicornis</i>	
	<i>Docosia fuscipes</i>	
	<i>Docosia gilvipes</i> #	
	<i>Docosia moravica</i>	
	<i>Docosia sciarina</i>	
	<i>Dynatosoma fuscicorne</i> #	
	<i>Ectrepesthoneura hirta</i> #	
	<i>Exechia bicincta</i>	
	<i>Exechia dorsalis</i> #	
	<i>Exechia neorepanda</i> #	
	<i>Exechiopsis crucigera</i>	
	<i>Exechiopsis intersecta</i> #	
	<i>Exechiopsis leptura</i> #	
	<i>Exechiopsis membranacea</i>	
	<i>Leia bimaculata</i> #	
	<i>Leia cylindrica</i>	
	<i>Macrobrachius kowarzii</i>	5th British record
	<i>Monoclona rufilatera</i> #	
	<i>Mycetophila cingulum</i> #	
	<i>Mycetophila curviseta</i>	
	<i>Mycetophila eppingensis</i>	
	<i>Mycetophila ocellus</i> #	
	<i>Mycetophila rudis</i>	
	<i>Mycetophila trinotata</i> #	
	<i>Mycomya circumdata</i>	
	<i>Mycomya flavicollis</i>	
	<i>Mycomya maura</i>	
	<i>Mycomya parva</i>	
	<i>Mycomya trilineata</i> #	
	<i>Neoempheria lineola</i> #	Vulnerable
	<i>Phronia biarcuata</i> #	
	<i>Phronia signata</i>	

	<i>Phronia strenua</i> #	
	<i>Phronia triangularis</i>	
	<i>Pseudobrachypeza helvetica</i> #	
	<i>Rymosia placida</i> #	
	<i>Rymosia spinipes</i>	
	<i>Sciophila baltica</i>	
	<i>Sciophila buxtoni</i> #	Nationally Scarce
	<i>Stigmatomeria crassicornis</i> #	
	<i>Synapha fasciata</i>	
	<i>Synapha vitripennis</i>	
	<i>Tarnania fenestralis</i> #	
	<i>Trichonta vitta</i> #	
	<i>Zygomyia humeralis</i>	
	<i>Zygomyia pictipennis</i> #	
	<i>Zygomyia semifusca</i> #	
Sciaridae	<i>Bradysia alpicola</i>	
	<i>Bradysia fungicola</i> #	
	<i>Bradysia forficulata</i>	
	<i>Bradysia ismayi</i>	
	<i>Bradysia pectoralis</i> #	
	<i>Bradysia signata</i>	
	<i>Corynoptera flavicauda</i>	
	<i>Corynoptera forcipata</i>	
	<i>Leptosciarella fuscipalpa</i>	
	<i>Leptosciarella rejecta</i>	
	<i>Leptosciarella scutellata</i>	
	<i>Leptosciarella trochanterata</i> #	
	<i>Lycoriella ingenua</i> #	
	<i>Pseudolykoriella paludum</i>	
	<i>Trichosia basdeni</i>	
	<i>Trichosia confusa</i> #	
	<i>Trichosia flavicoxa</i>	
	<i>Trichosia splendens</i> #	
Psychodidae	<i>Boreoclytocerus dali</i>	
	<i>Boreoclytocerus ocellaris</i>	
	<i>Mormia revisenda</i>	
	<i>Philosepedon humeralis</i>	
	<i>Psychoda albipennis</i>	
	<i>Psychoda cinerea</i> #	
	<i>Psychoda phalaenoides</i> #	
	<i>Saraiella consigliana</i>	
	<i>Telmatoscopus advenus</i> #	
	<i>Telmatoscopus rothschildii</i> #	
	<i>Telmatoscopus tristis</i> #	
	<i>Trichomyia urbica</i> #	
	<i>Vaillantodes miksici</i>	
Scatopsidae	<i>Apiloscatopse picea</i>	
	<i>Ectaetia platyscelis</i> #	

	<i>Holoplagia richardsi</i> #	
	<i>Scatopse notata</i>	
Anisopodidae	<i>Sylvicola cinctus</i> #	
	<i>Sylvicola punctatus</i>	
Mycetobiidae	<i>Mycetobia gemella</i> #	Data Deficient
	<i>Mycetobia obscura</i> #	Data Deficient
	<i>Mycetobia pallipes</i> #	
Culicidae	<i>Anopheles plumbeus</i> #	
Ceratopogonidae	<i>Forcipomyia pulchrithorax</i> #	
Stratiomyidae	<i>Chorisops tibialis</i>	
	<i>Eupachygaster tarsalis</i> #	Nationally Scarce
Atelestidae	<i>Atelestus pulicarius</i>	
Hybotidae	<i>Drapetis assimilis</i> #	
	<i>Bicellaria nigra</i>	
	<i>Bicellaria vana</i>	
	<i>Euthyneura gyllenhali</i>	
	<i>Hybos culiciformis</i>	
	<i>Oedalea apicalis</i> #	Nationally Scarce
	<i>Oedalea holmgreni</i> #	
	<i>Platypalpus exilis</i>	
	<i>Tachypeza nubila</i> #	
	<i>Trichina elongata</i>	
	<i>Trichinomyia flavipes</i>	
	<i>Empis chioptera</i>	
	<i>Empis livida</i>	
	<i>Empis planetica</i>	
	<i>Empis rufiventris</i>	
	<i>Empis tessellata</i>	
	<i>Hemerodromia unilineata</i>	
	<i>Hilara fuscipes</i>	
	<i>Hilara manicata</i>	
	<i>Rhamphomyia tarsata</i>	
Dolichopodidae	<i>Chrysotimus flaviventris</i>	
	<i>Microphor holosericeus</i>	
	<i>Neurigona pallida</i> #	
	<i>Neurigona quadrifasciata</i> #	
	<i>Neurigona suturalis</i>	
	<i>Sciapus longulus</i>	
	<i>Sciapus platypterus</i> #	
	<i>Systemus bipartitus</i> #	Data Deficient
	<i>Systemus scholtzii</i> #	
	<i>Xanthochlorus galbanus</i>	
Lonchopteridae	<i>Lonchoptera lutea</i>	
Syrphidae	<i>Brachyopa insensilis</i> #	
	<i>Eristalis tenax</i>	
	<i>Melanostoma scalare</i>	
	<i>Myathropa florea</i> #	
Lauxaniidae	<i>Calliopum aeneum</i>	

	<i>Calliopum tuberculosum</i>	
	<i>Meiosimyza platycephala</i>	
	<i>Meiosimyza rorida</i>	
	<i>Pseudolyciella stylata</i> #	
Dryomyzidae	<i>Dryomyza anilis</i>	
Sciomyzidae	<i>Euthycera fumigata</i>	
	<i>Pherbellia scutellaris</i>	
Chloropidae	<i>Lasiambia brevibucca</i> #	Nationally Scarce
Milichiidae	<i>Madiza britannica</i> #	Vulnerable
	<i>Madiza pachymera</i> #	Nationally Scarce
Oдиниidae	<i>Odinia boletina</i> #	
	<i>Odinia hendeli</i> #	Vulnerable
Agromyzidae	<i>Chromatomyia milii</i>	
Heleomyzidae	<i>Heteromyza rotundicornis</i>	
	<i>Suillia fuscicornis</i> #	
	<i>Suillia variegata</i> #	
	<i>Tephrochlamys flavipes</i> #	
	<i>Tephrochlamys rufiventris</i>	
Periscelididae	<i>Periscelis winnertzii</i> #	Vulnerable
Drosophilidae	<i>Drosophila obscura</i> #	
	<i>Drosophila phalerata</i> #	
	<i>Drosophila subobscura</i> #	
	<i>Drosophila suzukii</i>	
	<i>Hirtodrosophila confusa</i> #	
	<i>Leucophenga maculata</i> #	
	<i>Scaptomyza pallida</i>	
Scathophagidae	<i>Scathophaga stercoraria</i>	
Anthomyiidae	<i>Delia platura</i>	
	<i>Emmesomyia grisea</i>	
	<i>Eustalomyia festiva</i> #	
	<i>Hylemya vagans</i>	
	<i>Mycophaga testacea</i>	
	<i>Pegomya bicolor</i>	
	<i>Pegomya transversa</i> #	
Fanniidae	<i>Fannia sociella</i>	
	<i>Piezura pardalina</i> #	
Muscidae	<i>Coenosia agromyzina</i>	
	<i>Coenosia mollicula</i>	
	<i>Helina consimilis</i> #	Nationally Scarce
	<i>Helina depuncta</i>	
	<i>Helina evecta</i>	
	<i>Helina impuncta</i>	
	<i>Helina pertusa</i> #	
	<i>Muscina prolapsa</i>	
	<i>Phaonia laeta</i> #	Nationally Scarce
	<i>Phaonia pallida</i> #	
	<i>Phaonia pratensis</i> #	Nationally Scarce
	<i>Phaonia rufiventris</i> #	

	<i>Phaonia subventa</i> #
	<i>Phaonia tuguriorum</i>
	<i>Phaonia valida</i>
	<i>Polietes lardarius</i>
Calliphoridae	<i>Calliphora vicina</i>
	<i>Paykullia maculata</i> #
	<i>Tricogena rubricosa</i>
Tachinidae	<i>Ramonda spathulata</i>
	# at least in part saproxylic 103 spp

CADORA WOODS

Group	Family	Species Identification	Status	
Coleoptera	Biphyllidae	<i>Diplocoelus fagi</i>	Nationally Scarce	
	Cerambycidae	<i>Judolia cerambyciformis</i>		
		<i>Rhagium bifasciatum</i>		
	Chrysomelidae	<i>Oomorplus concolor</i>		
	Cryptophagidae	<i>Cryptophagus dentatus</i>		
		<i>Cryptophagus scanicus</i>		
	Curculionidae	<i>Acalles misellus</i>		
		<i>Acalles ptinoides</i>		Nationally Scarce
		<i>Strophosoma melanogramma</i>		
	Elateridae	<i>Agriotes pallidulus</i>		
		<i>Athous haemorrhoidalis</i>		
	Eucnemidae	<i>Epiphanis cornutus</i>		
	Latridiidae	<i>Cartodere nodifer</i>		
		<i>Enicmus testaceus</i>		
Leiodidae	<i>Anisotoma humeralis</i>			
Oedemeridae	<i>Oedemera femoralis</i>			
Ptinidae	<i>Anobium punctatum</i>			
Scirtidae	<i>Prionocyphon serricornis</i>	Nationally Scarce		
Scraptiidae	<i>Anaspis pulicaria</i>			
Sphindidae	<i>Aspidiphorus orbiculatus</i>			
Staphylinidae	<i>Dropephylla gracilicornis</i>	Nationally Scarce		
	<i>Quedius mesomelinus</i>			
	<i>Tachinus humeralis</i>			
	Throscidae	<i>Trixagus carinifrons</i>		
Diptera		see next table		
Hemiptera	Aradidae	<i>Aradus depressus</i>		
	Microphysidae	<i>Loricula elegantula</i>		
Mollusca		<i>Oxychilus alliarius</i>		
Orthoptera	Tettigonidae	<i>Meconema thalassinum</i>		
		<i>Pholidoptera griseoptera</i>		
Psocoptera	Caeciliusidae	<i>Valenzuela burmeisteri</i>		
	Stenopsocidae	<i>Graphopsocus cruciatus</i>		
		<i>Stenopsocus immaculatus</i>		
	Trichopsocidae	<i>Trichopsocus brincki</i>		

Diptera Family	Species	Comments
Tipulidae	<i>Ctenophora pectinicornis</i> #	Nationally Scarce
	<i>Tipula confusa</i>	
Pediciidae	<i>Tricyphona immaculata</i>	
Limoniidae	<i>Dicranomyia quadra</i>	
	<i>Neolimonia dumetorum</i> #	
	<i>Ormosia nodulosa</i>	
	<i>Rhipidia ctenophora</i> #	Vulnerable
	<i>Rhipidia uniseriata</i> #	Nationally Rare
Bibionidae	<i>Bibio nigriventris</i>	
Ditomyiidae	<i>Symmerus annulatus</i> #	
Keroplastidae	<i>Macrocera parva</i> #	
Mycetophilidae	<i>Acnemia nitidicollis</i> #	
	<i>Apolephthisa subincana</i> #	
	<i>Cordyla brevicornis</i> #	
	<i>Cordyla crassicornis</i>	
	<i>Docosia fuscipes</i>	
	<i>Docosia moravica</i>	
	<i>Docosia sciarina</i>	
	<i>Mycomya marginata</i> #	
	<i>Phronia nigricornis</i>	
	<i>Sciophila baltica</i>	
	<i>Synapha vitripennis</i>	
	<i>Tetragoneura sylvatica</i> #	
Sciaridae	<i>Bradysia fungicola</i> #	
	<i>Bradysia signata</i>	
	<i>Corynoptera forcipata</i>	
	<i>Leptosciarella rejecta</i>	
	<i>Trichosia splendens</i> #	
Scatopsidae	<i>Apiloscatopse picea</i>	
	<i>Holoplagia richardsi</i> #	
Psychodidae	<i>Boreoclytocerus dali</i>	
	<i>Psychoda cinerea</i> #	
	<i>Psychoda phalaenoides</i> #	
	<i>Trichomyia urbica</i> #	
Anisopodidae	<i>Sylvicola cinctus</i> #	
Mycetobiidae	<i>Mycetobia pallipes</i> #	
Rhagionidae	<i>Rhagio lineola</i>	
Hybotidae	<i>Drapetis assimilis</i> #	
	<i>Tachypeza nubila</i> #	
	<i>Trichina elongata</i>	
Empididae	<i>Empis planetica</i>	
Dolichopodidae	<i>Sciapus platypterus</i> #	
Phoridae	<i>Anevrina thoracica</i> #	
	<i>Megaselia picta</i>	
Lonchopteridae	<i>Lonchoptera lutea</i>	
Lauxaniidae	<i>Pseudolyciella stylata</i> #	

Chloropidae	<i>Lasiambia brevivucca</i> #	Nationally Scarce
Heleomyzidae	<i>Heteromyza rotundicornis</i> <i>Tephrochlamys flavipes</i> # <i>Tephrochlamys rufiventris</i>	
Drosophilidae	<i>Drosophila obscura</i> # <i>Drosophila subobscura</i> # <i>Drosophila suzukii</i> <i>Drosophila tristis</i> #	
Anthomyiidae	<i>Delia platura</i> <i>Hylemya vagans</i> <i>Mycophaga Testacea</i> <i>Pegoplata debilis</i>	
Muscidae	<i>Helina abdominalis</i> # <i>Helina evecta</i> <i>Helina impuncta</i> <i>Helina pertusa</i> # <i>Phaonia pallida</i> # <i>Phaonia subventa</i> #	Nationally Scarce
	# at least in part saproxylic 33 spp	

HIGHBURY WOOD NNR

Order	Family	Species Identification	Status
Coleoptera	Cantharidae	<i>Cantharis decipiens</i> <i>Malthinus flaveolus</i>	
	Carabidae	<i>Abax parallelepipedus</i>	
	Cerambycidae	<i>Rutpela maculata</i>	
	Ciidae	<i>Cis fagi</i>	
	Cryptophagidae	<i>Cryptophagus dentatus</i>	
	Curculionidae	<i>Acalles misellus</i> <i>Barypithes pellucidus</i> <i>Euophryum confine</i>	
	Elateridae	<i>Denticollis linearis</i> <i>Melanotus castanipes</i>	
	Histeridae	<i>Abraeus perpusillus</i>	
	Latridiidae	<i>Enicmus testaceus</i>	
	Monotomidae	<i>Rhizophagus bipustulatus</i>	
	Oedemeridae	<i>Ischnomera sanguinicollis</i>	Nationally Scarce
	Ptinidae	<i>Dorcatoma dresdensis</i>	Nationally Scarce
		<i>Grynobius planus</i>	
		<i>Ptilinus pectinicornis</i>	
		<i>Kissophagus vicinus</i>	Nationally Scarce
		<i>Anaspis garneysi</i>	
	Staphylinidae	<i>Micropeplus staphylinoides</i> <i>Quedius mesomelinus</i> <i>Quedius truncicola</i>	Nationally Scarce

Order	Family	Species Identification	Status
Coleoptera	Staphylinidae	<i>Quedius xanthopus</i> <i>Tasgius morsitans</i>	Nationally Scarce
	Throscidae	<i>Aulonthroscus brevicollis</i>	Nationally Rare
Diptera		see next table	
Hemiptera	Miridae	<i>Pantilius tunicatus</i>	
Psocoptera	Caeciliusidae	<i>Valenzuela burmeisteri</i>	
	Pseudocaeciliidae	<i>Chilenoaecilius ornatipennis</i>	
	Psocidae	<i>Loensia fasciata</i>	
Diplopoda		<i>Glomeris marginata</i>	
Mollusca		<i>Ashfordia granulata</i>	
		<i>Cepaea juv</i>	
		<i>Discus rotundatus</i>	
		<i>Oxychilus alliarius</i>	
		<i>Zenobiella subrufescens</i>	

Diptera Family	Species	Comments
Tipulidae	Tipula paludosa	
Limoniidae	Ormosia sp	
	Rhipidia uniseriata #	Nationally Rare
Keroplastidae	Macrocera pusilla	Nationally Scarce
	Neoplatyura modesta	
	Orfelia ochracea #	
Mycetophilidae	Apolephthisa subincana #	
	Docosia fuscipes	
	Mycetophila formosa #	
	Mycomya trilineata #	
	Phthinia humilis	
Sciaridae	Bradysia fungicola #	
	Corynoptera flavicauda	
	Corynoptera forcipata	
	Leptosciarella fuscipalpa	
	Leptosciarella rejecta	
Psychodidae	Pericoma extricata	
	Trichomyia urbica #	
Anisopodidae	Sylvicola cinctus #	
Rhagionidae	Chrysopilus asiliformis	
Stratiomyidae	Pachygaster leachii #	
Hybotidae	Platypalpus optivus	
	Tachypeza nubila #	
Empididae	Hilara litorea	
	Rhamphomyia tarsata	
Dolichopodidae	Chrysotus gramineus	
Syrphidae	Criorhina floccosa #	
Lauxaniidae	Meiosimyza platycephala	
Dryomyzidae	Dryomyza anilis	
Chloropidae	Lasiambia brevibucca #	Nationally Scarce
Clusiidae	Clusiodes sp	

Diptera Family	Species	Comments
Agromyzidae	Phytomyza ranunculi	
Heleomyzidae	Heteromyza rotundicornis	
Drosophilidae	Drosophila obscura #	
	Drosophila suzukii	
Anthomyiidae	Hylemya nigrimana #	
	Hylemya vagans	
	Mycophaga testacea	
Muscidae	Eudasyphora cyanella	
	Helina pertusa #	
	Phaonia pallida #	
Calliphoridae	Calliphora vicina	

at least in part saproxylic 16 spp

RODGE WOOD

Group	Family	Species Identification	Status	
Coleoptera	Cantharidae	<i>Malthodes marginatus</i>		
	Carabidae	<i>Pterostichus madidus</i>		
	Cerambycidae	<i>Rhagium bifasciatum</i>		
	Cryptophagidae	<i>Cryptophagus dentatus</i>		
		<i>Cryptophagus scanicus</i>		
	Cucujidae	<i>Pediacus dermestoides</i>		
	Curculionidae	<i>Acalles misellus</i>		
		<i>Kykliaacalles roboris</i>	Nationally Scarce	
		<i>Otiorhynchus singularis</i>		
		<i>Phyllobius viridiearis</i>		
		<i>Strophosoma melanogramma</i>		
		Elateridae	<i>Agriotes pallidulus</i>	
		Geotrupidae	<i>Anoploderes stercorosus</i>	
		Latridiidae	<i>Cartodere nodifer</i>	
		Leiodidae	<i>Anisotoma humeralis</i>	
	Monotomidae	<i>Rhizophagus bipustulatus</i>		
	Nitidulidae	<i>Glischrochilus hortensis</i>		
	Oedemeridae	<i>Ischnomera cyanea</i>		
		<i>Oedemera femoralis</i>	Nationally Scarce	
Ptinidae	<i>Grynobius planus</i>			
Scirtidae	<i>Prionocyphon serricornis</i>	Nationally Scarce		
Scraptiidae	<i>Anaspis garneysi</i>			
Scydmaenidae	<i>Stenichnus godarti</i>	Nationally Rare		
Staphylinidae	<i>Hapalaraea pygmaea</i>			
	<i>Quedius maurus</i>	Nationally Scarce		
	<i>Quedius mesomelinus</i>			
Diptera		see next table		
Psocoptera	Caeciliusidae	<i>Valenzuela flavidus</i>		
	Ectopsocidae	<i>Ectopsocus briggsi</i>		
	Pseudocaeciliidae	<i>Chilenoaecaecilius ornatipennis</i>		

Psocoptera Stenopsocidae *Stenopsocus immaculatus*

Diptera Family	Species	Comments
Tipulidae	<i>Ctenophora pectinicornis</i> # <i>Tipula confusa</i> <i>Tipula flavolineata</i> #	Nationally Scarce
Limoniidae	<i>Austrolimnophila ochracea</i> # <i>Dicranomyia quadra</i> <i>Ormosia nodulosa</i>	
Ditomyiidae	<i>Symmerus annulatus</i> #	
Keroplastidae	<i>Keroplastus testaceus</i> # <i>Macrocera fasciata</i> # <i>Macrocera stigmoides</i> #	
Mycetophilidae	<i>Acnemia nitidicollis</i> # <i>Brevicornu griseicolle</i> <i>Brevicornu sericoma</i> # <i>Coelosia flava</i> <i>Cordyla brevicornis</i> # <i>Cordyla fissa</i> <i>Docosia fuscipes</i> <i>Docosia sciarina</i> <i>Exechia dorsalis</i> # <i>Exechiopsis leptura</i> # <i>Leptomorphus walkeri</i> # <i>Mycetophila tridentata</i> # <i>Mycomya annulata</i> # <i>Mycomya cinerascens</i> # <i>Pseudobrachypeza helvetica</i> # <i>Saigusaia flaviventris</i> # <i>Synapha vitripennis</i> <i>Tetragoneura sylvatica</i> #	
Sciaridae	<i>Bradysia fungicola</i> # <i>Bradysia placida</i> # <i>Bradysia signata</i> <i>Corynoptera flavicauda</i> <i>Corynoptera flavosignata</i> <i>Corynoptera forcipata</i> <i>Leptosciarella fuscipalpa</i> <i>Phytosciara flavipes</i> <i>Trichosia caudata</i> # <i>Trichosia confusa</i> # <i>Trichosia splendens</i> #	
Psychodidae	<i>Boreoclytocerus dali</i> <i>Pericoma cognata</i> <i>Psychoda phalaenoides</i> # <i>Saraiella consigliana</i>	

Diptera Family	Species	Comments
	<i>Telmatoscopus rothschildii</i> #	
	<i>Telmatoscopus tristis</i> #	
Anisopodidae	<i>Sylvicola cinctus</i> #	
Rhagionidae	<i>Rhagio lineola</i>	
Hybotidae	<i>Elaphropeza ehippiata</i>	
	<i>Oedalea holmgreni</i> #	
	<i>Tachypeza nubila</i> #	
	<i>Trichinomyia flavipes</i>	
Empididae	<i>Chelipoda vocatoria</i>	
Dolichopodidae	<i>Sciapus platypterus</i> #	
Phoridae	<i>Anevrina thoracica</i> #	
Lonchopteridae	<i>Lonchoptera lutea</i>	
Syrphidae	<i>Brachyopa bicolor</i> #	Nationally Scarce
	<i>Melangyna lasiophthalma</i>	
	<i>Myathropa florea</i> #	
Lauxaniidae	<i>Meiosimyza platycephala</i>	
	<i>Meiosimyza rorida</i>	
	<i>Pseudolyciella stylata</i> #	
Dryomyzidae	<i>Dryomyza anilis</i>	
Oдиниidae	<i>Odinia boletina</i> #	
Drosophilidae	<i>Drosophila obscura</i> #	
	<i>Drosophila subobscura</i> #	
Scathophagidae	<i>Scathophaga stercoraria</i>	
Anthomyiidae	<i>Hylemya nigrimana</i> #	
	<i>Hylemya vagans</i>	
	<i>Mycophaga testacea</i>	
Fanniidae	<i>Fannia sociella</i>	
Muscidae	<i>Helina depuncta</i>	
	<i>Helina pertusa</i> #	
	<i>Muscina prolapsa</i>	
	<i>Phaonia pallida</i> #	
	<i>Phaonia palpata</i> #	
	<i>Phaonia valida</i>	

at least in part saproxylic 42 spp

REDDINGS INCLOSURE

Group	Family	Species Identification	Status		
Coleoptera	Carabidae	<i>Bembidion quadrimaculatum</i> <i>Pterostichus madidus</i>	Nationally Scarce		
	Cerambycidae	<i>Rhagium bifasciatum</i> <i>Rhagium mordax</i>			
	Chrysomelidae	<i>Oomorplus concolor</i>			
	Ciidae	<i>Cis fagi</i>			
	Cleridae	<i>Opilo mollis</i>			
	Cucujidae	<i>Pediacus dermestoides</i>			
	Curculionidae	<i>Acalles misellus</i> <i>Liophloeus tessulatus</i> <i>Strophosoma melanogramma</i>			
		Elateridae		<i>Melanotus castanipes</i>	
		Geotrupidae		<i>Anoploderes stercorosus</i>	
		Latriidiidae		<i>Cartodere nodifer</i> <i>Enicmus testaceus</i>	
				Leiodidae	<i>Anisotoma humeralis</i>
		Nitidulidae		<i>Epuraea silacea</i>	
		Oedemeridae		<i>Oedemera femoralis</i>	
		Ptinidae		<i>Anobium punctatum</i> <i>Grynobius planus</i> <i>Salpingus ruficollis</i>	
				Salpingidae	<i>Salpingus ruficollis</i>
				Scirtidae	<i>Prionocyphon serricornis</i>
	Scraptiidae	<i>Anaspis lurida</i> <i>Anaspis pulicaria</i>			
		Staphylinidae		<i>Quedius mesomelinus</i>	
	Throscidae	<i>Aulonothroscus brevicollis</i> <i>Trixagus carinifrons</i>			
		Zopheridae		<i>Pycnomerus fuliginosus</i>	
	Diptera	see next table			
	Psocoptera	Caeciliusidae		<i>Valenzuela flavidus</i>	
		Ectopsocidae		<i>Ectopsocus briggsi</i>	
Peripsocidae		<i>Peripsocus milleri</i>			
Psocidae		<i>Trichadenotecnum sexpunctatum</i>			
Stenopsocidae		<i>Stenopsocus immaculatus</i>			

Diptera Family	Species	Comments		
Limoniidae	<i>Cheilotrichia cinerascens</i> <i>Neolimonia dumetorum</i> # <i>Ormosia nodulosa</i> <i>Rhipidia ctenophora</i> # <i>Tasiocera fuscescens</i>	Vulnerable		
	Keroplastidae		<i>Cerotelion striatum</i> #	
	Mycetophilidae		<i>Acnemia amoena</i> # <i>Acnemia nitidicollis</i> #	Near Threatened

Diptera Family	Species	Comments
	<i>Brevicornu proximum</i>	
	<i>Cordyla crassicornis</i>	
	<i>Exechia dorsalis</i> #	
	<i>Monoclona rufilatera</i> #	
	<i>Mycomya annulata</i> #	
	<i>Tarnania nemoralis</i>	
Sciaridae	<i>Bradysia trivittata</i>	
	<i>Corynoptera flavicauda</i>	
	<i>Corynoptera forcipata</i>	
	<i>Leptosciarella fuscipalpa</i>	
	<i>Leptosciarella rejecta</i>	
Psychodidae	<i>Boreoclytocerus dali</i>	
	<i>Mormia revisenda</i>	
	<i>Psychoda cinerea</i> #	
	<i>Telmatoscopus tristis</i> #	
	<i>Trichomyia urbica</i> #	
Anisopodidae	<i>Sylvicola cinctus</i> #	
Mycetobiidae	<i>Mycetobia pallipes</i> #	
Rhagionidae	<i>Rhagio tringarius</i>	
Hybotidae	<i>Tachypeza nubila</i> #	
Empididae	<i>Rhamphomyia erythropthalma</i>	
	<i>Rhamphomyia nigripennis</i>	
	<i>Rhamphomyia tarsata</i>	
Dolichopodidae	<i>Sciapus platypterus</i> #	
	<i>Xanthochlorus galbanus</i>	
Phoridae	<i>Megaselia picta</i>	
Lauxaniidae	<i>Meiosimyza rorida</i>	
	<i>Pseudolyciella sp</i> #	
	<i>Tricholauxania praeusta</i>	
Dryomyzidae	<i>Dryomyza anilis</i>	
Chloropidae	<i>Lasiambia brevibucca</i> #	Nationally Scarce
Heleomyzidae	<i>Heteromyza rotundicornis</i>	
	<i>Tephrochlamys flavipes</i> #	
Drosophilidae	<i>Drosophila obscura</i> #	
	<i>Drosophila subobscura</i> #	
	<i>Hirtodrosophila confusa</i> #	
	<i>Leucophenga maculata</i> #	
Anthomyiidae	<i>Delia florilega</i>	
	<i>Hylemya vagans</i>	
	<i>Mycophaga testacea</i>	
Fanniidae	<i>Fannia sociella</i>	
Muscidae	<i>Helina pertusa</i> #	
	<i>Lophosceles mutatus</i>	
	<i>Phaonia gobertii</i> #	
	<i>Phaonia laeta</i> #	Nationally Scarce
	<i>Phaonia pallida</i> #	
	<i>Phaonia palpata</i> #	

Diptera Family
Calliphoridae

Species
Calliphora vicina

Comments

at least in part saproxylic 27
spp