Queen's Wood

Report on a ground invertebrate survey, June 2010 to June 2011

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1. Introduction

Queen's Wood is one of the very few fragments of ancient woodland left in north London. It was originally part of the extensive area of ancient woodland that existed in medieval times covering much of what is now the built-up areas of Finchley, Muswell Hill and parts of Barnet, and Coldfall Wood, along with Big Wood, and parts of Coppetts Wood are some of the small parcels that are left.

Botanical and historical details of the wood have been addressed by several other authors, notably Silvertown and Bevan; I will restrict my comments to the invertebrates. I have previously reported (briefly) on the spiders of the wood (Milner 1990).

Various aspects of the structure and management of the wood have a major bearing on the invertebrate fauna. Much of the wood consistes of stands of native hornbeam and oak with some others such as wild cherry, hazel, birch and rowan, together with understorey trees like holly and hawthorn. There are also numerous other trees which have been planted; David Bevan (in press) has documented the occurrence of different plants, including trees and garden-escaped shrubs and herbs. Much of the wood shows evidence, from the structure of the trees, of having been coppiced in the past; the trees involved were mainly hazel and hornbeam. Much of this history has been documentaed by Silvertown (1978). Other trees were clearly allowed to grow to their full height as standards (notably oak and cherry but also rowan, some planted London planes and a few other trees).

Coppicing has the effect of periodically opening the canopy and allowing light to reach the floor of the wood so that the ground flora including tree seedlings can thrive. Recently, an area at the north-east corner of the wood was coppiced again for the first time in over fifty years, and in this survey I was asked to pay particular attention to this area in compartment P. The other sites chosen were in compartments which Bevan has shown to have lower numbers of invasive species, and were therefore assumed to be least altered from ancient woodland conditions.

The survey would be conducted by setting pitfall traps and monitoring them on a monthly basisi for a single twelve-month period from June 2010 to June 2011.

2. The Survey

Woodland is a difficult habitat to assess comprehensively for invertebrates. Many species live in the canopy during the summer months, although they may spend time at ground level, in the leaf-litter or the soil during the winter. Large old trees especially those with damaged branches or hollow trunks, also provide many places for invertebrates to live. The present survey has been limited to sampling the leaf-litter and soil surface at the six selected sites by means of pitfall traps, but it should be emphasised that this is only a selective approach unlikely to provide comprehensive data. Systematic sampling of other levels such as the canopy are much more difficult to undertake and have not been attempted.

Many invertebrates are extremely secretive, and can (apparently) survive in very low densities; trapping for many years continues to produce new records but not final totals of species present. The author has been trapping invertebrates on the other side of Queen's Wood (compartments J, E/F, D, C and B) since 1989, and in most years previously enrecorded species are found. It was decided in consultation with members of the Friends that a new survey for a limited period taking in parts of the wood not previously examined, but including the new coppiced area would be the most appropriate development to inform future management of the wood for invertebrates.

A list of the trap sites is given in Table 1 (see also Map). The first three sites were in heaviy shaded areas of campartments U and T, sites 1001 and 1002 have a ground covering of ivy. Site 1004 was in short grass sward partially shaded under oak and hornbeam, while sites 1005 and 1006 were inside the new coppice area in the north-east corner of the wood.

Table 1: Habitat Compartments and trap-sites

Compa-rtment	Trap-site	Habitat	Ground vegetation
U	1001	Damp, shaded area with some leaf litter and partial ground covering of ivy	Partial cover
T	1002	Dry, slightly sloping, shaded site in the middle of large patch of ground covered with ivy.	Covered
T	1003	Dry, shaded site under large oak tree with no ground vegetation only leaf litter.	None
R	1004	Dry, very short grass sward under partial cover	Almost continuous
P	1005	Damp, dense herb layer in the new coppice area	Dense
P	1006	Dry edge beween short grass and tallherbs/bramble in new coppice area	Edge dense/sparse
		totals	

Pitfall traps were set in standard trios with a small quantity of ethylene glycol (holding agent) and commercial detergent (wetting agent). These compounds may act as an attractant for some species and discourage others but this standard form has been used throughout London in previous surveys and presumably the same bias (if any) occurs each time. The traps were emptied and the catch sorted on a monthly basis. The survey began when the traps were first set at the end of June 2010 and emptied every month until 1st July 2011.

Spiders were identified by the author, beetles by Mr N Heal, the pseudoscorpions by Dr G Legg, and bugs (Hemiptera) by Mr T Bantock.

3. Results and interpretation

In total 3273 spiders were trapped representing 69 spp. of which 10 had not been recorded in the wood previously. Because the beetles are very numerous they were not counted, but they represented 60 spp.of which 27 had not been recorded from the wood before.

Total numbers of species for the wood as a whole now stand at 139 spp. of spider, 234 spp. of beetle, 4 spp. of pseudoscorpion as well as 29 other identified invertebrates (mostly insects) including 3spp. of hymenopterous spider-parasites (Ichneumonidae). Complete lists for the wood are provided at the end of the report. A summary of the spiders trapped from the different sites is given in Table 2 below:

Table 2: Summary of spiders trapped at the six sites

Compa-rtment	Trap-site	Ground vegetation	Total no of spiders trapped	Spider spp.
U	1001	Partial cover	369	22
T	1002	Covered	335	15
T	1003	None	649	19
R	1004	Almost continuous	647	32
P	1005	Dense	317	29
P	1006	Edge dense/sparse	956	49
			3273	69 (10 new)

(a) Spiders

In the following discussion, perhaps the phrase ‘at ground level’ should always be borne in mind, but I shall omit it after the next sentence; while occasional individuals of spiders inhabiting above ground habitats such as the herb layer and the tree canopy found their way into the traps the main part of the catch comprised species inhabiting the leaf-litter or surface of the soil. It appears that at ground level most of the spiders in the wood are small money spiders (Linyphiidae) living in the leaf-litter, especially a number of species such as *Diplocephalus picinus, D. latifrons* and *Monocephalus fuscipes* which are all found most commonly in disturbed/secondary woodland habitats (as opposed to undamaged ancient woodland).

In the newly coppiced area, particularly the open area (site 1006) large numbers of wolf spiders (Lycosidae) were trapped particularly common open-ground species such as *Pardosa pullata, Alopecosa pulverulenta* and *Trochosa terricola* while pioneer species such as *Erigone dentipalpis* also occurred in large numbers as would be expected (see Table 2 below). Of the other species in Table 2, *Lepthyphantes flavipes* is a common disturbed-woodland spider, while *Bathyphantes gracilis* is ubiquitous – it occurs in most habitats, often in large numbers, and especially in damper places. *Pardosa amentata* is generally found in damp open habitats and not normally in woodland; as the coppice becomes somewhat more shaded it could be expected to decrease. The last two, *L zimmermanni* and *Microneta viaria* are both common woodland spiders, the latter exclusively so.

Table 3: Most abundant spiders at each trap site

Trapsite		Spiders (most abundant)	
1001	Shaded	*Bathyphantes gracilis* 86 (23%)	*Lepthyphantes zimmermanni* 42 (11%)
1002	Shaded	*Diplocephalus picinus* 111(33%)	*L. zimmermanni* 58 (17.3%)
1003	Shaded	*D. picinus* 308 (47.4%)	*Microneta viaria* 97 (14.9%)
1004	Part shaded	*D.picinus* 163 (25%)	*L.flavipes* 108 (16.7%)
1005	Part shaded/damp	*B.gracilis* 86 (27%)	*Erigone dentipalpis* 51 (16.1%)
1006	Open ground	*Pardosa amentata* 175 (18.3%)	*E.dentipalpis* 174 (18.2%)

While the most abundant species at each trapsite indicates the general nature of each site, and several other species were trapped at all the sites, it is the scarcer species which are potentially the most interesting. A few, such as the Nationally Notable *Philodromus albidus* (Philodromidae), the tiny tangle-web *Paidiscura pallens* (Theridiidae), and the buzzing spider *Anyphaena accentuata* (Anyphaenidae) all live in vegetation well above ground and are therefore only found in pitfall traps accidentally, while some are scarce ground-living species.

Perhaps the most interesting finds were two specimens (in April and May) of a spider that is extremely scarce in the London area: *Coelotes atropos*. The only other records are a small area of the Stockpond Wood on Hampstead Heath, and single individuals from three other sites in outer London. The related *C. terrestris* (a Nationally Notable species) is the one normally found in the London area and exclusively (in UK) across the southern quarter of England; several specimens were trapped (in October) at Queens Wood during this survey, and it is often abundant at sites on the south side of the wood. Queens Wood seems to be the first site found in the London area where the two species occur together. Both these spiders are quite large chunky species that spin an untidy web and retreat under stones or logs, and indeed the availability of suitable static logs within dense vegetation appears to be the main requirement for these species to thrive.

Other species found during this survey and not previously recorded from the wood are as follows:

Pachygnatha clercki occurs exclusively in damp areas of grassland or reedbeds; Site 1005 was damp, with an intermittent stream very nearby, and so this was a predictable find. Two of the new wolf spiders are also damp habitat species: *Trochosa ruricola* and *Pirata latitans* but these were trapped at site 1006, which though not actually damp, was close to the intermittent stream. Together with *P. amentata* this means that in that area four spiders normally associated with damp conditions have now been found.

Pardosa palustris was also trapped at site 1006; this is the wolf spider most favouring disturbed sites and so would be expected to occur in areas recently coppiced. *Dysdera crocata*, the 'woodlouse spider' also tends to occur where there are static dead logs with bark on them. The tiny money spider *Araeoncus humilis* is very scarce in the London area; here it was trapped in the new coppice (site 1006), as was the tiny *Agyneta decora* (site 1005) which is normally seen as a grassland spider. *Drassyllus pusillus* is a fairly scarce Gnaphosid spider associated with ants, while the small crab spider *Ozyptila sanctuaria* is a scarce (in London) inhabitant of well-established open-ground habitats. Some of these are the sort of species which may well be very scarce in woodland where coppicing has been abandoned but which would thrive if coppicing was maintained. Finally the 'local' (Harvey et al. 2002) *Tegenaria silvestris* is a smaller relative of the common house-spider that is found in damp woodland

usually only in well-established or even ancient woodland; it is fairly widespread in such places in the London area, but is never common.

Metellina merianae (trapped at site 1001 next to a small stream) was only found at Queens Wood for the first time in 2001 (after 12 years of trapping and collecting) and is clearly scarce in the wood; it is an orb-web spinner and tends to live in shaded places near water such as by woodland streams, in dirches and culverts. The mouse-spider Clubiona comta was trapped at several sites; this species inhabits both the litter and the canopy but spends some time near the ground. It is ubiquitous in London woodlands.

Helophora insignis is a woodland specialist trapped during this survey only at sites 1001 and 1002. It has only been recorded eight times previously, mainly from Compartment D, but also once each from Compartment F and C (on the boundary with D). This time only in Compartments U and T. This may suggest that it is associated with the least altered sections of the wood, but perhaps it is more likely that its occurrence is due to the presence of low vegetation such as bramble and ground ivy.

It is worth pointing out that the limited remnants of a specialised ancient woodland spider fauna are known from previous trapping elsewhere in the wood, although they were not found during this survey. These include the scarce jumping spider *Ballus chelybeius*, *Hahnia helveola* and the blue-web spider *Lathys humilis* – all species restricted to ancient woodland in the London area. One or two individuals of each have been trapped in the wood during the past 20 years, and these species could possibly flourish if conditions change, such as the extension of coppicing. There may even be other rarer ancient woodland species which have been found in adjacent woods, species such as the rare *Haplodrassus silvestris.*

(b) Beetles

The beetle data is more difficult to interpret than the spider data; beetles are very mobile and so their capture at particular places says less about that precise microhabitat than about their level of activity. Most of the beetles species found in this survey are widespread and common in London.

Of the species newly recorded 10 were (carnivorous) ground beetles (Carabidae) distributed among the different trap-sites, while 5 were (carnivorous) rove-beetles (Staphylinidae). Others included three flower beetles (Chrysomelidae) all from the new coppice area, while just one was a weevil (a plant-feeder)(Curculionidae). In fact the count of plant-feeding beetles recorded (in pitfalls) from the wood so far is remarkable for its lack of diversity, although naturally other beetle-hunters using different techniques may find additional species.

4. Conclusions and management recommendations

Overall, the results suggest that the diversity of the wood has been improved by the re-establishment of a coppice process, which has already added greatly to the vigour and diversity of the herb layer in that part of the wood, providing what is known as 'greater structural diversity' which directly benefits the spider population.

None of the newly recorded spiders are likely to have suddenly appeared, but may have effectively been suppressed by the excessive shading (and restricted structural diversity near the ground) of the wood over the past 50 years or so since coppicing was last done. Indeed there are some relatively scarce pioneer species which are frequently found on certain new habitats such as green roofs, but none of these has appeared (so far) at Queens Wood. On the other hand, as with the plants and the plant-feeding insects, the changes may take time – several years at least- partly due to the long gap since the last coppicing in these parts of the wood.

Many of the plant-feeding insects, and some of the woodland-glade spiders are not pioneers, and the presence of populations of foodplants/ diverse herb layer in an area that previously had liitle ground vegetation (except a few holly seedlings) may take several years to mature as a community and gain its expected suite of invertebrates, in particular those more specialised plant-feeders that depend on particular plant species.

Compared with other London sites the number of plant-feeders trapped at Queens Wood is low: for example the weevil numbers (Curculionidae) are as follows:

Queens Wood (over 20 years trapping): 22spp.;
Coldfall Wood (trapped non-continuousy for about 6 years): 16 spp. ;
Tower Hamlets Cemetery Park (mostly woodland with some open areas, trapped for just 5 years): 38spp.;
Mile End Park -trapped for 6 years) 33 spp.

While this is a rough and ready comparison, it does suggest that the ground flora at Queens Wood is at present rather limited. As a result of the restarted coppicing it is expected to become healthier and more diverse, as a result of which more plant-feeding species and a diverse assemblage of carnivores (such as spiders) is likely to thrive.

Plant-bugs (Hemipter-Homoptera) appear to be more adventurous pioneers and are already present in large numbers and some diversity in the as yet immature plant community in the coppice area, but all the plant-feeding groups such as flower beetles (Chrysomelidae) and weevils (Apionidae and Curculionidae) can be expected to increase in diversity in coming years.

The main conclusion to be drawn is that as a result of the new coppicing the wood already provides a richer and more complex habitat for invertebrates than before, and the biodiversity of the wood could benefit enormously if this process was extended. In fact a management plan for a complete coppice rotation of perhaps 12 years could even be considered. One problem is that the coppicing has led to the overdevelopment of impenetrable thickets of brambles etc., and efforts to control this might be considered. It is claimed that this was not a problem in former times as the bramble roots are a favourite of pigs which would have dug them up and eaten them while searching for acorns in the autumn.

If Queens Wood is compared with relatively undisturbed ancient woodland it is clear that the amount and variety of fallen dead and decaying timber, especially of a large diameter, is extremely limited. As indicated above, some spiders including *Coelotes* spp., *Dysdera crocata* etc., are specifically dependent upon the presence of sizeable static rotting logs, and this is even more the case with beetles. It has been estimated that 80% of the beetles

associated with woodland depend on dead wood of a variety of conditions for food; the paucity of dead wood both fallen and standing is a matter which should be addressed as a major management issue if the beetle fauna of the wood is to be improved.

Another habitat which is of very limited occurrence in the wood is damp ground, especially in relatively unshaded places. There is botanical and arachnological evidence that there was a damp-ground community in the wood which has largely disappeared. There are streams which flow through the wood but at present they are mostly small ravines which take the water very quickly through and out of the wood. It would be advantageous if some of the flow of these streams could be impeded especially if this could be combined with future coppicing, so that sunlight could reach the ground in these damp places as it does around site 1005 in the present survey. The result might well be to reinvigorate the whole damp-ground community of plants and invertebrates.

There are many other species of invertebrate, especially spider and beetle, which are known from adjacent woods and could be expected to occur at Queens Wood but have yet to be recorded. I fully expect that if the management suggestions above are followed, the diversity of invertebrates in the wood would increase over time, although this would be a process that would take decades rather than years to develop fully. If resources were available the continued and even extended monitoring of the invertebrate fauna would indicate how successful any changes in the management might be.

Management Recommendations

The three main management recommendations arising from the results of this short survey combined with the results of previous collecting and trapping in the wood are

(1) coppicing has been very successful and should be extended.
(2) the paucity of dead and decaying timber in the wood should be addressed.
(3) ways could be found to impede the drainage of some streams in the wood especially where they flow through newly coppiced areas (i e where light reaches the woodland floor).

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5. References

Bevan, D. (in press) Coppicing in Haringey's ancient woodlands. *Lond. Nat.*

Harvey, P. R., Nellist, D. R., and Telfer, M. G., (eds.) 2002. *Provisional atlas of British spiders (Arachnida: Araneae),* 2 vols.. Biological Records Centre, Huntingdon.

Milner, J.E. 1990. A study of the spider fauna of Queen's Wood, north London and some comparisons with two other London woodlands. *Lond. Nat*. **69**:95-114.

Silvertown, J. (1978) The history of woodlands in Hornsey. *Lond. Nat.* **57**: 11-25.

7. Map of Queens Wood showing trapsites