Forge Wood, Dallington Forest
East Sussex

Saproxylic Invertebrate Sampling

A contract commissioned by the Dallington Forest Project

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Tetratoma ancora copyright F Köhler

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SUMMARY

This document reports on the results of a project involving flight interception trapping on five selected veteran trees in Forge Wood, part of the medieval Dallington Forest. The aim was to document the number and range of saproxylic (wood-decay) species present:

- 150 species of insect were identified from the flight interception traps;
- 48 of the Coleoptera species, 37 of the Diptera and 2 Hemiptera were saproxylic – dependent on decaying wood, giving a total of 87 saproxylic species;
- 16 of the species trapped are of special note due to their rarity across Britain, and these comprise 5 Nationally Rare and 11 Nationally Scarce species;
- The most notable find was however a wetland crane fly *Ellipteroides alboscutellatus*, a species with a northern and western distribution in England and not previously known from SE England; it is presumed to be breeding within the adjoining Dallington Forest SSSI - its specific habitat is perched spring-line tufa flushes;
- The other rarities are all saproxylic: the fungus gnat *Dynatosoma thoracicum* which breeds in annual polypore fungi on deadwood, the long-headed fly *Systenus tener* and the cranefly *Rhipidia uniseriata* which both breed in tree rot-holes, and the beetle *Tetratoma ancora*, which breeds in decaying stems of old hazel and hornbeam;
- One additional species is of interest as a Caledonian pine forest species, the slime-mould associated beetle *Anisotoma castanea*, only once before reported from East Sussex (Ashdown Forest);
- the species composition overall reflected the condition of the trees which were trapped, with strong emphasis on specialist beetles of dead and decaying wood, but notably few species dependant on advanced decay of heartwood or rot-holes;
- assessment of the beetle fauna using the Index of Ecological Continuity and the Saproxylic Quality Index produces values of county significance;
- the richness of the documented saproxylic fauna amply justifies the current site management efforts;
- the fauna however remains relatively poorly studied and it is predicted that there is much more to be found;
- a long-term monitoring strategy for the saproxylic fauna should ideally be developed, to see how condition changes with site management.

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1 INTRODUCTION

1.1 Background

1.1.1 Dallington Forest

Dallington Forest originates from a medieval forest. It was extensively exploited for timber and charcoal production by the iron industry during the 17th Century. Conversion to conifer plantations began in the 1960s but active management ceased in Forge Wood in 1970. There was a clearance phase in 1987 following the Great Storm. A programme of conservation work started in 2007.

Part of the Forest has been designated as the Dallington Forest SSSI, primarily for its ghyll woodland which contains 'Atlantic' plant species, species which only occur in The Weald and in the west of Britain.

Forge Wood is currently rich in ancient and veteran trees (Table 1):

Table 1 Data on tree abundance in Forge Wood (supplied by Jamie Simpson)

Tree species	**Number of ancients**	**No of veterans**
Beech	29	182
Oak	3	106
Ash	1	
Crab	1	

The four key factors which determine species-richness in wood-decay (saproxylic) invertebrates are (Alexander, 2018):

- overall abundance of trees across the local landscape;
- the density pattern of trees, such that there is sufficient open space to enable the development of open-grown trees, as well as areas of denser trees;
- the age structure of the trees, so that future generations of older trees are continually developing;
- continuity over time, in terms of centuries and millenia.

In theory Dallington Forest should therefore be rich in saproxylic invertebrates. However, the history of intensive exploitation for timber products over many centuries may have meant that habitat continuity has been broken to some degree.

1.1.2 Entomological recording

The private nature of the woodlands of Dallington Forest has meant that entomological recording has not taken place to any great extent – if at all - and that the invertebrate fauna is currently little-known. Contact with local naturalists has confirmed that the site is not known to them. A brief visit by members of the Ancient Tree Forum in March 2017 resulted in the discovery of a small number of uncommon saproxylic invertebrates, including the flat bark beetle *Pediacus dermestoides*, the click beetle *Stenagostus rhombeus*, the awl-fly *Xylophagus ater* and the bark bug

Xylocoris cursitans. These are characteristic species of ancient semi-natural woodland in lowland England.

1.2 Objective

A project was organised by the Dallington Forest Project in 2018 to operate a series of flight interception traps within Forge Wood. The objective was to assess site quality for saproxylic invertebrates, to guide management operations.

2 METHODOLOGY

The entire focus of the study was to be flight interception trapping.

2.1 Flight interception trapping

The flight interception traps used are of a standardised construction (see Figure 1):

- Four 2l plastic drinks bottles, with large windows cut into their sides, and their bases bolted into a plastic base, the windows facing outwards;
- The plastic bases are hung within hollow trees or by large trunk cavities – at 1-1.5m above ground level - using baler twine, with the bottles hanging upside down beneath;
- The upside-down bottle tops are filled with preservative solution (commercial antifreeze 50/50 with tap-water, plus a little washing up liquid to reduce surface tension) which can then be drained through the plastic cap.

These were set up to operate between each of the sampling visits, with captured invertebrates killed and preserved in the solution. The traps were emptied and re-set during each subsequent visit, finally being closed down in November.

The dates adopted for operation of the traps were:

- April 29th traps placed
- May 29th
- June 30th
- August 2nd
- September 4th
- October 28th

The traps were therefore operated for 6 months across the full field season in 2018.

Jamie Simpson identified five potentially suitable trees (Table 2):

Table 2 Information on trees selected for flight trapping

Tree number	Height of trap (m)	Tree species	Trap situations
1	1	Beech	Stem cavity
2	5	Beech	Branch scar
3	8	Beech	Branch cavity

Tree number	Height of trap (m)	Tree species	Trap situations
4	5	Oak	Branch scar
5	4	Beech	Stem cavity

3 RESULTS

3.1 General

A total of 150 insect species have been identified from the flight trap samples, with Diptera and Coleoptera the most prominent groups (Table 3):

Table 3 Species counts from Dallington Forest flight trapping 2018

Group	Total species	Saproxylics
Diptera – two-winged flies	87	39
Coleoptera - beetles	53	41
Psocoptera – bark flies	4	
Hemiptera – true bugs	4	1
Hymenoptera – ants, bees & wasps	2	
Total	**150**	

The Diptera include six species with conservation status while the Coleoptera includes 10 species, giving a total of 16 species with conservation status. All except one of these are saproxylic.

3.1.1 Nationally Rare species

The Diptera include one species which was assessed as 'Endangered' in Britain by Falk (1991), although more recent data indicates that this assessment should be revised to Nationally Rare. This is a wetland cranefly *Ellipteroides alboscutellatus* (Limoniidae), known to Falk (1991) as *Gonomyia alboscutellata*. At that time it was only known from three sites in Herefordshire, Worcestershire and North Yorkshire. It was considered Endangered due to a perceived potential threat from land drainage and woodland clearance for intensive forestry – neither of which have subsequently taken place. By the time of Heaver (2006) it was known from 14 sites and more were added by Heaver (2014). It is now known from about 16 hectads, from the Mendip Hills of Somerset, along the Border counties of Herefordshire and Shropshire, up to North Yorkshire.

A mating pair were found in Trap 1 in August. This is a remarkable discovery as the species had been thought to be confined to northern and western England. It breeds in flushed *Palustriella* moss beds on perched spring-line tufa flushes. The Weald is famous for supporting a number of species which have similar British distributions – and this is the key reason that the site includes a SSSI - and so this crane fly can now be added to that list and the recognised botanical interest expanded to also recognise entomological interest. Heaver (2006) comments that, although fundamentally rare,

the scarce microhabitat that supports this crane fly is more widespread than expected. He goes on to say that during the principal flight period on favourable sites adult flies are the commonest flies found by sweep-netting. They tend to avoid open areas, preferring vegetated zones, especially where shaded by taller vegetation. They generally occupy a zone from ground level up to 1m – this is consistent with trap 1 being positioned at 1m up a beech trunk.

Fig 1 *Ellipteroides alboscutellatus* copyright J Salmela

Two Diptera species also found in the traps have more recently been assessed as Near Threatened. These are the fungus gnat *Dynatosoma thoracicum* and the long-headed fly *Systenus tener*. The fungus gnat is a saproxylic with the larvae developing in the soft polypore fungi *Tyromyces chioneus* and *Postia caesia* fruiting on moist decaying wood (P.J.Chandler, pers. comm.). The species was previously known from 11 hectads across SE England. A male was taken in trap 3 in November. The species is not included in Falk & Chandler (2005) and so it is not possible to say why it is thought to be Near Threatened. The long-headed fly develops in rot-holes in broad-leaved trees and all known sites are in Central and SE England. A male was found in trap 5 in June.

One final fly species, another crane fly *Rhipidia uniseriata* was assessed by Falk (1991) as Nationally Rare. The larvae develop in moist decaying wood of veteran trees, especially rot-holes and other tree cavities with white-rot; it has been reported from woodland, wood pasture and parkland, and hedgerow situations; invariably with broad-leaved trees. It has a scattered distribution across central and south-eastern England; Falk (1991) knew of only about 12 sites during the previous 30 years although it has been reported from a large number of new sites since then. A female was found in trap 2 in May.

The rarest of the beetles found is *Tetratoma ancora*. This has recently been assessed as Nationally Rare in Britain (Alexander et al 2014). It is associated especially with standing dead hazel stems in shady woodland situations, the stems white-rotted by a variety of wood-decay fungi, including *Peniophora, Phellinus, Plicatura* and *Xerula* species. Hornbeam coppice is also used in SE England. The requirement for shady

woodland may be due to a requirement for constant relatively high humidity. Most sites are large enclosed ancient woodland complexes, where there has been sufficient habitat constantly available despite coppice-cutting. Adults have been reported from most months of the year, overwintering beneath bark on deadwood, etc. One was found in trap 4 in May.

3.1.2 Nationally Scarce species

Two of the fly species captured have Nationally Scarce status in Britain. One is a fungus gnat *Dynatosoma cochleare*, a mainly Scottish species but since 1990 also found widely (7 hectads) in England and Wales. Its biology is not known but it has once been reared from under pine bark in Scotland (probably a pupation site); the larvae are likely to be on polypore fungi like other members of the genus. The other species is *Clusia tigrina* (Clusiidae), which has larvae develop in decaying wood of broadleaved trees, usually of standing trees with exposed heartwood. This distinctive picture-winged fly was once regarded as a rare ancient woodland species but has proved to be more widespread in recent decades.

The most interesting of the nine Nationally Scarce beetles is the false ladybird *Symbiotes latus*. It appears to feed on white-rotten wood and fungi characteristic of heartwood decay. It is likely to be up-graded to Nationally Rare when the conservation status of this group of beetles is next assessed by the Government agencies. The Weald appears to be its national stronghold.

The ecology of the other Nationally Scarce beetles is summarised below:

Diplocoelus fagi (Biphyllidae)

- Larvae and adults feed on fungi; until recently, exclusively associated with beech trees, the adults occurring under bark on deadwood, particularly the loose outer layer. Increasingly it has been found in association with sooty bark disease on sycamore logs in the London area. Associated with the fungus *Tubercularia confluens* and with Ascomycete *Biscogniauxia cinerioliacina* on lime in Scandinavia.
- Adults moderately mobile and are attracted to bracket fungi for feeding and overwinter in deadwood. One in trap 5 in June.

Melasis buprestoides (Eucnemidae – false click beetles)

- Larvae develop in fairly hard wood, undecayed apparently; the galleries are broad and flat, across the grain; adults emerge simultaneously and swarm; in ancient woodlands and historic parklands and wood pastures. One in trap 5 in May.

Platypus cylindrus (Platypodidae – oak pin-hole borer)

- Adults strongly attracted to smell of fermenting sap, arriving at freshly split or felled timber; adults and larvae in galleries extending deep into heartwood, feeding on fungi cultured in borings; mainly oak, but also beech and other broadleaved trees. Two in trap 5 in June.

Plegaderus dissectus (Histeridae)

- Adults found in moist crumbly decaying timber of various broad-leaved trees, generally associated with white rot; occasionally found under mouldy bark. Two in trap 4 in May.

Prionocyphon serricornis (Scirtidae)

- Long-horned and flattened larvae occur in bottom debris of water-filled tree-holes, especially between root buttresses; probably a scavenger; adults fly at dusk & favour canopy situations for oviposition rather than lower sites. Three in trap 3 and one in trap 4.

Quedius truncicola (Staphylinidae – rove beetles)

- In wet, very rotten heartwood of veteran trees, often with dense, clay-like blackish wood-mould, in tree holes and hollow trunks, generally beneath bird nests; adults also reported from rotten fungi and at sap. One in trap 2 in September.

Tillus elongatus (Cleridae – checkered beetles)

- A predator of woodworm beetles on old broad-leaved trees, especially larvae of *Ptilinus pectinicornis* and *Anobium punctatum*, and usually in hard dead heartwood of beech. The larvae hunt nocturnally under bark and on the outside of the tree. One in trap 3 in June.

Xyleborus dryographus (Curculionidae: Scolytinae – bark beetles)

- Another ambrosia beetle, mainly in freshly dead oak and sweet chestnut, but also beech and elm; boring galleries into moist dead heartwood, with larvae feeding on the fungi which develop as a lining to the galleries.

One further Nationally Scarce species may have been found in the traps but only females were found and so the species cannot be confirmed as present. This is the rove beetle *Quedius brevicornis* which is found in the nests of birds and hornet inside tree cavities, also in rot holes and fungi. Two females were found in trap 3 in June.

3.1.3 Anisotoma castanea

One of the more interesting beetles found in the flight traps does not have any conservation status in Britain because it is primarily a species of Caledonian pine forest and very widespread there. It develops in slime fungi under dead bark on pine timber. It has however been reported from East Sussex once before, when one was found in powdery slime fungus in Five Hundred Acre Wood, Ashdown Forest in 2011 (Hodge, 2012). One was found in trap 1 in June. The presence in SE England of this species may appear anomalous but it may be another example of The Weald supporting relict populations of species otherwise confined to the far west and/or north of Britain. But, equally, a case could be made for it being an introduction with past conifer forestry activities. It should not be assumed however that it is associated with conifers here in East Sussex as it feeds on slime-moulds on timber and it would be valuable to know which host fungus it is using in East Sussex.

3.1.4 Exotica

The beetles taken by the traps include four non-native species. The New Zealand wood-boring weevil *Euophryum confine* has been in Britain since 1937, the Australian *Pycnomerus fuliginosus* since 1964, and the most recently established of the saproxylic arrivals is the bark beetle *Xylographus monographus*, first found in the Home Counties as recently as 2003. One specimen of the Australian ladybird *Rhyzobius lophanthae* was also found – first detected in Britain in 1999.

The bark beetle *X. monographus* is a native European species but appears to have been accidentally introduced into SE England and has been spreading rapidly. It develops particularly in sickly or damaged trees but also in freshly fallen trunks and branches, and trees planted in waterlogged soil; oak, sweet chestnut, beech, elm, birch and ash are all used. The feeding tunnels of the beetles penetrate into the sapwood to deposit their eggs – it is an ambrosia beetle, the larvae feeding on fungal growth introduced into the galleries by the mother beetle. It is clearly well-established in Forge Wood, with 46 specimens trapped including immature adults only recently emerged from their breeding habitat.

One fungus gnat found, *Macrobrachius kowarzii*, is also a recent arrival in Britain but may have colonised naturally from across the English Channel. It was first found in Kent in 2016, Dallington in May 2018, and then Windsor Forest in July 2018. Its biology is not known but it is thought to develop in encrusting fungi on lying deadwood.

4 INDEX OF ECOLOGICAL CONTINUITY AND SPECIES QUALITY INDEX FOR SAPROXYLIC BEETLES

Two systems have been devised for the relative assessment of site quality for nature conservation using saproxylic beetles: the Index of Ecological Continuity (revised in Alexander, 2004) and the Saproxylic Quality Index (Fowles, Alexander & Key, 1999).

The Index of Ecological Continuity has been used to identify Britain's most important sites for the saproxylic invertebrates of ancient trees and wood-pasture type habitats, 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 old 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 Saproxylic Quality Index (Fowles et al, 1999) is a more recent development designed to take the whole saproxylic beetle fauna into account and to include some control of recording effort – there is no need for continued recording in order to boost the species list. The species are scored according to the level of their national status (largely based on 1998 data) 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 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 – selective rare species surveys cannot be used;
- the same attention should have been applied to recording common species as rare ones.

Fowles et al (1999) suggested that an SQI of 500 is probably an appropriate threshold for assessing national importance.

The SQI approach is of particular use in comparing a series of datasets from a single site –the IEC is less useful for this as the list of qualifying species should be built up with continuing recording effort. It has therefore been suggested that the SQI is best regarded as a site condition index (Alexander, 2014).

Table 4 provides a full list of the saproxylic Coleoptera known from Forge Wood, including records from the ATF 2017 visit as well as the flight trapping results – only the most recent record is given in the 'year' column. The Table indicates the species scores used for the SQI and IEC and illustrates the calculation of the Index values.

Table 4 List of saproxylic beetles known from Dallington Forest, with Site Quality Index and Index of Ecological Continuity scores

Family	Species	SQI	IEC	Year
Histeridae	*Paromalus flavicornis*	2		2018
	Plegaderus dissectus	8	2	2018
Leiodidae	*Anisotoma castanea*	2		2018
	Anisotoma humeralis	2		2018
Staphylinidae	*Stenichnus bicolor*	4	1	2018
	Scaphisoma agaricinum	2		2018
	Gabrius splendidulus	1		2018
	Quedius truncicola	8	1	2018
Lucanidae	*Sinodendron cylindricum*	2		2018
Scirtidae	*Prionocyphon serricornis*	8	1	2018
Eucnemidae	*Melasis buprestoides*	4	1	2018

Family	Species	SQI	IEC	Year
Elateridae	*Melanotus villosus*	1		2018
	Stenagostus rhombeus	4	1	2018
Cantharidae	*Malthinus seriepunctatus*	2		2018
Ptinidae	*Dorcatoma chrysomelina*	4	1	2018
	Grynobius excavatus	2		2018
	Ptilinus pectinicornis	1		2018
	Xestobium rufovillosum	4	1	2018
Cleridae	*Tillus elongatus*	8	1	2018
Melyridae	*Dasytes aeratus*	2		2018
Biphyllidae	*Diplocoelus fagi*	8	1	2018
Monotomidae	*Rhizophagus bipustulatus*	1		2018
	Rhizophagus dispar	1		2017
Cucujidae	*Pediacus dermestoides*	4	1	2017
Cerylonidae	*Cerylon ferrugineum*	2		2018
Endomychidae	*Endomychus coccineus*	2		2017
	Sybiotes latus	8	1	2018
Latridiidae	*Enicmus testaceus*	2		2018
Mycetophagidae	*Litargus connexus*	2		2018
	Mycetophagus quadripustulatus	2		2018
Tetratomidae	*Tetratoma ancora*	8	1	2018
Melandryidae	*Orchesia undulata*	4	1	2018
Zopheridae	*Bitoma crenata*	4	1	2018
	Pycnomerus fuliginosus			
Tenebrionidae	*Nalassus laevioctostriatus*			2018
Pyrochroidae	*Pyrochroa sp*			2017
Salpingidae	*Salpingus planirostris*	1		2018
	Salpingus ruficollis	1		2018
Scraptiidae	*Anaspis frontalis*	1		2018
	Anaspis garneysi			2018
	Anaspis pulicaria	1		2018
	Anaspis rufilabris	1		2018
Curculionidae	*Euophryum confine*			2018
	Leperesinus varius	1		2017
	Scolytus intricatus	2		2017
	Xyloborus dryographus	8	1	2018
	Xyloborus monographus			2018
Platypodidae	*Platypus cylindrus*	8	1	2018
	Saproxylic Quality Score	**143**		
	Species total	**43**		
	Saproxylic Quality Index	**333**		
	Index of Ecological Continuity		**18**	

The resulting IEC of 18 is a figure of county importance in Sussex as a whole – see below. The SQI of 333 does not meet national significance – no thresholds for county or regional importance have been suggested.

5 SAPROXYLIC DIPTERA

Table 5 provides a list of the saproxylic Diptera currently known from Forge Wood.

Table 5 Saproxylic Diptera recorded in Forge Wood in 2017 and 2018

Family	Species	Status	Year
Limoniidae	*Achyrolimonia decemmaculata*		2018
	Austrolimnophila ochracea		2018
	Neolimonia dumetorum		2018
	Rhipidia uniseriata	RDB3	2018
Mycetophilidae	*Dynatosoma cochleare*	NS	2018
	Dynatosoma reciprocum		2018
	Dynatosoma thoracicum	NT	2018
	Exechiopsis leptura		2018
	Macrobrachius kowarzii	2nd GB	2018
	Mycetophila tridentata		2018
	Mycomya marginata		2018
	Phronia forcipata		2018
	Phronia humeralis		2018
	Phronia notata		2018
	Phronia nigricornis		2018
	Saigusaia flaviventris		2018
	Tetragoneura sylvatica		2018
	Trichonta melanura		2018
	Trichonta vitta		2018
	Zygomyia pictipennis		2018
	Zygomyia semifusca		2018
Sciaridae	*Trichosia confusa*		2018
	Trichosia glabra		2018
	Trichosia splendens		2018
Psychodidae	*Telmatoscopus rothschildii*		2018
	Trichomyia urbica		2018
Anisopodidae	*Sylvicola cinctus*		2018
Mycetobiidae	*Mycetobia pallipes*		2018
Scatopsidae	*Ectaetia lignicola*		2018
Xylophagidae	*Xylophagus ater*		2017
Hybotidae	*Oedalea holmgreni*		2018
	Oedalea stigmatella		2018
	Tachypeza nubila		2018
Dolichopodidae	*Systenus tener*	NT	2018
Lauxaniidae	*Pseudolyciella pallidiventris*		2018
Clusiidae	*Clusia tigrina*	NS	2018
Drosophilidae	*Drosophila obscura*		2018
Muscidae	*Helina pertusa*		2018
	Phaonia palpata		2018

6 OVERVIEW OF SAPROXYLIC SIGNIFICANCE

Although a good range of saproxylic invertebrates have been demonstrated as present within Forge Wood, overall the species lists from the five flight interception traps show only a limited range of species associated with large old veteran trees, hollow trunks, and even rot-holes. A few species of this assemblage have been found, such as the beetles *Plegaderus dissectus* and *Quedius truncicola* and the long-headed fly *Systenus tener* but this is a very restricted version of what one might expect from old forest areas like Savernake or Epping. It does seem as if the history of forest management for the local iron industry has resulted in impoverishment of the large old tree fauna. However, the fauna is undoubtedly relatively rich overall, richer than one might expect from conventional ancient woodland, and this may reflect the scale of Dallington Forest – intensive exploitation will have reduced populations of many saproxylics but those that persisted are now more able to thrive under present management. Table 6 places Dallington's IEC of 17 in the context of other relatively well-studied sites across Sussex.

Table 6 Sussex sites with IEC and SQI data

Site name	**IEC**	**SQI**
Cowdray Park	67	595
Petworth Park	45	437
Parham Park	37	665
Buxted Park	33	420
Eridge Park	31	342
Slindon Park Woods	24	-
Dallington Forest	17	333

Many potentially interesting Sussex sites have not yet been assessed in this way, e.g. Arundel Park, Ebernoe Common, Knepp Castle Estate and The Mens. The IEC is cumulative and so additional survey work might increase the Index as previously overlooked species are discovered.

The current assessment of Dallington Forest is therefore 'county interest' for saproxylic beetles, a relatively rich site for saproxylic beetles and flies, but apparently with only limited representation of the old growth fauna supported by ancient and veteran trees – advanced heartwood decay and rot-hole faunas. Further recording effort may however revise this assessment.

7 RECOMMENDATIONS FOR FUTURE MANAGEMENT OF SAPROXYLIC INTERESTS

7.1 Conservation management principles for saproxylic invertebrates

Habitat quality and condition for saproxylic invertebrates depend on four key factors:

- The total number of veteran trees, as the fauna needs sufficient trees to maintain viable populations;
- The age structure of those trees, to ensure continual renewal of available decaying wood habitats;
- The density pattern of those trees, especially in maintaining open-grown conditions across part of the site at least;
- Continuity of habitat in time as well as space – the historic aspect of this fauna.

Conservation management therefore needs to focus especially on tree health, as it is living veteran trees which provide the important decaying wood habitats. The establishment of new generation, future veteran trees is also vitally important.

7.2 Future survey and monitoring

The Saproxylic Quality Index has been shown to be particularly valuable for site condition monitoring purposes (Alexander, 2014) as it can be calculated for individual datasets in a way that the Index of Ecological Continuity cannot. A direct comparison can be made of SQI values for each survey event. Site Condition Monitoring on SSSI's is typically carried out on a six-year cycle and it is suggested that a similar cycle be considered for Dallington Forest, assuming finances might be available. Repeat projects of flight interception trapping are probably the most cost-effective approach to long-term site condition monitoring. This would provide a broad-brush assessment of change in site condition from each survey event to the next, providing a measure of progress with site conservation management.

It would also be valuable to examine the species lists and catch sizes from successive runs of flight interception trapping, to monitor changes in representation and abundance of specialist saproxylic assemblages like the advanced heartwood decay and rot-hole assemblages. The project reported here provides an invaluable baseline for interpretation of change in the future.

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APPENDIX 1 INVERTEBRATES OTHER THEN DIPTERA IN FLIGHT INTERCEPTION TRAPS 2018

Group & Family	Species Identification	Trap 1	2	3	4	5	Status
Coleoptera							
Biphyllidae	*Diplocoelus fagi*					1	NS
Cantharidae	*Malthinus seriepunctatus*					2	
Carabidae	*Dromius quadrimaculatus*					1	
Cerylonidae	*Cerylon ferrugineum*			2	1		
Chrysomelidae	*Orsodacne cerasi*					1	
Cleridae	*Tillus elongatus*			1			NS
Coccinellidae	*Rhizobius lophantae*	1					
Colydiidae	*Bitoma crenata*				fragments		
	Pycnomerus fuliginosus				1	3	
Curculionidae	*Euophryum confine*		12	6	2		
	Xyloborus dryographus					1	NS
	Xyloborus monographus			1	21	23	
Dasytidae	*Dasytes aeratus*				1		
Dermestidae	*Anthrenus fuscus*					1	
Elateridae	*Athous haemorrhoidalis*		3	1		1	
	Dalopius marginatus		1	1	1		
	Melanotus villosus	2	1				
	Stenagostus villosus	1			2	1	
Endomychidae	*Sybiotes latus*	1			1	1	NS
Eucnemidae	*Melasis buprestoides*					1	NS
Histeridae	*Paromalus flavicornis*				1		
	Plegaderus dissectus				2		NS
Latridiidae	*Aridius nodifer*		1				

Group & Family	Species Identification	Trap 1	2	3	4	5	Status
	Dienerella ruficollis				6		
	Enicmus testaceus	2			6	1	
Leiodidae	*Anisotoma castanea*	1					NS
	Anisotoma humeralis	1				1	
Lucanidae	*Sinodendron cylindricum*			3			
Melandryidae	*Orchesia undulata*			1		1	
Monotomidae	*Rhizophagus bipustulatus*			1			
Mycetophagidae	*Litargus connexus*					2	
	Mycetophagus quadripustulatus					2	
Platypodidae	*Platypus cylindrus*					2	NS
Ptinidae	*Dorcatoma chrysomelina*					1	
	Grynobius excavatus	11	2	10	4	1	
	Ptilinus pectinicornis			3	2	9	
	Xestobium rufovillosum				1		
Salpingidae	*Salpingus planirostris*				6	1	
	Salpingus ruficollis			1	1		
Scirtidae	*Microcara testacea*			5			
	Prionocyphon serricornis			3	1		NS
Scraptiidae	*Anaspis frontalis*		2				
	Anaspis garneysi	1	5				
	Anaspis pulicaria	1					
	Anaspis rufilabris		4				
Staphylinidae	*Stenichnus bicolor*	1					
	Scaphisoma agaricinum					1	
	Gabrius splendidulus			3			
	Quedius sp female poss *brevicornis*			2			
	Quedius truncicola		1				NS
Tenebrionidae	*Nalassus laevioctostriatus*				2	2	

Group & Family	Species Identification	Trap 1	2	3	4	5	Status
Tetratomidae	*Tetratoma ancora*				1		NS
Throscidae	*Trixagus dermestoides*	1	1				
Hemiptera							
Aradidae	*Aradus depressus*					1	
Cercopidae	*Aphrophora alni*	4					
Issidae	*Issus coleoptratus*			1			
Pentatomidae	*Pentatoma rufipes*	1				1	
Hymenoptera							
Apidae	*Apis mellifera*			1			
Vespidae	*Vespa crabro*			present	present		
Psocoptera							
Peripsocidae	*Peripsocus milleri*		1				
Psocidae	*Loensia fasciata*		1				
	Metylophorus nebulosus		1				
	Trichadenotecnum sexpunctatum		1	1			

APPENDIX 2 DIPTERA IN FLIGHT INTERCEPTION TRAPS 2018

Species	**Trap 1**	**Trap 2**	**Trap 3**	**Trap 4**	**Trap 5**	**Status**
Tipulidae						
Nephrotoma quadrifaria	1m vi					
Tipula pabulina				1m v		
Pediciidae						
Ula mollissima			2f vi			
Limoniidae						
Achyrolimonia decemmaculata			1f vi			
Austrolimnophila ochracea				2m 2f v		
Ellipteroides alboscutellatus	1m 1f in cop viii					**EN**
Limonia nubeculosa		1f ix, 1m xi		2f vi		
Neolimonia dumetorum			1f v	2f vi		
Rhipidia uniseriata		1f v				**NR**
Bibionidae						
Bibio marci	1m viii					
Keroplatidae						
Antlemon servulum			1f vi			
Macrocera stigma				1m vi	1m viii	
Mycetophilidae						
Allodia grata			1m xi			
Apolephthisa subincana		1f v	1m v			
Boletina pallidula			2m v			
Docosia fuscipes		1m v				
Dynatosoma cochleare			1m xi			**NS**
Dynatosoma reciprocum			1m v, 1m xi			

Species	Trap 1	Trap 2	Trap 3	Trap 4	Trap 5	Status
Dynatosoma thoracicum			1m xi			**NT**
Exechia bicincta			1f xi			
Exechia dorsalis		1f xi				
Exechia fusca			1f xi			
Exechiopsis leptura			2m 1f v			
Leia bimaculata			1m xi			
Macrobrachius kowarzii		1m v				**2nd GB**
Mycetophila alea		1f xi				
Mycetophila britannica			1f xi			
Mycetophila perpallida			1m xi			
Mycetophila tridentata			1f vi			
Mycomya circumdata			1f v	1m vi		
Mycomya marginata			1f v			
Phronia forcipata		1m v	1m vi			
Phronia humeralis			1f v, 1m xi			
Phronia notata			1m v, 1m xi			
Phronia nigricornis			1m v			
Saigusaia flaviventris			1f v			
Tetragoneura sylvatica		1m v, 1m 1f vi, 1m ix	1m v	2f v		
Trichonta melanura			1m vi			
Trichonta vitta			8m 2f v, 1m vi	1m vi		
Zygomyia pictipennis			1f vi, 1m xi			
Zygomyia semifusca			1m xi			
Sciaridae						
Bradysia placida		1m xi	1m vi			
Lycoriella ingenua			1m v			
Phytosciara flavipes		1m vi, 1m xi				

Species	Trap 1	Trap 2	Trap 3	Trap 4	Trap 5	Status
Schwenckfeldina carbonaria		1m vi				
Trichosia confusa	1m viii					
Trichosia glabra		1m vi	1m v			
Trichosia splendens					1f vi	
Psychodidae						
Boreoclytocerus dalii			3m v, 1m vi			
Psychoda phalaenoides		1m v				
Telmatoscopus rothschildii		1m vi	1m vi			
Trichomyia urbica		1m vi	1m vi, 1m viii			
Anisopodidae						
Sylvicola cinctus	1f viii	2f v, 1f ix	4f v, 1m viii, 1m xi	2f v, 2m 1f vi	1f ix	
Mycetobiidae						
Mycetobia pallipes				1f viii		
Scatopsidae						
Ectaetia lignicola		2m vi, 1m viii				
Rhagionidae						
Rhagio lineola		1m vi				
Rhagio scolopaceus				3m v		
Asilidae						
Neioitamus cyanurus				1f vi, 1f ix		
Hybotidae						
Hybos femoratus	1m viii					
Oedalea holmgreni	1f vi					
Oedalea stigmatella		1f v				
Tachypeza nubila				1f xi		
Empididae						
Empis albinervis				1m vi		

Species	Trap 1	Trap 2	Trap 3	Trap 4	Trap 5	Status
Empis grisea				1f vi		
Empis nuntia					1m 1f v	
Dolichopodidae						
Chrysotus gramineus					1m vi	
Neurigona quadrifasciata			2m 2f v, 4m 3f vi, 2f viii	3m 2f v, 2m 4f vi		
Sciapus platypterus	2f vi	1f vi	1m 1f vi	2f vi		
Systenus tener					1m vi	**NT**
Lauxaniidae						
Meiosimyza platycephala				1f ix		
Pseudolyciella pallidiventris					1m viii	
Clusiidae						
Clusia tigrina					1m xi	**NS**
Agromyzidae						
Chromatomyia nigra				2m vi		
Sphaeroceridae						
Coproica ferruginata					1m vi	
Drosophilidae						
Drosophila obscura		2f vi	2f vi, 1f viii			
Scathophagidae						
Scathophaga furcata			1f v			
Scathophaga stercoraria	1m viii					
Anthomyiidae						
Hylemya vagans			1m v	1f v		
Mycophaga testacea		1f ix				
Muscidae						
Helina depuncta			2f xi		1f xi	
Helina impuncta			1f vi			

Species	Trap 1	Trap 2	Trap 3	Trap 4	Trap 5	Status
Helina pertusa			1m 1f vi, 1f viii, 3m xi			
Phaonia pallida			1f vi, 1f x			
Phaonia palpata			1m v			
Phaonia subventa			1f vi			
Rhinophoridae						
Tricogena rubricosa			4f vi, 3f viii			
Calliphoridae						
Pollenia rudis					1f xi	