

Hazeley Wood Study Group

Annual Report No. 3

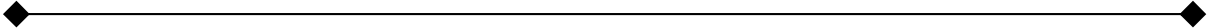
Primarily surveys carried out in 2006

Including some data from 1995-2005

**“Each study group report is a self-contained sub-section with
Title, Summary, Text and Tables, Figures, Maps, Appendices,
Bibliography, as appropriate”**

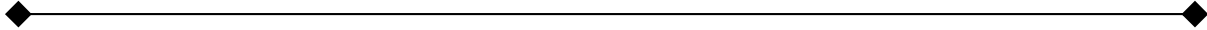
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**Milton Keynes Natural History Society
The Parks Trust, Milton Keynes**



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A.1 INTRODUCTION



By

John Wickham



This report gives the findings of surveys principally carried out in 2006 but with extensions in a few cases and also such data as had been observed in some of the years from 1995 onwards which are shown in a separate section (F). Thus, this is the third, and most comprehensive in the Hazeley Wood Report Series, following those for 1993 and 1994. Each study group report is a self-contained sub-section with Title, Summary, Text and Tables, Figures, Maps, Appendices, Bibliography, as appropriate.

The inaugural meeting of this present study and subsequent meetings drew a large and enthusiastic group of members of the Milton Keynes Natural History Society and others so that eventually more than 30 observers took part in some aspect of these studies, often in more than one study group. For some of these, this was their first attempt at recording and several took part in various training sessions either in house or at other institutions, to acquire the appropriate skills. Identifications by such individuals were always supervised by more experienced members of the team. Some, more difficult / unusual species were submitted by the team leader to specialists for confirmation. In all, 20 study groups were surveyed in 2006, which contrasts with the 14 groups examined hitherto. All results will be lodged with the Bucks & MK Environmental Records Centre. The most notable non-records were for Amphibia, Reptiles and Galls which had been initially intended but in the event no recorder came forward.

The principal change in the appearance of the wood since 1995 is of course the increase in growth which has transformed fields planted with small trees (mean heights - oak 1.7m; birch 2.4m; hornbeam 1.6m), into a structured spinney (mean heights – oak 7.7m; birch 9.6m; hornbeam 7.2m) with leaf litter and herbs / shrubs in and around the edges. Details of the site management, including woodland flora introductions and possible effects, are given in the first of the study group reports in Section A.2. In addition the adjacent area of Grange Farm has been developed so that house gardens now reach the eastern boundary along Cropside and H4 Danstead Way with a small car park for the site, borders part of the same boundary. As a consequence a pond has formed near the north-east entrance and a new entrance has been formed near the eastern end of the cross hedge providing an open area in the vicinity of the car park. An up-to-date map of the area is shown as Map A.1 on page 3 and an example of the original map used until 2006 is shown as Map F – 1995 on page 132. Throughout this report, 2 maps of Hazeley Wood are used, the up-

to-date map A.1 and several variations of the original as given in Hazeley Wood reports 1 and 2 (Wickham & Street, 1994; Wickham & Street, 1995).

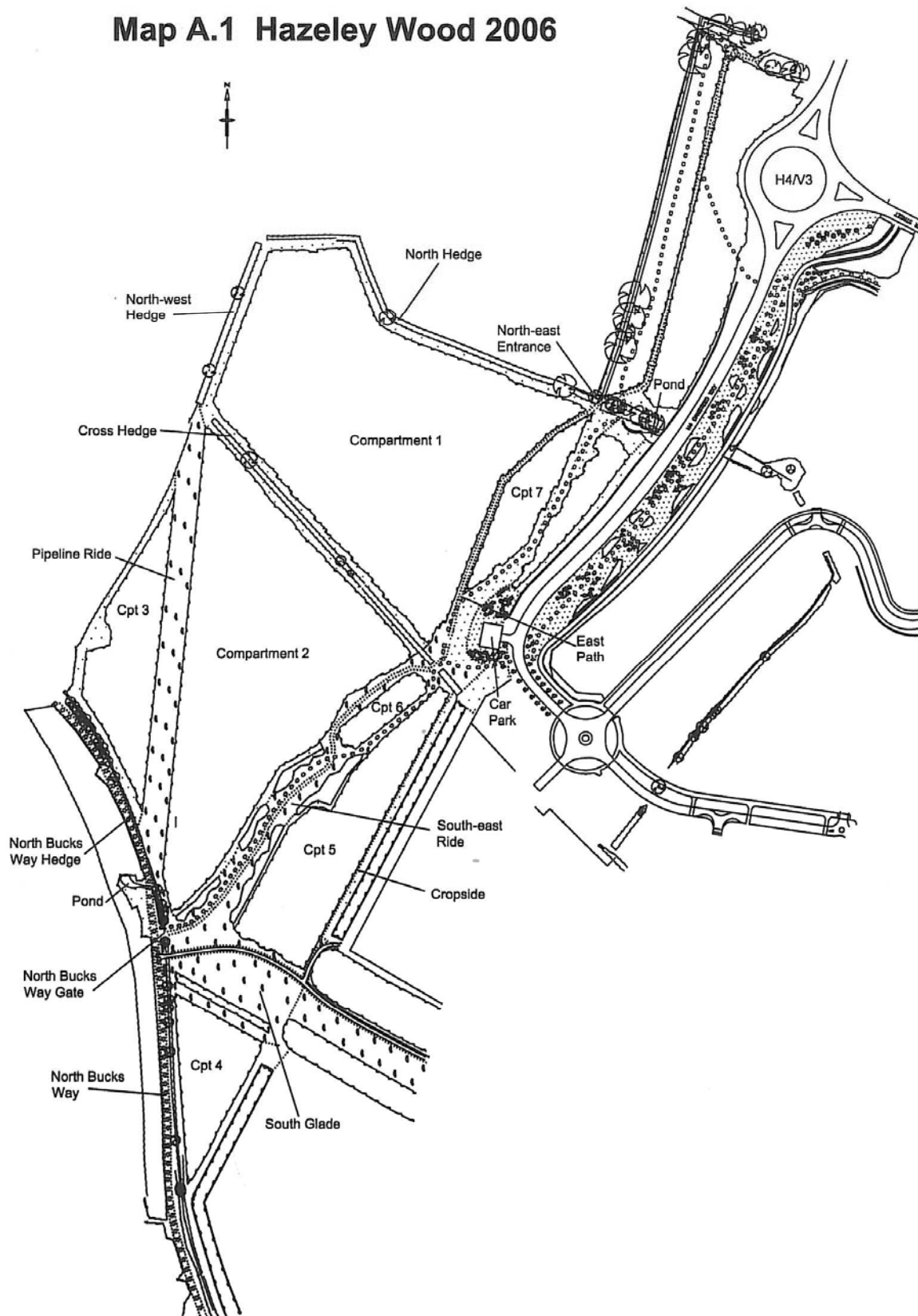
Copies of this report will be submitted to MKNHS, MK Parks Trust (to whom thanks are due for their valued material input in many ways) and the Bucks County Museum, for safekeeping.

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Map A.1 Hazeley Wood 2006



A.2 MANAGEMENT OF HAZELEY WOOD



By

Mike Street



1. MANAGEMENT IN THE EARLY YEARS

As reported previously, the post-planting management regime from 1991 to 1996 was the maintenance of weed-free conditions in a 1m wide strip along the tree rows, with bi-annual mowing between the rows. A small amount of NPK fertiliser was applied to each tree in the spring of the first three years. This resulted in excellent tree establishment and growth, some birch trees in late 2006 being in excess of 12m tall, with stem diameters over 140mm.

The open ride areas have been managed by taking a late hay crop, usually in late August or early September followed by aftermath mowing to maintain a sward height of a minimum of 50mm over winter. A narrow strip along the edges of the rides was left uncut to retain some winter cover for invertebrates.

The perimeter strip around the wood and along both sides of the cross-hedge was cut to the Trust's long grass specification – i.e. only once per year, usually in late September or early October, leaving a sward height of 50-100mm.

The grass path through part of the eastern compartment and the main ride was cut as short grass, i.e. cut back to 50mm whenever it reached 100mm.

The hedgerows around and through the site were cut just once per year in September, maintaining them at around 2.0m width to a height of 2 to 2.5m, except the North Bucks Way hedge, which is kept at 1.5m wide by 1.5m high.

Shrub beds planted along the main ride to create a woodland edge habitat have been coppiced once since planting.

2. MANAGEMENT BETWEEN 1996 AND 2006

The weed control along the rows by herbicide and mowing of the inter-row strips (which reduced to an annual cut in 1996) ceased to be mown in 1999.

In the eastern compartment some tree rows were brashed by the removal of the lower branches, which were failing due to shade, to create rackways easing access for inspection and monitoring, and a small amount of formative pruning was undertaken by volunteers. Brashings and prunings were left on site between the rows as a source of deadwood.

Some grey squirrel damage has occurred and numbers have been controlled since 2000 by use of warfarin bait in hoppers that can be accessed only by animals as heavy as squirrels or brown rats.

3. EFFECTS OF EARLY MANAGEMENT

The good establishment, rapid early growth and close initial spacing of the trees meant that canopy closure was more or less complete by 1997. A leaf litter layer has begun to develop, and the increase in shade has more or less eliminated the flora of predominantly ruderal forbs and grasses that established between the rows in the early years.

4. CURRENT AND PROPOSED MANAGEMENT

A management plan has been prepared by the Parks Trust. This covers the 150 years to 2151, and copies are available from the Trust. It is hoped that the early work of the MKNHS Hazeley Wood Study Group will continue until and beyond that time.

The first major work required by the plan is the thinning operation that was begun in January 2007. This entails removal of 35% of the trees, which means coppicing of 25% of the hornbeam and for other species, preferential removal of dead, dying and diseased trees, those of poor form, and 'wolf trees' whose over-developed crowns are suppressing better trees. The smaller diameter felled material has been chipped and spread thinly on site to aid the development of a more carbon-rich woodland soil, while some of the larger diameter stems are left scattered in small pieces to provide deadwood. The Trust intends to import some larger, substantial pieces of deadwood in the near future to boost the amount of deadwood.

The thinning will allow more light to reach the woodland floor for a number of years, stimulating the growth of herbaceous field layer plants again (*including the introduced woodland species – see section 5 of this report) until they are once more shaded out by coppice regrowth.

All of the cut stems, with the exception of those in the small block in the main ride just west of the car park, will be allowed to re-grow as coppice stools. This will create a far better structure to the wood as they develop into a shrub layer, and they will act as 'trainers' to the oaks, shading the lower stems and reducing the formation of epicormic shoots. A number of hornbeam stems have been cut at a little over 1m in height, to create high coppice/low pollards, so that the squirrels will have attractive sites for bark-stripping, hopefully reducing their impact on the better trees. (Squirrels prefer to strip small branches that are above the ground, not on low coppice stools).

The small block where the cut stumps have been killed will provide a lightly wooded, shady space where a seating and picnic area will be established close to the car park and site entrance.

The timing of these operations will allow the recording of the immediate responses of the flora and fauna of the wood to them if sufficient high quality data has been collected this summer, just prior to the work.

This thinning and coppicing operation will be repeated at 5 year intervals over the next 15 years until the last 25% of the hornbeam is coppiced in 2021, after which hornbeam will be coppiced on a 10 year cycle, in woodland that will have become coppice with oak standards and scattered maturing birches.

Other species, e.g. ash, hawthorn, blackthorn, cherry, dog rose and bramble will be recruited by natural regeneration, whilst others such as hazel, guelder rose and wild privet will be planted amongst the coppiced areas to enrich the understorey and shrub layer.

The shrub beds on the sides of the main ride will be re-coppiced in 2008.

5. WOODLAND FLORA INTRODUCTIONS

It is widely accepted that woodland field layer species characteristic of ancient woodland have poor powers of dispersal to and colonisation of, new plantations and may take hundreds of years to appear with planted trees. Also, although the North Bucks way hedges support some woodland species, there are no ancient woodlands adjoining Hazeley Wood for appropriate field layer species to colonise from. Without introductions many deep-shade, true woodland species such as bluebell would probably never arise.

The enhancement of the field layer of new plantations in Milton Keynes has been a feature of the development of the woodlands of the new town, and detailed monitoring of these trials has illustrated the success of direct seeding of a range of woodland and woodland edge forbs as a technique to establish a field layer that is more appropriate than that which is able to colonise new plantations naturally.

In the spring of 2000, it was considered that Hazeley Wood was at an appropriate stage of development for the field layer to be enhanced in this way. The weed-free conditions along the tree rows (then one winter out of herbicide treatment) and the degree of shade provided by the canopy cover, provided ideal conditions for woodland wildflower seeding.

It was also considered that this new plantation woodland at Hazeley provided an excellent opportunity for a field experiment to complement and build on the earlier work in the seeded grid-road and park plantations since 1990.

The row arrangement of the trees at Hazeley allowed for an experimental design that facilitated the monitoring of the results of woodland wildflower introductions and the performance of individual species under varying conditions of light and shade.

To achieve this, eight linear plots were treated with a mixture of seeds of 5 woodland and 6 woodland edge forbs on the 7th April 2000. The species chosen were those that had been shown to be successful in earlier monitoring studies. The species in the mixture are shown below. The mixture includes both deep shade tolerant 'true woodland' species and more light-demanding 'edge' species.

<i>Alliaria petiolata</i>	Hedge Mustard
<i>Allium ursinum</i>	Ramsons
<i>Conopodium majus</i>	Pignut
<i>Galium mollugo</i>	Hedge Bedstraw
<i>Geum urbanum</i>	Wood Avens
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Hypericum perforatum</i>	Perforate St John's-Wort
<i>Primula vulgaris</i>	Primrose
<i>Silene dioica</i>	Red Campion
<i>Stachys sylvatica</i>	Hedge Woundwort
<i>Torilis japonica</i>	Upright Hedge Parsley

The eight seeded plots were marked out in the north-east corner of the wood. The seed mixture was applied only to the 1.0m wide weed free strips along the tree rows. Each seeded tree row was 100m long and 5 parallel adjacent rows made up one plot. The eastern-most plot however, consisted of 6 seeded rows, making a total of 41 seeded rows. Each seeded row in a plot was separated by a non-seeded inter-row, which was a 1.0m wide vegetated strip, with a grass-dominated ground flora that had developed under the management regime imposed since planting, i.e. bi-annual mowing.

Each 'treated' plot of 5 seeded rows was separated from the next one by a plot consisting of 5 'untreated' non-seeded rows and their inter-rows. This provided a number of replicated areas for effective monitoring, with alternating seeded/unseeded blocks with light conditions at the edges and ends of rows, and shade conditions in the middle of the rows. The rest of the plantation was left unseeded and the block to the west of the central hedge provides an untreated control area.

The total seed weight applied to the 41 strips in the plots was 4.142 kg. Each of the 41 seeded strips is 100m long and 1.0m wide, i.e. 4100 m² (0.41ha) so the seed rate on the ground along the weed free tree rows was 10kg per ha. However, within each five row plot, taking into account the 1 m wide non seeded inter-row area, this equates to a whole site rate for the plot of 5 kg per ha, with the seed targeted onto the weed free areas within the plot, as is now the practice in real field-scale plantation seeding in Milton Keynes.

The mix of seeds was made up using data on seed numbers per gram to calculate the proportion of each species in the mixture to give an approximately equal number of seeds of each of them. This works out as approximately 45 seeds of each species per m², with 11 species used, giving a total of approx 500 seeds applied per m² along the tree rows.

The long term objectives of the trial are to measure seedling establishment success, persistence, population development and dispersal of each of these species when sown as an intimate mixture, containing approximately the same number of seeds of each.

In order to assess the first year performance of the introduced woodland species Dr Joanna Francis was commissioned to undertake a survey of seedling success in 2001. A copy of Joanna's survey report (Francis 2001) has been provided to MKNHS.

The results are summarised briefly below:

In May/June 2001 all vascular plants, including introduced meadow and woodland field layer species, naturally colonising forbs and grasses, tree and shrub seedlings were recorded throughout the woodland compartments and the open areas, as well as along the hedgerows to produce full site species lists. A more detailed survey was implemented within the experimental area in Compartment 1 to monitor the germination and seedling establishment of the 11 introduced field layer species. Site characteristics, such as canopy cover and soil pH, were also assessed.

Species richness, diversity, frequency and mean cover were calculated for plants in the woodland compartments and open areas. Cover data was analysed using Tablefit to describe community types within the developing field layers.

A total of 144 vascular plant species were recorded, including 4 trees, 18 shrubs, 90 forbs and 32 grasses, sedges and rushes. Of the 30 introduced meadow species present at the site, twenty-six have established within the open areas, whilst 4 of the 11 woodland field layer species are present as small seedlings along the tree rows in seeded trial plots in Compartment 1.

Vegetation is well established within the open areas of the site, where meadow communities are dominated by the introduced 'MG5 type' grassland with localised pockets of MG9 and MG10 communities related to changes in soil moisture status. Woodland field layer communities that have developed since management ceased in 1999 are best described as W24 Bramble-Yorkshire-fog underscrub and MG9 Yorkshire-fog-Tufted Hair-grass grassland. Initial germination and seedling survival of the introduced field layer species is very poor. However, Bluebell seedlings were present in 56% of quadrats and at a density of 2.3 seedlings m⁻². The poor establishment was attributed to the compacted nature of the clay soil, the lack of organic matter, and the very dry spring conditions.

The survey was also intended to provide a snapshot of the flora after the first 10 years against which to measure future changes in the field layer and ride flora, particularly the dispersal of the introduced woodland forbs into the rest of the site, and future studies by MKNHS and the Trust will address the issues of persistence, development and dispersal of the populations of the introduced species.

Dispersal will be assessed by the future rate of spread of these species into adjacent non-seeded areas (i.e. out of the seeded rows into the inter-row strips and into the sets of five unseeded rows between the seeded plots) and into the rest of the site generally, comparing the relative performance of each species in light and shade conditions when sown as part of an intimate mixture, as used in large scale applications.

Following the failure of the majority of the introduced species to establish as seedlings, a strip approximately 3m wide all the way around the eastern compartment was seeded with

a woodland mixture in the spring of 2005 in order to get them established so that appropriate field layer species may be present to colonise the rest of this block. The western compartment remains un-seeded as a control area and it is anticipated that in the long term this arrangement will provide an opportunity to monitor the effects of field layer introduction on the ecology of new plantations. In theory the seeded area should, for example, support more woodland invertebrates than the unseeded area, with knock-on effects on birds, bats etc.

B.1 GROUND FLORA and HEDGEROWS



By

Roy Maycock



SUMMARY

Four data collecting visits were made during 2006. Two were for general recording and two for quadrat sampling in the plantation area.

1. INTRODUCTION

Since the last survey in 1994, MKNHS members had carried out no systematic work. However, Dr Joanna Francis conducted a very comprehensive survey in 2001 and her report has been consulted.

2. SURVEY METHODS

The 35 grid intersections shown on earlier plans of the site had been relocated and new posts erected in the appropriate places. Finding the marker posts was not easy, but MKNHS plant surveyors located 34 of them. As in previous surveys, 1.5m diameter quadrats were centred on the posts and vascular plant taxa present listed. Also, as before, no assessment of frequency was made.

Throughout the survey plant names were taken from Stace (1997).

3. SITE VISITS

Jean and John Aslett, Joan Lancaster, Roy Maycock, Linda Murphy and Margaret Wickham carried out the general species recording of the site in conjunction with the two MKNHS field meetings (2 May and 30 August).

Quadrat sampling by all or most of the above was carried out on 31 May and 15 June.

4. RESULTS

A spreadsheet table of results for the quadrat sampling is given in Appendix B.1.1.
A complete list of the vascular plant species recorded during the four visits is given in Appendix B.1.2.

5. DISCUSSION

In the 11 years since sampling last took place the trees have shown enormous growth and weed control and mowing of the inter-row strips have ceased. The inter-rows are now not visible as such, are completely shaded by the trees and, except for the edges, no trace of previous arable vegetation was encountered.

43 taxa were recorded in the quadrats in both the 1994 and 2006 samplings but they were very different. Only 12 taxa were recorded in both years! 5 were grasses whilst the other 7 could be regarded as “weed species” except, perhaps, *Primula veris* (Cowslip) whose presence may be due to its being included in the original seed-mix used on site.

Of the 43 taxa recorded in 1994 (Wickham & Street 1995), 20 that were not recorded in 2006 are arable weeds i.e. *Aethusa cynapium* (Fool’s Parsley), *Alopecurus myosuroides* (Bloss Grass), *Anagalis arvensis* (Scarlet Pimpernel), *Atriplex patula* (Common Orache), *Chenopodium album*, (Fat-hen), *Euphorbia exigua* (Dwarf Spurge), *Fallopia convolvulus* (Black-bindweed), *Kickxia spuria* (Round-leaved Fluellen), *Persicaria lapathifolia* (Pale Persicaria), *Persicaria maculosa* (Redshank), *Plantago major* (Greater Plantain), *Poa annua* (Annual Meadow-grass), *Senecio vulgaris* (Groundsel), *Sinapsis arvensis* (Charlock), *Stellaria media* (Common Chickweed), *Trifolium dubium* (Lesser Trefoil), *Veronica arvensis* (Wall Speedwell), *Veronica persica* (Common Field-speedwell) and *Veronica serpyllifolia* (Thyme-leaved Speedwell). Two others *Glyceria fluitans* (Floating Sweet-grass) and *Juncus bufonius* (Toad Rush) are more characteristic of wet ground whilst the others would have been lost for other, unknown, reasons.

Taxa coming into the 2006 list include woody species that may establish and add variety to those in the original planting. *Fraxinus excelsior* (Ash) was by far the most frequently recorded species in the quadrats, albeit most specimens being only seedlings or saplings. Also coming in were *Acer campestre* (Field Maple), *Corylus avellana* (Hazel), *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn), *Rosa* sp(p) (Rose(s)) and *Rubus* sp(p) (Bramble(s)). Seedlings of *Betula pendula* (Silver Birch) and *Quercus robur* (Pedunculate Oak) were also seen – presumably from the originally planted trees. Again, “weed” species are still occurring, but in decreasing frequency. A few species from the original seed-mix are still present around the edges.

In 2000, “11 shade tolerant and woodland edge species, listed in Appendix B.1.4, were introduced into 8 trial plots in Hazeley Wood.” (Francis 2001). Of these only 2 were recorded in the MKNHS quadrats viz. *Hyacinthoides non-scripta* (Bluebell) and *Primula vulgaris* (Primrose) – in 3 and 2 quadrats respectively with *Torilis japonica* (Upright Hedge Parsley) being found outside the quadrat sample areas. Similar results (i.e. the above three species plus Garlic Mustard (*Alliaria petiolata*)) were observed by Francis in 2001.

A further five species were proposed for introduction in 2001 (see appendix B.1.5) but it is not known whether this took place. In any event none of these proposed species were recorded in 2006.

6. CONCLUSIONS

All of the tree species originally planted are still present and appear to be flourishing.

14 of the 20 herbaceous species planted in 1992 (see Appendix B.1.3) were recorded as still being present in 2006.

3 of the 11 herbaceous species planted in 2000 were recorded as being present in 2006.

From the above, it can be concluded that the woodland is developing its tree component and, in fact, it is now being supplemented naturally.

The original herb planting, too, seems to have been useful in helping to retain a herb variety, albeit mostly in the grassy "ride" areas. Very few herbaceous plants now grow beneath the trees.

The planting of herbs more typical of the woodland floor, however, has been unsuccessful. Comments in Francis (2001) suggest that the species chosen for introduction were unsuitable for the conditions present. Be that as it may, the further suite suggested for planting (see Appendix 5) is even less appropriate than the original, not taking into account the local distribution of native plants. For example there are currently no known woodland or other sites for *Geum rivale* (Water avens) or *Myosotis sylvatica* (Wood forget-me-not) in the County. Suggestions for the woody plants are much more constructive e.g. the planting and coppicing of hazel and the ring-barking of some of the birch trees.

7. REFERENCES

- Francis J (2001) – Botanical Survey of Hazeley Wood. Report for Milton Keynes Parks Trust
 Stace C A (1997) – New Flora of the British Isles (2nd edition), Cambridge University Press
 Wickham J C and Street M J (eds) (1995). Hazeley Wood Study Group Annual Report No. 2

Appendix B.1.1

HAZELEY WOOD PLANT SURVEY																																				
	A4	A5	A6	B1	B2	B3	B4	B5	B6	B7	B8	C2	C3	C4	C5	C6	C7	C8	C9	C10	D4	D5	D6	D7	D8	D9	D10	D11	E6	E7	E8	E9	F7	F8	F9	
Field Maple	+	+									+																									3
Meadow Foxtail										+																			+							2
False Oat-grass	+																																			1
Silver Birch			+											+																						2
Common Knapweed	+									+																			+							4
Creeping Thistle				+																																1
Field Bindweed																								+	+	+										4
Hazel																	+											+								2
Hawthorn		+		+				+									+											+								5
Cock's-foot																	+											+								2
Dactylis glomerata																																				1
Wild Carrot										+																										1
Tufted Hair-grass																																				1
Broad-leaved Willow																									+											1
Meadow Fescue	+																																			1
Red Fescue	+	+											+																							1
Ash	+	+	+	+	+									+																						7
Cleavers	+	+	+	+	+											+																				6
Cut-leaved C's-bill																																				1
a Crane's-bill											+																									2
Hogweed																																				4
Yorkshire-fog	+													+																						6
Bluebell														+																						3
Oxeye Daisy										+																										2
Bird's-foot-trefoil																																				2
Ribwort Plantain										+																										3
Smooth Midw-grass										+																										6
Rough Midw-grass	+													+																						19
Cowslip	+									+																										3
Primrose																																				2
Selfheal										+																										3
Blackthorn											+																									1
Pedunculate Oak	+																																			4
Meadow Buttercup	+																																			2
Creeping B'cup										+				+																						7
Dog Rose																																				1
Bramble																																				2
Wood Dock																																				5
Hoary Ragwort																																				4
Senecio erucifolius																																				9
Taraxacum agg.																																				1
Trifolium repens																																				3
Vicia sativa																																				1
Vicia tetrasperma																																				
	13	4	3	3	8	4	3	1	3	10	14	0	7	2	2	0	6	5	3	2	2	2	4	8	5	6	4	7	14	3	4	3	4	3	3	

Appendix B.1.2

Vascular Plant Species List 2006

<i>Acer campestre</i>	Field Maple
<i>Acer platanoides</i>	Norway Maple
<i>Achillea millefolium</i>	Yarrow
<i>Agrostis stolonifera</i>	Creeping Bent
<i>Alopecurus pratensis</i>	Meadow Foxtail
<i>Anthriscus sylvestris</i>	Cow Parsley
<i>Arrhenatherum elatius</i>	False Oat-grass
<i>Arum maculatum</i>	Lords-and-ladies
<i>Bellis perennis</i>	Daisy
<i>Betula pendula</i>	Silver Birch
<i>Brachypodium sylvaticum</i>	False -brome
<i>Bromus commutatus</i>	Meadow Brome
<i>Calamagrostis epigejos</i>	Wood Small-reed
<i>Carex flacca</i>	Glaucous Sedge
<i>Centaurea nigra</i>	Common Knapweed
<i>Cerastium fontanum</i>	Common Mouse-ear
<i>Chaerophyllum temulum</i>	Rough Chervil
<i>Cirsium arvense</i>	Creeping Thistle
<i>Cirsium vulgare</i>	Spear Thistle
<i>Convolvulus arvensis</i>	Field Bindweed
<i>Cornus sanguinea</i>	Dogwood
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Crataegus x media</i>	Hybrid Hawthorn
<i>Cynosurus cristatus</i>	Crested Dog's-tail
<i>Dactylis glomerata</i>	Cock's-foot
<i>Daucus carota</i>	Wild Carrot
<i>Deschampsia cespitosa</i>	Tufted Hair-grass
<i>Dipsacus fullonum</i>	Teasel
<i>Epilobium ciliatum</i>	American Willowherb
<i>Epilobium hirsutum</i>	Hairy Willowherb
<i>Epilobium montanum</i>	Broad-leaved Willowherb
<i>Epilobium parviflorum</i>	Hoary Willowherb
<i>Epilobium tetragonum</i>	Square-stalked Willowherb
<i>Festuca arundinacea</i>	Tall Fescue
<i>Festuca gigantea</i>	Giant Fescue
<i>Festuca pratensis</i>	Meadow Fescue
<i>Festuca rubra</i>	Red Fescue
<i>Fraxinus excelsior</i>	Ash
<i>Galium aparine</i>	Cleavers
<i>Geranium dissectum</i>	Cut-leaved Crane's-bill
<i>Geranium pratense</i>	Meadow Crane's-bill
<i>Geranium robertianum</i>	Herb-Robert
<i>Glechoma hederacea</i>	Ground Ivy
<i>Heracleum sphondylium</i>	Hogweed
<i>Holcus lanatus</i>	Yorkshire-fog
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Juncus effusus</i>	Soft Rush
<i>Juncus inflexus</i>	Hard Rush
<i>Knautia arvensis</i>	Field Scabious
<i>Lapsana communis</i>	Nipplewort
<i>Lathyrus nissolia</i>	Grass Vetchling

<i>Lathyrus pratensis</i>	Meadow Vetchling
<i>Leontodon autumnalis</i>	Autumn Hawkbit
<i>Leucanthemum vulgare</i>	Oxeye Daisy
<i>Lolium multiflorum</i>	Italian Rye-grass
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Malva moschata</i>	Musk Mallow
<i>Mercurialis perennis</i>	Dog's Mercury
<i>Odontites vernus</i>	Red Bartsia
<i>Persicaria maculosa</i>	Redshank
<i>Phleum pratense</i>	Timothy
<i>Picris echioides</i>	Bristly Ox-tongue
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Plantago major</i>	Greater Plantain
<i>Poa annua</i>	Annual Meadow-grass
<i>Poa pratensis</i>	Smooth Meadow-grass
<i>Poa trivialis</i>	Rough Meadow-grass
<i>Potentilla reptans</i>	Creeping Cinquefoil
<i>Primula veris</i>	Cowslip
<i>Primula vulgaris</i>	Primrose
<i>Prunella vulgaris</i>	Selfheal
<i>Prunus domestica</i>	Wild Plum
<i>Prunus spinosa</i>	Blackthorn
<i>Pulicaria dysenterica</i>	Common Fleabane
<i>Quercus robur</i>	Pedunculate Oak
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Ranunculus bulbosus</i>	Bulbous Buttercup
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Rosa canina</i> agg.	Dog-rose
<i>Rubus fruticosus</i> agg.	Bramble
<i>Rumex acetosa</i>	Common Sorrel
<i>Rumex crispus</i>	Curled Dock
<i>Rumex obtusifolius</i>	Broad-leaved Dock
<i>Rumex sanguineus</i>	Wood Dock
<i>Salix fragilis</i>	Crack-willow
<i>Sambucus nigra</i>	Elder
<i>Senecio erucifolius</i>	Hoary Ragwort
<i>Senecio jacobaea</i>	Common Ragwort
<i>Sison amomum</i>	Stone Parsley
<i>Solanum dulcamara</i>	Bittersweet
<i>Sonchus arvensis</i>	Perennial Sow-thistle
<i>Sonchus asper</i>	Prickly Sow-thistle
<i>Stachys officinalis</i>	Betony
<i>Stachys sylvatica</i>	Hedge Woundwort
<i>Tamus communis</i>	Black Bryony
<i>Taraxacum</i> agg	Dandelion
<i>Torilis japonica</i>	Upright Hedge-parsley
<i>Trifolium pratense</i>	Red Clover
<i>Trifolium repens</i>	White Clover
<i>Typha angustifolia</i>	Lesser Reedmace
<i>Ulmus procera</i>	English Elm
<i>Urtica dioica</i>	Stinging Nettle
<i>Veronica serpyllifolia</i>	Thyme-leaved Speedwell
<i>Vicia cracca</i>	Tufted Vetch
<i>Vicia sativa</i>	Common Vetch
<i>Vicia tetrasperma</i>	Smooth Tare

Appendix B.1.3

Vascular Plant List of Taxa Introduced in 1992 (Emorsgate Seed-mix EM4)

<i>Achillea millefolium</i>	
<i>Agrostis capillaris</i>	
<i>Alopecurus pratensis</i>	
<i>Centaurea nigra</i>	
<i>Cynosurus cristatus</i>	
<i>Festuca pratensis</i>	
<i>Festuca rubra ssp. commutata</i>	
<i>Festuca rubra ssp. juncea</i>	
<i>Festuca rubra ssp. rubra</i>	
<i>Galium verum</i>	
<i>Leucanthemum vulgare</i>	
<i>Lotus corniculatus</i>	subsequently identified as <i>L. corniculatus</i> var. <i>sativus</i>
<i>Plantago lanceolata</i>	
<i>Primula veris</i>	
<i>Prunella vulgaris</i>	
<i>Ranunculus acris</i>	
<i>Rhinanthus minor</i>	
<i>Rumex acetosa</i>	
<i>Saxifraga granulata</i>	
<i>Silene alba</i>	
<i>Stachys officinalis</i>	
<i>Taraxacum officinale</i> agg	

Appendix B.1.4

Shade Tolerant and Woodland Edge Plant List of Introduced Species, 2000

<i>Alliaria petiolata</i>	Hedge Mustard
<i>Allium ursinum</i>	Ramsons
<i>Conopodium majus</i>	Pignut
<i>Galium mollugo</i>	Hedge Bedstraw
<i>Geum urbanum</i>	Wood Avens
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Hypericum perforatum</i>	Perforate St John's-wort
<i>Primula vulgaris</i>	Primrose
<i>Silene dioica</i>	Red Campion
<i>Stachys sylvatica</i>	Hedge Woundwort
<i>Tollis japonica</i>	Upright Hedge-parsley

Appendix B.1.5

Subsequent List of Species Proposed for Introduction, 2001

<i>Angelica sylvestris</i>	Wild Angelica
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Geum rivale</i>	Water Avens
<i>Lychnis flos-cuculi</i>	Ragged-Robin
<i>Myosotis sylvatica</i>	Wood Forget-me-not

B.2 TREES



By

**Mike Street
and
Melvyn Jones**



1. INTRODUCTION

The height of the planted oak, hornbeam and silver birch were measured in the earlier surveys to demonstrate the rate of growth in the early establishment period, five years post-planting. The dimensions were taken directly from the trees while the apices were still fully accessible. For these measurements, a number of 10m x 10m plots were established at random on the 50m grid intersection points in 1993 and all of the marked trees within them were measured then and re-measured in 1994 and 1996. In 1996, the circumference of each stem was measured at breast height (1.32m). The present survey recorded the height and diameter at breast height (dbh) of planted trees 10 years after the last measurements.

2. SURVEY METHODS

Attempts were made during 2006 to re-measure the same sets of trees that were measured in 1993, 1994 & 1996. However, while most of the 50m grid intersection marker posts could be re-located and re-marked, it proved virtually impossible to identify the individual trees that were measured in previous years due to the loss of marker tags and uncertainties over the exact location of each 'corner tree' in the selected plots.

However, three such plots were re-located during the first visits, the trees within them were re-marked and attempts were made to measure them using a 5metre telescopic fishing pole, a 10m tape and a long arm! This proved to be very inaccurate because it was not possible for the observer to get far enough back from the tree to be able to see the top clearly and so, due to that fact and equipment failure (the pole end broke and the arm got tired) it was impossible to complete measurements on these trees in the plots inside the wood.

An inclinometer was therefore obtained and used for further measurements of tree heights. As with the first attempts, it proved impossible to use this on trees deep within the wood due to the inability to see the tops clearly from the 25m away, as required by the use of the inclinometer. To overcome this problem, a random sample of each species of

tree was identified, selecting the fifth tree back in every fifth row, starting from a randomly selected row. The top and trunk base of each selected tree was then visible from an open area outside the plantation, but they were at least five rows inside it to avoid the impacts of any 'edge effect' (Trees right on the edge could be shorter due to less competition for light, those deeper in being 'drawn up' by shade of neighbours).

The diameter at breast height (1.32m) of each sampled tree was also recorded (cm) and the mean diameter of each species in 1996 was calculated from the circumference measurements taken then.

Measurements were taken of 46 oaks, 34 silver birch and 38 hornbeams.

3. RESULTS

Hazeley Wood Tree Measurements 2006

Common Oak		Silver Birch		Hornbeam	
Height m	DBH cm	Height m	DBH cm	Height m	DBH cm
7.80	7.50	10.20	13.00	8.50	6.60
7.00	5.80	10.20	11.00	6.40	11.00
6.50	6.00	4.80	2.50	6.70	9.00
7.20	7.50	10.40	13.00	7.30	6.50
7.10	7.00	9.80	18.00	7.00	14.00
7.20	7.00	9.70	10.00	6.50	12.00
10.80	8.80	10.75	9.00	8.25	9.00
2.75	2.50	10.75	11.00	9.25	8.00
9.50	8.50	10.35	11.00	9.65	9.00
7.20	8.00	10.35	10.00	6.80	7.00
8.60	10.00	10.35	14.00	9.00	11.00
6.70	9.00	9.65	6.50	7.20	7.00
10.25	10.50	9.00	10.00	6.50	6.00
9.25	9.00	10.20	11.00	6.80	6.60
10.35	12.00	8.00	8.00	6.80	6.00
3.90	4.50	10.30	15.00	7.30	7.00
9.25	11.00	7.40	7.50	6.00	9.00
10.65	13.00	7.50	7.00	5.30	7.50
8.00	7.00	7.20	7.00	8.20	12.00
10.50	12.00	12.80	11.40	8.30	9.00
9.10	10.00	9.60	14.00	6.40	11.00
3.30	6.00	9.40	10.50	6.70	10.00
10.50	9.00	9.00	9.00	6.00	9.50
8.40	14.00	7.40	7.50	7.60	10.00
7.30	8.00	8.10	10.00	6.40	10.00
6.20	8.00	7.50	8.00	6.20	8.00
8.00	8.00	12.10	13.00	8.00	8.00
8.70	9.00	11.60	12.00	7.00	7.50
7.40	12.00	11.50	14.50	6.70	7.00
7.70	9.00	9.80	8.40	8.10	9.00
6.80	8.50	8.90	8.00	6.50	7.00
8.70	10.00	9.20	11.00	6.70	6.50
6.70	13.00	11.70	13.20	7.40	7.20
7.30	7.50	12.10	12.80	6.50	8.00
8.80	9.20			7.20	6.70
8.60	8.50			8.00	8.50
8.40	11.50			7.20	9.00
6.20	12.00				
6.90	8.50				
6.60	8.00				
7.60	10.50				
7.50	9.00				
7.50	12.00				
7.50	8.50				
6.60	10.00				
6.60	10.00				
Mean height (m)	Mean dbh (cm)	Mean height (m)	Mean dbh (cm)	Mean height (m)	Mean dbh (cm)
7.73	9.05	9.64	10.52	7.20	8.54
Mean ht in 1993 (m)	2.23	Mean ht in 1993 (m)	2.23	Mean ht in 1993 (m)	1.43
1.37		1.7		1.21	
Height increase (m)		Height increase (m)		Height increase (m)	
6.36		7.94		5.99	

Fig 1 – Tree heights

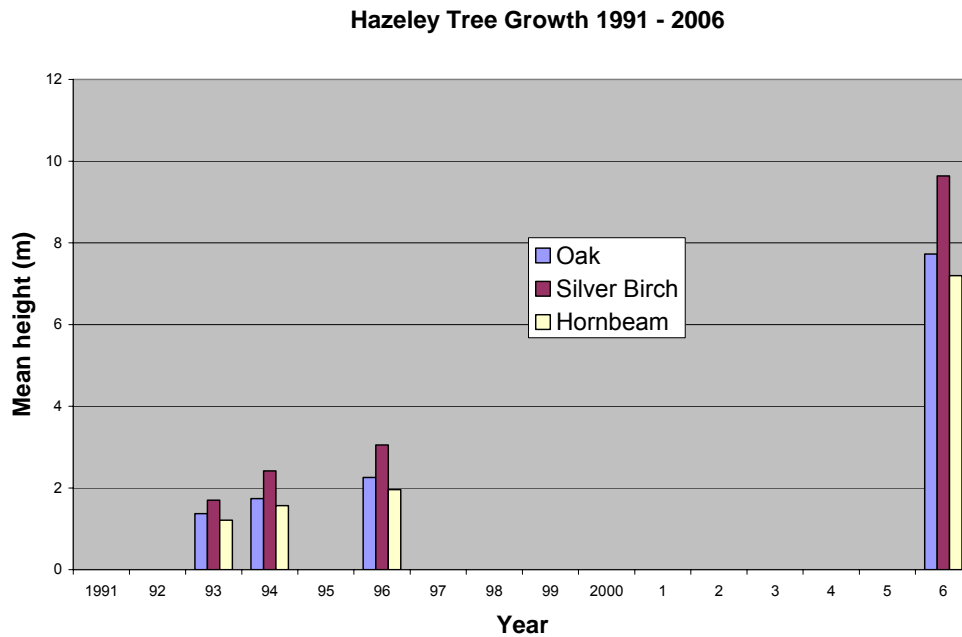
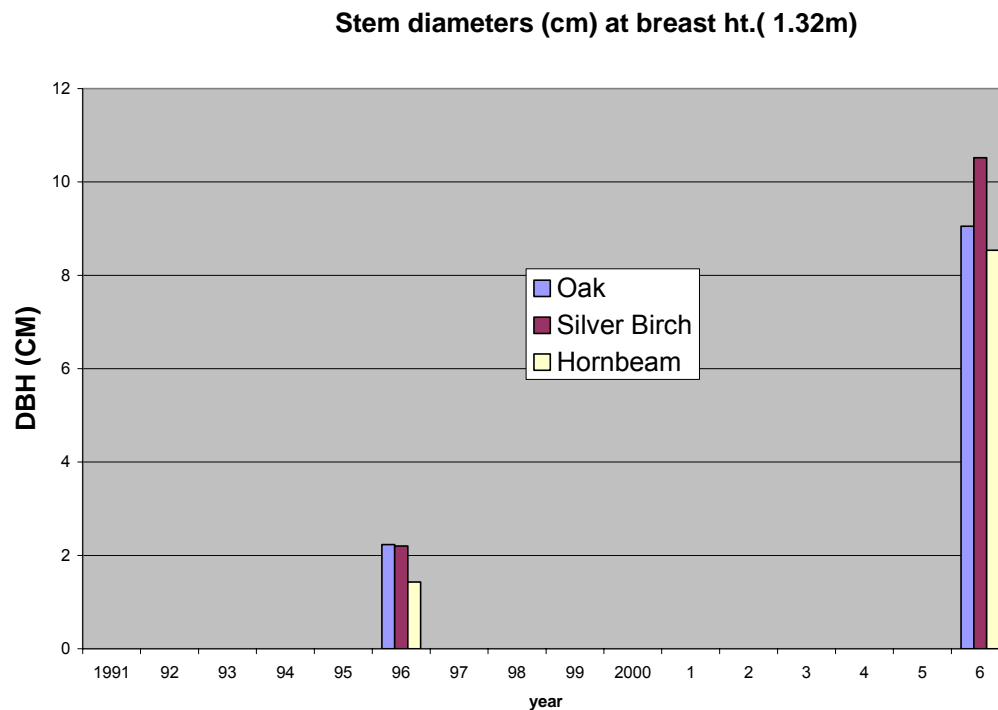


Fig 2 - Stem diameters



The silver birch performed better than the oaks both in terms of height and girth increases, putting on an average of 80cm per year since 1996, while the oaks put on an average of 63cm pa. Both out-performed the hornbeam, which put on 60cm pa.

4. DISCUSSION

The growth of all species has been remarkably good, when compared with that of the majority of small farm woodland plantations. This is the result of the initial use of seedling trees planted in tree shelters, and the maintenance of weed-free conditions for the first five years, with small amounts of fertiliser in the first three years.

The proposed management operations in the winter of 2006/07 will result in the coppicing of 25% of the hornbeam (all of which will be coppiced eventually) and will remove dead, dying, diseased and dangerous specimens and the 'wolf' trees – those that significantly over-top and suppress their neighbours. The actual percentage thinning has yet to be decided, but it will be between 40 and 50%. This will allow light to reach the wood floor again, to stimulate the growth of the shaded out field layer plants. A proportion of the oak stools will be allowed to re-generate as coppice.

B.3 BRYOPHYTES



By

Frances Higgs



SUMMARY

After a ten year break recording on this site has been resumed. Visits were used for general and detailed observations so that current findings can be compared with previous records.

1. INTRODUCTION

All signs of the plantation have gone and the wood has developed. The ground under trees is deeply shaded and covered with leaf litter. Tree growth has covered the intervening avenues and the present height makes some of the paths dark. Grass grows thickly in the lighter places right to the margins of the tree compartments.

2. SURVEY METHODS

Grid posts put in at 50m intervals were the focus of the detailed survey. Ground in a radius of 1m from the post was examined for signs of bryophyte growth and species noted. General observations were also made on the site.

3. SITE VISITS

2005 : October 29th 2006 : March 6th and April 21st
Each visit was made with the companionship of Viola Read.

4. SITES STUDIED

Compartment 2 - This visit was used as a re-introduction to the wood. The exterior of the compartment was viewed and changes noted

Compartment 3 - General observations
Pipeline Ride

North Bucks Way / Hazeley Wood Hedge

Grid posts surveyed: B1, B8, C9, C10, D7, D10, E6, E7, E8, E9, F8, F9

5. RESULTS

Compartment 2 showed signs of good moss growth at the edges even though fallen leaves made a thick covering. These were the pleurocarpous mosses (trailing plants that bear fertile parts and capsules on short side branches) – *Brachythecium rutabulum* and *Eurhynchium praelongum* var. *praelongum*. In well shaded places these had begun to cover tree boles. The edge of the compartment opposite the Cross Hedge is particularly shaded and some new growths of epiphytic mosses (*Orthotrichum* spp) were visible on a few Oak (*Quercus robur*) branches. These plants will have to develop capsules before they can be specifically identified.

Compartment 3 – general observations were made.

Brachythecium rutabulum, *Eurhynchium praelongum* and *Fissidens taxifolius* ssp. *taxifolius* were the only plants seen.

Pipeline Ride – many moss patches appear in the grass.

Amblystegium serpens var. *serpens*, *Brachythecium rutabulum*, *Caliergon cuspidatum* and *Eurhynchium praelongum* var. *praelongum* were recorded.

North Bucks Way / Hazeley Wood Hedge

Amblystegium serpens var. *serpens*, *Aulacomnium androgynum*, *Brachythecium rutabulum*, *Bryum capillare* var. *capillare*, *Dicranoweissia cirrata*, *Eurhynchium praelongum* var. *praelongum*, *Hypnum cupressiforme* var. *cupressiforme*, *Orthotrichum affine* and *Rhynchosostegium confertum*. All of these species were present in the established hedge when surveyed in 1993.

An ancient Sallow (*Salix* sp) near the North Hedge was found to be supporting *Brachythecium rutabulum*, *Bryum capillare* var. *capillare*, *Hypnum cupressiforme* var. *cupressiforme*, *Orthotrichum affine*, *O. diaphanum* and *Ulota phyllantha*. The first county record for the *Ulota* was made at Hyde Lane in 1991. This may be only the second record for VC24 and is therefore important.

Grid posts

Grid post surveys produced only three species. *Brachythecium rutabulum*, *Eurhynchium praelongum* var. *praelongum* and *Fissidens taxifolius* ssp. *taxifolius*.

Appendix B.3.1 shows the comparison of species recorded in 1996 and 2006. It was impossible to give sub specific names in this table. Full names and taxonomic changes appear in Appendix B.3.2.

6. CONCLUSIONS

The wood is developing and the trees are 4+ metres in height. Leaf litter and lack of light in the compartments have completely changed the growing conditions for bryophytes.

With the exception of *Fissidens taxifolius* ssp. *taxifolius*, acrocarpous species (those that grow in tufts and small patches with fertile parts and capsules at the stem tip) have been lost. They grew on bare soil patches in open situations. *Fissidens taxifolius* ssp. *taxifolius* seems to cope both in the open sites and in deep shade under leaf litter.

Brachythecium rutabulum is a moss 'thug'. It grows widely and on many substrates e.g. soil patches in grass, on tree boles and on the wood floor towards the edges of compartments. It is an established species in the old hedges surrounding the site as is *Eurhynchium praelongum* var. *praelongum*.

New paths have been introduced to the wood which are at present bare and gritty. Exploration of these is likely to show more acrocarpous species appearing as mosses become established along the edges.

Epiphytes are likely to increase in the most humid situations.

7. ACKNOWLEDGEMENTS

My thanks to:- Viola Read for accompanying me on slow, cold work.
Roy Maycock for his advice and the creation of the table in App. B.3.1

8. REFERENCES

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Appendix B.3.1

Table to show Bryophytes recorded at selected Grid Posts in the years 1996 and 2006

Grid Post	B1		B8		C9		C10		D7		D10		E6		E7		E8		E9		F8		F9	
	96	06	96	06	96	06	96	06	96	06	96	06	96	06	96	06	96	06	96	06	96	06	96	06
<i>Barbula unguiculata</i>	+		+								+								+				+	
<i>Brachythecium rutabulum</i>									+							+								+
<i>Bryum argenteum</i>	+																							+
<i>Bryum bicolor</i>	+																				+			
<i>Bryum sp.</i>							+				+													
<i>Ceratodon purpureus</i>																	+				+			+
<i>Dicranella staphylina</i>																		+						
<i>Eurhynchium praelongum</i>		+				+			+		+		+		+		+					+		
<i>Eurhynchium swartzii</i>	+																		+					
<i>Fissidens taxifolius</i>	+	+	+	+	+	+	+	+			+	+	+	+			+	+	+			+		+
<i>Leptobryum pyriforme</i>	+																							
<i>Phascum cuspidatum</i>	+				+																			
<i>Pollia starkeana</i>					+																			
<i>Pollia truncata</i>	+		+		+		+												+				+	
<i>Weissia controversa</i>	+																							
<i>Weissia longifolia</i>					+		+												+					
<i>Weissia microstoma</i>							+																	
<i>Weissia squarrosa</i>							+																	
<i>Weissia sterilis</i>	+																							
Total	10	2	3	1	6	2	6	2	0	2	3	2	2	3	0	2	3	2	6	1	5	1	4	2

Appendix B.3.2

Full names of species in Appendix B.3.1

Ceratodon purpureus ssp. *purpureus*

Eurhynchium praelongum var. *praelongum*

E. swartzii var. *swartzii*

Fissidens taxifolius ssp. *taxifolius*

Phascum cuspidatum var. *cuspidatum*

Pottia startkeana var. *controversa*

W. longifolia var. *longifolia*

This was a new record for VC24

W. microstoma var. *brachycarpa*

Since this study began recent taxonomy has brought some name changes:

Fissidens taxifolius ssp. *taxifolius* is now ***Fissidens taxifolius* var. *taxifolius***

Bryum bicolor is now ***Bryum dichotomum***

Eurhynchium praelongum var. *praelongum* changed to ***Kindbergia praelonga***. This was not well accepted. It is currently ***Eurhynchium praelongum*** and this includes the varieties ***praelongum*** and ***stokesii***.

E. swartzii var. *swartzii* is now ***Eurhynchium hians***.

Phascum cuspidatum var. *cuspidatum* is now ***Tortula acaulon***.

Pottia starkeana ssp. *minutula* is now ***Microbryum davallianum***.

Pottia truncata is now ***Tortula truncata***.

Weissia microstoma var. *brachycarpa* is now ***W. brachycarpa* var. *brachycarpa***.

B.4 FUNGI



By

Jo Ayers, Petra Seath



SUMMARY

Several fungi surveys have been completed at Hazeley Wood. These have identified at least twenty-one species are now present in the wood.

1. INTRODUCTION

The purpose of these surveys was to locate and identify the fungi species that have colonised Hazeley Wood. These results will build on the records from 1993 & 1994, when only 3 species were found.

2. SURVEY METHODS

The original site transect was not used. Each visit to the site incorporated a brisk walk round the mature hedges and within the wood in compartments 1 & 2. Twenty-one species of fungi have been identified. They are all common in the UK.

Most fungi were found near the mature hedges, the North Bucks Way Hedge, North Hedge, North-west Hedge and the Cross Hedge.

Identification of fungi can be extremely difficult and may require the use of microscopes or spore prints. When positive ID could be made in the field, the species was recorded and the specimen was left in situ. Specimens which were harder to identify were removed for further investigation. If there was any doubt in identification the fungi was not recorded.

3. RECORDS

29th October 2005 *Lycoperdon foetidum*
 Lactarius sp. – Milk Cap

Identified from photographs by Jeff Blincow

13th November 2005 *Mycena galopus*

Lepiota procera – Parasol Mushroom
Trametes veriscolor - Many-zoned Polypore

Identified by Jo Ayers and Petra Seath

14th December 2005 *Laccaria laccata*
Lepiota procera – Parasol Mushroom
Mycena galopus
Mycena leucogala
Mycena pura
Stereum hirsutum - Hairy Stereum
Tremella mesenterica – Yellow Brain Fungus
Tuberia furfuracea

Identified by Jeff Blincow, Jo Ayers and Petra Seath

8th January 2006 *Auricularia auricula-judae* - Jews' Ear
Coniophora puteana
Crepidotus cesatii
Dacrymyces stillatus
Excidia glandulosa - Witches' Butter - on Oak
Mycena galericulata - Bonnet Mycena - (D7)
Rutstroemia firma
Schizopora paradoxa
Stereum hirsutum - Hairy Stereum - (C10)
Trametes veriscolor - Many-zoned Polypore - (C10)
Tuberis furfuracea - (D7)
Xylaria hypoxylon - Candle-snuff Fungus or Stag's Horn

Identified by Derek Schaffer, Jo Ayers & Petra Seath

2nd April 2006 *Auricularia auricula-judae* - Jews' Ear (E9.5)
Excidia glandulosa - Witches' Butter on fallen oak branch (E/F 9)
Trametes veriscolor - Many-zoned Polypore on tree stump (E/F 9)
Tremella mesenterica – Yellow Brain Fungus (A7)

Identified by Jo Ayers & Petra Seath

23rd November 2006 *Coprinus comatus* - Shaggy Ink Cap
Mycena galopus
Stereum hirsutum
Trametes veriscolor - Many-zoned Polypore
Tremella mesenterica – Yellow Brain Fungus
Xylaria hypoxylon – Candle-snuff Fungus or Stag's Horn

Identified by Jo Ayers and Peter Blyth

4. LIST OF RECORDED SPECIES

Auricularia auricula-judae - Jews' Ear
Coniophora puteana
Coprinus comatus - Shaggy Ink Cap
Crepidotus cesatii
Dacrymyces stillatus
Excidia glandulosa - Witches' Butter
Laccaria laccata - Deceiver
Lactarius sp. – Milk Cap
Lepiota procera – Parasol Mushroom
Lycoperdon foetidum
Mycena galericulata - Bonnet Mycena
Mycena galopus
Mycena leucogala
Mycena pura
Rutstroemia firma
Schizopora paradoxa
Stereum hirsutum - Hairy Stereum
Trametes veriscolor - Many-zoned Polypore
Tremella mesenterica – Yellow Brain Fungus
Tuberia furfuracea
Xylaria hypoxylon - Candle-snuff Fungus or Stag's Horn

5. DISCUSSION

There were several specimens found that could not be positively identified, it is safe to say that there are more than the twenty-one species recorded present on site.

In 1993 the majority of the fungi recorded were found in the mature hedges: The Cross Hedge, North Bucks Way Hedge. This trend has continued, however some fungi can now be found within the main body of the wood such as Witches' Butter *Excidia glandulosa* found growing on an Oak, Yellow Brain Fungus *Tremella mesenterica* growing on older tree stumps and *mycena sp.* growing on the woodland floor.

The last fungi report was completed in 1994, at this time there were only three species of fungi recorded in Hazeley Wood. We now have at least twenty-one species. It would seem that there has been a steady influx of fungi during the life of Hazeley Wood. This trend is expected to continue as the wood matures and the leaf litter develops further.

6. REFERENCES

Dickinson (2002) - Mushrooms and Toadstools of Britain and Europe, London: New Holland Publishers

Jordan (2004) - The Encyclopaedia of Fungi of Britain and Europe, London: Frances Lincoln Ltd

Keizer (1998) - The Complete Encyclopaedia of Mushrooms, The Netherlands: Rebo International

Pegler (2001) - Mushrooms and Toadstools of Britain and Europe, London: Kingfisher

Phillips (1981) - Mushrooms and other Fungi of Great Britain and Europe, London: Pan Books

7. ACKNOWLEDGEMENTS

Thanks to the following individuals for their help in various forms:

Jeff Blincow
Peter Blyth
Derek Schaffer

C.1 MOLLUSCS



By

Jo Ayers, Petra Seath,
Bob Stott



SUMMARY

Several surveys of mollusca have been completed in Hazeley Wood. These have produced 25 species, excluding *Arion* spp.

1. INTRODUCTION

It was agreed by the three recorders to visit monthly during the warmer months after an initial survey in November. The first visit was made on the weekend of 27th/28th of November 2005, in order to discuss and determine the methods to be used in the survey, and to familiarise ourselves with the specific sites to be checked in order to make legitimate comparisons with the survey carried out during 1993/1994. Further visits were made in February, April, May and June of 2006.

2. SURVEY METHODS

After an early trial, we determined that pitfall trapping was inappropriate, and the best method of finding specimens was by sifting through leaf litter and soil from the sample area, alongside turning over stones and larger pieces of vegetation.

When positive identification could be made in the field, we recorded that specimen, and replaced it before departure. We were often able to identify other specimens, with the aid of further books and stronger lenses back at the car and those animals were also returned to the wood.

Record specimens were collected during the May visit, and will be retained by Bob Stott. Jo Ayers and Bob Stott attended an Invertebrate (Mollusca) Identification Workshop at Hill End Field Study Centre in Oxfordshire on May 7th, and we found this to be very valuable in confirming the methods we had chosen, and the identifications made to that date.

3. RESULTS

The seven visits made between November 2005 and June 2006 produced a total of 25 species (excluding *Arion ater agregate*). This compares with 6 species recorded during four visits in 1993, and 10 species (excluding *Arion ater agregate*) recorded during seven visits in 1994 (although it was recorded, *Agriolimax caruanae* was not reported in 1994, as it was thought to be a 'doubtful' record at the time).

The tables of results are attached. The first (appendix C.1.1) shows the recorded specimens in family order, by date of recording; the second (appendix C.1.2) shows the records by site. Of particular interest to the recorders were the discovery of *Cochlicopa lubrica* on our last visit – a tree-climbing species which we had not previously located; *Euconulus fulvus* – a very small shell, with catholic habitats, but not easy to locate; and *Agriolimax maximus* – one of our largest slugs, known as the 'leopard' slug because of its distinct markings.

4. CONCLUSIONS

It would seem from the results that there has been a steady influx of Mollusca over the life of the wood, and there is no reason to suppose that this will not continue as leaf litter becomes deeper, and more humus develops in the immediate sub-strata. The recorders intend to pay more visits during 2007.

5. REFERENCES

- Beedham (1972) – Identification of the British Mollusca
Janus H (1965) – Young Specialist – Molluscs, English
Kerney & Cameron (1979) – A Field Guide to the Land Snails of Britain and North-west Europe, Collins

Appendix C.1.1

**Subclass Pulmonata; Order Basommatophora;
Total Species Recorded in Family sequence, listed in date order**

Legend; Y = 1 location; YY = 2 locations; YYY = several locations.
Im = Immature/Juvenile. Sp = record specimen retained.

Names	1993	1994	2005		12/02	2006 visits			
			27/11	28/11		09/04	15/04	14/05	18/06
Cochlicopidae;									
<i>Cochlicopa lubrica</i> (Muller 1774)									Y
Valloniidae;									
<i>Vallonia excentrica</i> (Sterki 1892)	YY	YY							
Endodontidae;									
<i>Discus rotundatus</i> (Muller 1774)						Y		Y	
Arionidae;									
<i>Arion ater</i> ?aggregate		YYY			Y	YY		Y	Y
<i>Arion ater ater</i> (Linne 1758)		Y			Y	YY			
<i>Arion subfuscus</i> (Draparnaud 1805)	Y	YYY				YYY			Y
<i>Arion circumscriptus</i> (Johnston 1828)						Y			
<i>Arion hortensis</i> (Ferussac 1819)				Y					
Vitrinidae;									
<i>Vitrina pellucida</i> (Muller 1774)	Y				Y				
Zonitidae;									
<i>Oxychilus alliarius</i> (Miller 1822)			YY		Y	YY		Y	Y
<i>Oxychilus cellarius</i> (Muller 1774)	Y	Y	YYY		YYY	Y		YY	Y
<i>Oxychilus draparnaldi</i> (Beck 1837)								Y Sp	Y
<i>Oxychilus helveticus</i> (Blum 1881)		Y						Y Sp	Y
<i>Retinella nitidula</i> (Draparnaud 1805)			YY	Y	YYY	YYY			
<i>Retinella pura</i> (Alder 1830)								Y Sp	Y
<i>Zonitoides nitidus</i> (Muller 1774)				YY	YY	Y			Y
Milacidae;									
<i>Agriolimax maximus</i> (Linne 1758)							Y		
<i>Agriolimax reticulatus</i> (Muller 1774)	YYY	YYY	YY	Y	YYY	Y		Y	YY
<i>Agriolimax laevis</i> (Muller 1774)						Y			
<i>Agriolimax caruanae</i> (Pollonera 1891)	YYY	Y							
<i>Limax tenellus</i> (Muller 1774)				YY	Y				
<i>Milax budapestensis</i> (Hazay 1881)		Y	Y		YY	YYY		Y	Y
Euconulidae;									
<i>Euconulus fulvus</i> (Muller 1774)			Y			Y		Y Sp	Y
Helicidae;									
<i>Cepaea hortensis</i> (Muller 1774)							Y		
<i>Cepaea nemoralis</i> (Linne 1758)		YY				Y	Y	Y	YY
<i>Monacha granulata</i> (Alder)		Y							
<i>Monacha cantiana</i> (Montagu 1803)		Y				Y			
<i>Trichia hispida</i> (Linne 1758)			YYY	Y	YYY	YYY		YY	YYY
Lymnaeidae;									
<i>Lymnea peregra</i> (Muller 1774)								Y	Y

Appendix C.1.2

Total Species Recorded; listed by Location (Incl. SP Ref.).

Names	First Record	A6 Pylons 8125 3690	B1 8130 3665	C4 S.ride 8135 3680	C6 8135 3690	C10 8135 3710	D7 Hedge 8140 3695	D9 8140 3705	E7 E.Path 8145 3695	F7 Pond 8150 3695	F9 8150 3705	Pipe- line 8130 3695	Outer edges
Cochlicopidae;													
<i>Cochlicopa lubrica</i>	18/06/06			1 st YY									
Vallonidae;													
<i>Valonia. Excentrica</i>	31/10/93							Y				1 st Y	
Endodontidae;													
<i>Discus rotundatus</i>	09/04/06	1 st Y											Y
Arionidae;													
<i>Arion ater aggregate</i>	22/05/94	Y							Y				Y
<i>Arion ater ater</i>	04/05/94	Y		1 st Y	Y		Y	Y			Y		
<i>Arion subfuscus</i>	31/10/93				YY	Y	Y	YY		Y		1 st Y	Y
<i>Arion circumscriptus</i>	09/04/06			1 st Y									
<i>Arion hortensis</i>	28/11/05			1 st Y									
Vitrinidae;													
<i>Vitrina pellucida</i>	19/09/93			Y			1 st Y						
Zonitidae;													
<i>Oxychilus alliarius</i>	27/11/05					Y			Y		1 st Y		Y
<i>Oxychilus cellarius</i>	19/09/93					Y	1 st YY	Y	Y Y		Y	Y	Y
<i>Oxychilus draparnaldi</i>	14/05/06						1 st Y						Y
<i>Oxychilus helveticus</i>	22/05/94	1 st Y					Y					Y	
<i>Retinella nitidula</i>	27/11/05	Y		Y		Y	Y	YY			1 st Y		
<i>Retinella pura</i> *1	14/05/06				Y				1 st Y				
<i>Zonitoides nitidus</i>	28/11/05	Y		1 ST Y							Y		Y
Milacidae;													
<i>Milax budapestensis</i>	04/09/94			Y		Y	Y	1 st YY			Y	Y	
<i>Agriolimax maximus</i>	16/04/06						Y				1 st Y		Y
<i>Agriolimax reticulatus</i>	19/09/93	Y	Y	Y	YY	1 st YY	YY	YYY	Y	YYY	YYY	YY	Y
<i>Agriolimas laevis</i>	09/04/96										1 st Y		Y
<i>Agriolimax caruanae</i> *2	31/10/93	1 st Y											
<i>Limax tenellus</i> *3	28/11/05	Y		1 st Y									
Euconulidae;													
<i>Euconulus fulvus</i>	27/11/05							1 st Y	Y			Y	
Helicidae;													
<i>Monacha granulata</i> *4	27/11/94							1 st Y					
<i>Monacha cantiana</i>	22/05/94			YY						YYY			1 st YY
<i>Trichia hispida</i>	27/11/05	Y	Y	Y		Y	Y	1 st Y	Y		Y	Y	Y
<i>Cepaea species</i>													Imm
<i>Cepaea nemoralis</i>	22/05/94	1 st Y							Y	YY	Y	Y	Y
<i>Cepaea hortensis</i>	16/04/06										1 st Y		Y
Lymnaeidae;													
<i>Lymnea peregra</i>	14/05/06									1 st YY			

Notes:

Items marked with an asterisk could be deemed to be 'doubtful';

1. *Retinella pura* (Alder 1830) - First time recorded in Hazeley. Very small snail, the shell is almost white, translucent, thin-walled, only 2 mm high, and 4 mm, across, with 6 whorls, and a wide umbilicus. Under

the microscope, the shell has a network of fine striations. A specimen has been retained. The live animal had a creamy-white appearance with dark spots on the mantle.

2. *Agriolimax caruanae* (Pollonera 1891) - Only one record, 31 October 1993 at A6. This could well have been an *Agriolimax laevis* (Muller 1774), as an immature caruanae is very similar to a mature laevis.
3. *Limax tenellus* (Muller 1774) - According to Kerney and Camerons (A Field Guide to the Land Snails of Britain and North-west Europe) this animal was restricted to a few local areas which did not include our locality. However the keys used, and cross-checking carried out between all three reference books, would suggest that this was correctly identified. Unfortunately, we were unable to preserve a reference specimen. This species was also recorded at four other sites (Angling Spring Wood, Great Missenden; Peterley Wood, Prestwood; Pulpit Hill; and the Ashdown Estate) as reported by Bucks Invertebrate Group, newsletter Number 16.
4. *Monacha granulata* (Alder) - This was only ever recorded once, in 1994, and no reference specimen was retained. It can generally be identified by the prominent whitish hairs in oblique rows on the shell, and should not have presented any problems at the time of recording.

Synonyms;

Names used in this list;

Arion circumscriptus (Johnston)
Oxychilus draparnaldi (Beck)
Retinella nitidula (Draparnaud)
Retinella pura (Alder)
Agriolimax reticulatus (Muller)
Agriolimax caruanae (Pollonera)
Trichia hispida (Linne 1758)
Lymnea peregra (Muller)

= Synonym;

= *Arion fasciatus* (Nilsson)
 = *Oxychilus lucidus* (Draparnaldi)
 = *Aegopinella nitidula* (Draparnaud 1805)
 = *Aegopinella pura* (Alder 1830)
 = *Deroceras reticulatum* (Muller 1774)
 = *Deroceras carunanae* (Pollonera 1891)
 = *Hygromia hispida* (Linne)
 = *Lymnea pereger* (Muller)

C.2 BUTTERFLIES



By

Melvyn Jones



SUMMARY

A survey of butterfly presence in Hazeley Wood was carried out using standardised baseline techniques to cover major habitats present in the wood and butterfly flight times during the year. 25 species were recorded. Data relating to species distribution and frequency was also collected, and, to a less comprehensive extent, species abundance.

1. INTRODUCTION

Annual records for the monitoring of butterfly species presence in Hazeley Wood between 1991 and 1995 indicate that species diversity increased fairly rapidly from under 10 to just over 20 (Appendix C.2.1). Ten years on, the wood was surveyed to assess the extent of any subsequent changes.

Although only species presence was required of the new survey, data was collected on a baseline format, following a fixed transect along the various rides and areas of open meadow within the wood. The transect was subdivided into sections that approximated to changing habitat, in particular where there was substantial differences in width of ride or open space, orientation to the sun, and degree of shade. The transect and its sections were recorded on a map (Appendix C.2.2).

An information pack was produced for volunteers as an attempt to standardise recording methods, effort, etc as well as to provide background information on those species likely to be present, their flight times etc (Appendix C.2.3). The monitoring system adopted closely followed that advocated by BBOWT, and their baseline surveying leaflet was also included in the pack (Appendix C.2.4). Contact details and further advice were also provided in an introductory letter for those less experienced volunteers in case of uncertainty over identification (Appendix C.2.5).

The survey was carried out to cover the full flight period (early May to late August) with a minimum of four visits corresponding to BBOWT's recommended dates, times and weather conditions.

Results were collected for species presence over the whole period but presence data exists with respect to each of the 13 visits spanning the end of April to the beginning of September, and to each of the sections. Similar abundance data also exists, although due to variation in recording techniques this is not comprehensive.

2. OUTLINE OF SURVEY METHODS

The survey method used was based on BBOWT baseline survey guidelines (Appendix C.2.4) but extended to cover habitat sections. The guidelines specify the approximate dates of the recommended minimum of 4 visits together with optimum times and weather conditions, as well as general advice on recording techniques. A recording sheet based on a standard format was tailored to take account of the transect's sections and copies made available in the volunteer pack (Appendix C.2.6).

3. RESULTS

Species presence data was collated in a single spreadsheet for all of the visits (Table 1). The spreadsheet incorporates abundance data for each of the species recorded, either numerically or as indices, as well as total species per visit and total species across the whole survey period. Data on section presence and abundance also exists but remains un-collated. Contact Melvyn Jones for further details. Also, although section habitat characteristics were beyond the remit of the survey and were therefore not formally recorded, they are available anecdotally from the surveyors, in particular Mike Killeby.

Six experienced volunteers were involved in collecting data, sometimes working as pairs, sometimes singly. As such, a level of recording variability was inevitable, but as the aim of the survey was merely to record presence this is not considered to have had a significant influence on the results.

4. DISCUSSION / CONCLUSIONS

Butterfly species diversity has increased over the past ten years from approximately 20 to 25. New species for the wood include Clouded Yellow, Holly Blue (although this was seen off-site on the adjacent North Bucks Way in 1995), Comma and White Admiral, all in relatively low numbers. Essex Skipper and Small Skipper were both recorded, whereas previously they had been recorded as indistinguishable, equivalent to one species. However Small Heath was not recorded despite its presence in the wood ten years earlier, and neither were Purple Hairstreak or White Letter Hairstreak, again also recorded earlier, outside the wood along the North Bucks Way.

Whether these shifts in species presence are significant, and in particular whether they are the result of the ongoing maturation of the wood and Milton Keynes Parks Trust management procedures, or correspond to regional patterns linked to climate or broader habitat change, or are just mere anomalies, is difficult to say.

The absence of comparative long-term abundance data is also not helpful in identifying shifts in either individual species or overall butterfly populations. However the spreadsheet does give an indication of which species are more common and when, and the un-collated section data clearly indicates that the more open grassland areas attract by far the most species in most numbers, and the narrower and overhung woodland rides far fewer.

Nevertheless the data does represent an interesting snapshot of Hazeley Wood's butterflies for 2006, and hopefully will be of use in a continuing monitoring of its biodiversity.

5. ACKNOWLEDGEMENTS

The following individuals contributed to the collection of data.

Jo Ayers
Rai Darke
Mike Killeby
Alan Nelson
Mike Sheridan

HAZELEY WOOD STUDY GROUP

BUTTERFLY BASELINE DATA FOR HAZELEY WOOD - SUMMER 2006 COMPILED BY MELVYN JONES

AUTHOR	MK	MJ/ JA	MK	MJ	MJ/ JA	JA/ RD	MK	MJ	MK	JA/ AN	MJ	MK	MS	Note: 8 habitat sections surveyed but with all data collated here. Further details from MJ
DATE	28/04	30/04	30/04	09/05	09/06	29/06	05/07	11/07	21/07	02/08	05/08	06/08	01/09	
TIME	2.00- 3.40	11.10 12.10	11.25 -?	3.15- 4.00	2.40- 3.30	2.15- 3.45	12.30 -?	3.10- 4.10	12.30 -2.10	12.00 -1.30	3.00- 4.15	2.15- 4.30	1.35- 2.55	
CONDITIONS	Fair	Fair	Fair	Fair	Good	Good	?	Good	Good	Fair	Good	Good	Good	
Black Hairstreak														Author key: MK Mike Killeby JA Jo Ayers AN Alan Nelson RD Rai Darke MJ Mel Jones MS Mike Sheridan
Brimstone	X		X	1	1		X	2	X				4	
Brown Argus							X		X	7	2	X	1	
Clouded Yellow											1	X	1	
Comma		1		2		3		5			2			
Common Blue					4	5	X		X	21	17	XX	10	
Essex Skipper						2				1				
Gatekeeper							XX	12	XX	35	11	XX		
Green-Veined White	X	1	X	5		1					1	X		
Holly Blue										3				MK's Section System: X 1 to 4 of 1 to 9/sn XX 5 to 9 of 10 to 19/sn XXX 10+ of 20 to 29/sn ? collation impractical
Large Skipper						9		3			1			
Large White				7	10		XX	9	XX	50	13	X	14	
Marbled White					11		X	7	X					
Meadow Brown						80	XX	117	XX	66	40	XX	3	
Orange Tip				3										
Painted Lady					2		X		X	161	19	XX		
Peacock	X	1	X				XX		XX	2	20	XX	1	
Purple Hairstreak														TOTAL : 25
Red Admiral								7		4	1			
Ringlet						33	XX	101	XX			X		
Silver-Washed Fritillary														
Small Copper							X		X		3	X	1	
Small Heath														
Small Skipper					2	8	X	8	X	1	1			
Small Tortoiseshell		1	X											
Small White		1					X		X	3	10	XX	13	
Speckled Wood				8	8	14	X	3	X	9	16	X	14	
Wall Brown										1			1	
White Admiral										2				
White-Letter Hairstreak														
Wood White														
TOTAL COUNT	?	5	?	26	27	169	?	274	?	359	157	?	63	
TOTAL SPECIES	3	5	4	6	6	10	14	11	14	15	16	13	12	

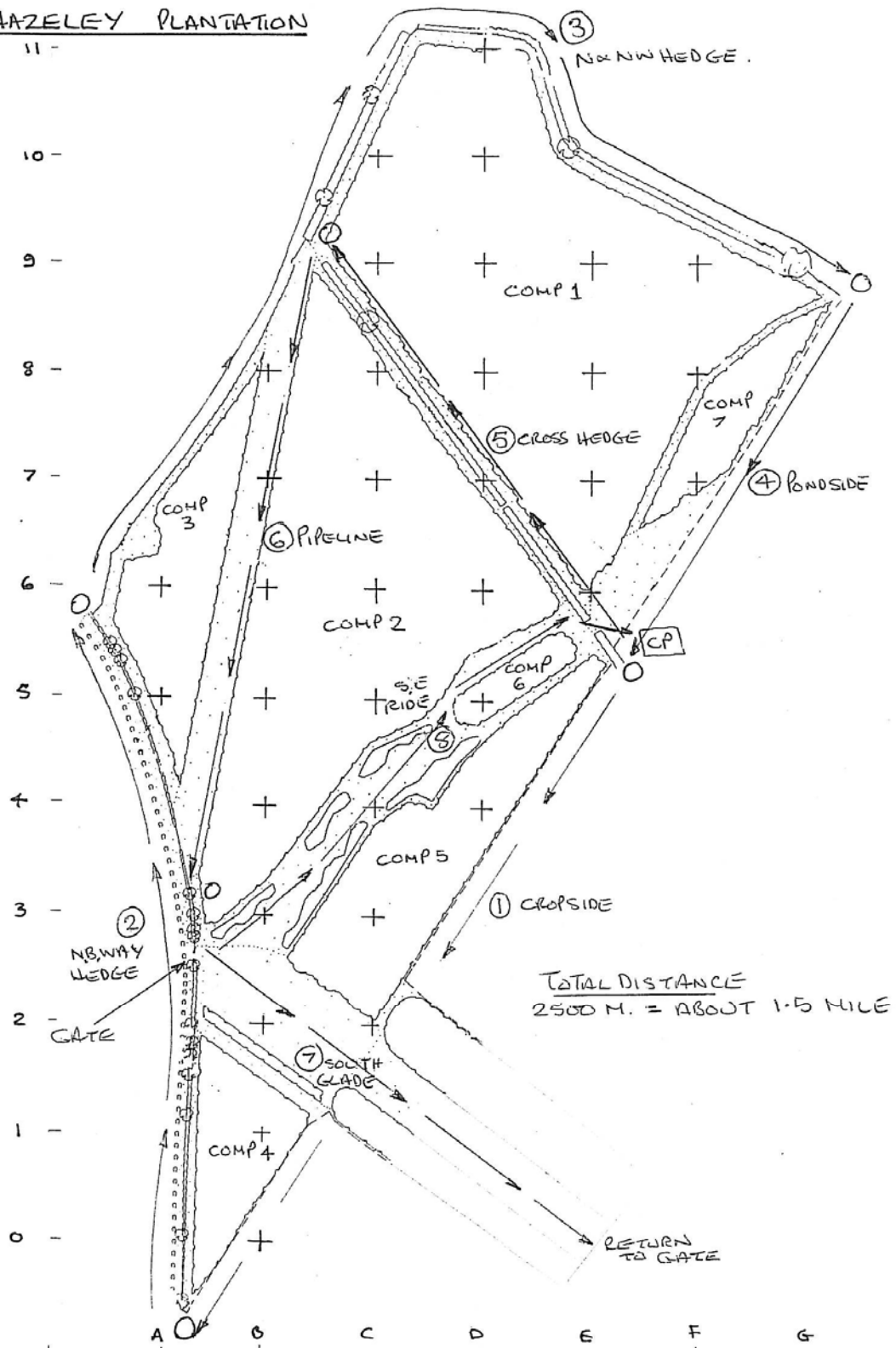
Appendix C.2.1

Butterfly Recording – Previous Records

Species	1991	1992	1993	1994	1995	1996	1997
Brimstone			✓	✓	✓		
Brown Argus	✓	✓		✓	✓		
Common Blue				✓	✓		
Gatekeeper		✓	✓	✓	✓		
Green Veined White	✓	✓	✓	✓	✓		
Large Skipper				✓	✓		
Large White		✓	✓	✓	✓		
Marbled White					✓		
Meadow Brown	✓		✓	✓	✓		
Orange Tip			✓	✓			
Painted Lady				✓	✓		
Peacock				✓	✓		
Red Admiral			✓	✓			
Ringlet	✓				✓		
Small Copper		✓	✓	✓	✓		
Small Heath				✓	✓		
Small/Essex Skipper	✓		✓	✓	✓		
Small Tortoiseshell		✓	✓	✓	✓		
Small White		✓	✓	✓	✓		
Speckled Wood				✓	✓		
Wall Brown				✓	✓		
Totals:	7	7	11	19	19		
Off site North Bucks Way:							
Purple Hairstreak					✓		
White Letter Hairstreak					✓		
Holly Blue					✓		

Appendix C.2.2

HAZELEY PLANTATION



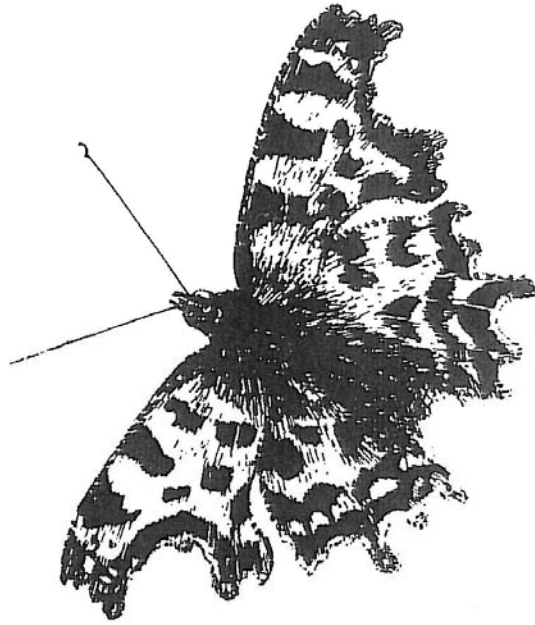
[illegible]



Berkshire
Buckinghamshire
Oxfordshire

Appendix C.2.4

Surveying for Butterflies



BUTTERFLIES Biodiversity survey methodologies

Recommended Identification Books

- Lewington, R. 2003. *A Pocket Guide to the Butterflies of Great Britain and Ireland*. British Wildlife Publishing
- Tomlinson, D. 2002. *Britain's Butterflies*. Wild Guides.
- Butterflies of Britain – FSC Publications, Fold-out Guide, www.field-studies-council.org

If at any stage during the surveying process you have any questions, please do not hesitate to get in touch with the

Biodiversity Survey Officer at BBOWT HQ by telephoning 01865 775476 or fax 01865 711301 or email: debbielewis@bbowt.org.uk

Thank you for your time and support!

The Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust is one of 47 Wildlife Trusts across the UK working to achieve the shared aim of securing a better future for wildlife. Berks, Bucks & Oxon Wildlife Trust, The Lodge, 1 Armstrong Road, Littlemore, Oxford OX4 4XT. Tel: 01865 775476. Fax: 01865 711301. Email: bbowt@clx.co.uk Website: www.bbowt.org.uk Registered Charity No. 204330.

The Reserve Surveying Programme

BBOWT launched the Reserve Surveying Programme in April 2002. In the past, many surveys have been carried out on BBOWT nature reserves by both amateurs and professionals. However, much of this data has been collected in an *ad hoc* way, indicating only the species' presence or absence. The baseline survey aims to standardise BBOWT's surveying approach and collect quantitative data using a repeatable methodology.

The Reserve Survey Programme aims to:

- 1 Collect data to direct the management of reserves
- 2 Collect data to direct future monitoring programmes
- 3 Inspire, train and involve volunteers

Survey data will be used to establish both the species that are present on reserves and the population trends of some of those species. This kind of information is essential in determining the management strategy for reserves. The continuation of surveying will also help to establish if any management alteration has worked. For example, a butterfly population may be shown to be declining on a chalk grassland site, possibly as a result of scrub encroachment. The survey data indicates that a change in management, i.e. scrub clearance, needs to be implemented. Continued monitoring will show if the butterfly population is seen to recover. Some species require very specialised habitats and unless the species present on a reserve are known the reserve may not receive the particular management they require.

In addition to "baseline surveying", The Reserve Surveying Programme aims to carry out some "monitoring surveys" too. Monitoring surveys require more frequent visits, in order to provide more detailed data than the baseline surveys generate. Although, baseline surveys remain of great importance, as they are needed to determine which sites require more detailed monitoring and help to keep a record of what is on the reserve.

However, because resources are limited, the 90 or so reserves and species groups to be surveyed and monitored must be prioritised.

It is essential that data is collected using a standard methodology to ensure that the records can be accurately compared between years. This is vital if reliable population trends are to be established. It is for this reason that methodologies for each species group and set survey routes have been designed. It is central to the success of the programme that surveyors carry out the surveys as indicated by the methodology in this booklet.

Surveying Hints and Tips

- Using two identification books can sometimes prove useful. They often have slightly different illustrations and/or text about the species in question.
- Survey with someone else, not only is safer and more fun, it often helps to have someone to discuss the finer identification details with.
- Always make sure, that once you have decided what species you think it is, you check out the following:
 - i) Habitat – does your chosen species live in the habitat you have found it in?
 - ii) Distribution – does your chosen species occur in the part of the UK you are in? (Warning: distribution maps can be out of date!)
 - iii) Time – does your chosen species fly/flower etc at the time of year you are surveying?
- If in doubt, do not record the species. Lack of data is much better than 'wrong' data.
- Photos or samples of unknown species can also be sent in to the Biodiversity Survey Officer.
- Reading through ID books before going out in the field can help familiarise yourself with where families etc are located in the book.
- Finally don't spend hours agonising over identification of a single species. Surveying is supposed to be fun!

Risk Assessment

Surveying is not a dangerous task, it is however important that all surveyors are aware of the potential risks and take the necessary precautions. The following page gives a detailed risk assessment for surveying. Please read it through carefully before carrying out any survey work.

Butterfly Survey – Guidance Notes

Background

This survey is designed to record the species and numbers of all butterflies encountered over a pre-set survey route.

The majority of species will simply be recorded as the total number encountered during an individual survey visit. This in turn will generate an average total figure for the site over the four visits.

For a limited number of *priority* species these observations will be additionally marked on a reserve map to pin point an individuals location.

Equipment

- Survey Record Sheet
- Reserve Map, with marked transect route
- Clipboard
- ID book
- Pen/pencil
- Binoculars

Timing of Visits

The site should be visited on four separate occasions as detailed below.

- Visit 1: Early May
- Visit 2: Mid June
- Visit 3: Mid July
- Visit 4: Late August

Weather Conditions

Surveys should be carried out in warm, sunny weather (over 17°C), between 10.45am and 3.45pm. A transect may be walked when the temperature is between 13 – 17°C as long as there is over 60% sunshine.

Survey Methodology

1. Please write Location/Date/Time/Surveyor on the top right hand corner of the map. You should also use a new Reserve Map and Survey Record Sheet for each survey visit.
2. Record on the record sheet: the temperature (this can be estimated, from the weather forecast); the average percentage cover of sunlight (see below); and the windspeed (using the Beaufort Scale, see below).
3. Walk the pre-set survey route as illustrated on your Reserve Map. Progress at a slow walking pace, stopping regularly to scan for butterflies (including in tree tops/ scrub).
4. For each species encountered begin a running tally in the appropriate row of your record sheet.
5. If the species encountered corresponds with a shaded row on your record sheet, you should also mark the sighting on your Reserve Map. (These are priority butterfly species for which we require further spatial detail.)
6. To do this write the appropriate species code and the numbers seen on the Reserve Map at the exact point where the butterfly was recorded.
7. Continue recording all butterflies encountered until you have completed one circuit of your survey route.

If possible, please also record any day-flying moths that are seen in the same way as described for butterflies. Add the species names of any day- flying moths seen to the bottom of the record sheet.

Your first survey visit is now completed. Complete the next three as previously stated. Don't forget to use a new Survey Record Sheet and Reserve Map for each visit.

In order to prevent a back log of data, please send in your survey results as you complete each survey. If possible please make a photocopy of your Survey Record Sheets; results have been known to go missing in the post!

- Percentage sun is estimated from the amount of sunshine experienced during the surveying. For example if it was sunny during three quarters of the survey then the percentage cover of sun would be 75%. It is officially sunny when an object can cast a shadow.

The Beaufort Scale

0. Smoke rises vertically
1. Slight smoke drift
2. Wind felt on face, leaves rustle
3. Leaves and twigs in slight motion
4. Dust raised and small branches move
5. Small trees in leaf begin to sway

Appendix C.2.5

BUTTERFLY RECORDING

The group will endeavour to record the presence and frequency of butterfly species in each of the eight grass rides in the Hazeley plantation. These rides/sections are marked out on a map in the form of a numbered transect, as well as on a survey record sheet.

The survey is a 'baseline' survey, and as such follows a set transect and should be carried out on a minimum of four occasions (in optimal weather conditions) during the year to cover all species' flight times. These times have been fixed as:

Early May
Mid-June
Mid-July
Late-August

Optimal weather conditions and other survey guidelines are specified within the BBOWT 'Surveying for Butterflies' leaflet, and the record sheet refers to the presence/absence of sun in each of the rides, as well as average wind conditions, and the time the survey was carried out, date, who by etc. These should be completed if possible.

However, more frequent casual surveys are also welcome outside of these time constraints and weather conditions, but preferably, although not necessarily, following all or part of the transect.

Although the HWSG survey is not intended to gather abundance data for each species, it would be useful if approximate totals for each species could be estimated per full survey/transect.

The pace of the survey should be brisk but steady, for the length of the transect, and should take about 45 minutes.

Please note on record sheet where identification is unclear and speak to Mike or Mel. Photographs in such circumstances would be useful, and/or details of flight behaviour, appearance, food plant, etc. Note that some species can be difficult to distinguish: Small/Essex Skippers, some Hairstreaks and Whites.

There is a sheet available covering previous butterfly records for the wood between 1991-1995 for comparison purposes. There is also the BBOWT record sheet that lists the butterflies likely to be seen in the region. Finally, there is an average flight times sheet giving information on when, during the year, each species is likely to be seen on the wing.

Mike Killeby
Melvyn Jones

Appendix C.2.6

HAZELEY WOOD STUDY GROUP

Record form

HAZELEY WOOD TRANSECT - BUTTERFLY RECORD SHEET

YEAR DATE RECORDER

START TIME FINISH TIME WIND LEVEL

SPECIES	SECTION	1	2	3	4	5	6	7	8			TOTAL
Brimstone												
Brown Argus												
Comma												
Common Blue												
Essex Skipper												
Gatekeeper												
Green V. White												
Large Skipper												
Large White												
Meadow Brown												
Orange Tip												
Painted Lady												
Peacock												
Red Admiral												
Ringlet												
Small Copper												
Small Heath												
Small Skipper												
Small Tortoiseshell												
Small White												
Speckled Wood												
Wall Brown												
TOTAL												
IN SUN												

C.3 MOTHS



By

**Gordon Redford
and
Mike Killeby**



SUMMARY

During the four visits the number of moths attracted to two UV lights and two Actinic lights on each occasion totalled 65 macro-moths and 29 micro-moths. This is both lower than expected and only slightly higher than 1993 when two visits recorded 68 macro-moths and 7 micro-moths.

The more intensive survey of 1999 provided a better picture of macrolepidoptera on the site. However, moth populations are known to fluctuate naturally with all stages of their life cycles very much at the mercy of the weather and other environmental factors. It is interesting to note then that despite the much fewer and shorter visits of 1993 and 2006, they still attracted macro-moths (3 in 1993 and 8 in 2006) not found in 1999.

1. INTRODUCTION

The survey recorded the species of moths found on the site principally by attraction to UV and Actinic light traps but occasionally using other methods. It also provided an opportunity to compare records from previous surveys in 1993 and 1999.

2. THE SITE

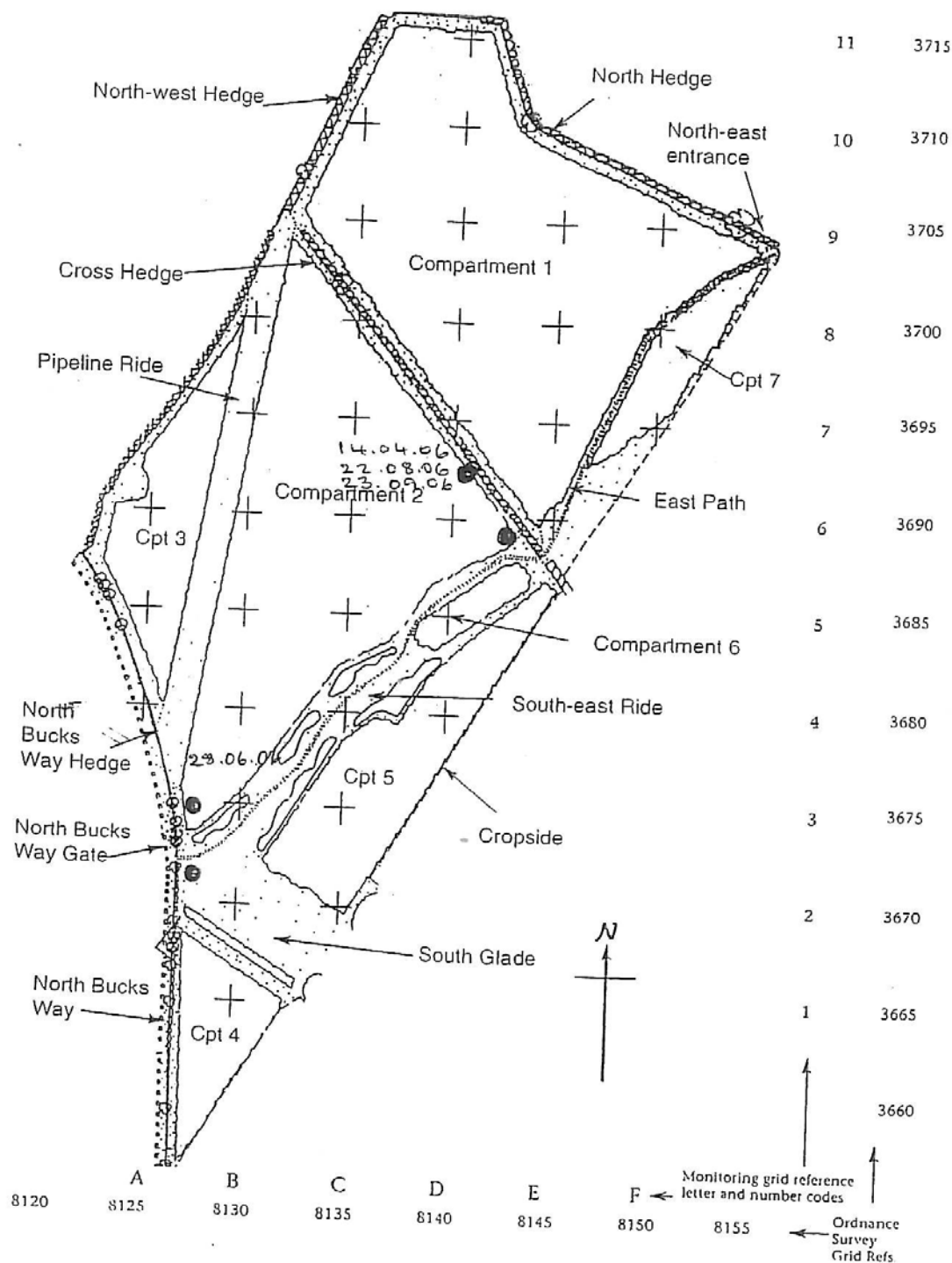
Location of sites for moth lights was determined in part by ground conditions, by site locations in previous surveys and the ease or otherwise of vehicular access.

3. SURVEY METHODS

Seven visits were planned on a monthly basis from March to September. In the event four visits were made in April, June, August and September during 2006. Moths were attracted by using two mercury vapour bulbs (80 watts) suspended over white sheets, one actinic bulb (40 watts) in a moonlander trap over a white sheet and one actinic light in a Heath

trap. Power for mercury vapour bulbs was provided by a SIP Medusa Compact generator and actinic bulbs were powered by 12V batteries.
Lights were operated at two locations as indicated on map C.3.1 below.

Map C.3.1. – Positions of lamps for moth recording and dates



4. RESULTS

The total number of moth species recorded on the 4 visits in 2006 was 94 of which 29 were microlepidoptera and 65 macrolepidoptera. 9 species were recorded on 14th April, 57 species on 28th June, 23 on 22nd August and 20 species on 23rd September. These are listed in Table C.3.2. Table C.3.3 shows these results alongside the records collected in 1993 and 1999.

5. DISCUSSION

The number of species overall recorded during the 4 visits in 2006 was disappointing as this was generally a good year for moths. The weather conditions though were not ideal on the visits made in August and September. There was an expectation that the cessation of spraying and reduction in mowing of food plants (identified as limiting factors in species abundance in 1993) along with the natural development of the woodland over the intervening period and double the trap nights would result in a greater number of species being recorded in 2006. In the event only 19 more were listed than for 1993.

The survey carried out in 1999, focussing on macrolepidoptera only, was in much greater depth: 6 traps were left on site on 10 separate occasions and 5 on another (65 trap nights) from dusk till dawn and these yielded results that can better be used as a yardstick from which to gauge developments on the site.

This notwithstanding, the survey of 1993 found 3 species of macrolepidoptera not recorded in 1999. These were;

Little Emerald (*Jodis lactearia* Linnaeus)
Vapourer (*Orgyia antiqua* Linnaeus)
Beautiful Golden Y (*Autographa pulchrina* Haworth)

The survey of 2006 added a further 9 species of macrolepidoptera to the Hazeley Wood records. These were;

Scalloped Hook-tip (*Falcaria lacertinaria* Linnaeus)
Shoulder Stripe (*Anticlea badiata* Dennis and Schiffermüller)
Red-green Carpet (*Chloroclysta siterata* Hufnagel)
Dusky Thorn (*Ennomos fuscantaria* Haworth)
Twin-spotted Quaker (*Orthosia munda* Dennis and Schiffermüller)
Deep-brown Dart (*Aporophyla lutulenta* Dennis and Schiffermüller)
Large Ranunculus (*Polymixis flavicincta* Dennis and Schiffermüller)
Lunar Underwing (*Omphaloscelis lunosa* Haworth)
Red Underwing (*Catocala nupta* Linnaeus)

The lack of Pugs, only 1 recorded in 2006, is surprising as 4 were recorded in 1993 and 16 in 1999. This serves to illustrate both the temperamental nature of moth species populations and indeed the attraction to recording moths as one is never sure what will turn up or, in the case of Pugs, what will not turn up.

6. ACKNOWLEDGEMENTS

Thanks are due to G. and F. Higgs for help with confirmation of identification of some species and for reading and commenting on this report and D.Manning for identifying some of the microlepidoptera.

7. REFERENCES

Bradley JD (2000) - Log Book of British Lepidoptera
Goater B (1986) - British Pyralid Moths - a guide to their identification
Skinner B (1984) - Colour Identification Guide to Moths of the British Isles
Waring P & Townsend M (2003) - Field Guide to the Moths of Great Britain and Ireland

Table C.3.2

LIST OF MOTH SPECIES RECORDED AT HAZELEY WOOD DURING 2006

Code	Taxon	Vernacular	14 Apr	28 Jun	22 Aug	23 Sep
410	<i>Argyresthia brockella</i>			*		
	<i>Yponomeuta</i> sp.				*	
449	<i>Prays fraxinella</i>	Ash Bud Moth		*		
450	<i>Scythropia crataegella</i>	Hawthorn Moth		*		
460	<i>Ypsolopha parenthesesella</i>					*
464	<i>Plutella xylostella</i>	Diamond-back Moth				*
518	<i>Coleophora mayrella</i>			*		
663	<i>Diurnea fagella</i>		*			
765	<i>Teleiodes vulgella</i>			*		
936	<i>Cochylimorpha straminea</i>			*		
965	<i>Cochylis hybridella</i>			*		
969	<i>Pandemis corylana</i>	Chequered Fruit-tree Tortrix			*	
970	<i>Pandemis cerasana</i>	Barred Fruit-tree Tortrix		*		
977	<i>Archips podana</i>	Large Fruit-tree Tortrix		*		
998	<i>Epiphyas postvittana</i>	Light Brown Apple Moth		*	*	*
1010	<i>Ditula angustiorana</i>	Red-barred Tortrix		*		
1032	<i>Aleimma loeflingiana</i>			*		
1033	<i>Tortrix viridana</i>	Green Oak Tortrix		*		
1076	<i>Celypha lacunana</i>			*		
1082	<i>Hedya pruniana</i>	Plum Tortrix		*		
1115	<i>Ancylis achatana</i>			*		
1175	<i>Epiblema uddmanniana</i>	Bramble Shoot Moth		*		
1176	<i>Epiblema trimaculana</i>			*		
1200	<i>Eucosma hohenwartiana</i>			*		
1301	<i>Crambus lathoniellus</i>			*		
1376	<i>Eurrhynx hortulata</i>	Small Magpie		*		
1405	<i>Pleuroptya ruralis</i>	Mother of Pearl			*	
1452	<i>Phycita roborella</i>			*		
1513	<i>Pterophorus pentadactyla</i>	White Plume Moth		*		
1640	<i>Euthrix potatoria</i>	Drinker		*		
1645	<i>Falcaria lacertinaria</i>	Scalloped Hook-tip		*		
1652	<i>Thyatira batis</i>	Peach Blossom		*		
1653	<i>Habrosyne pyritoides</i>	Buff Arches		*		
1669	<i>Hemithea aestivaria</i>	Common Emerald		*		
1690	<i>Scopula imitaria</i>	Small Blood-vein				*
1713	<i>Idaea aversata</i>	Riband Wave		*		
1727	<i>Xanthorhoe montanata montanata</i>	Silver-ground Carpet		*		
1742	<i>Camptogramma bilineata bilineata</i>	Yellow Shell		*	*	
1746	<i>Anticlea badiata</i>	Shoulder Stripe	*			
1760	<i>Chloroclysta siterata</i>	Red-green Carpet				*
1764	<i>Chloroclysta truncata</i>	Common Marbled Carpet				*
1765	<i>Cidaria fulvata</i>	Barred Yellow		*		
1860	<i>Pasiphila rectangulata</i>	Green Pug		*		
1887	<i>Lomaspilis marginata</i>	Clouded Border		*		
1889	<i>Macaria notata</i>	Peacock Moth			*	
1906	<i>Opisthograptis luteolata</i>	Brimstone Moth		*	*	
1914	<i>Ennomos fuscantaria</i>	Dusky Thorn			*	
1917	<i>Selenia dentaria</i>	Early Thorn	*			

HAZELEY WOOD STUDY GROUP

Code	Taxon	Vernacular	14 Apr	28 Jun	22 Aug	23 Sep
1922	<i>Ourapteryx sambucaria</i>	Swallow-tailed Moth		*		
1931	<i>Biston betularia</i>	Peppered Moth		*		
1937	<i>Peribatodes rhomboidaria</i>	Willow Beauty		*		
1941	<i>Alcis repandata repandata</i>	Mottled Beauty		*		
1947	<i>Ectropis bistortata</i>	Engrailed	*			
1958	<i>Lomographa temerata</i>	Clouded Silver		*		
1961	<i>Campaea margaritata</i>	Light Emerald		*		
1981	<i>Laothoe populi</i>	Poplar Hawk-moth			*	
2050	<i>Eilema lurideola</i>	Common Footman		*		
2089	<i>Agrotis exclamationis</i>	Heart and Dart		*		
2092	<i>Agrotis puta puta</i>	Shuttle-shaped Dart			*	
2098	<i>Axylia putris</i>	Flame		*		
2102	<i>Ochropleura plecta</i>	Flame Shoulder		*	*	
2107	<i>Noctua pronuba</i>	Large Yellow Underwing		*	*	*
2109	<i>Noctua comes</i>	Lesser Yellow Underwing			*	*
2110	<i>Noctua fimbriata</i>	Broad-bordered Yellow Underwing			*	*
2126	<i>Xestia c-nigrum</i>	Setaceous Hebrew Character			*	*
2128	<i>Xestia triangulum</i>	Double Square-spot		*		
2134	<i>Xestia xanthographa</i>	Square-spot Rustic			*	*
2182	<i>Orthosia cruda</i>	Small Quaker	*			
2187	<i>Orthosia cerasi</i>	Common Quaker	*			
2188	<i>Orthosia incerta</i>	Clouded Drab	*			
2189	<i>Orthosia munda</i>	Twin-spotted Quaker	*			
2190	<i>Orthosia gothica</i>	Hebrew Character	*			
2198	<i>Mythimna impura</i>	Smoky Wainscot		*	*	*
2199	<i>Mythimna pallens</i>	Common Wainscot		*	*	
2231	<i>Aporophyla lutulenta</i>	Deep-brown Dart				*
2232	<i>Aporophyla nigra</i>	Black Rustic				*
2252	<i>Polymixis flavicincta</i>	Large Ranunculus				*
2269	<i>Atethmia centrargo</i>	Centre-barred Sallow			*	
2270	<i>Omphaloscelis lunosa</i>	Lunar Underwing				*
2272	<i>Xanthia aurago</i>	Barred Sallow				*
2297	<i>Amphipyra pyramidea</i>	Copper Underwing				*
2306	<i>Phlogophora meticulosa</i>	Angle Shades				*
2321	<i>Apamea monoglypha</i>	Dark Arches		*		
2322	<i>Apamea lithoxylaea</i>	Light Arches		*		
2327	<i>Apamea epomidion</i>	Clouded Brindle		*		
2339	<i>Oligia latruncula</i>	Tawny Marbled Minor		*		
2361	<i>Hydraecia micacea</i>	Rosy Rustic			*	
2381	<i>Hoplodrina alsines</i>	Uncertain		*		
2384	<i>Hoplodrina ambigua</i>	Vine's Rustic			*	
2410	<i>Protodeltote pygarga</i>	Marbled White Spot		*		
2441	<i>Autographa gamma</i>	Silver Y			*	
2452	<i>Catocala nupta</i>	Red Underwing			*	
2474	<i>Rivula sericealis</i>	Straw Dot		*		
2477	<i>Hypena proboscidalis</i>	Snout		*		*
Total Species			9	57	23	20

Table C.3.3

LIST OF MOTH SPECIES RECORDED AT HAZELEY WOOD 1993-2006

Code	Taxon	Vernacular	1993	1999	2006
15	<i>Hepialus sylvina</i>	Orange Swift		*	
17	<i>Hepialus lupulinus</i>	Common Swift		*	
161	<i>Zeuzera pyrina</i>	Leopard		*	
169	<i>Zygaena filipendulae</i>	Six-spot Burnet		*	
410	<i>Argyresthia brockella</i>				*
424	<i>Yponomeuta</i> sp.				*
449	<i>Prays fraxinaella</i>	Ash Bud Moth			*
450	<i>Scythropia crataegella</i>	Hawthorn Moth			*
460	<i>Ypsolopha parenthesella</i>				*
464	<i>Plutella xylostella</i>	Diamond-back Moth			*
518	<i>Coleophora mayrella</i>				*
663	<i>Diurnea fagella</i>				*
765	<i>Teleiodes vulgella</i>				*
965	<i>Cochylis hybridella</i>				*
969	<i>Pandemis corylana</i>	Chequered Fruit-tree Tortrix			*
970	<i>Pandemis cerasana</i>	Barred Fruit-tree Tortrix			*
977	<i>Archips podana</i>	Large Fruit-tree Tortrix			*
998	<i>Epiphyas postvittana</i>	Light Brown Apple Moth			*
1010	<i>Ditula angustiorana</i>	Red-barred Tortrix			*
1032	<i>Aleimma loeflingiana</i>				*
1033	<i>Tortrix viridana</i>	Green Oak Tortrix			*
1076	<i>Celypha lacunana</i>				*
1082	<i>Hedya pruniana</i>	Plum Tortrix			*
1115	<i>Ancylis achatana</i>				*
1150	<i>Ep[ino]ta abbreviana</i>		*		
1175	<i>Epiblema uddmanniana</i>	Bramble Shoot Moth			*
1176	<i>Epiblema trimaculana</i>				*
1200	<i>Eucosma hohewartiana</i>				*
1301	<i>Crambus lathoniellus</i>				*
1376	<i>Eurrhpara hortulata</i>	Small Magpie	*		*
1392	<i>Udea olivalis</i>		*		
1405	<i>Pleuroptya ruralis</i>	Mother of Pearl	*		*
1413	<i>Hypsopygia costalis</i>	Gold Triangle	*		
1452	<i>Phycita roborella</i>				*
1513	<i>Pterophorus pentadactyla</i>	White Plume Moth	*		*
1524	<i>Emmelina monodactyla</i>	Plume Moth	*		
1631	<i>Poecilocampa populi</i>	December Moth		*	
1634	<i>Malacosoma neustria</i>	Lackey		*	
1640	<i>Euthrix potatoria</i>	Drinker	*	*	*
1645	<i>Falcaria lacertinaria</i>	Scalloped Hook-tip			*
1646	<i>Watsonalla binaria</i>	Oak Hook-tip		*	
1648	<i>Drepana falcata</i>	Pebble Hook-tip		*	
1651	<i>Cilix glaucata</i>	Chinese Character		*	
1652	<i>Thyatira batis</i>	Peach Blossom		*	*
1653	<i>Habrosyne pyritoides</i>	Buff Arches	*	*	*
1654	<i>Tethea ocularis</i>	Figure of Eighty		*	
1666	<i>Geometra papilionaria</i>	Large Emerald		*	
1669	<i>Hemithea aestivaria</i>	Common Emerald		*	*

HAZELEY WOOD STUDY GROUP

Code	Taxon	Vernacular	1993	1999	2006
1674	<i>Jodis lactearia</i>	Little Emerald	*		
1680	<i>Cyclophora punctaria</i>	Maiden's Blush		*	
1682	<i>Timandra griseata</i>	Blood Vein	*	*	
1690	<i>Scopula imitaria</i>	Small Blood-vein		*	*
1702	<i>Idaea biselata</i>	Small Fan-footed Wave		*	
1708	<i>Idaea dimidiata</i>	Single Dotted Wave	*	*	
1712	<i>Idaea emarginata</i>	Small Scallop		*	
1713	<i>Idaea aversata</i>	Riband Wave	*	*	*
1716	<i>Rhodometra sacraria</i>	Vestal		*	
1724	<i>Xanthorhoe spadicearia</i>	Red Twin-spot Carpet	*	*	
1726	<i>Xanthorhoe quadrifasiata</i>	Large Twin-spot Carpet		*	
1727	<i>Xanthorhoe montanata montanata</i>	Silver-ground Carpet	*	*	*
1728	<i>Xanthorhoe fluctuata</i>	Garden Carpet		*	
1732	<i>Scotopteryx chenopodiata</i>	Shaded Broad-bar	*	*	
1738	<i>Epirrhoe alternata</i>	Common Carpet	*	*	
1742	<i>Camptogramma bilineata bilineata</i>	Yellow Shell	*	*	*
1746	<i>Anticlea badiata</i>	Shoulder Stripe			*
1752	<i>Cosmorhoe ocellata</i>	Purple Bar		*	
1758	<i>Eulithis pyraliata</i>	Barred Straw	*	*	
1760	<i>Chloroclysta siterata</i>	Red-green Carpet			*
1764	<i>Chloroclysta truncata</i>	Common Marbled Carpet		*	*
1765	<i>Cidaria fulvata</i>	Barred Yellow	*	*	*
1769	<i>Thera britannica</i>	Spruce Carpet		*	
1773	<i>Electrophaes corylata</i>	Broken-barred Carpet		*	
1776	<i>Colostygia pectinataria</i>	Green Carpet		*	
1777	<i>Hydriomena furcata</i>	July Highflyer		*	
1791	<i>Philereme vetulata</i>	Brown Scallop		*	
1792	<i>Philereme transversata</i>	Dark Umber		*	
1795	<i>Epirrita dilutata</i>	November Moth		*	
1799	<i>Operophtera brumata</i>	Winter Moth		*	
1803	<i>Perizoma alchemillata</i>	Small Rivulet	*	*	
1804	<i>Perizoma bifaciata</i>	Barred Rivulet		*	
1811	<i>Eupithecia tenuiata</i>	Slender Pug		*	
1812	<i>Eupithecia inturbata</i>	Maple Pug		*	
1813	<i>Eupithecia haworthiata</i>	Haworth's Pug		*	
1819	<i>Eupithecia exiguata</i>	Mottled Pug		*	
1825	<i>Eupithecia centaureata</i>	Lime-speck Pug		*	
1827	<i>Eupithecia intricata</i>	Freyer's Pug	*	*	
1830	<i>Eupithecia absinthiata</i>	Wormwood Pug		*	
1834	<i>Eupithecia vulgata</i>	Common Pug		*	
1838	<i>Eupithecia icterata</i>	Tawny-speckled Pug		*	
1837	<i>Eupithecia subfuscata</i>	Grey Pug		*	
1839	<i>Eupithecia succenturiata</i>	Bordered Pug	*	*	
1842	<i>Eupitheciasimpliciata</i>	Plain Pug		*	
1858	<i>Chloroclystis v-ata</i>	V Pug		*	
1859	<i>Chloroclystis chloerata</i>	Sloe Pug		*	
1860	<i>Pasiphila rectangulata</i>	Green Pug	*	*	*
1862	<i>Gymnoseclis rufifasciata</i>	Double-striped Pug	*	*	
1864	<i>Chesias legatella</i>	Streak		*	
1867	<i>Aplocera plagiata</i>	Treble-bar		*	
1876	<i>Hydrelia flammeolaria</i>	Small Yellow Wave		*	
1884	<i>Abraxas grossulariata</i>	The Magpie	*	*	
1887	<i>Lomaspilis marginata</i>	Clouded Border	*	*	*

HAZELEY WOOD STUDY GROUP

Code	Taxon	Vernacular	1993	1999	2006
1888	<i>Ligdia adustata</i>	Scorched carpet		*	
1889	<i>Macaria notata</i>	Peacock Moth		*	*
1893	<i>Semiothisa liturata</i>	Tawny-barred Angle		*	
1904	<i>Plagodis dolabraria</i>	Scorched Wing		*	
1906	<i>Opisthograptis luteolata</i>	Brimstone Moth	*	*	*
1913	<i>Ennomos alniaria</i>	Canary-shouldered Thorn	*	*	
1914	<i>Ennomos fuscantaria</i>	Dusky Thorn			*
1917	<i>Selenia dentaria</i>	Early Thorn	*	*	*
1919	<i>Selenia tetralunaria</i>	Purple Thorn		*	
1921	<i>Crocalliselinguaria</i>	Scalloped Oak	*	*	
1922	<i>Ourapteryx sambucaria</i>	Swallow-tailed Moth	*	*	*
1923	<i>Colotois pennaria</i>	Feathered Thorn		*	
1927	<i>Lycia hirtaria</i>	Brindled Beauty		*	
1931	<i>Biston betularia</i>	Peppered Moth		*	*
1935	<i>Erannis defoliaria</i>	Mottled Umber		*	
1936	<i>Menophra abruptaria</i>	Waved Umber		*	
1937	<i>Peribatodes rhomboidaria</i>	Willow Beauty	*	*	*
1941	<i>Alcis repandata repandata</i>	Mottled Beauty	*	*	*
1947	<i>Ectropis bistortata</i>	Engrailed		*	*
1955	<i>Cabera pusaria</i>	Common White Wave		*	
1956	<i>Cabera exanthemata</i>	Common Wave		*	
1958	<i>Lomographa temerata</i>	Clouded Silver	*	*	*
1961	<i>Campaea margaritata</i>	Light Emerald	*	*	*
1979	<i>Mimas tiliae</i>	Lime Hawk-moth		*	
1980	<i>Smerinthus ocellata</i>	Eyed Hawk-moth	*	*	
1981	<i>Laothoe populi</i>	Poplar Hawk-moth		*	*
1991	<i>Deilephila elpenor</i>	Elephant Hawk-moth	*	*	
1994	<i>Phalera bucephala</i>	Buff-tip		*	
1997	<i>Furcula furcula</i>	Sallow Kitten		*	
2000	<i>Notodonta dromedarius</i>	Iron Prominent		*	
2003	<i>Notodonta ziczac</i>	Pebble Prominent		*	
2007	<i>Pheosia tremula</i>	Swallow Prominent		*	
2008	<i>Ptilodon capucina</i>	Coxcomb Prominent	*	*	
2009	<i>Ptilodon cucullina</i>	Maple Prominent		*	
2011	<i>Pterostoma palpina</i>	Pale Prominent	*	*	
2015	<i>Drymonia ruficornis</i>	Lunar Marbled Brown		*	
2019	<i>Clostera curtula</i>	Chocolate-tip		*	
2020	<i>Diloba caeruleocephala</i>	Figure of Eight		*	
2026	<i>Orygia antiqua</i>	The Vapourer	*		
2028	<i>Calliteara pudibunda</i>	Pale Tussock		*	
2030	<i>Euproctis similis</i>	Yellow-tail	*	*	
2044	<i>Eilema griseola</i>	Dingy Footman		*	
2047	<i>Eilema complana</i>	Scarce Footman		*	
2050	<i>Eilema lurideola</i>	Common Footman		*	*
2057	<i>Arctia caja</i>	Garden Tiger	*	*	
2060	<i>Spilosoma lubricipeda</i>	White Ermine		*	
2061	<i>Spilosoma luteum</i>	Buff Ermine		*	
2063	<i>Diaphora mendica</i>	Muslin Moth		*	
2064	<i>Phragmatobia fuliginosa</i>	Ruby Tiger		*	
2069	<i>Tyria jacobaeae</i>	Cinnabar		*	
2077	<i>Nola cucullatella</i>	Short-cloaked		*	
2082	<i>Euxoa nigricans</i>	Garden Dart		*	
2087	<i>Agrotis segetum</i>	Turnip Moth	*	*	

HAZELEY WOOD STUDY GROUP

Code	Taxon	Vernacular	1993	1999	2006
2088	<i>Agrotis clavis</i>	Heart and Club		*	
2089	<i>Agrotis exclamationis</i>	Heart and Dart	*	*	*
2091	<i>Agrotis ipsilon</i>	Dark Sword Grass		*	
2092	<i>Agrotis puta puta</i>	Shuttle-shaped Dart		*	*
2098	<i>Axylia putris</i>	Flame	*	*	*
2102	<i>Ochropleura plecta</i>	Flame Shoulder	*	*	*
2107	<i>Noctua pronuba</i>	Large Yellow Underwing	*	*	*
2109	<i>Noctua comes</i>	Lesser Yellow Underwing	*	*	*
2110	<i>Noctua fimbriata</i>	Broad-bordered Yellow Underwing		*	*
2111	<i>Noctua janthina</i>	Lesser Broad-bordered Yellow Underwing	*	*	
2112	<i>Noctua interjecta</i>	Least Yellow Underwing		*	
2114	<i>Graphiphora augur</i>	Double Dart		*	
2123	<i>Diarsia rubi</i>	Small Square-spot		*	
2126	<i>Xestia c-nigrum</i>	Setaceous Hebrew Character	*	*	*
2128	<i>Xestia triangulum</i>	Double Square-spot	*	*	*
2133	<i>Xestia sexstrigata</i>	Six-striped Rustic		*	
2134	<i>Xestia xanthographa</i>	Square-spot Rustic		*	*
2145	<i>Discestra trifoli</i>	Nutmeg		*	
2154	<i>Mamestra brassicae</i>	Cabbage		*	
2155	<i>Melanchra persicariae</i>	Dot		*	
2160	<i>Laconobia oleracea</i>	Bright-line Brown-eye	*	*	
2163	<i>Ceramica lisi</i>	Broom		*	
2170	<i>Hadena compta</i>	Varied Coronet	*	*	
2173	<i>Hadena bicurvis</i>	Lychnis		*	
2178	<i>Tholera decimalis</i>	Feathered Gothic		*	
2182	<i>Orthosia cruda</i>	Small Quaker		*	*
2186	<i>Orthosia gracilis</i>	Powdered Quaker		*	
2187	<i>Orthosia cerasi</i>	Common Quaker		*	*
2188	<i>Orthosia incerta</i>	Clouded Drab		*	*
2189	<i>Orthosia munda</i>	Twin-spotted Quaker			*
2190	<i>Orthosia gothica</i>	Hebrew Character		*	*
2193	<i>Mythimna ferrago</i>	Clay		*	
2198	<i>Mythimna impura</i>	Smoky Wainscot	*	*	*
2199	<i>Mythimna pallens</i>	Common Wainscot	*	*	*
2225	<i>Brachylomia viminalis</i>	Minor Shoulder-knot		*	
2227	<i>Brachionycha sphinx</i>	Sprawler		*	
2231	<i>Aporophyla lutulenta</i>	Deep-brown Dart			*
2232	<i>Aporophyla nigra</i>	Black Rustic		*	*
2237	<i>Lithophane ornitopus</i>	Grey Shoulder-knot		*	
2240	<i>Lithophane leautieri</i>	Blair's Shoulder-knot		*	
2245	<i>Allophytes oxyacanthae</i>	Green-brindled Crescent		*	
2248	<i>Dryobotodes eremita</i>	Brindled Green		*	
2252	<i>Polymixis flavicincta</i>	Large Ranunculus			*
2256	<i>Eupsilia transversa</i>	Satellite		*	
2259	<i>Conistra ligula</i>	Dark Chestnut		*	
2262	<i>Agrochola circellaris</i>	Brick		*	
2263	<i>Agrochola lota</i>	Red-line Quaker		*	
2264	<i>Agrochola macilenta</i>	Yellow-line Quaker		*	
2267	<i>Agrochola lychnidis</i>	Beaded Chestnut		*	
2269	<i>Atethmia centrargo</i>	Centre-barred Sallow		*	*
2270	<i>Omphaloscelis lunosa</i>	Lunar Underwing			*
2272	<i>Xanthia aurago</i>	Barred Sallow		*	*
2274	<i>Xanthia ictertia</i>	Sallow		*	

HAZELEY WOOD STUDY GROUP

Code	Taxon	Vernacular	1993	1999	2006
2278	<i>Acronicta megacephala</i>	Poplar Grey		*	
2279	<i>Acronicta aceris</i>	Sycamore		*	
2280	<i>Acronicta leporina</i>	Miller		*	
2281	<i>Acronicta alni</i>	Alder		*	
2284	<i>Acronicta</i> Sp	Dagger Sp	*	*	
2289	<i>Acronicta rumicis</i>	Knot Grass		*	
2293	<i>Cryphia domestica</i>	Marbled Beauty		*	
2297	<i>Amphipyra pyramidea</i>	Copper Underwing		*	*
2298	<i>Amphipyra berbera</i>	Svennson's Copper Underwing		*	
2299	<i>Amphipyra tragopoginis</i>	Mouse		*	
2302	<i>Rusina Ferruginea</i>	Brown Rustic	*	*	
2303	<i>Thalophila matura</i>	Straw Underwing	*	*	
2305	<i>Euplexia lucipara</i>	Small Angle Shades		*	
2306	<i>Phlogophora meticulosa</i>	Angle Shades	*	*	*
2312	<i>Ipimorpha subtusa</i>	Olive		*	
2314	<i>Parastichtis ypsilon</i>	Dingy Shears		*	
2318	<i>Cosmia trapezina</i>	The Dun-bar	*	*	
2319	<i>Cosmia pyralina</i>	Lunar-spotted Pinion		*	
2321	<i>Apamea monoglypha</i>	Dark Arches	*	*	*
2322	<i>Apamea lithoxylaea</i>	Light Arches		*	*
2326	<i>Apamea crenata</i>	Clouded-bordered Brindle		*	
2327	<i>Apamea epomidion</i>	Clouded Brindle		*	*
2330	<i>Apamea remissa</i>	Dusky Brocade		*	
2331	<i>Apamea unanimitis</i>	Small Clouded Brindle		*	
2333	<i>Apamea anceps</i>	Large Nutmeg	*	*	
2334	<i>Apamea sordens</i>	Rustic Shoulder-knot		*	
2337	<i>Oligia strigilis</i>	Marbled Minor	*	*	
2338	<i>Oligia versicolor</i>	Rufous Minor		*	
2339	<i>Oligia latruncula</i>	Tawny Marbled Minor	*	*	*
2340	<i>Oligia fasciuncula</i>	Middle-barred Minor	*	*	
2341	<i>Mesoligia furuncula</i>	Cloaked Minor	*	*	
2343	<i>Mesapamea secalis</i>	Common Rustic	*	*	
2345	<i>Photodes minima</i>	Small Dotted Buff		*	
2352	<i>Eremobia ochroleuca</i>	Dusky Sallow		*	
2353	<i>Luperina testacea</i>	Flounced Rustic		*	
2361	<i>Hydraecia micacea</i>	Rosy Rustic		*	*
2364	<i>Gortyna flavago</i>	Frosted Orange		*	
2368	<i>Celaena leucostigma</i>	Crescent		*	
2381	<i>Hoplodrina alsines</i>	Uncertain	*	*	*
2382	<i>Hoplodrina bianda</i>	Rustic		*	
2384	<i>Hoplodrina ambigua</i>	Vine's Rustic		*	*
2387	<i>Caradrina morpheus</i>	Mottled Rustic	*	*	
2389	<i>Caradrina clavipalpis</i>	Pale Mottled Willow		*	
2410	<i>Protodeltote pygarga</i>	Marbled White Spot		*	*
2421	<i>Bena bocolorana</i>	Scarce Silver-lines		*	
2422	<i>Pseudoips fagana</i>	Green Silver-lines		*	
2423	<i>Nycteola revayana</i>	Oak Nycteoline		*	
2434	<i>Diachrysia chrysitis</i>	Burnished Brass		*	
2441	<i>Autographa gamma</i>	Silver Y	*	*	*
2442	<i>Autographa pulchrina</i>	Beautiful Golden Y	*		
2443	<i>Autographa jota</i>	Plain Golden Y	*	*	
2449	<i>Abrostola triplasia</i>	Spectacle		*	
2452	<i>Catocala nupta</i>	Red Underwing			*

HAZELEY WOOD STUDY GROUP

Code	Taxon	Vernacular	1993	1999	2006
2466	<i>Lygephila pastinum</i>	Blackneck		*	
2469	<i>Scoliopteryx libatrix</i>	The Herald	*	*	
2473	<i>Laspeyria flexula</i>	Beautiful Hook-tip		*	
2474	<i>Rivula sericealis</i>	Straw Dot		*	*
2477	<i>Hypena proboscidalis</i>	Snout	*	*	*
2484	<i>Schrankia costastrigalis</i>	Pinion-streaked Snout		*	
2489	<i>Zanclognatha tarsipennalis</i>	Fan-foot		*	
2492	<i>Herminia grisealis</i>	Small Fan-foot		*	
Total Species Recorded			75	223	81

C.4 MICRO MOTH LEAF MINERS



By

Mike Killeby



1. INTRODUCTION

These very small moths pass their larval stage feeding within the thickness of leaves of their food plant. The moths are so small as to be difficult to be seen and thus not easily recorded. Many are day flying and are not attracted to MV light traps. Fortunately the various species of micro moth larvae have not only a limited range of food plants but also the larvae make identifiable and specific mine styles and patterns. Generally the way larvae feed in leaves results in either serpentine mines, creases, blotches, tents or folds or a combination, as described in Emmet, 1988.

2. SURVEY METHOD

Micromoth mines are usually found by the close examination of the leaves of trees and shrubs from September to leaf fall. Some mines require microscopic examination of the larva to separate different species. To validate the determinations here, a second opinion was sought from D V Manning (Bedfordshire Micromoth Recorder); this was duly provided. Two visits were made on 22.10.2005 and on 23.10.2005, collecting leaves from the Southern edge of compartment two. Examinations were focused on tree and shrub species forming the original planting.

3. RESULTS

Bradley & Fletcher No. (see references)

Hornbeam (*Carpinus betula*)

<i>Stigmella microtheriella</i>	111
<i>Phyllonorycter esperella</i>	343
<i>Phyllonorycter tenerella</i>	318
<i>Phyllonorycter messaniella</i>	321

Oak (*Quercus robur*)

<i>Stigmella basiguttella</i>	89
<i>Stigmella ruficapitella</i>	84
<i>Stigmella roborella</i>	86

<i>Ectoedemia subbimacullella</i>	38
<i>Phyllonorycter messaniella</i>	321
<i>Ectoedemia heringi</i>	39
Hazel (<i>Corylus avellana</i>)	
<i>Stigmella floslactella</i>	75
<i>Stigmella microtheriella</i>	111
<i>Parornix devoniella</i>	304
<i>Phyllonorycter coryli</i>	342
Hawthorn (<i>Crataegus monogyna</i>)	
<i>Parornix anglicella</i>	303
<i>Phyllonorycter oxyacanthae</i>	323
Blackthorn (<i>Prunus spinosa</i>)	
<i>Stigmella plagicolella</i>	67
<i>Lyonetia clerkella</i>	263
<i>Phyllonorycter spinicolella</i>	329

4. DISCUSSION

This survey work was carried out in 2005 for the convenience of the recorder. Some of the species found are uncommon but most are common and widespread.

5. REFERENCES

- Bradley J D & Fletcher D S (1979, updated in 1986) – A Recorder's Log Book, British Butterflies & Moths
 Emmet A M (1988) – Smaller British Lepidoptera

C.5 HOVERFLIES



by

**John Wickham
and
Jean Cooke**



SUMMARY

Overall, a total of 23 different species were found to be present during 10 of 13 visits. Most of these occur commonly and might be expected to be present in this type of habitat, except for two, *Cheilosia grossa* and *Eupeodes nitens*. Both of these species are generally regarded as uncommon or local and these records have been found to be the first registered with The Buckinghamshire and Milton Keynes Environmental Record Centre (BMERC).

1. INTRODUCTION

Surveys were conducted collecting individual insects whilst following parts of a transect. No attempt was made to assess the numbers of hoverflies present in an area.

2. ROUTE OF THE TRANSECT

Figure A.1 (page 3) is a map of Hazeley Wood showing the location of the various sections and areas.

A transect usually followed the following route

- | | | |
|---------|---|----------------------------------------------------------------------------------------------|
| Section | 1 | From Car Park along S.E. ride to NBW gate. |
| | 2 | Along inside of NBW hedge to N.W. hedge. |
| | 3 | N.W. hedge to junction of Pipeline/Cross Hedge then along S. side of Crosshedge to Car Park. |

On some occasions Section 3 was substituted by 3a:-

- | | | |
|---------|----|------------------------------------------------------------------------------------------------------------------------------------|
| Section | 3a | N.W. hedge past junction of Pipeline/Cross Hedge then to North Hedge around to N.E. Entrance and return through Cpt 7 to Car Park. |
|---------|----|------------------------------------------------------------------------------------------------------------------------------------|

or Sections 2 & 3 were substituted by 2/3b:-

Section 2/3b Along inside of NBW hedge to Pipeline Ride along to junction
Crosshedge then along S. side of Crosshedge to Car Park.

These changes were made to include other areas, usually where flowers were present at the time.

3. SURVEY METHODS

On each visit specimens were collected by netting, and stored in a tube with an indication of the site pending later identification carried out by the two authors. Many identifications were cross checked among ourselves and several were subsequently verified by experienced dipterists; Roger Morris and Tony Marshall.

On three occasions visits were curtailed by bad weather, but generally there were at least some sunny periods during most of each visit.

Identifications were made using dead specimens, following the keys given in "British Hoverflies" - "An Illustrated Identification Guide" by A.E. Stubbs & S. Falk, 2nd Edition, 2002.

4. RESULTS

Table C.5.1 shows the list of species (23), the occasions, and the total number of individuals collected (62) during the season.

5. DISCUSSION

In general, most of the species occur commonly in the UK and might be expected to be found in new wettish woodland such as Hazeley Wood. There were two exceptions to this finding in that we collected one specimen each of *Cheilosia grossa* and *Eupeodes nitens*, neither of which has previously been registered with The Buckinghamshire and Milton Keynes Environmental Record Centre (BMERC).

In relation to the species found in 1994; five species were found that did not occur on this occasion; six species occurred both times; and 17 were additions in 2006. It is unlikely that any significance can be attributed to these differences owing to the small sample sizes.

6. ACKNOWLEDGEMENTS

Thanks are due to the whole team consisting of Charlie Blake, Jean Cooke, Wally Lancaster, John Wickham and Tony Wood who all contributed to the overall effort.

Our appreciation is extended to Roger Morris and Tony Marshall who kindly verified some of our identifications.

Table C.5.1 - Summary of Findings

			Dates:	21 Apr	07 May	18 May	15 Jun	2 July	23 July	10 Aug	03 Sep	14 Sep	Total Indivi- duals	
Subfamily	Tribe	Species												
Syrphinae	Syrphini	<i>Epistrophe eligans</i>		X	X	X							5	
		<i>Episyrphus balteatus</i>			X	X		X	X	X		6		
		<i>Syrphus ribesii</i>			X	X			X			3		
		<i>Syrphus vitripennis</i>		X			X					2		
		<i>Leucozona lucorum</i>			X							1		
		<i>Eupeodes nitens</i>			X							1		
		<i>Sphaerophoria scripta</i>						X	X		X	5		
		Bacchini	<i>Melanostoma mellinum</i>		X						X		X	3
	<i>Melanostoma scalare</i>					X				X		X	4	
	<i>Platycheirus albimanus</i>					X							1	
	<i>Platycheirus clypeatus</i>			X									2	
	Milesiinae	Cheilosini	<i>Cheilosia grossa</i>	X										1
			<i>Cheilosia vernalis</i>										X	1
<i>Rhingia campestris</i>				X		X				X	X	5		
Eristalini		<i>Eristalis (Eo) arbustorum</i>									X	X	2	
		<i>Eristalis (Eo) interruptus</i>								X	X		3	
		<i>Eristalis (Eo) intricatus</i>							X				1	
		<i>Eristalis (E) tenax</i>				X		X		X	X	7		
		<i>Eristalis (Eo) pertinax</i>		X								1		
		<i>Myathropa florea</i>			X							1		
		<i>Helophilus pendulus</i>						X		X	X	5		
Xylotini		<i>Syritta pipiens.</i>				X							1	
		<i>Chalcosyrphus (Xyl)</i>												
		<i>nemorum</i>								X			1	

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C.6 DRAGONFLIES / DAMSELFLIES



by

Colin Docketty



SUMMARY

A total of 12 species (5 damselflies and 7 dragonflies) were recorded in the wood on at least one occasion. This is an indication of how the habitat has changed since the previous surveys in 1994 & 1995 when no dragonflies/damselflies were seen. One strange unanswerable oddity was the complete lack of any blue damselflies in the grassland within the wood.

1. INTRODUCTION

There are 18 established dragonfly species (8 damselflies and 10 dragonflies) occurring in Milton Keynes plus one recent newcomer which is colonising the country, the Small Red-eyed damselfly, found at Stony Stratford. Most species are common in suitable habitats.

2. SURVEY METHODS

The study method used was checking the roadside and North Bucks Way ponds and their associated ditches and walking the rides within the wood on many Sundays, between 12.30 and 14.00. A few additional site visits were also made at other times.

3. DETAILS OF SIGHTINGS

Large Red damselfly

28 May	1 on wood side of North Bucks Way (NBW).
24 June	Pair in tandem and separate male at roadside pond.

Azure damselfly

4 June	3 Pairs in tandem with green females egg laying at roadside pond. Others present.
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25 June Pair in tandem green female egg laying at NBW pond.
Female on oak leaf at ride edge in the wood eating Daddy long legs.

Common Blue damselfly

15 June 2 males on wood side of NBW hedge.
1 female egg laying (solitary) NBW pond.
None seen in grasslands within the wood.

Blue-tailed damselfly

4, 24, 25 June 1 male at roadside pond.
8 July 1 male NBW pond.
16 July 2 males on wood side of NBW hedge.

Banded demoiselle

4 June 1 female resting on wood side of NBW hedge.
No further sightings of this species.

Broad-bodied chaser

4 June 1 male defending territory on NBW pond; same individual seen until 16 July (at least 6 weeks old).
At NBW pond 2 males and 1 female (egg laying).
1 male at roadside pond.
1 female flying in wood by NBW hedge after egg laying; also perched on wood side of hedge.

15 June Pair seen at NBW pond.

24 June At NBW pond, 3 males chasing each other low over the water. Third male was most likely from the roadside pond as he was absent from there on this day but back there the next day.

25 June At NBW pond, 2 males and 1 female. The female was egg laying with the territorial male hovering above her.
The second male was at the back of the pond.
At roadside pond, 1 male.

2 July At NBW pond, 1 male.
1 female and a male seen flying in the wood; a female also perched on the wires.

8 July At NBW pond 1 male.

16 July At NBW pond, the 'territorial' male.

Emperor dragonfly

24 June 1 male patrolling in the wood.
No further sightings of this species.

Brown hawker

2, 8, 16 July 1 patrolling rides in the wood.
8, 16 July 1 at roadside pond.
16 July 1 at NBW pond.

Southern hawker

6 Aug 2 males patrolling rides in the wood.

9 Aug	1 male patrolling rides in wood.
30 Aug	2 males flying and 1 male hanging in the wood. 1 female hanging by NBW ditch then flew into wood.
3 Sep	1 male patrolling in the wood.

Migrant hawk

6 Aug	6 plus near car park waiting for ants to take off; saw one take an ant.
9 Aug	2 in wood.
27 Aug	Quite a few flying in the wood.
30 Aug	9 flying around wood edge near car park.
3 Sep	3 flying around wood edge near car park.

Ruddy darter

9,16 Aug	Some males seen in the wood.
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Common darter

25 June	2 newly emerged in grass by roadside pond. 2 males plus a pair in tandem egg laying at roadside pond.
16 July	Male at NBW pond.
6 Aug	2 males and 1 female at roadside pond.
9 Aug	Many seen on hedges in the wood.
30 Aug	2 males at roadside pond.
3 Sep	Some seen in wood.

4. DISCUSSION

I was surprised how many species use woodland at sometime in their life. A total of 12 species (5 damselflies and 7 dragonflies) were recorded in the wood on at least one occasion. One strange unanswerable oddity was the complete lack of any Blue damselflies in the grassland within the wood, despite walking through the grass several times. Nor were any noticed by other members of the Society.

Probably the most interesting find was a recently emerged female Azure damselfly sitting on an oak leaf consuming a Daddy-longlegs. Also interesting was the length of time a male Broad-bodied chaser at the North Bucks Way lived. It was easy to know it was the same individual by its territorial behaviour and he lived for at least 6 weeks. Also of note were Migrant hawkers getting an easy meal by waiting for emerging ants to take off, snapping them up before they had a chance to get away.

5. ACKNOWLEDGEMENTS

I wish to acknowledge records received from Alan Nelson.

C.7 ORTHOPTERA



by

Paul Lund



SUMMARY

In the two surveys carried out during the year, five species were definitely identified with the probability that a further two species were present (see list in Details of Sightings). None of this was particularly noteworthy.

1. INTRODUCTION

The aim is to record Orthoptera in Hazeley wood, surveying the various habitats by looking, listening directly and also by using a bat detector. Walking slowly through grassy areas reveals grasshoppers and crickets as they try to move away. Listening allows identification of species which are audible, if you are familiar with their song. Using an ultrasound converter (bat detector) allows identification of species whose stridulation is beyond human hearing. This varies from person to person.

Immature Orthoptera can be difficult to identify to species and do not stridulate so for this reason surveys were not carried out until late summer when most species would be adult.

2. SURVEY METHODS

Two surveys were done. The first on my own on 19th August, on a warm sunny afternoon following a route from the car park along the south side of the Cross Hedge and bearing right to circumnavigate Compartment 1 (the northern sector of the site) then along the South East Ride and back.

On the second survey on 13th September we again followed the same route around Compartment 1 but instead of using the South East Ride we continued along the North side of Cross Hedge and then retraced our steps to the car park. We started at 7.30pm and continued after dark in the hope of finding species such as the Dark Bush Cricket *Pholidoptera griseoaptera*, and Oak Bush Cricket *Meconema thalassinum*,

On both these surveys the bat detector used was an early Mark 1 Magenta Electronics model, built from a kit which I modified to increase sensitivity and also to give a loudspeaker effect.

3. DETAILS OF SIGHTINGS

Species found in locations given below were:-

Meadow Grasshopper	<i>Corthippus parallelus</i>
Lesser Marsh Grasshopper	<i>Corthippus albomarginatus</i>
Speckled Bush-cricket	<i>Leptophyes punctatissima</i>
Long-winged Conehead	<i>Conocephalus discolor</i>
Conehead	<i>Conocephalus sp.</i>
Roesel's Bush-cricket	<i>Metrioptera roeselii</i>
Dark Bush-cricket	<i>Pholidoptera griseoaptera</i>

19th August

Speckled bush-cricket; (3+)		Cross hedge
Roesel's bush-cricket; (2 males [1 long-winged form])	}	Cross hedge N. end
Conehead sp.	}	Cross hedge N. end
Speckled bush-cricket	}	N.W. hedge - N. hedge to
Conehead sp.	}	N.E. entrance
Speckled bush-cricket		E. path, Compartment 7
Roesel's bush-cricket	}	
Lesser Marsh grasshopper (female)	}	Near Car Park, long grass
Long-winged conehead	}	
Roesel's bush-cricket	}	
Conehead sp.	}	S.E. ride
Lesser Marsh grasshopper	}	
Meadow grasshopper (male & female)	}	

13 September

Roesel's bush-cricket		Cross hedge N. end
Speckled bush-cricket	}	In Cross hedge
or Dark bush-cricket	}	N. hedge to N.E. entrance
		E. path, Compartment 7

No other Orthoptera were 'sighted' during this second survey.

4. DISCUSSION

Both Roesel's bush-cricket and Coneheads have been extending their range for some years and both were in the Milton Keynes area about ten years ago, so I am not surprised to find them in Hazeley Wood.

The Oak bush-cricket stridulates by drumming with one hind leg on the surface upon which it is standing and consequently is inaudible to us from a short distance.

The bat detector indicated a number of Speckled bush-crickets but none were seen despite careful searching and beating branches where they had been heard, into an upturned open umbrella.

No Oak bush-crickets were found despite extensive beating.

No Dark bush-crickets were found, though the hedges around the wood would appear to be ideal habitats. I can no longer hear this species without using a bat detector and I have no reference recordings of what it sounds like to compare with Speckled bush-cricket so it is possible that some of my Speckled bush-crickets were in fact Dark bush-crickets, particularly in the hedges. I have CD recordings but the limited frequency response of CD (20 kHz), means that such recordings do not give a true impression of a live insect to a bat detector.

In view of my continued hearing loss I do not expect to be making further significant contributions to grasshopper and cricket records for Hazeley Wood.

5. ACKNOWLEDGEMENTS

Thanks to Martin Kincaid for helping with the second survey.

C.8 GROUND BEETLES



by
Mike LeRoy

with



**Jean Cooke, Colin Docketty, Carol Watts, John Wickham,
Tony Wood and Jo Ayers**

SUMMARY

Monitoring of ground beetles (Carabidae) at Hazeley Wood was carried out between May and December 2006, by pitfall trapping. Ten sets of five pitfall traps were installed. Each set was sited close to where a pitfall trap had been located for a previous study in 1994. Ten species of ground beetle were found during the 2006 study, some of them in considerable quantities. An analysis was made of distribution of species by trap site. Comparisons were also made between species found there in 1994, 1995 and 2006; and with a 1977 survey of nearby Howe Park Wood.

1. INTRODUCTION

- 1.1 Hazeley Wood was planted in 1991 so at the time of the first study at this site, in 1994, the rows of young trees were still interspersed with remnant open grassland. Related to these eco-system characteristics and the previous use of the site for crops, many of the species found at that time were generalists or species of cultivated land. By 2006, the woodland had become well established, with a closed canopy and a build-up of a limited amount of ground layer litter and ground flora. These factors were expected to be reflected in a different range of species to be found in 2006.
- 1.2 The Hazeley Wood ground beetle (Carabidae) study group was comprised of six people. A seventh member joined the group for identification sessions. The group; located pitfall sites; installed traps; made site visits to set, inspect and empty traps; and participated in a series of identification sessions. The report was drafted by Mike LeRoy.
- 1.3 An initial briefing note was circulated to members of the Hazeley Wood ground beetle study group in February 2006. This set out:
 1. aims of the study
 2. background, including a summary of the 1994 survey findings

3. expectations of changes to carabid fauna that might be expected as a result of the maturing of trees in the woodland
4. a brief summary of the lifecycle and seasonal characteristics of carabids
5. collection methods
6. a proposed methodology for pitfall trapping
7. main tasks to be carried out
8. a provisional programme for the calendar year
9. equipment required
10. safety requirements.

1.4 The main aims – as set out in the February 2006 briefing note – were:

- 1) “List all the species of adult ground beetle we can find in the study area.”
- 2) “Record where each species is found within the study area in relation to specific locations and habitat types (woodland, shrub, hedge, grassland).”
- 3) “Provide a summary of the ground beetle study for the Hazeley Wood Study Group 2006 report.”
- 4) “Provide individual records for the Buckinghamshire & Milton Keynes Ecological Records Centre (BMERC).”

1.5 Two other potential aims were proposed for consideration, but with an indication that considerably more time would be needed if these were to be completed.

These were to:

- a) “Prepare a voucher specimen to be held for each record submitted to BMERC”.
 - Voucher and other specimens have been retained in dilute alcohol, but none have been dry-carded. The records are being submitted to BMERC.
- b) “Estimate the size of the population of each species in the study area”.
 - There were insufficient resources to carry out ‘mark, release, recapture’ techniques for reliable estimation of population size of each species found, and the other quantitative data was inadequate as a basis for estimating populations. The inconclusive issue of population sizes is discussed further in paragraph 2.14 below.

2. SURVEY METHODS AND COLLECTING

2.1 Pitfall trapping was the method selected. This enabled near replication of the 1994 ground beetle survey.

2.2 Much of the available literature on pitfall trapping methodology (e.g. Southwood & Henderson 2000; Henderson 2003; Sutherland 1996; New 1998) concentrates more on specific guidance about individual traps than on the sampling strategy required to decide on number of traps to be installed, or the spacing between them. Other sources provide more guidance on these aspects (Woodcock, in Leather 2005; and Luff 1996). But overall there is a lack of consensus on these issues. Varying advice is given on the spatial arrangement of traps; whether they should be grouped, linear or random. Random placement has scientific and practical disadvantages and linear is used where a transition between habitats is to be studied. The advice of Mark Telfer (Telfer 2004) and others is that traps should be set in groups, with a minimum of five, each a couple of paces from each other.

2.3 For the 1994 survey, and a follow-up study in 1995, eight sites had been used, at each of which there was one pitfall trap. However, in five respects the 2006 sites differed from the 1994 and 1995 ones:

- 1) for the 2006 survey, ten sites rather than eight were planned, with eight of these as close as possible to the eight used in the 1994 survey;
 - 2) not all the 1994 sites could be replicated exactly, and there were also minor discrepancies because some marker posts had been moved or removed;
 - 3) a set of five pitfall traps was installed at each of the sites for the 2006 study, in comparison to the single trap at each for the 1994 study.
 - 4) sites were re-numbered for the 2006 study to relate to a standard collection route, with the first site south-west of the car park, and a clockwise route around the site to the tenth site immediately north of the car-park; as shown on the map following section 8 of this report;
 - 5) the set of traps at site Nine (2006) was damaged soon after installation and was not replaced.
- 2.4 The chosen method for the 2006 study was to install sets of five pitfall traps in a rectangle of four with a fifth at the centre of the rectangle, and a distance between the central trap and each other trap of approximately two metres. These sets of five were positioned in the eight locations used for the 1994 and 1995 studies and at two other locations, chosen to be well-spaced from the other sites.
- 2.5 Evidence came to light after site surveying had been completed and traps installed that some of the woodland grid marker posts (reference points for siting pitfall sets) were not in their correct locations. Of the 2006 sites, this affected only sites Two, Seven and Ten, which were out of position by: 2.5m, 2m, and 6m respectively, as indicated in column 4 of Table1 below. These divergences were considered to be too small to be significant.
- 2.6 Five of the 2006 pitfall sites were planned to be on exactly the same site as used for the 1994 study (sites numbered in 1994 as: 1, 2, 3, 5, 8). But changed circumstances since 1994 necessitated the repositioning of three other sites (numbered in 1994 as: 4, 6, 7). At the time of the earlier survey, no housing had been developed in the adjacent area, Grange Farm. By 2006, that area was largely complete and occupied, so Hazeley Wood had become well used by local residents. It was no longer possible to install pitfalls in open grassed areas without risking their interference by people or dogs; so three vulnerable sites were replaced by locations within woodland, relatively close to their original positions.
- 2.7 Two additional sites were installed for the 2006 study (2006 numbers, Three & Eight). One of these (Eight) extended coverage to the north end of Compartment 1, adjoining a ride and close to a perimeter hedge. The other one (Three) provided coverage at the southern end of Compartment 2, to the east of the pipeline ride.
- 2.8 Table 1 below gives the location of each 2006 pitfall sites in relation to: woodland compartment numbers; Hazeley Wood map grid letter & number; OS Grid References; and distance from the nearest external boundary or hedge of Hazeley Wood. A table and map of the locations of 1994 sites is in the report of the 1994 survey (Wickham & Street, 1995).

Table 1:
Pitfall trap sites – Hazeley Wood, 2006

2006 Site No.	Equivalent 1994/1995 Site No.	Compartment	Location of 2006 site in relation to Hazeley Wood map grid letter & number (distance in metres from nearest marker post)	Ordnance Survey Grid Reference of 2006 site	Distance of 2006 site to nearest external boundary / hedge
One	5	5	10m east of C3	SP 8136 3675	20m
Two	8	4	30m west of B1 [2.5m offset S of 1994 site]	SP 8127 3665	10m
Three	-	2	10m south of B4	SP 8130 3679	5m
Four	1	2	20m north-west of C5	SP 8133 3687	100m
Five	* [4]	3	3m west of A6	SP 8125 3690	15m
Six	* [7]	2	3m west of C8	SP 8135 3700	5m
Seven	3	3	20m north-west of D9 [2m offset N of 1994 site]	SP 8138 3707	60m
Eight	-	1	5m south of D11	SP 8140 3715	8m
** Nine	2	4	10m north of E8	SP 8145 3704	80m
Ten	* [6]	1	5m north-west of E6 [6m offset S of 1994 site]	SP 8145 3690	4m

* Square brackets around a 1994 site number indicate that a 2006 site is close to but not in precisely the same location as the one for the 1994 study.

** Site Nine was damaged and not replaced because it was vulnerable

- 2.9 Sites for the 2006 pitfall trap sets One to Ten were surveyed during March 2006 and installed in March and April. However, the traps at Site Nine were damaged before they could be brought into use. These were not replaced, as brashing of lower tree branches and undergrowth, subsequent to the installation of these pitfalls, had made the site so visible that it was vulnerable to further damage.
- 2.10 Each trap was set with a non-toxic anti-freeze diluted with water to retain and preserve specimens; and a few drops of washing-up liquid to reduce surface viscosity which would hold invertebrates on the surface. A metal grid was pinned across the top of each trap to prevent access by small mammals and domestic animals, but with substantial gaps through which beetles could go. Each trap was covered by a quarry tile 'lid' supported on four rubble supports to prevent rain from flooding the traps; these left substantial gaps for beetles to gain access. Care was taken to comply in each respect with the 'Code of Conduct for Collecting Insects and Other Invertebrates' (Invertebrate Link, 2002 and 2003).
- 2.11 Collection visits were made at irregular intervals, from 14th May 2006 onwards; but no collecting took place in the period 2nd July to 27th August, though some traps were left open throughout that period – these months are periods of least ground

beetle activity. Traps were opened and closed in response to both numbers of specimens caught and the resources available to manage and empty them. In total, 14 collection visits were made between May and December. All traps and equipment were removed in November and December, at which times holes were backfilled.

- 2.12 Traps caught mainly adult beetles (Coleoptera), but by-catch such as slugs (Pulmonata), woodlice (Isopoda), a few flies (Diptera) and a small number of invertebrate larvae were caught as well. Most slugs were returned to the site. Though ground beetles (Carabidae) predominated, many rove beetles (Staphylinidae) were also trapped. No tiger beetles (Cicindelidae) were found, although one other non-carabid Coleoptera species was found). The by-catch was later separated, with all but slugs, damaged specimens and larvae kept for potential future identification.
- 2.13 Inevitably, some ground-beetle species (such as *Pterostichus madidus*) were collected in quantity, which reflects their general, relative abundance. Other species, such as *Carabus violaceus* were almost always a single specimen in a trap, which reflects the general lesser abundance of larger species such as this.
- 2.14 The trapping periods were not of even length, so the number of specimens trapped could not be used as a reliable measure of species abundance. This report therefore does not address the issue of population sizes.

3. IDENTIFICATION

- 3.1 The Hazeley ground beetle group learned about ground beetles and their identification during the study. Two of the group had some prior training in beetle identification, but limited experience. There was therefore very limited identification skill within the group, particularly early on. A series of seven identification sessions was held at the Parks Trust offices from September 2006 through to February 2007 to both learn identification skills and determine the species collected. This was backed up by a Milton Keynes ground beetle training day, on 25th February, arranged jointly with the Buckinghamshire County Records Officer, Martin Harvey. This was attended by most of the Hazeley ground beetle group and others. Further identification and checking was carried out by Jean Cooke and Mike LeRoy.
- 3.2 Most of the group's identification work was done using the keys in the second edition of 'Ground Beetles' (Forsythe, T G, 2000). This was backed up by use of the Royal Entomological Society Handbook on the Carabidae (Lindroth, C.H. 1974). Also the UK Biological Records Centre's 'Provisional atlas of the ground beetles – Coleoptera, Carabidae of Britain' (Luff, M.L. 1998) proved particularly useful for checking whether initial identifications were likely to be correct. The occasional mis-identification of a species was challenged when the 'Provisional atlas' indicated that the species was specific to an entirely different habitat or UK location. Other works used for identification are listed in the bibliography.
- 3.3 Work on identification of species was incomplete. In particular, the catch from sites Seven and Eight has yet to be identified. These sites have therefore been excluded from the following analysis.

4. RESULTS 2006

- 4.1 Ten ground beetle (Carabidae) species were found through the 2006 study. These were:

- | | | |
|--------------------------------------|-------------------------------|---------------------------------|
| 1. <i>Carabus violaceus</i> | 2. <i>Leistus fulvibarbis</i> | 3. <i>Nebria brevicollis</i> |
| 4. <i>Pterostichus cupreus</i> | 5. <i>Pterostichus macer</i> | 6. <i>Pterostichus madidus</i> |
| 7. <i>Pterostichus melanarius</i> | 8. <i>Pterostichus niger</i> | 9. <i>Abax parallelipipedus</i> |
| 10. <i>Anisodactylus binotatus</i> . | | |

- 4.2 In addition to ground beetles, more than one species of rove beetles, Staphylinidae, were found, but these remain un-identified (see para 2.12 above); and one carrion beetle (of the family Silphidae) *Nicrophorus humator*.
- 4.3 The distribution of ground beetle species across the Hazeley Wood pitfall sites is shown in Table 2 below. This indicates which species were found at each site. At the foot of the table is the number of different species found at each site; and in the right-hand column, the quantity of sites at which each individual species was found. The analysis applies to seven sites (One to Ten, excluding Site Nine which was not operated and Sites Seven and Eight, as identification work has not been done for these).
- 4.4 At none of the sites were all ten ground beetle species found. Two species were found at five sites, but neither of these was found at Site Four; these were: *Pterostichus madidus* and *Pterostichus melanarius*. It is notable that Site Four is more distant from woodland edge than any other of the seven sites analysed here. Both forms of *Pterostichus madidus* were found: the Continental form with black legs; and the Atlantic form with red legs, *Pterostichus madidus (concinus)* Sturm).
- 4.5 In contrast, three species were each found at only a single site. These species were: *Abax parallelipipedus* (Site Two; at the south-western edge, close to the hedge to the North Bucks Way); *Anisodactylus binotatus* (Site Four, well within the interior of Compartment 2); *Pterostichus macer* (Site Ten, in the largest Compartment, 1).
- 4.6 Sites with the highest number of species present were: Site Ten (in Compartment 1, close to the woodland edge and thick grass and near the car park), with eight species; and Site One (in Compartment 5, backing onto Grange Farm gardens) with six species.

Table 2:
Ground beetle species collected, by pitfall site – Hazeley Wood 2006

Species of <i>Carabidae</i>		Pitfall sites – Hazeley Wood, 2006 (Site Nine was not used) (No identifications for Sites 7 and 8)									Quantity of sites where each species was found
		<i>[distance to external boundary or hedge]</i>									
		1 20 m	2 10 m	3 5 m	4 100 m	5 15 m	6 5 m	7 60 m	8 8 m	10 4 m	
1	<i>Carabus violaceus</i>			●			●			●	3
2	<i>Leistus fulvibarbis</i>	●								●	2
3	<i>Nebria brevicollis</i>	●	●							●	3
4	<i>Pterostichus cupreus</i>	●								●	2
5	<i>Pterostichus macer</i>									●	1
6a	<i>Pterostichus madidus</i> (black legs)	●	●	●			●			●	5
6b	<i>Pterostichus madidus</i> (form <i>concinus</i> Sturm; red legs)									●	1
7	<i>Pterostichus melanarius</i>	●		●		●	●			●	5
8	<i>Pterostichus niger</i>	●		●		●					3
9	<i>Abax parallelipipedus</i>		●								1
10	<i>Anisodactylus binotatus</i>				●						1
Number of species at each pitfall site		6	3	4	1	2	3	?	?	8	

5. COMPARISONS BETWEEN 1994, 1995 AND 2006

5.1 The availability of reports of the 1994 and 1995 Hazeley ground beetle studies enabled useful comparisons to be made with data from 2006. The twelve ground beetle species that had been found in 1994 are listed below. The four species found again in 2006 are in bold:

- | | |
|---------------------------------------|-------------------------------------------|
| 1. <i>Amara plebeja</i> | 2. <i>Bembidion guttula</i> |
| 3. <i>Clivina fossor</i> | 4. <i>Harpalus affinis</i> |
| 5. <i>Harpalus rufipes</i> | 6. <i>Nebria brevicollis</i> |
| 7. <i>Notiophilus biguttatus</i> | 8. <i>Notiophilus substriatus</i> |
| 9. <i>Pterostichus cupreus</i> | 10. <i>Pterostichus melanarius</i> |
| 11. <i>Pterostichus niger</i> | 12. <i>Pterostichus strenuus</i> |

5.2 Twelve species were found from the second survey in 1995, but only ten of these were the same as those found in 1994. Two of those found in 1994 were not found again in 1995; these were: *Amara plebeja* and *Notiophilus substriatus*. However, in 1995, two additional species had been found, which were: *Patrobus atrorufus* and *Trechus quadristriatus*; neither of these re-appeared in the 2006 survey.

5.3 A further six species were found in the most recent survey in 2006 that had not been found during either the 1994 or the 1995 survey; these were:

- | | |
|-----------------------------|-------------------------------|
| 1. <i>Carabus violaceus</i> | 2. <i>Leistus fulvibarbis</i> |
|-----------------------------|-------------------------------|

- | | |
|---------------------------------|-------------------------------------|
| 3. <i>Pterostichus macer</i> | 4. <i>Pterostichus madidus</i> |
| 5. <i>Abax parallelipipedus</i> | 6. <i>Anisodactylus binotatus</i> . |

5.4 From the above it is apparent that comparisons between 1994 and 2006 data show significant change in species present, as shown in Table 3 below and discussed in Section 7 below.

Table 3:
Ground beetle species found at equivalent sites, 2006, 1995 & 1994 – Hazeley Wood

[Species that were found at the same site in more than one year are presented in bold]

Site No. in 2006	Species found in 2006	Species found in 1995	Species found in 1994	1994/1995 equivalent site No.
One	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Pterostichus cupreus</i> <i>Pterostichus madidus</i> <i>Pterostichus melanarius</i> <i>Pterostichus niger</i> <i>Leistus fulvibarbis</i> 	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Pterostichus cupreus</i> <i>Harpalus rufipes</i> 	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Notiophilus biguttatus</i> <i>Notiophilus substriatus</i> 	5
Two	<ul style="list-style-type: none"> <i>Pterostichus madidus</i> <i>Nebria brevicollis</i> <i>Abax parallelipipedus</i> 	<ul style="list-style-type: none"> <i>Pterostichus melanarius</i> <i>Bembidion guttula</i> <i>Harpalus rufipes</i> 	<ul style="list-style-type: none"> <i>Pterostichus strenuus</i> <i>Pterostichus niger</i> 	8
Three	<ul style="list-style-type: none"> <i>Carabus violaceus</i> <i>Pterostichus madidus</i> <i>Pterostichus melanarius</i> <i>Pterostichus niger</i> 	[No 1995 equivalent site]	[No 1994 equivalent site]	-
Four	<ul style="list-style-type: none"> <i>Anisodactylus binotatus</i> 	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Harpalus rufipes</i> <i>Notiophilus biguttatus</i> <i>Pterostichus cupreus</i> <i>Pterostichus melanarius</i> <i>Pterostichus niger</i> <i>Pterostichus strenuus</i> 	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Clivina fossor</i> 	1
Five	<ul style="list-style-type: none"> <i>Pterostichus melanarius</i> <i>Pterostichus niger</i> 	<ul style="list-style-type: none"> <i>Pterostichus cupreus</i> <i>Harpalus rufipes</i> <i>Nebria brevicollis</i> 	<ul style="list-style-type: none"> <i>Pterostichus cupreus</i> <i>Clivina fossor</i> <i>Harpalus rufipes</i> 	4
Six	<ul style="list-style-type: none"> <i>Pterostichus madidus</i> <i>Pterostichus melanarius</i> <i>Carabus violaceus</i> 	<ul style="list-style-type: none"> <i>Pterostichus strenuus</i> <i>Trechus quadristriatus</i> 	<ul style="list-style-type: none"> <i>Pterostichus strenuus</i> <i>Amara plebeja</i> <i>Bembidion guttula</i> 	7
Seven	[Species not identified]	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Pterostichus cupreus</i> 	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Amara plebeja</i> <i>Clivina fossor</i> <i>Harpalus affinis</i> <i>Harpalus rufipes</i> 	3
Eight	[Species not identified]	[No 1995 equivalent site]	[No 1994 equivalent site]	-
Nine	[Pitfall traps damaged. No beetles collected]	<ul style="list-style-type: none"> <i>Pterostichus melanarius</i> 	<ul style="list-style-type: none"> <i>Pterostichus melanarius</i> 	2

Site No. in 2006	Species found in 2006	Species found in 1995	Species found in 1994	1994/1995 equivalent site No.
		<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Harpalus rufipes</i> <i>Harpalus affinis</i> <i>Pterostichus cupreus</i> 	<ul style="list-style-type: none"> <i>Pterostichus strenuus</i> <i>Clivina fossor</i> 	
Ten	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Pterostichus cupreus</i> <i>Pterostichus melanarius</i> <i>Pterostichus macer</i> <i>Pterostichus madidus</i> <i>Carabus violaceus</i> <i>Leistus fulvibarbis</i> 	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Pterostichus cupreus</i> <i>Harpalus rufipes</i> <i>Clivina fossor</i> <i>Patrobus atrorufus</i> 	<ul style="list-style-type: none"> <i>Nebria brevicollis</i> <i>Pterostichus cupreus</i> <i>Pterostichus melanarius</i> <i>Harpalus rufipes</i> <i>Amara plebeja</i> 	6

6. COMPARISON WITH HOWE PARK WOOD STUDY, 1977/78

6.1 Howe Park Wood is less than five kilometres south of Hazeley Wood, but it is ancient woodland designated as a Site of Special Scientific Interest (SSSI). In 1977 and 1978, Stott carried out a survey of Carabids at two sites in Howe Park Wood (Stott, 1984). One site – ‘the Clearing’ – was a recently-cleared area of coppice with standards, with dense ground vegetation; the other – ‘the Coppice’ – had been coppiced four years before, had dense tree growth and bramble but little ground vegetation other than grass tussocks and nettles.

6.2 The trapping methodology used by Stott was similar to that used for the 2006 Hazeley Wood survey – a set of five pitfall traps at each site. Collections were made monthly from July 1977 for a year. Fourteen ground beetle species were trapped in the Clearing and eleven in the Coppice, with sixteen different species being found altogether. Species found are shown in Table 4 below.

6.3 Of the sixteen species found in the two areas covered by the Howe Park survey (1977/78), five were found in the 2006 Hazeley Wood study and a further five had been found in either the 1994 or 1995 studies of Hazeley Wood. The five from Hazeley Wood 2006 in were:

- | | | |
|--------------------------------|-------------------------------------|------------------------------|
| 1. <i>Abax parellipipedus</i> | 2. <i>Carabus violaceus</i> | 3. <i>Nebria brevicollis</i> |
| 4. <i>Pterostichus madidus</i> | 5. <i>Pterostichus melanarius</i> . | |

The five that had been found in the 1994 or 1995 Hazeley Wood studies were:

- | | | |
|---------------------------------|-------------------------------------|------------------------------|
| 6. <i>Bembidion guttula</i> | 7. <i>Notiophilus biguttatus</i> | 8. <i>Patrobus atrorufus</i> |
| 9. <i>Pterostichus strenuus</i> | 10. <i>Trechus quadristriatus</i> . | |

6.4 The six species from the Howe Park survey that have not been found from the Hazeley Wood studies – from either 1994, 1995 or 2006 – are:

- | | | |
|---------------------------|-----------------------------|---------------------------------|
| a. <i>Agonum assimile</i> | b. <i>Bembidion lampros</i> | c. <i>Carabus nemoralis</i> |
| d. <i>Trechus secalis</i> | e. <i>Amara plebeja</i> | f. <i>Leistus ferrugineus</i> . |

Table 4
Ground beetle species found at Howe Park Wood, 1977/78

	Species found in 'The Clearing'	Species found in 'The Coppice'
1	<i>Abax parellipipedus</i>	<i>Abax parellipipedus</i>
2	<i>Agonum assimile</i>	<i>Agonum assimile</i>
3	<i>Bembidion guttula</i>	<i>Bembidion guttula</i>
4	<i>Bembidion lampros</i>	<i>Bembidion lampros</i>
5	<i>Carabus nemoralis</i>	
6	<i>Carabus violaceus</i>	
7	<i>Nebria brevicollis</i>	<i>Nebria brevicollis</i>
8	<i>Notiophilus biguttatus</i>	
9	<i>Patrobus atrorufus</i>	
10	<i>Pterostichus madidus</i>	<i>Pterostichus madidus</i>
11	<i>Pterostichus melanarius</i>	
12	<i>Pterostichus strenuus</i>	<i>Pterostichus strenuus</i>
13	<i>Trechus quadristriatus</i>	<i>Trechus quadristriatus</i>
14	<i>Trechus secalis</i>	<i>Trechus secalis</i>
15		<i>Amara plebeja</i>
16		<i>Leistus ferrugineus</i>

7. DISCUSSION

- 7.1 There had been considerable change between 1994 and 2006 in the ground beetle species present in Hazeley Wood, as shown in Table 3 above (which lists species at each site in 2006 against the equivalent sites in 1994 and 1995). Only four of the twelve species found in 1994 were still found to be present in 2006. Six additional species were found to be present in 2006 that had not been found in the 1994 and 1995 studies.
- 7.2 Evidence of complete continuity of species at the same location was evident from two sites; these were 2006 Sites One and Ten. At Site One, *Nebria brevicollis* was found in 1994, 1995 and 2006. At Site Ten, two species that had been found in 1994 and 1995 were found again in 2006; these were *Nebria brevicollis* and *Pterostichus cupreus*; a further species, *Pterostichus melanarius*, was found at this site in both 1994 and 2006. At Site One, a further species was found in 1995 (but not 1994) and again in 2006; this was *Pterostichus cupreus*. Otherwise, the data indicates discontinuity of species at the other sites over the period 1994 to 2006.
- 7.3 Of the species found in 2006, five are common in woodlands, though also present in other habitats; these are: *Carabus violaceus*, *Leistus fulvibarbis*, *Pterostichus madidus*, *Pterostichus niger* and *Abax parallelipipedus*. Other species found are generalists rather than woodland specialists; these are: *Nebria brevicollis* and *Pterostichus macer*. The remaining species are not truly woodland species, but may well be present because of the grassland and hedges associated with Hazeley Wood, the surrounding farmland, or through their use of gardens to the south-east of the site. These are usually species of open habitats, grassland, and arable fields: *Pterostichus cupreus*, *Pterostichus melanarius*, and *Anisodactylus binotatus*. Another factor to be considered is that some non-woodland ground beetle species move into woodland in autumn to over-winter.

- 7.4 The Howe Park Wood data is instructive, as it describes a wider range of ground beetle species found in established and mature ancient woodland, with coppice stands managed in rotation. Species found there that have not been found at Hazeley Wood are: *Agonum assimile*, *Bembidion lampros*, *Carabus nemoralis*, *Trechus secalis*, *Amara plebeja* and *Leistus ferrugineus*; but Hazeley Wood was planted only 15 years before the 2006 study.
- 7.5 As yet, the woodland floor litter at Hazeley Wood is not deep and there is little deadwood. As this builds up, it may favour yet another range of ground beetles that are more specifically species of woodland. In the longer-term, other families and genera of beetles may be worth studying in Hazeley Wood. For example, when there is fallen timber, and some tree rot develops, yet another range of beetles may be found in the Wood. However, ground beetles can continue to provide a useful indicator of habitat change.

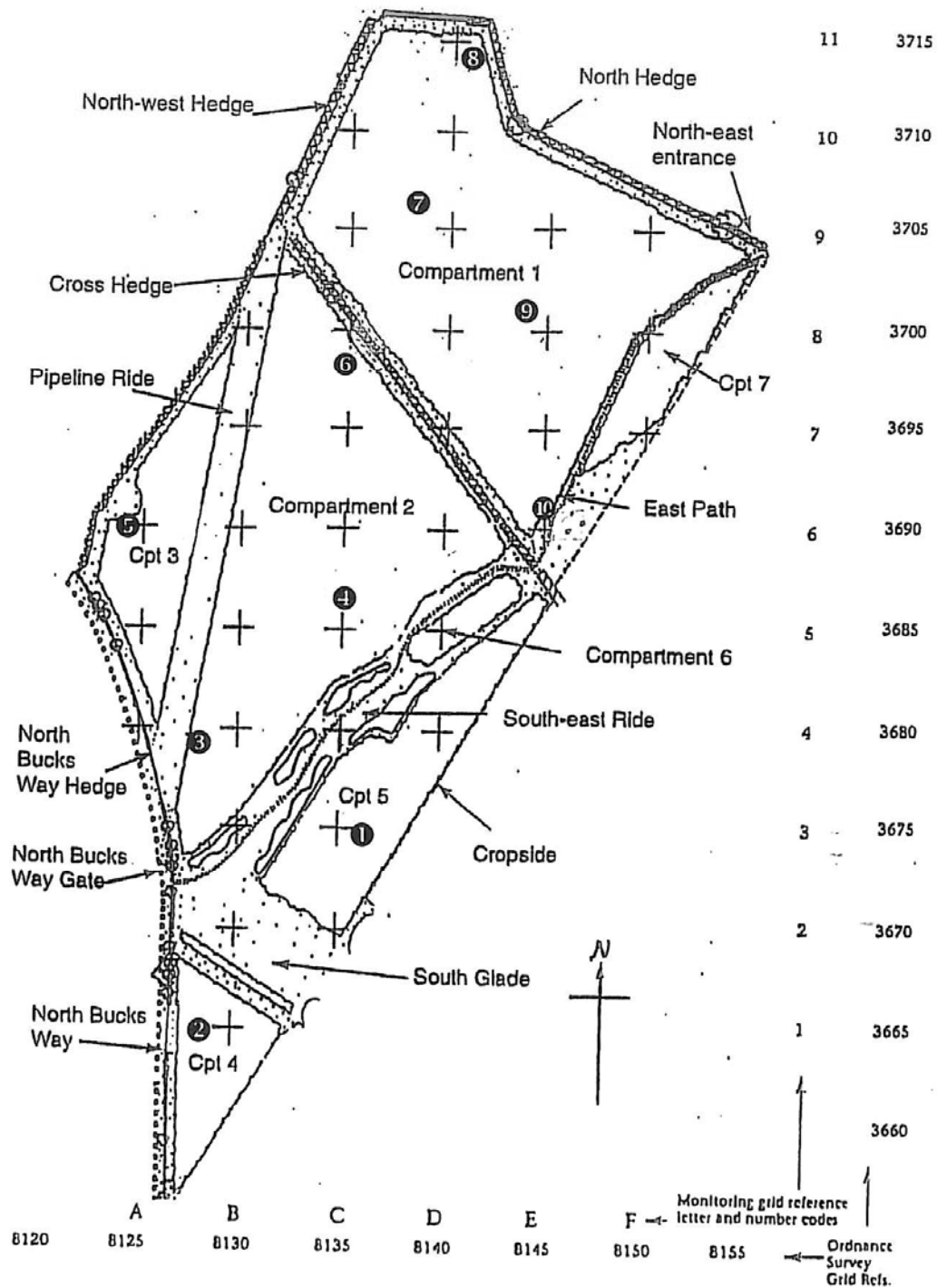
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Appendix C.8.1

Hazeley Wood: Ground-Beetle Pitfall Trap Sites, 2006



C.9 ANTS



By

Mike Killeby



1. INTRODUCTION

During May and June 1994 four individual ants were collected and declared as belonging to the genus *Myrmica*.

In 2006 eight recording visits were made from April to September concentrating on the south east facing wood boundary and those compartment edges receiving maximum sun.

2. SURVEY METHOD

Careful examination of the ground and its flora, tree leaves and trunks in full sun, combined with sweep netting and tree beating was carried out. Any stones, small rocks, timber etc were lifted for investigation and returned in place.

3. RESULTS

Four species of ants were recorded as follows:

Ant species	No. of nests	No. of foraging groups
<i>Lasius niger</i> SL*	4	16
<i>Lasius flavus</i>	0	1
<i>Myrmica ruginodis</i>	0	1
<i>Myrmica scabrinodis</i>	5	2

* No systematic analyses were made relating to *Lasius niger* (*Sensu stricto*) so the group as a whole are referred to as *Sensu lato* – SL, i.e. could be *Lasius platythorax*.

Nests consist of many individual ants and 'brood' i.e. eggs, larvae and pupae. Other ants found are referred to as foraging groups.

Most ants were recorded close to footpaths and particularly in the Cropside ditch; none were found within the planted areas.

4. DISCUSSION

The ant population of Hazeley Wood should reflect those species that are common and local. The above are such species and should include *Myrmica rubra* and *Formica fusca* which were not found. Much of the site floor is heavy clay and is not ideal for building ant colonies. Many ant species excavate beneath flat stones and rocks, timber and dead tree stumps, all of these potential habitats are lacking at present. Ant recording in Hazeley Wood will continue.

5. REFERENCE

Bolton & Collingwood (1975) – R.E.S. Handbook – Formicidae
Skinner G J & Allen G W (1996) – Ants

C.10 LADYBIRDS



By

Mike Killeby



1. INTRODUCTION

Of the twenty four British species of ladybirds, about fourteen are sufficiently common for them to be found in Milton Keynes and possibly Hazeley Wood.

2. SURVEY METHOD

Specimens were recorded by a combination of close examination of tree and ground flora, sweep netting and tree beating over a tray. Areas in full sun were examined during seven visits between April and September 2006.

3. RESULTS

Larch ladybird	<i>Aphidecta oblitterata</i>
16-Spot ladybird	<i>Micrapsis 16-punctata</i>
2-Spot ladybird	<i>Adalia 2-punctata</i>
10-Spot ladybird Typical	<i>Adalia 10-punctata</i>
10-Spot ladybird Chequered ¹	<i>Adalia 10-punctata</i>
10-Spot ladybird Melanic ¹	<i>Adalia 10-punctata</i>
7-Spot ladybird	<i>Coccinella 7-punctata</i>
Orange ladybird ²	<i>Halyzia 16-guttata</i>
22-Spot ladybird	<i>Psyllobora 22-punctata</i>
14-Spot ladybird	<i>Propylea 14-punctata</i>
Pine ladybird	<i>Exochromus 4-pustulatus</i>

¹ these are common forms of the very variable 10 spot ladybird

² the orange ladybird is the only British ladybird to be found at MV lights.

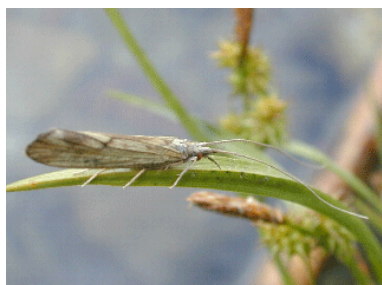
4. DISCUSSION

Nine species of ladybirds were recorded; the most common was the 14 spot closely followed by the 10 spot then the 7 spot. Those species found are either abundant or common except the Orange ladybird which is listed as local and scarce. Two species were probably missed; the Cream-streaked and Cream-spot ladybirds and it would be appreciated if interested parties would report possible sightings of these. The alien species the Harlequin ladybird although now present in Milton Keynes, was not found in Hazeley Wood.

5. REFERENCE

Majerus M & Kearns P (1989) - Ladybirds

C.11 CADDIS FLIES



By

Mike Killeby



1. INTRODUCTION

Caddis larvae are freshwater insects and have a life cycle of about a year; the adults have a brief life, are mostly nocturnal and are attracted to light.

2. SURVEY METHOD

Specimens were collected and identified during mothing sessions using mercury vapour lights.

3. RESULTS

Date	No. of Species	Species
14.04.06	Nil	-
28.06.06	3	<i>Leptoceridae oecetis ochracea</i> <i>Leptoceridae mystacides longicornis</i> <i>Leptoceridae leptocerus tineiformis</i>
22.08.06	Nil	-
23.09.06	3	<i>Limnephilidae limnephilus flavicornis</i> <i>Limnephilidae glyphotaelius pellucidus</i> <i>Limnephilidae limnephilus auricula</i>

4. DISCUSSION

The six species recorded represent two large families, both use still or slow moving water and the latter, temporary water bodies such as water filled ditches or shallow brooks as can be found on the boundary of Hazeley Wood. Many more species would be recorded by more frequent collecting and 24 hour light trapping in different areas of the site.

5. REFERENCE

Macan T T (1973) – British Trichoptera

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Wallace I D (1990) – A Review of the Trichoptera of Great Britain

C.12 MISCELLANEOUS ARTHROPODS



By

**Steve Brady
Jean Cooke, Colin Docketty
and Mike LeRoy**



1. INTRODUCTION

In addition to formal studies with specified groups, an informal survey was conducted during a walk around the wood on Sunday 4th June 2006 from 14.00hr to 16.00hr, led by Steve Brady accompanied by J. Cooke, C. Docketty and M. LeRoy. Conditions were sunny with a temperature of around 23 °C.

2. SURVEY METHOD

Specimens were collected and identified where possible in the field, otherwise retained for later examination.

3. RESULTS

The following species were recorded:-

HYMENOPTERA

Ants

Lasius niger

Black Garden Ant

Myrmica sp. (queen)

Bumble Bees

Bombus lapidarius (freshly eclosed worker, so nest nearby)

Red Tailed Bumble Bee

Bombus pascuorum (worker)

Common Carder Bee

Sawflies

Rhogogaster viridis

no common name

Tenthredo sp.

DIPTERA - Flies

Calliphora vomitoria

Scathophaga stercoraria

Lucilia caesar

Sarcophaga sp.

Bombylius major (many seen 9 April 06 by JCW)

Bluebottle

a blowfly

Greenbottle

a fleshfly

a Bee fly

COLEOPTERA - Beetles

Thea 22-punctata

Rhagonycha fulva

22-spot Ladybird

a Soldier beetle

LEPIDOPTERA - Butterflies

Vanessa cardui

Painted Lady

ODONATA - Dragonflies

Libellula quadrimaculata

Four-spotted Chaser

DIPLODA - Millipedes

Polydesmus angustus

a millipede

CRUSTACEA - ISOPODA - Woodlice

Armadillidium vulgare

Pill Woodlouse

ARACHNIDA - Spiders

Tetragnatha extensa

Araniella cucurbitina

Xysticus cristatus

Theridion sp.

Pardosa sp.

Fam. Tetragnathidae

Fam. Araneidae

Fam. Thomisidae

Fam. Theridiidae

Fam. Lycosidae

4. CONCLUSION

All of the species found are common and might be expected to be present in a 'woodland with glades' habitat such as Hazeley Wood, but it is appropriate to have these records.

D.1 BIRDS



By

**Paul Moon
Martin Kincaid**



1. Summary

A total of 38 species of bird were recorded over the duration of the survey. A number of species recorded in 1994 were absent in 2005/6, whilst several 'new' species were recorded. The loss of certain species (eg Yellowhammer, Linnet) can clearly be attributed to the maturation of the woodland plantation, which would not suit the farmland birds. Species typical of scrubby habitat, like Whitethroat, have similarly disappeared. Conversely, the maturity of the wood has benefited species associated with woodland with several new species being recorded (e.g. coal tit, goldcrest, siskin). The most productive month was March, with a total of eighteen bird species recorded.

It would be fair to say that in its current intermediate state, the wood is more suitable to generalist species than to habitat specialists.

Several species recorded outside the formal survey sessions included, Sparrowhawk (*Accipiter nisus*), Treecreeper (*Certhia familiaris*), Common Redstart (*Phoenicurus phoenicurus*) and Grey Wagtail (*Motacilla cinerea*).

2. Introduction

The bird survey was conducted by Gerry Baker, Martin Kincaid and Paul Moon as part of the Hazeley Wood Study Group's 2006 survey. Several others assisted the survey on certain visits (see Acknowledgements). Although the HWSG at large started the survey in January 2006, it was decided to commence the avifauna study in November 2005. This was due to the likely commencement of forestry operations in the wood in October 2006 which would disturb the bird population and thereby distort the results. Therefore, the calendar year for the purposes of this survey ran from November 2005 to October 2006.

In line with the original survey of 1994, the majority of visits were made in early-mid morning (8-10am) but to give early and late species comparisons, one early morning (May) and one evening (June) visit were also made. However, the variety of species recorded on these two special visits showed no significant contrast to the regular morning visits.

3. Weather Conditions

Broadly speaking, the weather conditions during the winter months of the bird survey were good, with very little rain or high winds. It was decided that in the event of heavy downpours a monitoring session would be aborted but in the event this was not necessary. However, both January and February's surveys were conducted in misty conditions which may have impeded views of birds in flight. The winter was steadily cold with temperatures recorded between 1 and 4 degrees Celcius.

4. Survey Method

Gerry Baker, as one of the team involved in the original bird survey, was keen that the same methodology be repeated for the 2005/6 survey. This is the BTO endorsed Point Count System. A route was plotted throughout the wood with fixed points, numbered 1 to 10, located on intersecting nodes. Each point count covers a maximum diameter of 50 metres and at no point overlaps with an adjacent point count zone. Gerry ensured that we used original fixed points, as accurately as possible, for the sake of continuity. At each point, the survey team would record all birds seen within the 50M diameter over a five minute period. Species were recorded in short hand using the BTO two letter codes.

However, the team soon found the process of distinguishing details such as direction of flight and distance of bird cumbersome and obsolete, so concentrated on recording the salient details (e.g. species, numbers and activity). Bird activity was coded as Heard (H), Perched (P) and Overhead (O).

5. Results

A total of 38 species of bird were recorded over the duration of the survey. A number of species recorded in 1994 were absent in 2005/6, whilst several 'new' species were recorded. The loss of certain species (eg Yellowhammer, Linnet) can clearly be attributed to the maturation of the woodland plantation, which would not suit the farmland birds. Species typical of scrubby habitat, like Whitethroat, have similarly disappeared. Conversely, the maturity of the wood has benefited species associated with woodland with several new species being recorded (e.g. coal tit, goldcrest, siskin). The most productive month was March, with a total of eighteen bird species recorded.

The interim period between the two surveys of 1994 and 2006 has seen major changes in land use immediately adjacent to Hazeley Wood, most notably the development of the Grange Farm housing estate to the south. This development also occupies former farm land so it is not surprising that farmland birds have been the worst affected. However, the gardens which back on to the southern boundary of the wood, themselves provide food and nesting opportunities for many birds and may account for the success of semi-urban species like Collared dove (*Streptopelia decaocto*) and Robin (*Erithacus rubecula*). It would be fair to say that in its current state the wood is more suitable to generalist species than to habitat specialists.

At present, the diversity of bird species at Hazeley Wood is limited by the lack of structural diversity within the wood itself. The lack of mature trees, dead wood and understorey mean that for most species there is little suitable habitat for foraging and breeding. The only species confirmed as breeding were Magpie (*Pica pica*) and Woodpigeon (*Columba palumbus*). Many of the more typical woodland species recorded during the survey probably originated from the adjacent North Bucks Way and were merely passing through Hazeley Wood whilst dispersing to new territories. In the summer months, a number of Blackcap (*Sylvia atricapilla*) and Willow Warbler (*Phylloscopus trochilus*) were heard singing in the wood and they would certainly have originated from the North Bucks Way.

In addition to those species recorded during the formal survey sessions, casual observations included a number of sightings of hunting Sparrowhawk (*Accipiter nisus*), most often flying low along the cross hedge. Petra Seath and Jo Ayers reported a Treecreeper (*Certhia familiaris*), seen whilst working on the Ground Mammals survey.

In 2007, two more interesting species were added by Martin Kincaid on two separate visits to Hazeley Wood: Common Redstart (*Phoenicurus phoenicurus*) and Grey Wagtail (*Motacilla cinerea*). The former is a scarce passage migrant in Milton Keynes whilst the latter is rather more common and probably a regular winter visitor to more open areas of Hazeley Wood.

6. Acknowledgements

To the following members of Milton Keynes Natural History Society for their assistance with the bird survey: Michael Sheridan; John Wickham; Margaret Wickham; Stephen Sutherland; Melvyn Jones.

To Gerry Baker for his invaluable assistance and advice with the survey, and in particular its methodology

To John Day for advice.

TABLE 1

List of Bird Species recorded at Hazeley Wood during 2005/6 survey

Mallard	<i>Anas platyrhynchos</i>
Sparrowhawk	<i>Accipiter nisus</i>
Black-headed Gull	<i>Larus ridibundus</i>
Common Gull	<i>L. canus</i>
Lesser Black-backed Gull	<i>L. fuscus</i>
Woodpigeon	<i>Columba palumbus</i>
Feral Pigeon	<i>C. livia</i> (domest.)
Collared Dove	<i>Streptopelia decaocto</i>
Swift	<i>Apus apus</i>
Green Woodpecker	<i>Picus viridis</i>
Great Spotted Woodpecker	<i>Dendrocopus major</i>
Swallow	<i>Hirundo rustica</i>
House Martin	<i>Delichon urbica</i>
Wren	<i>Troglodytes troglodytes</i>
Dunnock	<i>Prunella modularis</i>
Robin	<i>Erithacus rubecula</i>
Blackbird	<i>Turdus merula</i>
Song Thrush	<i>T.philomelos</i>
Redwing	<i>T.ilicacus</i>
Fieldfare	<i>T.pilaris</i>
Blackcap	<i>Sylvia atricapilla</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Chiffchaff	<i>P.collybita</i>
Goldcrest	<i>Regulus regulus</i>
Long Tailed Tit	<i>Aegithalos caudatus</i>
Great Tit	<i>Parus major</i>
Blue Tit	<i>P. caeruleus</i>
Coal Tit	<i>P.ater</i>
Jay	<i>Garrulus glandarius</i>
Magpie	<i>Pica pica</i>
Jackdaw	<i>Corvus frugilegus</i>
Carrion Crow	<i>C. corone corone</i>
Starling	<i>Sturnus vulgaris</i>
Chaffinch	<i>Fringilla coelebs</i>
Goldfinch	<i>Carduelis carduelis</i>
Greenfinch	<i>C. chloris</i>
Siskin	<i>C. spinus</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>

Also seen in casual observations were Treecreeper (*Certhia familiaris*), Common Redstart (*Phoenicurus phoenicurus*) and Grey Wagtail (*Motacilla cinerea*).

D.2 GROUND MAMMALS

(All Mammals Other Than Bats)



By

Paul Manchester



1. SUMMARY

Most areas of the site were covered by our survey during a total of four site visits made in March, April and May 2006. The only small mammal species found in the Longworth traps were Wood Mice. A total of 16 Wood Mice were found during the four site visits. These were all found in the old hedgerow along the North and the North West perimeter of the wood, and also in the Shrub beds along the edges of South East Ride. No small mammals were found within any of the Woodland Compartments. Signs of other mammal species observed on the site were Grey Squirrel, Fox, Mole, Rat, Muntjac Deer, Rabbit, Hedgehog, and a Common Shrew corpse was found at map grid reference 8135, 3678 along the edge of the South East Ride.

2. SURVEY METHODS

We surveyed a wide area across the site during the site visits to cover all of the different types of habitat. We set traps in all of the hedgerows, along the sides of the rides, and deep within the different wooded compartments. Twenty Longworth traps were used and each numbered 1 to 20. The traps were put out on the evening of each of the four survey dates just before dusk. Each trap was surrounded in bubble wrap, with an inner plastic sleeve to provide additional insulation from the cold. Each trap was filled with straw for insulation and bedding. The following foods were added:- A piece of apple to prevent dehydration of the mammal, a small hand full of peanuts, wheat seeds, sun flower seeds and approximately 50 fresh maggot casters for insectivorous shrews to eat.

The traps were carefully hidden to avoid tampering by the public. The approximate trap locations were recorded on maps of Hazeley Wood. Also a written descriptive note was made of where each trap was hidden. To aid recovery of the traps the locations were indicated nearby with small markers attached to twigs. The traps were recovered early the following morning soon after sun rise. After recovery of the traps the markers were removed again. When recovered, if the traps had been activated the contents were emptied into a large plastic bag. The mammal species that had been captured were identified, weighed, sexed and then released again at the same position that the trap had been set. Weighing was done using a 60g Pesola weigh scale zeroed with a small plastic sealable bag to hold the mammal.

If Pigmy Shrews had been captured they would have been released immediately without further handling to avoid the risk of death of the Pygmy Shrew due to the further stress from handling.

The appropriate licence to take shrews for scientific or educational purposes had been obtained from English Nature (Now Natural England), appendices D.2.1 and D.2.2. Appropriate risk assessments had been obtained from the Berkshire, Buckinghamshire, and Oxfordshire Wildlife Trust related to the task of general species surveying and small mammal trapping, appendices D.2.3 and D.2.4.

3. RESULTS - SITE VISIT REPORTS

The position of all the Longworth traps on the four site visits are shown on the four results maps headed with the collection date. The position of each trap is indicated with a * symbol and the number of the trap next to it. Were the traps were positioned inside a hedge, the * symbol on the map has been indicated beside the hedge, so that it can still be clearly seen on the map. Descriptions of the positions of each trap are listed with the mammal survey results as follows in the site visit reports. The only mammal species found in the traps were Wood Mice. The Results Summary Map shows at a glance the locations where all of the 16 traps that had caught Wood Mice had been laid during all of the four site visits. Any signs and sightings of other mammal species are listed under the headings Additional Mammal Findings for each site visit.

SATURDAY 25th & SUNDAY 26th MARCH 2006

Conditions

Saturday 25th March between 4.30pm - 6 pm : Raining but mild. Temperature approx 13°C.

Overnight: Mild with rain. Temperature approx. 10°C

Sunday 26th March between 8 am – 9.45 am: Sunny morning. Temperature approx 14°C.

Team

Paul Manchester, Jo Ayers, Petra Seath, Mel Jones, Carol Watts.

Locations and Findings (also see trap location map headed 26/03/06)

- | | | |
|----|-----------------------------------------------------------------------------------|------------|
| 1) | In grassy tussock on edge of South East Ride (8137, 3683) | Trap Empty |
| 2) | In grassy tussock in shrubbery of South East Ride (8132, 3678) | Trap Empty |
| 3) | In grassy tussock on edge of South East Ride (8130, 3675) | Trap Empty |
| 4) | In grassy tussock on edge of South East Ride at south tip of comp. 2 (8128, 3673) | Trap Empty |
| 5) | In grassy tussock woodland edge at south of comp. 3 (8125, 3683) | Trap Empty |

6)	In grassy tussock, woodland edge comp. 2, by the Cross Hedge path (8138, 3695)	Trap Empty
7)	Under dead wood, in woodland comp. 1 (8138, 3713)	Trap Empty
8)	Under a stick pile in woodland comp. 1 (8143, 3708)	Trap Empty
9)	Under a stick pile in woodland edge of comp. 1 (8150, 3705)	Trap Empty
10)	Under a stick pile in the middle of comp. 1 (8145, 3700)	Trap Empty
11)	In North Bucks Way Hedge at the end of the Pipeline Ride (8126, 3679)	Trap Empty
12)	In North Bucks Way Hedge, towards the bottom of comp. 4 (8127, 3659)	Trap Empty
13)	In North West Hedge half way along comp. 3 (near old nest box) (8125, 3695)	Trap Empty
14)	In North West Hedge at the top of the Pipeline Ride (8130, 3702)	Wood Mouse, Male 19.5g
15)	In North West Hedge at western corner of comp. 1 (8132, 3708)	Wood Mouse, Male 23g
16)	In North West Hedge at north west corner of comp. 1 (8135, 3715)	Wood Mouse, Male 24g
17)	In North Hedge (8150, 3707)	Wood Mouse, Female, 19g
18)	In North Hedge grass verge (8148, 3707)	Trap Empty
19)	In North Hedge at corner in ditch (8142, 3716)	Wood Mouse, Female, 17.5g (black-tipped tail)
20)	In North Hedge near east corner of comp. 1 (8154, 3705)	Trap Empty

Additional Mammal Findings

None

Summary

Wood Mouse, Male, 19.5g (*Apodemus sylvaticus*)

Wood Mouse, Male, 23g (*Apodemus sylvaticus*)

Wood Mouse, Male, 24g (*Apodemus sylvaticus*)

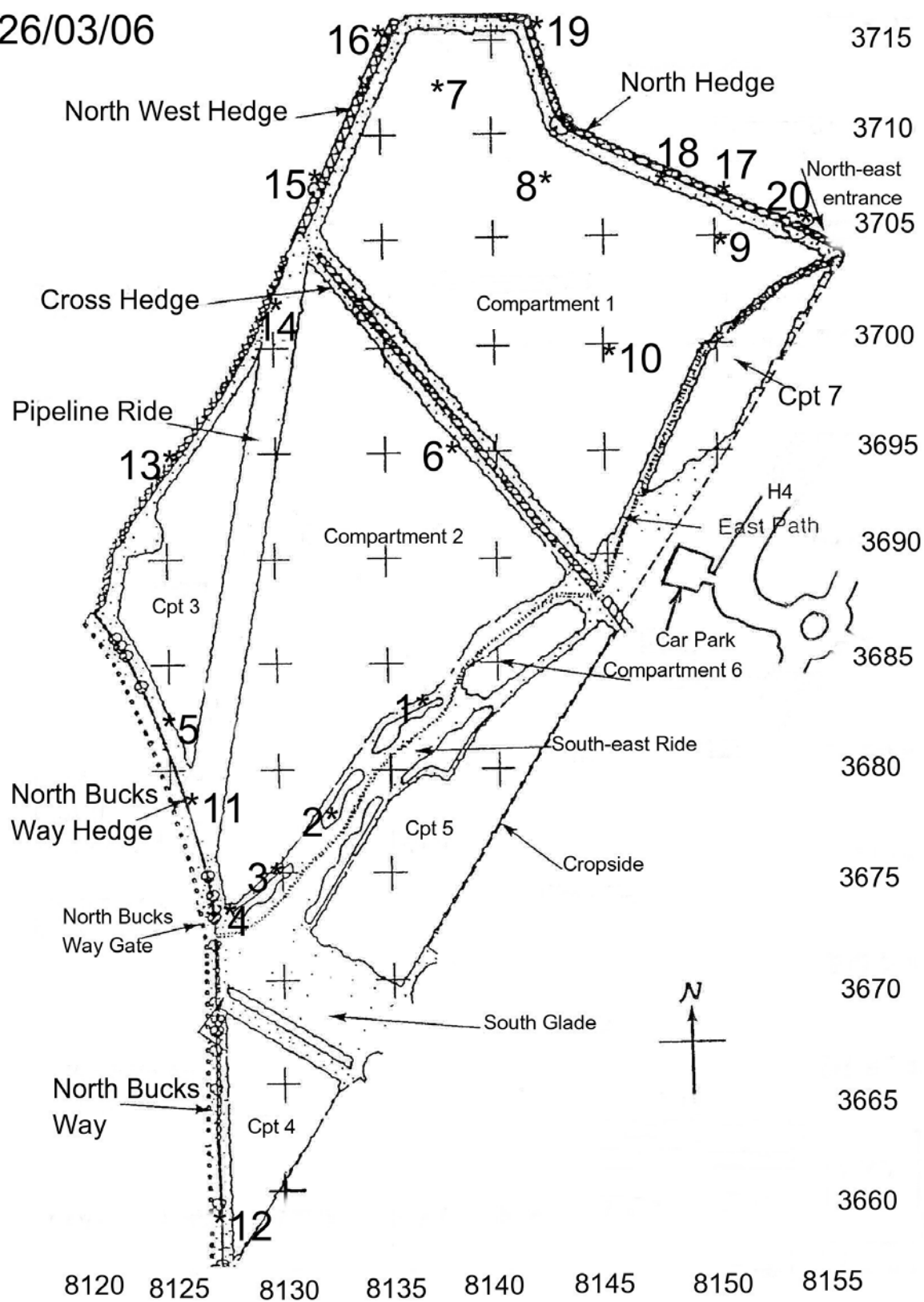
Wood Mouse, Female, 19g (*Apodemus sylvaticus*)

Wood Mouse, Female, 17.5g (*Apodemus sylvaticus*)

Five out of ten traps placed in the hedgerows trapped Wood Mice. These were all trapped in the North and the North West Hedges. No Wood Mice were trapped in the ten traps placed within the main woodland compartments or in shrubby areas along the edges of the rides.

TRAP LOCATION MAP

26/03/06

**KEY**

* Indicates the approximate position of the numbered longworth trap on the site.

SATURDAY 15th & SUNDAY 16th APRIL 2006

Conditions

Saturday 15th April 6.30pm – 8pm: Sunny and mild. Overnight: Mild.

Sunday 16th April 7am – 8.30am: Sunny morning.

Team

Paul Manchester, Jo Ayers, Petra Seath, Mel Jones, Martin Kincaid.

Locations and Findings (also see trap location map headed 16/04/06)

- | | | |
|-----|--------------------------------------------------------------------------|----------------------------------------------|
| 1) | In North Hedge close to the North East entrance to the wood (8153, 3706) | Trap Empty |
| 2) | In woodland, comp. 1 (8150, 3705) | Trap Empty |
| 3) | In North Hedge (8147, 3708) | Trap Empty |
| 4) | In woodland, comp. 1 (8144, 3707) | Trap Empty |
| 5) | In North Hedge (8143, 3713) | Wood Mouse, Male, 24g |
| 6) | In woodland, comp. 1 (8140, 3713) | Trap Empty |
| 7) | In North Hedge (8138, 3715) | Wood Mouse, Male, 20g |
| 8) | In woodland, comp. 1 (8137, 3713) | Trap Empty |
| 9) | In woodland, comp. 1 (8134, 3705) | Trap Empty |
| 10) | In North West Hedge (8132, 3707) | Trap Empty |
| 11) | In Cross Hedge (8134, 3702) | Trap Empty |
| 12) | In Cross Hedge (8137, 3697) | Trap Empty |
| 13) | In North West Hedge (8129, 3701) | Wood Mouse, Male, 25.5kg |
| 14) | In North West Hedge (8125, 3695) | Wood Mouse (unknown sex & weight) |
| 15) | In woodland, comp. 3 (8126, 3692) | Trap Empty |
| 16) | In corner of North West Hedge and the North Bucks Way (8120, 3683) | Trap Empty |
| 17) | In woodland, comp. 4, behind the fence (8128, 3660) | Trap Empty |
| 18) | In woodland by the South Glade (8133, 3665) | Trap Empty |
| 19) | In woodland, comp. 5 (8132, 3672) | Trap Empty |
| 20) | In comp. 5 north edge near end of Cross Hedge (8145, 3685) | Trap Empty |

Additional Mammal Findings

2 Grey Squirrels seen in the North Bucks Way opposite compartment 4.

Smell of Fox in several locations within the wood.

Hare and Fox spotted several fields away from the wood.

Summary

Wood Mouse, Male, 24g (*Apodemus sylvaticus*)

Wood Mouse, Male, 20g (*Apodemus sylvaticus*)

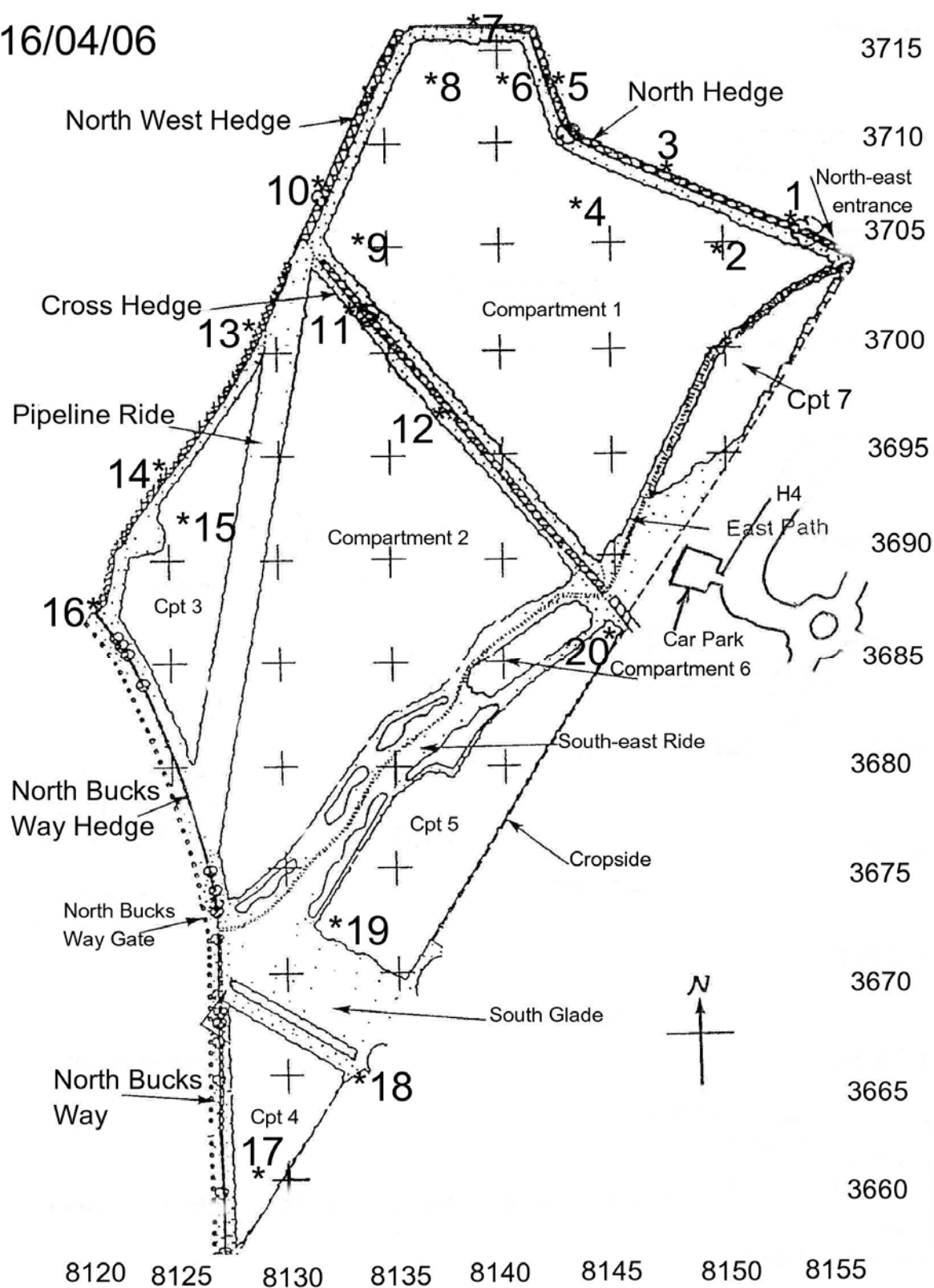
Wood Mouse, Male, 25.5g (*Apodemus sylvaticus*)

Wood Mouse (*Apodemus sylvaticus*) (escaped, unknown sex and weight)

Four Wood Mice were found, these were all trapped in the North and North West Hedges. No mammals were trapped within the main woodland compartments. The South East Ride was not sampled.

TRAP LOCATION MAP

16/04/06

**KEY**

* Indicates the approximate position of the numbered longworth trap on the site.

SATURDAY 29th & SUNDAY 30th APRIL 2006

Conditions

Saturday 29th April 6.30pm – 8pm: Sunny and mild. Overnight: Mild.

Sunday 30th April 7am – 8am: Wet but mild.

Team

Paul Manchester, Martin Kincaid, Jo Ayers, Mel Jones.

Locations and Findings (also see trap location map headed 30/04/06)

- | | | |
|-----|----------------------------------------------------------------|------------------------------|
| 1) | In woodland of comp. 2 by South East Ride (8142, 3689) | Trap Empty |
| 2) | In woodland of comp. 2 by South East Ride (8138, 3688) | Trap Empty |
| 3) | In woodland of comp. 2 by South East Ride (8136, 3685) | Trap Empty |
| 4) | In woodland of comp. 2 by South East Ride (8133, 3682) | Trap Empty |
| 5) | Trap 5 had been lent out so was not available for this survey | |
| 6) | In woodland of comp. 2 by South East Ride (8130, 3678) | Trap Empty |
| 7) | In woodland of comp. 3 by Pipeline Ride (8126, 3684) | |
| 8) | In woodland of comp. 1 by North West Hedge (8134, 3706) | Trap Empty |
| 9) | In woodland of comp. 1 by North West Hedge (8136, 3711) | Trap Empty |
| 10) | In woodland of comp. 1 by North Hedge (8138, 3714) | Trap Empty |
| 11) | In woodland of comp. 1 by North Hedge (8140, 3713) | Trap Empty |
| 12) | In woodland of comp. 1 by North Hedge (8142, 3708) | Trap Empty |
| 13) | In woodland of comp. 1 by North Hedge (8147, 3706) | Trap Empty |
| 14) | In grass tussocks in verge of hedge by the pond (8157, 3705) | Trap Empty |
| 15) | In woodland of comp. 1 off the East Path (8148, 3700) | Trap Empty |
| 16) | In shrubbery on north side of the South East Ride (8135, 3682) | Wood Mouse, Male, 22g |
| 17) | In shrubbery on south side of the South East Ride (8134, 3678) | Trap Empty |
| 18) | In shrubbery on south side of the South East Ride (8133, 3675) | Wood Mouse, Male, 25g |
| 19) | In shrubbery on north side of the South East Ride (8130, 3675) | Trap Empty |
| 20) | In shrubbery on south side of the South East Ride (8132, 3673) | Trap Empty |

Additional Mammal Findings

Muntjac Deer foot prints by North East Entrance grid reference (8157, 3703).

Rabbit seen going into North Bucks Way Hedge at the bottom of compartment 3, grid reference (8125, 3680).

Summary

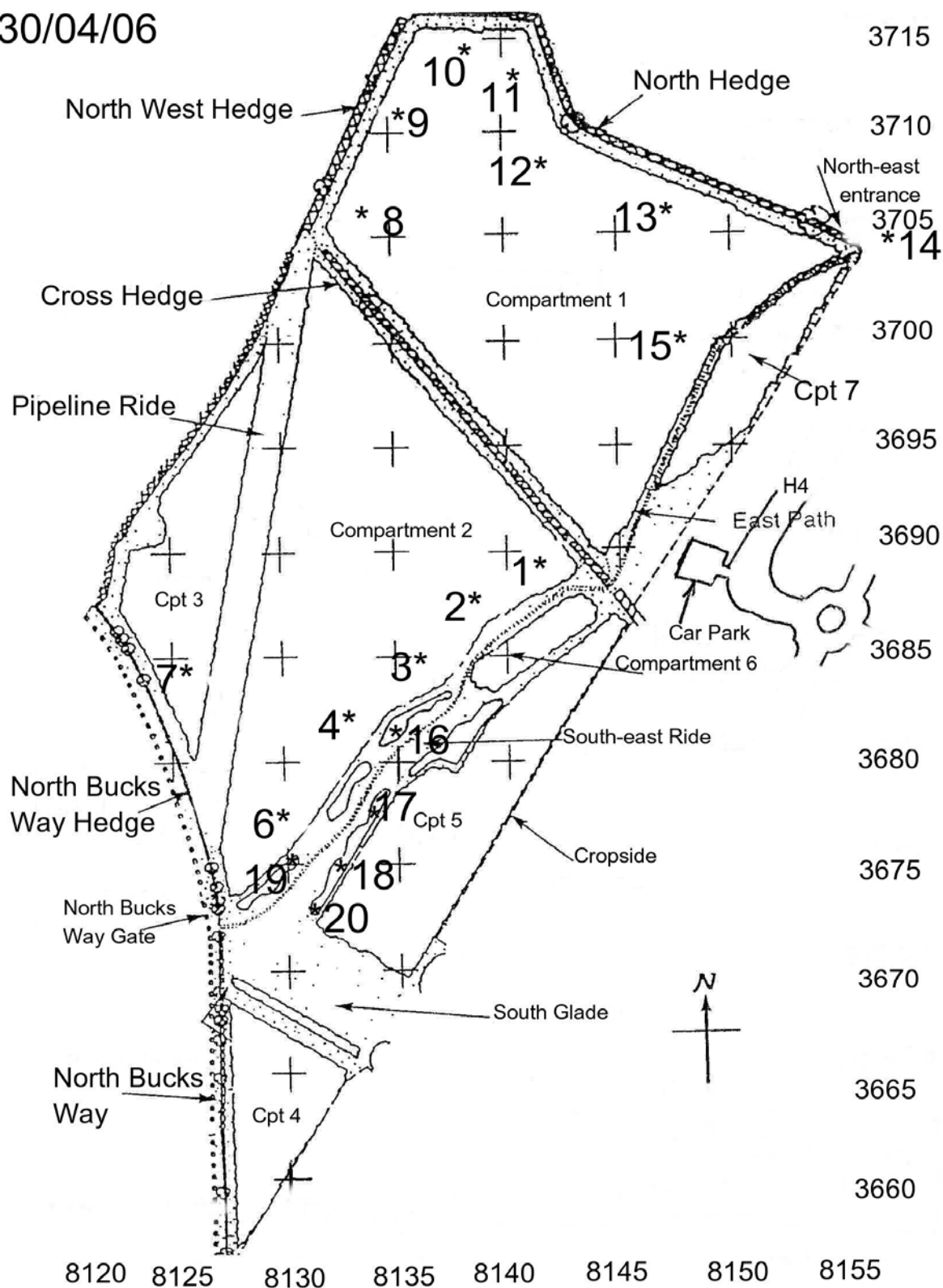
Wood Mouse, Male, 22g (*Apodemus sylvaticus*)

Wood Mouse, Male, 25g (*Apodemus sylvaticus*)

Both Wood Mice were trapped in the South East Ride in shrubberies and grass tussocks around shrubberies. No mammals were trapped within the main woodland compartments.

TRAP LOCATION MAP

30/04/06

**KEY**

* Indicates the approximate position of the numbered Longworth trap on the site.

SATURDAY 13th & SUNDAY 14th MAY 2006

Conditions

Saturday evening 6.30-8.00pm was cloudy but mild.

Overnight it was mild with light drizzle.

Sunday morning 7.00-9.00am was cloudy and mild.

Team

Paul Manchester, Jo Ayers, Petra Seath, Bob Stott.

Locations and Findings (also see trap location map headed 14/05/06)

- | | |
|--------------------------------------------------------------------------------|-------------------------------------|
| 1) In the wood by East Path (8147, 3695) | Trap Empty |
| 2) In undergrowth north of pond at end of North Hedge (8157, 3704) | Trap Empty |
| 3) In pile of branches in woodland Comp. 1 (8148, 3705) | Trap Empty |
| 4) Near base of tree in woodland Comp. 1 (8145, 3704) | Trap Empty |
| 5) In the North Hedge two thirds down on north side (8144, 3710) | Wood Mouse, Male, 26 grams |
| 6) In North Hedge at most northern edge of site (8137, 3716) | Wood Mouse, Female, 18 grams |
| 7) In North West Hedge (8125, 3695) | Trap Empty |
| 8) In grass tussocks on edge of wood Comp. 3 (8124, 3691) | Trap Empty |
| 9) In edge of woodland Comp. 2, adjacent to North Bucks Way hedge (8128, 3678) | Trap Empty |
| 10) In the wood at middle of Comp. 4 (8128, 3664) | Trap Empty |
| 11) In North Bucks Way hedge at bottom of Comp. 4 (8127, 3659) | Trap Empty |
| 12) On left side of South Glade at bottom (8132, 3667) | Trap Empty |
| 13) In the woodland at north edge of Comp. 4 (8130, 3667) | Trap Empty |
| 14) On south side of South Glade at top (8130, 3668) | Trap Empty |
| 15) At bottom of east side of Comp. 5 (8135, 3670) | Trap Empty |
| 16) In shrubbery on north side of South East Ride (8130, 3675) | Trap Empty |
| 17) In shrubbery on south side of South East Ride (8132, 3673) | Trap Empty |
| 18) In shrubbery on south side of South East Ride (8134, 3678) | Wood Mouse, Female, 21 grams |
| 19) In shrubbery on north side of South East Ride (8133, 3680) | Wood Mouse, Male, 24.5 grams |
| 20) In shrubbery on north side of South East Ride (8137, 3685) | Wood Mouse, Male, 22.5 grams |

Additional Mammal Findings

Fox seen by Paul Manchester coming out of the wood grid reference (8155, 3705) going past the pond and crossing road towards housing estate just after dusk.

Mole hills seen within North West Hedge near grid reference (8125, 3695).

Also Hedgehog dropping reported found by Jo Ayers on 2/5/06.

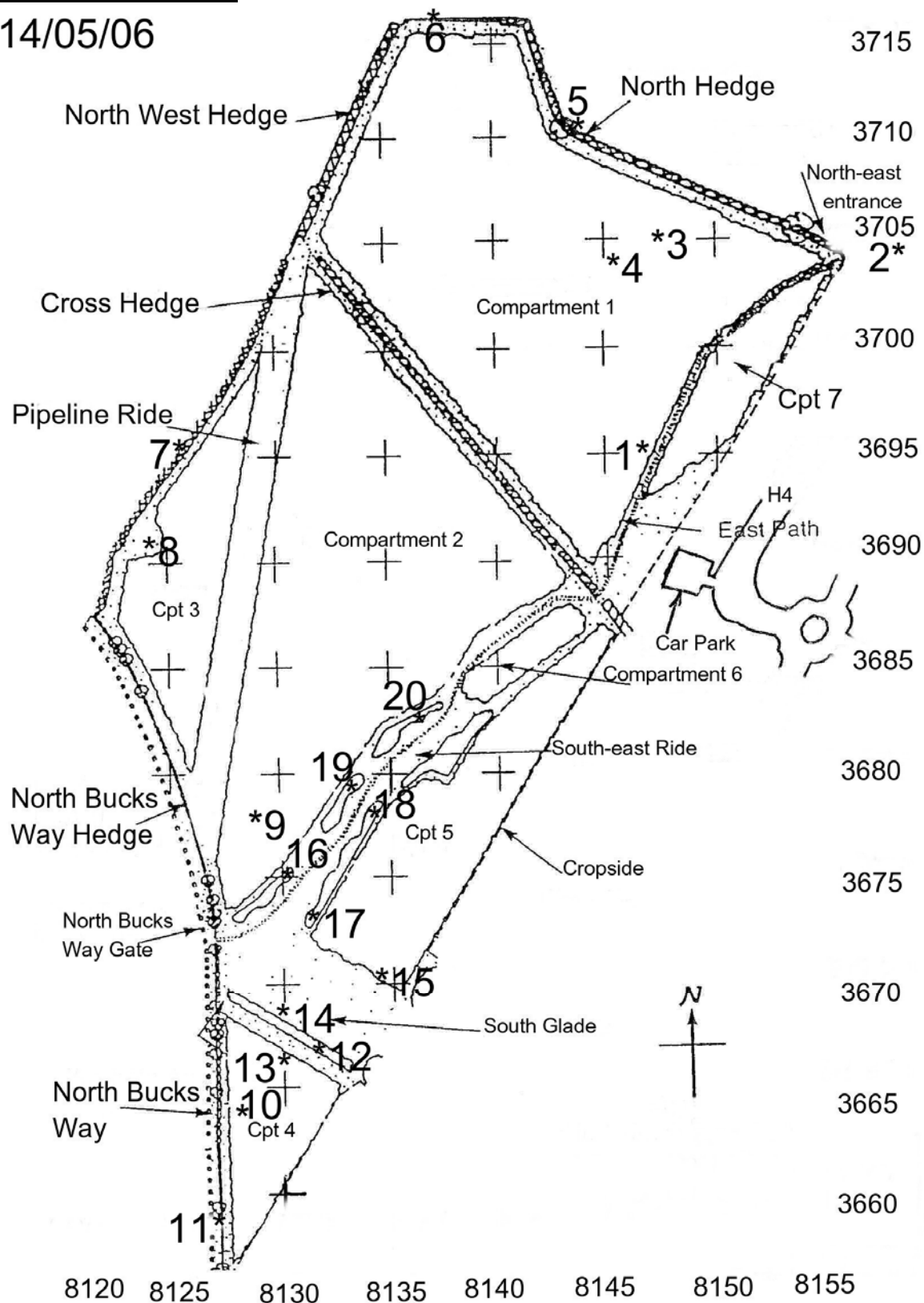
A Common Shrew corpse - grid reference (8135, 3678) reported found by Mel Jones on 21/06/06. This was right in the centre of the site along the edge of the South East Ride.

Summary

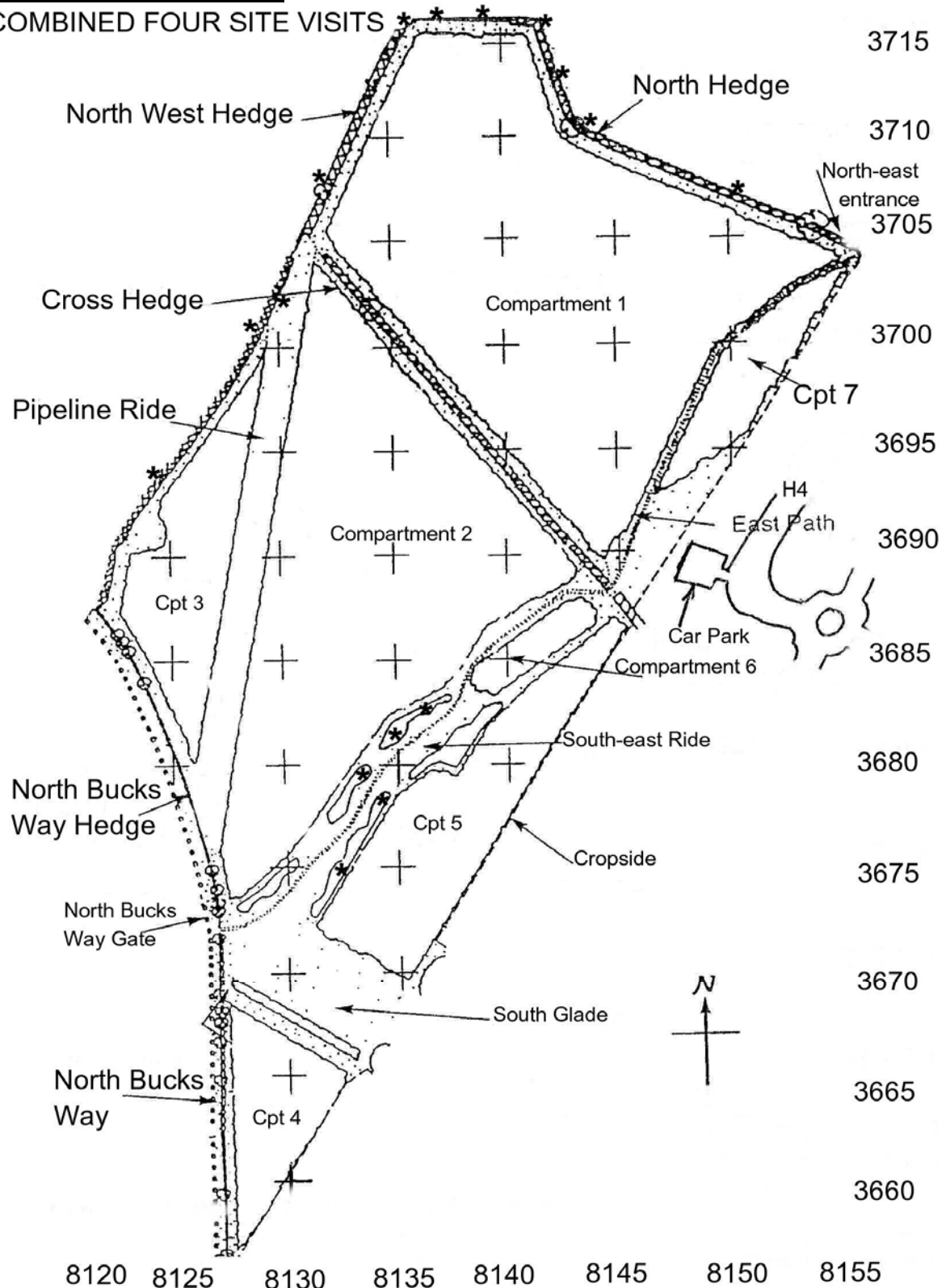
Wood Mouse, Male, 26g (*Apodemus sylvaticus*)
Wood Mouse, Female, 18g (*Apodemus sylvaticus*)
Wood Mouse, Female, 21g (*Apodemus sylvaticus*)
Wood Mouse, Male, 24.5g (*Apodemus sylvaticus*)
Wood Mouse, Male, 22.5g (*Apodemus sylvaticus*)

TRAP LOCATION MAP

14/05/06

**KEY**

* Indicates the approximate position of the numbered Longworth trap on the site.

RESULTS SUMMARY MAP**COMBINED FOUR SITE VISITS****KEY**

* Indicates the approximate positions on the site, of the 16 Longworth traps that caught Wood Mice during the four site visits.

4. DISCUSSION AND CONCLUSIONS

During the survey all of the available habitats were sampled. These included all of the hedgerows, the small shrubby areas along the edges of the South East Ride, South Glade, and within the main woodland compartments. The results were split into these three areas and each area considered separately as discussed below. Also see the Results Summary Map showing the location of all the traps that caught Wood Mice during the four site visits.

THE MAIN WOODLAND COMPARTMENTS

Total number of traps set on all site visits = $6 + 9 + 13 + 7 = 35$

Number of Wood Mice found on all site visits = $0 + 0 + 0 + 0 = 0$

This was found to be a poor habitat for small mammals. Out of 35 traps set none contained mammals. This habitat currently has very little ground cover except dead leaves and a few piles of sticks that have been removed from low branches of the trees. All the trees are the same age planted in 1991, with no older trees to offer holes under roots to provide cover for small mammals. This habitat would be improved by thinning trees and leaving the resulting wood to make dead hedges and log piles. This would allow light into some areas for a field layer to grow, and the dead hedges and log piles would give the woodland floor some structural diversity to provide cover for small mammals.

THE HEDGEROWS

Total number of traps set on all site visits = $10 + 8 + 1 + 5 = 24$

Number of Wood Mice found on all site visits = $5 + 4 + 0 + 2 = 11$

The hedgerows were found to be good habitat for Wood Mice. Out of 24 traps set 11 caught Wood Mice. However these hedgerows would probably have been good habitat well before 1991 when Hazeley Wood was planted. No other small mammal species were found in traps which suggest that this hedgerow habitat was dominated predominantly by Wood Mice.

THE SMALL SHRUBBERY AREAS AND GRASS TUSsockS ALONG THE EDGES OF THE SOUTH EAST RIDE AND THE SOUTH GLADE

Total number of traps set on all site visits = $4 + 1 + 5 + 7 = 17$

Number of Wood Mice found on all site visits = $0 + 0 + 2 + 3 = 5$

Initially no mammals were found around these areas in March. However towards the end of April and into mid May as the grass and shrubs grew and provided more cover, then 5 out of 12 traps caught Wood Mice. This would suggest that these Wood Mice had come from the hedgerows where Wood Mice were found in March April and May. Also in June the only evidence of Common Shrew was found in this habitat. This was not trapped but was found dead and partially decayed on 21 June 2006. Perhaps with further site visits for trapping during the summer months, we may have found more Wood Mice and also Common Shrews along the South East Ride. Further surveys in the summer months could also include the Pipeline Ride but this ride did lack shrubby areas to provide cover.

5. ACKNOWLEDGEMENTS

Team Mammal Surveyors: Jo Ayers, Petra Seath, Carol Watts, Mel Jones,
Bob Stott, Martin Kincaid, Paul (M.D) Manchester

Site Visit Results Compiled: Jo Ayers, Petra Seath, Paul Manchester

6. BIBLIOGRAPHY

Flowers J - Mice and Voles

Sargent G & Morris P – How to Find and Identify Mammals - The Mammal Society

Conservation Handbook - A practical guide to conservation management in Berks, Bucks
and Oxon, by Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust

APPENDIX D.2.1



WILDLIFE AND COUNTRYSIDE ACT 1981
(AMENDED BY THE ENVIRONMENTAL PROTECTION ACT 1990)

Licence to take shrews (*Soricidae*) for scientific or educational purposes or for the purpose of ringing or marking or examining any ring or mark

This licence, granted by English Nature under Section 16(3) (a) and (b) of the Wildlife and Countryside Act 1981, (amended by the Environmental Protection Act 1990) authorises the **taking of shrews (*Soricidae*)** by the use of **appropriate live traps** (see note 9 overleaf) for scientific or educational purposes and for the purpose of marking using appropriate humane methods in all counties of **England**.

This licence is valid until **31 December 2006** and is granted subject to the following conditions:-

- (1) Anyone making use of this licence shall possess appropriate knowledge and experience of shrews or shall operate under the guidance of such a person.
- (2) No work shall be carried out under this licence on a National Nature Reserve except with the prior written permission of English Nature's local office.
- (3) Any wild animal taken under this licence shall be liberated at the site of capture immediately after examination and/or marking.
- (4) All equipment used for the purpose of this licence shall be so constructed and maintained as to avoid cruelty and distress to wild animals. (See notes overleaf).
- (5) The licensee must report shrew deaths to English Nature to help assess the effectiveness of this trapping method.

Date: 1 January 2006

Signed:

A handwritten signature in black ink that reads "Ian Carter".

for and on behalf of
English Nature

APPENDIX – D.2.2

Guidance notes on construction, maintenance and use of small mammal traps so as to avoid cruelty or distress to shrews

1. Leave plenty of suitable food in the trap nest-box. Blowfly larvae or pupae are best; minced beef can be used for common or pygmy shrews, but it is not appropriate for water shrews. A small amount of tinned dog food can be used. All meat can 'go off' in hot weather, tainting the nest-box and possibly attracting animals to the trap, thus perhaps giving artificially high results if you are estimating density.
2. Leave bedding in the nest-box to provide insulation. Hay is best. Ensure it is dry. Do not trap in very cold or very hot conditions if the trap is exposed.
3. Inspect the trap at suitable frequent intervals. If sufficient food and bedding are left, 12 hourly inspections (dusk and early morning) should be enough. Examine the food supply at each visit and replace it if 'off'.
4. If for any reason food cannot be left, shrews are likely to die in the trap if left there for more than 3-4 hours, and visits should be correspondingly frequent (at least every 4 hours) - particularly if trapping from July to September when larger number of shrews may be caught. Remember, however, that very frequent visits to the trap will cause disturbance to the habitat and this may affect trapping success.
5. If you do not require to catch shrews, a shrew escape hole 13mm in diameter can be drilled in the trap nest-box. A brass washer should be glued around the hole to prevent gnawing by rodents which can soon enlarge the hole. The brass washer should be glued using epoxy resin to the aluminium of Longworth traps or direct onto the plastic traps which are now available to trap small mammals. Alternatively set the treadle to catch animals of over 8g in weight only. Clearly either of these expedients will allow small or juvenile rodents to escape as well as shrews.
6. If shrew deaths occur, adjust the amounts of food and bedding, or the frequency of inspections, as appropriate. If despite this, deaths continue, suspend trapping and seek advice. (See conditions 4 and 5 on this licence).
7. Remember to put the prebait door catch on (this holds the door open) when the trap is temporarily out of use.
8. The Mammal Society Booklet *Live Trapping Small Mammals - A Practical Guide* by J Gurnell and J R Flowerdew, contains many useful hints. It is available from The Mammal Society, 2B Inworth Street, London, SW11 3EP Tel: 0207 498 4358.
9. Appropriate live-traps are those that are designed, set and operated in such a manner as to avoid death or injury. These should be provided with a nest-box containing suitable nesting material.

Additional notes

1. Nothing in this licence shall confer any right of entry on to land.
2. This licence is granted subject to compliance with the conditions as specified.
3. Anything done otherwise than in accordance with the terms of the licence may constitute an offence.
4. This licence may be modified or revoked at any time by English Nature.

APPENDIX – D.2.3

Berkshire
Buckinghamshire
Oxfordshire

**RISK ASSESSMENT RECORD**

TASK ASSESSED General species surveying		ASSESSMENT DATE February 2006		ASSESSED BY Debbie Jackson	
TASK LOCATION BBOWT Reserves		NEXT ASSESSMENT BEFORE February 2007		APPROVED BY Matt Jackson	
TASK HAZARD	Who's at risk?	PRECAUTIONS to reduce the risk level	Risk level	Who will do them?	When?
Potential for harm to persons or property					
Risk of exposure to extreme weather conditions, including sunburn, sunstroke, dehydration, hypothermia.	Surveyor	<ul style="list-style-type: none"> Carry enough drinking water to last the length of the activity Wear a high factor sun cream and a broad rimmed sun hat when sunny. Wear appropriate outdoor clothing with a waterproof layer when the weather is cold. 	L-M	Surveyor	Before/ During
Risk of bee, hornet and wasp stings, triggering allergic reactions.	Surveyor	<ul style="list-style-type: none"> Be aware of personal allergies to bites and stings and carry appropriate medication. 	L	Surveyor	Before
Risk of contracting tetanus following skin lacerations on barbed wire etc.	Surveyor	<ul style="list-style-type: none"> Ensure tetanus vaccination is up-to-date. Familiarise with symptoms and contact doctor immediately if infection suspected. 	L	Surveyor	Before/ After
Risk of contracting Weils Disease (leptospirosis) after contact with contaminated water and droppings.	Surveyor	<ul style="list-style-type: none"> If handling soil, water or faeces during the activity, clean hands and forearms with antiseptic or antibacterial soap before eating, drinking and smoking whilst surveying and wash hands at end of activity. Familiarise with symptoms and contact doctor immediately if infection suspected. 	L	Surveyor	Before/ During/ After
Risk of contracting Lymes Disease following contact with ticks.	Surveyor	<ul style="list-style-type: none"> Check carefully for any ticks. Familiarise with symptoms and contact doctor immediately if infection suspected. 	L	Surveyor	Before/ During/ After
Risk to personal safety through meeting people in isolated places.	Surveyor	<ul style="list-style-type: none"> Work in pairs where possible If possible, carry a fully charged mobile phone and keep on at all times. Inform someone of your whereabouts and expected time of return, and ensure they know what to do if you do not return at the specified time. Do not challenge the behaviour of aggressive and confrontational people. Call the police if the behaviour constitutes criminal activity. 	L	Surveyor	Before/ During
Risk of trips/falls etc which lead to injury	Surveyor	<ul style="list-style-type: none"> Wear suitable footwear Take a stick if necessary Only operate within your physical limits Simple First Aid kit and whistle may be appropriate to take. 	L	Surveyor	During
Risk of surveying near water		<ul style="list-style-type: none"> Don't go into the water. Be aware of bank topography. 	L	Surveyor	During
Risk of personal injury from livestock and dogs.	Surveyor	<ul style="list-style-type: none"> Do not provoke aggressive behaviour from dogs and livestock. 	L	Surveyor	Before/ During

Personal protective equipment needed by surveyor:

Appropriate footwear, Change of clothes (in cold weather), Waterproof clothing, Antiseptic wipes
Waterproof plasters, Drinking water, sun cream, sun hat (in sunny weather), Mobile phone

APPENDIX – D.2.4

Berkshire
Buckinghamshire
Oxfordshire

**RISK ASSESSMENT RECORD**

TASK ASSESSED Small Mammal Trapping		ASSESSMENT DATE Feb 2006		ASSESSED BY Debbie Jackson	
TASK LOCATION BBOWT Reserves		NEXT ASSESSMENT BEFORE Feb 2007		APPROVED BY Nick Forster	
TASK HAZARD potential for harm to persons or property	Who's at risk?	PRECAUTIONS to reduce the risk level	Risk level	Who will do them?	When ? Before During
Risk of being bitten by the small mammal.	Surveyor	<ul style="list-style-type: none"> Ensure that surveyor has attended at least one training course (or has previous experience) on handling mammals before carrying out surveys Wear thin protective gloves while carrying out survey work If bitten: clean the wound and cover with a dressing. Also ensure to check the wound for infection 	M	Surveyor	Before
Risk of contracting disease from small mammal	Surveyor	<ul style="list-style-type: none"> Wear gloves while handling the animals Do not eat, drink or smoke while surveying and clean hand thoroughly before doing so after surveying Ensure thorough cleaning of hands after survey work using antiseptic wipes etc 	L	Surveyor	Before/ During/ After
Risk of trapping fingers in the Longworth trap.	Surveyor	<ul style="list-style-type: none"> Take care while setting the trap Ensure that surveyor has attended at least one training day (or has previous experience) before setting traps. 	L	Surveyor	During

Additional Personal protective equipment needed by surveyor:

- Antiseptic wipes/antiseptic hand wash
- Thin protective cotton gloves.

D.3 BATS



by

Linda Piggott



SUMMARY

Observations were carried out on four occasions during 2006, using various types of bat detector whilst walking a specific transect.

At least two, possibly three varieties of bat were recorded, several each of soprano Pipistrelles and unspecified Pipistrelles in various locations, with a single Noctule on the south eastern perimeter of the wood.

The general lack of access to a time expansion or frequency division bat detector (except on one occasion), limits our ability to record all bats that may be present, so it may be that some species go unrecorded.

Another factor which should be noted is that we tended to record more bats in areas of the wood adjacent to surroundings where more mature habitats were present.

1. INTRODUCTION

Continuing on from earlier observations since 1995, particularly the records shown in section F8 of the present report, observations were taken during several visits in 2006, as described below.

2. SURVEY METHODS

As before, the procedure was to walk a given transect (see below) using direct sight observation or a Mini-3 bat detector and a home-made bat detector. However, where in previous surveys we had our detectors tuned to 50kHz to detect as many bats as possible, this year we have had one detector tuned to 55kHz and one to 45kHz, in order to distinguish between common and soprano Pipistrelles when recording. On some occasions we had the use of a Batbox 3 and another home-made detector. On these occasions one detector would be tuned to between 25 and 30 kHz to increase the

chances of recording other species (Natterer's, Noctule, Serotine) if present. On 10th June Keith Parnell brought along his Duet bat detector to assist with recording. This is a frequency division/heterodine bat detector, so that bats could be recorded at any frequency all the time.

At dusk, the survey route started at the Car Park in the direction of the Cross Hedge; where turn left down South-east Ride; at North Bucks Way Gate (NBWG) turn south and follow inside North Bucks Way Hedge to tip of Compartment 4; then turn left round Compartment 4 and follow western edge into South Glade and continue to NBWG again; turn right along inside of North Bucks Way Hedge passing Pipeline Ride on the right; follow western boundary to northern edge of wood and continue right along North Hedge to North-east entrance; turn right down East Path until reach Cross Hedge where turn right along the hedge until meet North-west boundary with Pipeline Ride to the left; walk down Pipeline Ride until again meet NBWG; turn left and walk eastwards along South Glade until reach the south-east boundary; turn left along boundary until meet with Cross Hedge and back to Car Park.

Those present on various occasions were; Linda & Alan Piggott, Paul Lund, and Keith Parnell.

3. RESULTS

13/05/06 Although it was raining for much of the time, with temperature at 21°C and falling, soprano Pipistrelles were recorded in three locations; one at each end of the Cross Hedge; and a highly active bat under a large oak near the North-east entrance.

10/06/06 In fair weather, temperature 24°C, soprano Pipistrelles were recorded at two locations; at the western junction of the Cross Hedge and Pipeline Ride where two were active; and in the South Glade / NBWG area where three were active. An unspecified Pipistrelle was noted at the southern end of the Pipeline Ride. A Noctule was located on the South-east boundary of compartment 5.

09/09/06 In inclement windy weather with temperature 23°C but no rain, a total of eleven soprano Pipistrelles and five unspecified Pipistrelles were recorded. Several groups were located; with two soprano Pipistrelles at the westernmost section of north hedge; four unspecified Pipistrelles and two soprano Pipistrelles in the area of the western junction of the Cross Hedge and the nearby North-west Hedge; and three soprano Pipistrelles at the southern end of the Pipeline Ride/North Bucks Way Hedge. Single soprano Pipistrelles were noted at; north-east entrance; at three intervals along the north-west hedge between the groups at the north and south ends of the Pipeline Ride; and a single unspecified Pipistrelle midway along the Cross Hedge.

07/10/06 On this last occasion of the year, the weather was cloudy, with a medium breeze, and temperature 23°C. Only four bats were noted, all on the borders of (but within) the study area. One soprano Pipistrelle was heard on the south-eastern edge of compartment 5; one unspecified Pipistrelle was heard in the NBWG area; and two were seen (probably Pipistrelles) but not heard on the south-eastern edge of compartment 4 near South Glade.

4. DISCUSSION

As on previous surveys, we tended to record more bats in areas of the wood adjacent to surroundings where more mature habitats were present (i.e. North Bucks Way, North-west Hedge, North-east Entrance) and also along Cross hedge which is a long-standing hedge left *in situ*. More bats were recorded in the summer months than in spring or autumn, which is not surprising. More surprising was the highly active soprano pipistrelle recorded under the large oak tree near the North-east Entrance on 13th May, despite heavy rain at that point. The tree provided a lot of shelter for us and obviously for the bat too. There may have been a slight increase in the total number of bats recorded, but this was not considered to be significant.

However, on the 10th June, it was significant to note the first recorded instance of a Noctule at Hazeley Wood. It was recorded on Keith Parnell's Duet bat detector which is able to record on all frequencies used by British bats at the same time and it is likely that in the past, Noctules have been unrecorded rather than not present.

The same might apply to other species (particularly Brown long-eared which is difficult to detect anyway) and illustrates that the lack of access to a time expansion or frequency division bat detector, limits our ability to record all bats that may be present.

E.1. PHOTOGRAPHS



by

Charlie Blake



SUMMARY

On various occasions during 2006/07, photographs were taken of both the site and some of the plants and insects present, including a few of survey teams at work.

For general interest, some of those of the site are shown below which may be contrasted with those given in the previous Hazeley Wood Reports for 1993 and 1994.

As expected the principal change in the appearance of the wood since 1995 is of course the increase in growth of the vegetation so that what was once a young plantation now resembles a wood in the making. As a consequence it was not possible to replicate photos from the exact positions adopted previously so 6 have been selected from several places of particular interest. See Map A.1 to establish the detail given with each photo.

Views of Hazeley Wood



Figure E.1.1

View north from near North Bucks Way gate with North Bucks Way hedge on left; centre looking down pipeline ride with compartment 3 left, compartment 2 right. February 2007



Figure E.1.2

South-east ride near compartment 6, looking south towards North Bucks Way gate showing planted scrub areas on edges of compartment 5 left; compartment 2 right. April 2007

Figure E.1.3

View from new entrance near car park (raised area to left) looking north towards north east entrance (obscured) and eventually city centre. Far left is compartment 1; centre is compartment 7; right is planted shrub area obscuring new pond. East path starts left of prominent silver birch. March 2007



Figure E.1.4

New pond located at the north-east entrance facing north towards H4/V3 intersection. February 2007

Figure E.1.5

Cross hedge running
north-west to south-east
between compartments
1 and 2.
March 2007



Figure E.1.6

North Bucks Way gate to
the left, facing north,
compartment 2 in centre.
November 2006

E.2 WEATHER RECORDS 2005/2006



by

John Wickham



SUMMARY

Records made at the Milton Keynes Borough Weather Station in Central Milton Keynes are given as monthly summaries for Temperature, Atmospheric Pressure, Windspeed and Rainfall from September 2005 to December 2006. Other records are available from Milton Keynes Council Environmental Health Department.

1. GENERAL

Weather recording was not possible on site at Hazeley Wood, so to provide a general account of the climate throughout the year the records taken at the Milton Keynes Weather Station have been incorporated into this Report. This weather station is on the roof of the Council building (128m above mean sea level) at SP 85085 39052 which is about 4km (2.5 miles) North East of Hazeley Wood.

Measurements are recorded at the weather station automatically throughout 24 hours and stored on computer by the Environmental Health Department.

Because some of the surveys in the main report were taken in the autumn of 2005, weather data are given here from September 2005 to December 2006, see tables E.2.1 to E.2.4.

2. COMMENTS

The autumn into winter weather in 2005 showed little evidence of extremes in any of the four categories recorded here. Temperatures ranged from a maximum of 28°C in September to -4°C in December; average windspeed was about 3m/s; and the average number of days without rain in any month was 13.

In 2006 the minimum temperature during the first four months was below freezing, although the average temperatures for these months was not out of the ordinary nor was the 15 days without rain and the average windspeed of 3.3 m/s.

During the summer, July was noticeable for having the highest readings for the average, the maximum and minimum temperatures for the year and at the same time the monthly rainfall was at its annual highest nationally; the summer was the hottest on record particularly the period from April to October.

During the last four months there were heavy rains on occasion and temperatures were mild in October/November but otherwise, no exceptional records were observed.

3. ACKNOWLEDGEMENTS

We are pleased to acknowledge the help received from Megan Williams of MK Council Environmental Health Department, in the preparation of these records.

Table E.2.1

WEATHER SUMMARY – 2005

		TEMPERATURE		PRESSURE		WINDSPEED			RAINFALL		
		°C	Notes	mb	Notes	mph	m/s	Notes	mm	inches	Notes
Sep	Average	15.64		1,003		6.12	2.73				
	Maximum	28.40	on 4th	1,015	on 3rd	13.89	6.20	on 28th			
	Minimum	4.60	on 17th	993	on 25th						
	Total/Month								22.8	0.88	18 days without rain
	Max on 1day								2.4	0.09	on 30th
Oct	Average	13.35		1,000		6.99	3.12				
	Maximum	21.80	on 11th	1,018	on 3rd	16.58	7.40	on 25th			
	Minimum	6.70	on 2nd	977.00	on 21st						
	Total/Month								58.6	2.25	10 days without rain
	Max on 1day								6.4	0.25	on 24th
Nov	Average	6.24		1,001		6.99	3.12				
	Maximum	17.50	on 2nd	1,025	on 22nd	18.59	8.30	on 3rd			
	Minimum	-4.10	on 20th	974	on 25th						
	Total/Month								40.6	1.56	13 days without rain
	Max on 1day								5.4	0.21	on 3rd
Dec	Average	4.72		1,003		6.83	3.05				
	Maximum	10.90	on 16th	1,027	on 12th	16.80	7.50	on 2nd			
	Minimum	-3.70	on 18th	961	on 2nd						
	Total/Month								34.6	1.33	13 days without rain
	Max on 1day								2.0	0.08	on 3rd

Table E.2.2

WEATHER SUMMARY – 2006

		TEMPERATURE		PRESSURE		WINDSPEED			RAINFALL		
		°C	Notes	mb	Notes	mph	m/s	Notes	mm	inches	Notes
Jan	Average	4.49		1,008		6.79	3.03				
	Maximum	11.90	on 18th	1,023	on 22nd	15.90	7.10	on 11th			
	Minimum	-3.90	on 25th	978	on 1st						
	Total/Month								19.8	0.76	15 days without rain
	Max on 1day								1.4	0.05	on 20th

Feb	Average	3.58		1,001		7.26	3.24				
	Maximum	11.60	on 15th	1,019	on 5th	18.82	8.40	on 15th			
	Minimum	-3.80	on 2nd	966	on 17th						
	Total/Month								35.2	1.35	15 days without rain
	Max on 1day								2.8	0.11	on 15th

Mar	Average	4.76		995		8.29	3.70				
	Maximum	15.70	on 30th	1,016	on 12th	19.94	8.90	on 28th			
	Minimum	-4.70	on 3rd	976	on 24th						
	Total/Month								46.4	1.78	12 days without rain
	Max on 1day								4.8	0.18	on 30th

Apr	Average	8.71		1,000		6.97	3.11				
	Maximum	17.10	on 25th	1,013	on 27th	16.58	7.40	on 2nd			
	Minimum	-2.00	on 5th	987	on 1st						
	Total/Month								33.4	1.28	17days without rain
	Max on 1day								2.4	0.09	on 11th

Table E.2.3

WEATHER SUMMARY – 2006

		TEMPERATURE		PRESSURE		WINDSPEED			RAINFALL		
		°C	Notes	mb	Notes	mph	m/s	Notes	mm	inches	Notes
May	Average	12.57		999		6.97	3.11				
	Maximum	26.60	on 4th	1,013	on 31st	17.02	7.60	on 19th			
	Minimum	4.20	on 31st	971	on 22nd						
	Total/Month								92.2	3.55	11 days without rain
	Max on 1day								14.8	0.57	on 22nd
Jun	Average	17.03		1,006		5.67	2.53				
	Maximum	30.70	on 12th	1,017	on 2nd	17.02	7.60	on 26th			
	Minimum	5.50	on 1st	993	on 19th						
	Total/Month								6.8	0.26	24 days without rain
	Max on 1day								1.4	0.05	on 13th
Jul	Average	20.52		1,004		5.87	2.62				
	Maximum	35.10	on 19th	1,019	on 14th	15.23	6.80	on 9th			
	Minimum	9.70	on 14th	991	on 31st						
	Total/Month								124.8	4.80	18 days without rain
	Max on 1day								21.8	0.84	on 6th
Aug	Average	16.12		998		6.61	2.95				
	Maximum	26.80	on 6th	1,010	on 8th	15.46	6.90	on 1st			
	Minimum	9.40	on 30th	985	on 17th						
	Total/Month								71.8	2.76	13 days without rain
	Max on 1day								7.8	0.30	on 19th

Table E.2.4

WEATHER SUMMARY – 2006

		TEMPERATURE		PRESSURE		WINDSPEED			RAINFALL		
		°C	Notes	mb	Notes	mph	m/s	Notes	mm	inches	Notes
Sep	Average	17.12		998		6.52	2.91				
	Maximum	28.40	on 11th	1,017	on 8th	18.14	8.10	on 3rd			
	Minimum	8.50	on 8th	985	on 21st						
	Total/Month								62.4	1.33	11 days without rain
	Max on 1day								9.0	0.19	on 13th
Oct	Average	13.29		995		7.12	3.18				
	Maximum	20.00	on 10th	1,017	on 13th	18.14	8.10	on 31st			
	Minimum	-2.60	on 31st	971	on 24th						
	Total/Month								100.6	2.14	15 days without rain
	Max on 1day								8.0	0.17	on 1st
Nov	Average	8.50		999		8.00	3.57				
	Maximum	14.90	on 13th	1,021	on 2nd	19.04	8.50	on 20th			
	Minimum	0.20	on 2nd	964	on 23rd						
	Total/Month								84.6	1.8	10 days without rain
	Max on 1day								10.4	0.22	on 17th
Dec	Average	6.66		1,004		7.95	3.55				
	Maximum	13.80	on 5th	1,030	on 21st	21.50	9.60	on 3rd			
	Minimum	-4.00	on 20th	969	on 8th						
	Total/Month								71.4	1.52	10 days without rain
	Max on 1day								4.8	0.10	on 30th

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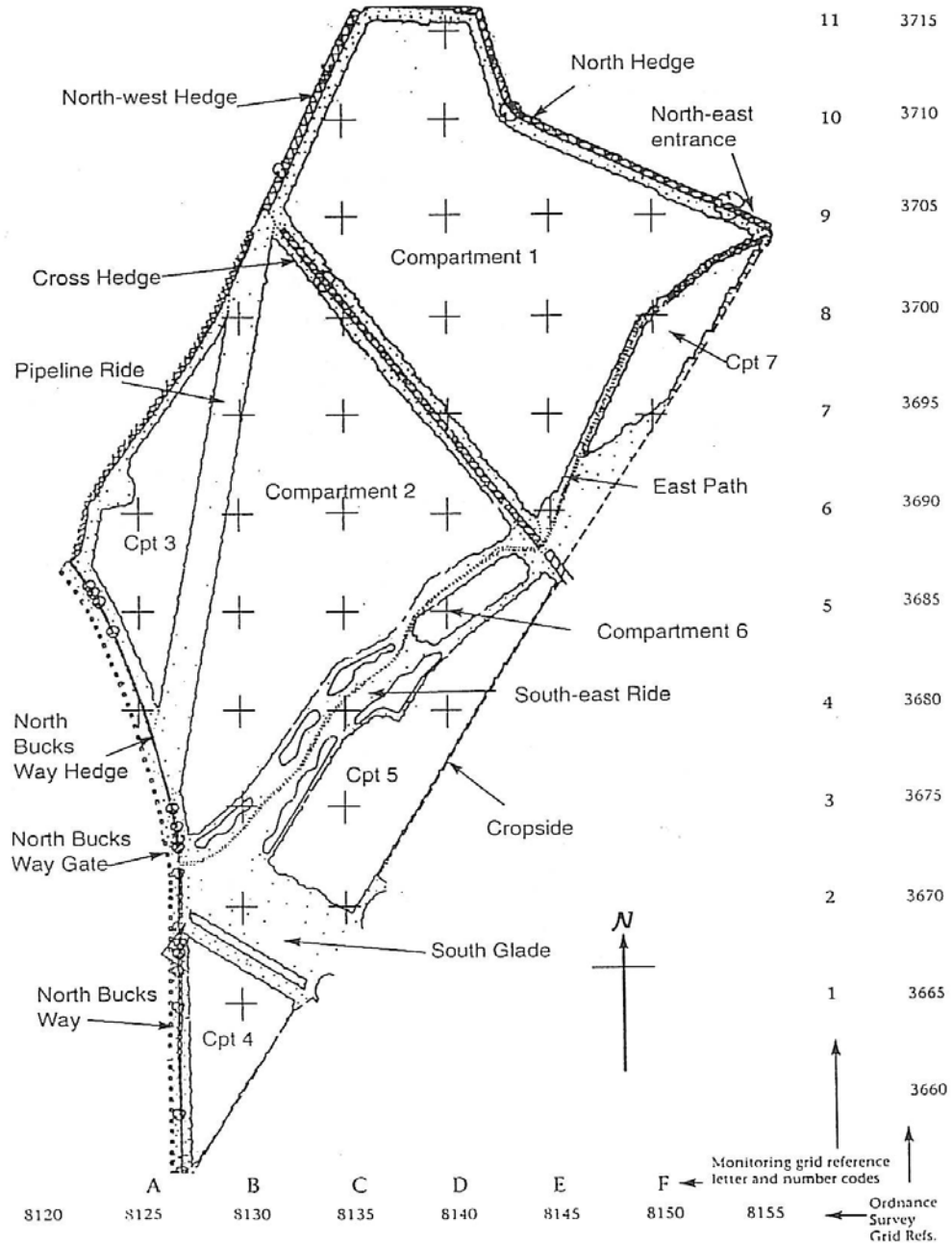
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Data Collected

1995 - 2005

Map F - 1995

Detailed location of site features showing also the position of the grid, together with the names adopted for the various rides, compartments and hedges.



F.1 GROUND FLORA / HEDGEROWS

1995, 1996 & 1997

By

Roy Maycock

SUMMARY

In 1995, 1996 and 1997 a single day was given each year to recording the vascular plants growing within as many of the sample areas as could be found. Marker posts were located and, as in previous years, 1.5m diameter quadrats around them were surveyed for species present.

1. INTRODUCTION

The methodology set out in 1993 and used for the first time in 1994 was repeated in 1995, 1996 and 1997. The management of the site up to the time of the visits had continued as planned so this had no effects on the results obtained.

2. SURVEY METHODS

The quoits ring with strings and pegs attached was again used to describe the 1.5m diameter quadrat around the marked posts. Each year difficulties were encountered in locating some of these, and, as a result, only 17 areas in 1995, 29 areas in 1996 and 17 in 1997 were surveyed.

3. SITE VISIT

9 June 1995	Joan Lancaster and Roy Maycock
1 July 1996	Joan Lancaster, Roy Maycock and Margaret Wickham
17 July 1997	Joan Lancaster, Roy Maycock and Margaret Wickham

4. RESULTS

Details of the findings showing species present in each quadrat, together with species totals and percentage frequency, are given at the end of this section as:-

Appendices F.1.1 for 1995
 F.1.2. for 1996
 and F.1.3 for 1997

Also shown are updates of the vascular plant species list showing species additional to the lists given in previous reports e.g. 1994 report p.11, as:-

Appendices F.1.4 for 1995
 and F.1.5 for 1996

5. DISCUSSION

A summary of results is shown in the following table:

	1994	1995	1996	1997
No. of quadrats sampled	23	17	29	17
Maximum number of taxa per quadrat	14	13	13	18
Minimum number of taxa per quadrat	3	3	2	1
Average number of taxa per quadrat	8.6	8.8	6.3	9.1
Total number of records	198	149	182	154

In 1995

43 taxa were recorded from 23 quadrats in 1994; 40 taxa from 17 quadrats in 1995. 14 of the taxa from 1994 were not recorded in 1995 but 11 new ones were!

21 of the species recorded in 1995 were annuals – plants which readily colonise the bare ground around the marker posts then produce their flowers and fruits before the herbicides kill them off. However, the number of seedlings recorded in each quadrat was always low.

It is interesting to note that eight of the taxa first recorded in 1995 were perennials; it remains to be seen whether or not they will become established. Six were recorded from just one quadrat each, the others from just two.

In 1996

42 taxa were recorded. Of these 13 were first time records for the quadrats but 13 species previously recorded were not found this year. Ash (*Fraxinus excelsior*) and Bramble (*Rubus fruticosus* agg.) were each recorded once, but they may not have survived – as was predicted for Elder (*Sambucus nigra*) in 1994.

Oxeye Daisy (*Leucanthemum vulgare*) and Common Bird's-foot-trefoil (*Lotus corniculatus*) were both included in the 1992 seed-mix and appeared in quadrats for the first time.

Other new species may have been seen because of the greater number of sites able to be sampled. However, overall fewer taxa per quadrat were recorded.

In 1997

52 taxa were recorded, 11 seen previously were not recorded but 10 new ones were.

6. CONCLUSIONS

For 1995

The grasses *Poa trivialis* and *Alopecurus myosuroides* were still found in more quadrats than any other species – 100% and 88% respectively. *Aethusa cynapium* was in 76% of the quadrats, *Anagallis arvensis* in 59%, *Geranium dissectum* in 53% and *Sonchus asper* in 59%. None of these was present in more than 50% of the quadrats in 1994, indicating that the herbaceous plants associated with the trees are still in a considerable state of flux. It will be a long time before the ground vegetation stabilises.

For 1996

The herbaceous flora of the plantation area continues to show a state of flux – with species appearing and disappearing from the sample sites. This may not mean that the flora is changing, as so many of the species recorded are still annuals and they are likely to occur or not as the occasion arises. Only one species, Scarlet Pimpernel (*Anagallis arvensis*), occurred in more than 60% of the quadrats this year; grasses were far fewer.

For 1997

There continues to be a state of change in the plants growing beneath the increasing tree canopy. Several are still characteristic of the previous (arable) use of the site but none is characteristic of woodland. Such species are still a long way off!

Appendix F.1.1 Table showing species present in each quadrat together with species totals and percentage frequency - 1995

	A5	A6	B6	B7	B8	C6	C7	C10
<i>Aethusa cynapium</i>	+			+		+	+	
<i>Alopecurus myosuroides</i>		+	+	+	+	+	+	+
<i>Anagallis arvensis</i>	+			+	+		+	
<i>Atriplex patula</i>			+		+	+		
<i>Chamerion angustifolium</i>						+		
<i>Chenopodium album</i>								
<i>Cirsium arvense</i>				+				
<i>Convolvulus arvensis</i>								
<i>Epilobium hirsutum</i>		+						
<i>Epilobium parviflorum</i>								
<i>Epilobium sp.</i>	+	+						
<i>Euphorbia exigua</i>						+	+	
<i>Fallopia convolvulus</i>								
<i>Festuca rubra</i>								
<i>Fraxinus excelsior</i>	+				+			
<i>Geranium dissectum</i>								
<i>Geranium molle</i>								
<i>Glyceria declinata</i>	+							
<i>Gnaphalium uliginosum</i>		+						
<i>Holcus lanatus</i>								+
<i>Kickxia spuria</i>								
<i>Lolium perenne</i>								+
<i>Malva moschata</i>								
<i>Persicaria lapathifolium</i>		+						
<i>Persicaria maculosa</i>	+				+	+		
<i>Picris echioides</i>								
<i>Plantago major</i>								
<i>Poa annua</i>	+	+						+
<i>Poa pratensis</i>								
<i>Poa trivialis</i>	+	+	+	+	+	+	+	+
<i>Ranunculus acris</i>				+				
<i>Rumex crispus</i>					+			
<i>Senecio vulgaris</i>	+					+		
<i>Sinapis arvensis</i>						+	+	
<i>Sonchus asper</i>		+		+		+	+	
<i>Taraxacum agg.</i>				+				
<i>Triticum aestivum</i>								
<i>Veronica arvensis</i>						+		
<i>Veronica chamaedrys</i>						+		
<i>Veronica persica</i>						+	+	
No. of species per quadrat	9	8	3	8	8	13	9	6

Appendix F.1.1 Table showing species present in each quadrat together with species totals and percentage frequency - 1995 (Continued)

	D4	D5	D6	D8	D9	E6	E8
<i>Aethusa cynapium</i>	+	+	+	+	+	+	+
<i>Alopecurus myosuroides</i>	+	+	+	+	+	+	+
<i>Anagallis arvensis</i>		+	+		+	+	+
<i>Atriplex patula</i>				+			
<i>Chamerion angustifolium</i>							
<i>Chenopodium album</i>					+		
<i>Cirsium arvense</i>		+					
<i>Convolvulus arvensis</i>						+	
<i>Epilobium hirsutum</i>							
<i>Epilobium parviflorum</i>							
<i>Epilobium</i> sp.							
<i>Euphorbia exigua</i>		+	+	+	+		
<i>Fallopia convolvulus</i>						+	
<i>Festuca rubra</i>					+		
<i>Fraxinus excelsior</i>							
<i>Geranium dissectum</i>	+	+	+		+	+	
<i>Geranium molle</i>							
<i>Glyceria declinata</i>							
<i>Gnaphalium uliginosum</i>							
<i>Holcus lanatus</i>				+			
<i>Kickxia spuria</i>					+		+
<i>Lolium perenne</i>							
<i>Malva moschata</i>						+	
<i>Persicaria lapathifolium</i>							
<i>Persicaria maculosa</i>							
<i>Picris echioides</i>							
<i>Plantago major</i>		+		+		+	
<i>Poa annua</i>		+		+			
<i>Poa pratensis</i>						+	
<i>Poa trivialis</i>	+	+	+	+	+	+	+
<i>Ranunculus acris</i>							
<i>Rumex crispus</i>		+	+				+
<i>Senecio vulgaris</i>	+	+	+	+		+	
<i>Sinapis arvensis</i>			+				
<i>Sonchus asper</i>	+	+	+	+	+		+
<i>Taraxacum</i> agg.							
<i>Triticum aestivum</i>							
<i>Veronica arvensis</i>							
<i>Veronica chamaedrys</i>							
<i>Veronica persica</i>		+	+				
No. of species per quadrat	6	13	11	10	10	11	7

Appendix F.1.1 Table showing species present in each quadrat together with species totals and percentage frequency - 1995 (Continued)

	No. of quadrats where species present			
	F7	F9	Total	%
<i>Aethusa cynapium</i>	+	+	13	76
<i>Alopecurus myosuroides</i>		+	15	88
<i>Anagallis arvensis</i>		+	10	59
<i>Atriplex patula</i>		+	5	19
<i>Chamerion angustifolium</i>			1	6
<i>Chenopodium album</i>			1	6
<i>Cirsium arvense</i>			2	12
<i>Convolvulus arvensis</i>			1	6
<i>Epilobium hirsutum</i>			1	6
<i>Epilobium parviflorum</i>		+	1	6
<i>Epilobium sp.</i>			2	12
<i>Euphorbia exigua</i>			6	35
<i>Fallopia convolvulus</i>			1	6
<i>Festuca rubra</i>			1	6
<i>Fraxinus excelsior</i>			1	6
<i>Geranium dissectum</i>		+	9	53
<i>Geranium molle</i>		+	1	6
<i>Glyceria declinata</i>			1	6
<i>Gnaphalium uliginosum</i>			1	6
<i>Holcus lanatus</i>			2	12
<i>Kickxia spuria</i>			2	12
<i>Lolium perenne</i>			1	6
<i>Malva moschata</i>			1	6
<i>Persicaria lapathifolium</i>			1	6
<i>Persicaria maculosa</i>			3	18
<i>Picris echioides</i>		+	1	6
<i>Plantago major</i>			3	18
<i>Poa annua</i>	+	+	7	41
<i>Poa pratensis</i>		+	2	12
<i>Poa trivialis</i>	+	+	17	100
<i>Ranunculus acris</i>			1	6
<i>Rumex crispus</i>	+		5	29
<i>Senecio vulgaris</i>	+		8	47
<i>Sinapis arvensis</i>			3	18
<i>Sonchus asper</i>			10	59
<i>Taraxacum agg.</i>			1	6
<i>Triticum aestivum</i>		+	1	6
<i>Veronica arvensis</i>			1	6
<i>Veronica chamaedrys</i>			1	6
<i>Veronica persica</i>			4	24
No. of species per quadrat	5	12		

Appendix F.1.2 Table showing species present in each quadrat together with species totals and percentage frequency - 1996

	A5	A6	B1	B2	B3	B4	B5	B6	B7	B8	C3
<i>Aethusa cynapium</i>					+		+	+		+	
<i>Agrostis stolonifera</i>											+
<i>Alopecurus myosuroides</i>	+	+	+			+	+	+			+
<i>Anagallis arvensis</i>			+	+	+	+	+	+		+	
<i>Arrhenatherum elatius</i>											
<i>Atriplex patula</i>							+				
<i>Avena fatua</i>					+						
<i>Chenopodium album</i>			+	+							
<i>Chenopodium polyspermum</i>											
<i>Cirsium arvense</i>				+					+		
<i>Convolvulus arvensis</i>											
<i>Elytrigia repens</i>										+	
<i>Epilobium</i> sp.	+	+				+	+		+		
<i>Euphorbia exigua</i>				+			+	+			+
<i>Fallopia convolvulus</i>											
<i>Festuca rubra</i>											
<i>Fraxinus excelsior</i>	+										
<i>Galium aparine</i>					+						
<i>Geranium dissectum</i>											
<i>Geranium molle</i>									+		
<i>Holcus lanatus</i>											
<i>Kickxia spuria</i>							+				
<i>Lactuca serriola</i>					+						
<i>Leucanthemum vulgare</i>									+		
<i>Lotus corniculatus</i>					+						
<i>Malva moschata</i>											
<i>Persicaria maculosa</i>						+	+				
<i>Picris echioides</i>								+			
<i>Plantago major</i>				+		+	+				
<i>Poa annua</i>								+			
<i>Poa trivialis</i>				+							+
<i>Prunella vulgaris</i>					+			+			
<i>Pulicaria dysenterica</i>							+				+
<i>Ranunculus repens</i>											
<i>Rubus fruticosus</i> agg.											
<i>Rumex crispus</i>							+	+			
<i>Senecio vulgaris</i>					+						
<i>Sinapis arvensis</i>				+							
<i>Sonchus asper</i>			+				+		+		
<i>Taraxacum</i> agg.		+									
<i>Veronica arvensis</i>							+				
<i>Veronica persica</i>											
No. of species per quadrat	3	3	4	7	8	5	13	8	5	3	5

It is likely that all (or some) of the *Epilobium* sp. records are for *E. tetragonum*.

Appendix F.1.2 Table showing species present in each quadrat together with species totals and percentage frequency – 1996 (Continued)

	C5	C6	C7	C8	C9	C10	D4	D5	D6	D7	D8
<i>Aethusa cynapium</i>		+			+	+		+			
<i>Agrostis stolonifera</i>											
<i>Alopecurus myosuroides</i>	+	+		+	+	+		+			+
<i>Anagallis arvensis</i>		+	+	+	+	+			+		+
<i>Arrhenatherum elatius</i>										+	
<i>Atriplex patula</i>											
<i>Avena fatua</i>						+					
<i>Chenopodium album</i>											
<i>Chenopodium polyspermum</i>						+					
<i>Cirsium arvense</i>		+						+			
<i>Convolvulus arvensis</i>					+					+	
<i>Elytrigia repens</i>				+				+		+	
<i>Epilobium</i> sp.						+	+				
<i>Euphorbia exigua</i>	+		+		+			+	+		+
<i>Fallopia convolvulus</i>									+		
<i>Festuca rubra</i>											
<i>Fraxinus excelsior</i>											
<i>Galium aparine</i>										+	
<i>Geranium dissectum</i>								+			+
<i>Geranium molle</i>	+										+
<i>Holcus lanatus</i>						+					
<i>Kickxia spuria</i>				+	+	+					
<i>Lactuca serriola</i>											
<i>Leucanthemum vulgare</i>											
<i>Lotus corniculatus</i>											
<i>Malva moschata</i>											
<i>Persicaria maculosa</i>					+						
<i>Picris echioides</i>				+	+						
<i>Plantago major</i>						+			+		
<i>Poa annua</i>	+							+			
<i>Poa trivialis</i>	+							+		+	+
<i>Prunella vulgaris</i>											
<i>Pulicaria dysenterica</i>											
<i>Ranunculus repens</i>	+										
<i>Rubus fruticosus</i> agg.										+	
<i>Rumex crispus</i>								+			
<i>Senecio vulgaris</i>			+			+	+				
<i>Sinapis arvensis</i>						+					
<i>Sonchus asper</i>		+	+	+	+	+					
<i>Taraxacum</i> agg.						+	+				
<i>Veronica arvensis</i>								+			
<i>Veronica persica</i>		+							+		
No. of species per quadrat	6	6	4	6	9	13	3	10	5	6	6

Appendix F.1.2 Table showing species present in each quadrat together with species totals and percentage frequency – 1996 (Continued)

	D9	D10	E6	E7	E8	F8	F9	No. of quadrats where species present	
								Total	%
<i>Aethusa cynapium</i>						+		9	31
<i>Agrostis stolonifera</i>								1	3
<i>Alopecurus myosuroides</i>	+	+			+			17	59
<i>Anagallis arvensis</i>	+	+	+	+	+		+	20	69
<i>Arrhenatherum elatius</i>								1	3
<i>Atriplex patula</i>								1	3
<i>Avena fatua</i>				+				3	10
<i>Chenopodium album</i>								2	7
<i>Chenopodium polyspermum</i>								1	3
<i>Cirsium arvense</i>			+					5	17
<i>Convolvulus arvensis</i>	+		+					4	14
<i>Elytrigia repens</i>							+	5	17
<i>Epilobium sp.</i>			+			+	+	10	34
<i>Euphorbia exigua</i>	+	+						12	41
<i>Fallopia convolvulus</i>								1	3
<i>Festuca rubra</i>			+					1	3
<i>Fraxinus excelsior</i>								1	3
<i>Galium aparine</i>								2	7
<i>Geranium dissectum</i>	+						+	4	14
<i>Geranium molle</i>	+	+	+					6	21
<i>Holcus lanatus</i>								1	3
<i>Kickxia spuria</i>							+	5	17
<i>Lactuca serriola</i>								1	3
<i>Leucanthemum vulgare</i>								1	3
<i>Lotus corniculatus</i>								1	3
<i>Malva moschata</i>			+					1	3
<i>Persicaria maculosa</i>								3	10
<i>Picris echioides</i>	+	+			+			6	21
<i>Plantago major</i>			+					6	21
<i>Poa annua</i>								3	10
<i>Poa trivialis</i>	+	+					+	9	31
<i>Prunella vulgaris</i>			+					3	10
<i>Pulicaria dysenterica</i>								2	7
<i>Ranunculus repens</i>								1	3
<i>Rubus fruticosus agg.</i>								1	3
<i>Rumex crispus</i>	+			+			+	6	21
<i>Senecio vulgaris</i>				+				5	17
<i>Sinapis arvensis</i>								2	7
<i>Sonchus asper</i>	+	+		+				11	38
<i>Taraxacum agg.</i>			+					4	14
<i>Veronica arvensis</i>								2	7
<i>Veronica persica</i>								2	7
No. of species per quadrat	10	7	10	5	3	2	7	182	

Appendix F.1.3 Table showing species present in each quadrat together with species totals and percentage frequency – 1997

	A6	B2	B5	B8	C7	C10	D4	D5	D6	D8	D9
<i>Aethusa cynapium</i>			+		+				+	+	
<i>Agrostis stolonifera</i>	+										
<i>Alopecurus myosuroides</i>	+	+	+	+	+	+	+		+	+	+
<i>Anagallis arvensis</i>			+			+			+	+	+
<i>Arrhenatherum elatius</i>											
<i>Atriplex patula</i>										+	
<i>Chamerion angustifolium</i>											
<i>Centurea nigra</i>									+		
<i>Chenopodium album</i>			+								
<i>Chenopodium polyspermum</i>										+	
<i>Cirsium arvense</i>		+			+			+			
<i>Convolvulus arvensis</i>										+	+
<i>Elytrigia repens</i>		+	+	+				+			+
<i>Epilobium hirsutum</i>	+		+				+	+	+		
<i>Epilobium sp.</i>	+	+	+		+	+	+	+			+
<i>Euphorbia exigua</i>					+			+	+		
<i>Fallopia convolvulus</i>									+		
<i>Festuca rubra</i>		+			+				+		
<i>Geranium dissectum</i>			+	+	+	+	+	+			+
<i>Holcus lanatus</i>						+			+		
<i>Kickxia elatine</i>											
<i>Kickxia spuria</i>						+					
<i>Leucanthemum vulgare</i>											
<i>Lolium perenne</i>	+										
<i>Malva moschata</i>									+		
<i>Myosotis arvensis</i>											
<i>Persicaria maculosa</i>											
<i>Picris echioides</i>						+			+		
<i>Plantago major</i>											
<i>Poa trivialis</i>						+			+		
<i>Prunella vulgaris</i>		+							+		
<i>Rumex crispus</i>									+		
<i>Rumex sanguineus</i>									+		
<i>Sambucus nigra</i>				+							
<i>Senecio vulgaris</i>	+		+		+	+		+		+	
<i>Sinapis arvensis</i>		+								+	
<i>Sonchus asper</i>		+	+			+		+	+	+	
<i>Taraxacum agg.</i>	+	+	+	+	+	+	+	+	+	+	+
<i>Trifolium repens</i>											
<i>Veronica hederifolia</i>									+		
<i>Veronica persica</i>						+					
No. of species per quadrat	7	9	11	5	9	12	5	9	18	10	7

Appendix F.1.3 Table showing species present in each quadrat together with species totals and percentage frequency – 1997 (Continued)

	D10	E6	E7	E8	F8	F9	No. of quadrats where species present	
							Total	%
<i>Aethusa cynapium</i>							4	24
<i>Agrostis stolonifera</i>							1	6
<i>Alopecurus myosuroides</i>			+	+	+		13	76
<i>Anagallis arvensis</i>	+	+		+	+	+	10	59
<i>Arrhenatherum elatius</i>						+	1	6
<i>Atriplex patula</i>	+						2	12
<i>Chamerion angustifolium</i>		+					1	6
<i>Centurea nigra</i>							1	6
<i>Chenopodium album</i>	+						2	12
<i>Chenopodium polyspermum</i>	+						2	12
<i>Cirsium arvense</i>		+	+				5	29
<i>Convolvulus arvensis</i>		+					3	18
<i>Elytrigia repens</i>	+						6	35
<i>Epilobium hirsutum</i>							5	29
<i>Epilobium sp.</i>		+		+		+	11	65
<i>Euphorbia exigua</i>							3	18
<i>Fallopia convolvulus</i>							1	6
<i>Festuca rubra</i>			+	+	+		6	35
<i>Geranium dissectum</i>	+	+	+	+	+	+	13	76
<i>Holcus lanatus</i>							2	12
<i>Kickxia elatine</i>		+					1	6
<i>Kickxia spuria</i>						+	2	12
<i>Leucanthemum vulgare</i>			+				1	6
<i>Lolium perenne</i>							1	6
<i>Malva moschata</i>		+					2	12
<i>Myosotis arvensis</i>				+			1	6
<i>Persicaria maculosa</i>	+						1	6
<i>Picris echiodes</i>				+			3	18
<i>Plantago major</i>		+					1	6
<i>Poa trivialis</i>							2	12
<i>Prunella vulgaris</i>							2	12
<i>Rumex crispus</i>				+			1	6
<i>Rumex sanguineus</i>	+						2	12
<i>Sambucus nigra</i>							1	6
<i>Senecio vulgaris</i>			+	+	+	+	10	59
<i>Sinapis arvensis</i>							2	12
<i>Sonchus asper</i>	+	+	+				9	53
<i>Taraxacum agg.</i>	+		+	+	+	+	16	94
<i>Trifolium repens</i>					+		1	6
<i>Veronica hederifolia</i>							1	6
<i>Veronica persica</i>							1	6
No. of species per quadrat	10	10	8	10	7	7	154	

Appendix F.1.4 Update of Vascular Plant Species List first recorded on site - 1995

<i>Briza media</i>	Quaking-grass
<i>Chenopodium polyspermum</i>	Many-seeded Goosefoot
<i>Glyceria declinata</i>	Small Sweet-grass
<i>Gnaphalium uliginosum</i>	Marsh Cudweed
<i>Lolium perenne</i>	Perennial Rye-grass
<i>Veronica chamaedrys</i>	Germander Speedwell

Appendix F.1.5 Update of Vascular Plant Species List first recorded on site - 1996

<i>Avena fatua</i>	Wild Oat
<i>Brachypodium sylvaticum</i>	False Brome
<i>Cichorium intybus</i>	Chicory
<i>Corylus avellana</i>	Hazel
<i>Geranium pratense</i>	Meadow Crane's-bill
<i>Senecio jacobaea</i>	Common Ragwort
<i>Viburnum opulus</i>	Guelder Rose (Planted)

F.2 TREE SURVEY

1996 & 1997

by

John and Audrey Prince

SUMMARY

In general the trees continued to grow satisfactorily without showing any significant differences in height or circumference although there was a tendency for Silver Birch to grow higher than either the Oak or Hornbeam.

1. SURVEY METHODS

The height and the circumference (at chest height) of the trees in the same selected grids as previously, were measured in February 1996, i.e. a delayed reading of the 1995 data. A similar delay in taking the 1996 readings occurred when the measurements were taken in January 1997.

Difficulty was experienced from time to time in that some of the tags and other means of identification were missing or obliterated but by using a compass and measuring tape the problem was resolved.

2. SITE VISITS

For 1995; February 1996.

For 1996; January 1997.

3. RESULTS

Details of individual measurements are given in Tables F.2.1 to F.2.5. A summary of the shortest, tallest and group mean heights of the trees on each of the occasions is given in Table F.2.6, together with the overall mean values for each species on both occasions. A summary of the circumferences on each of the occasions is given in Table F.2.7.

4. DISCUSSION

Overall, the tree heights of the Oak and Hornbeam in each of the years were similar whilst those of the Silver Birch began to show higher values. However, it was surprising that from 1995 to 1996, the percentage increase of all three species was about the same at c. 20%, so perhaps as previously these differences were not significant.

With respect to the tree circumferences, the Oak and Silver Birch in each of the years were similar, whereas with Hornbeam there was an indication that growth was slower. However, the differences were not great and there was an indication from the percentage increase from 1995 to 1996 that Hornbeam may be improving.

Table F.2.1

Measurements of Tree Heights & Circumferences - A6 & B5

Grid Code A6		Feb – 96 (for 95)		Jan – 97 (for 96)	
Tree No.	Type	Height	Circ.	Height	Circ.
1	Silver Birch	2.80	0.05	3.32	0.07
2	Oak	2.20	0.07	2.67	0.10
3	Hornbeam	1.85	0.04	2.17	0.07
4	Oak	2.50	0.07	2.64	0.10
5	Silver Birch	2.84	0.04	3.08	0.05
6	Oak	2.18	0.05	2.60	0.10
7	Hornbeam	0.94	0.00	1.12	0.00
8	Oak	3.12	0.08	3.52	0.11
9	Silver Birch	3.52	0.06	4.24	0.10
10	Oak	2.31	0.06	3.02	0.10
11	Hornbeam	2.33	0.05	2.56	0.08
12	Oak	3.12	0.09	3.37	0.13
13	Hornbeam	1.47	0.00	1.63	0.00
14	Oak	2.78	0.07	2.73	0.10
15	Hornbeam	1.83	0.03	2.23	0.06
16	Oak	1.32	0.00	1.68	0.00
17	Silver Birch	2.19	0.03	2.76	0.05
18	Hornbeam	2.28	0.05	2.67	0.06
19	Oak	2.80	0.06	3.34	0.09
20	Silver Birch	2.71	0.05	3.56	0.09
21	Oak	1.58	0.04	2.09	0.07
22	Hornbeam	0.36	0.00	1.02	0.00
23	Silver Birch	Tree Missing	Tree Missing	-	-
24	Not Listed				

Grid Code B5		Feb – 96 (for 95)		Jan – 97 (for 96)	
Tree No.	Type	Height	Circ.	Height	Circ.
1	Oak	2.23	0.06	2.65	0.09
2	Silver Birch	2.70	0.06	3.40	0.09
3	Oak	2.83	0.07	3.42	0.10
4	Hornbeam	2.16	0.06	2.60	0.07
5	Not Listed				
6	Oak	2.00	0.06	2.30	0.07
7	Silver Birch	2.43	0.05	3.20	0.09
8	Oak	2.40	0.07	2.48	0.08
9	Tree Missing				
10	Oak	2.11	0.04	2.56	0.07
11	Silver Birch	2.37	0.03	3.06	0.05
12	Oak	2.09	0.05	2.61	0.10
13	Hornbeam	1.62	0	1.96	0.05
14	Oak	2.15	0.05	2.59	0.09
15	Silver Birch	2.83	0.06	3.68	0.10
16	Oak	2.10	0.10	2.06	0.15
17	Tree Missing				
18	Oak	1.40	0	2.09	0.04
19	Hornbeam	1.64	0	1.80	0.03
20	Oak	1.61	0.03	1.84	0.04
21	Silver Birch	2.86	0.05	3.63	0.08
22	Oak	1.48	0.02	1.75	0.08
23	Hornbeam	1.80	0.04	2.14	0.06
24	Silver Birch	2.60	0.05	3.18	0.07

Table F.2.2

Measurements of Tree Heights & Circumferences - B6 & C7

Grid Code B6		Feb – 96 (for 95)		Jan – 97 (for 96)	
Tree No.	Type	Height	Circ.	Height	Circ.
1	Hornbeam	2.15	0.05	2.57	0.09
2	Oak	2.55	0.07	3.00	0.10
3	Silver Birch	3.13	0.07	3.57	0.08
4	Oak	2.66	0.08	3.24	0.13
5	Tree Missing				
6	Oak	3.01	0.09	3.33	0.14
7	Silver Birch	2.48	0.05	3.40	0.09
8	Tree Missing				
9	Oak	2.50	0.08	3.09	0.11
10	Hornbeam	1.58	0	1.96	0.04
11	Oak	2.58	0.07	3.08	0.10
12	Tree Missing				
13	Oak	2.78	0.09	3.42	0.14
14	Silver Birch	1.81	0.03	2.62	0.05
15	Oak	2.44	0.05	2.37	0.09
16	Hornbeam	2.02	0.04	2.35	0.09
17	Oak	1.2	0	1.57	0.04
18	Silver Birch	2.3	0.04	2.52	0.06
19	Hornbeam	2.5	0.06	2.90	0.08
20	Oak	2.53	0.06	3.20	0.10
21	Tree Missing				
22	Oak	2.17	0.04	2.78	0.08
23	Hornbeam	2.30	0.04	2.54	0.06
24	Not Listed				

Grid Code C7		Feb – 96 (for 95)		Jan – 97 (for 96)	
Tree No.	Type	Height	Circ.	Height	Circ.
1	Oak	3.3	0.12	3.72	0.16
2	Silver Birch	4.1	0.12	4.62	0.16
3	Oak	2.58	0.08	2.80	0.11
4	Hornbeam	2.26	0.05	2.85	0.10
5	Oak	2.06	0.06	2.46	0.09
6	Silver Birch	3.17	0.08	3.98	0.13
7	Oak	2.10	0.05	2.92	0.09
8	Tree Missing				
9	Oak	2.55	0.10	3.22	0.12
10	Hornbeam	2.07	0.04	2.46	0.06
11	Oak	2.25	0.11	3.05	0.15
12	Silver Birch	4.09	0.13	4.65	0.17
13	Oak	2.18	0.06	2.52	0.10
14	Oak	2.63	0.06	3.18	0.10
15	Hornbeam	1.99	0.04	2.32	0.07
16	Oak	2.21	0.06	2.65	0.11
17	Silver Birch	3.75	0.13	4.32	0.18
18	Oak	1.63	0.06	1.67	0.08
19	Oak	2.38	0.07	2.61	0.10
20	Tree Missing				
21	Oak	2.64	0.07	2.78	0.10
22	Silver Birch	2.40	0.04	2.87	0.06
23	Oak	2.87	0.10	3.33	0.16
24	Not Listed				

Table F.2.3

Measurements of Tree Heights & Circumferences – C10 & D6

Grid Code C10						Grid Code D6					
		Feb – 96 (for 95)		Jan – 97 (for 96)				Feb – 96 (for 95)		Jan – 97 (for 96)	
Tree No.	Type	Height	Circ.	Height	Circ.	Tree No.	Type	Height	Circ.	Height	Circ.
1	Silver Birch	2.81	0.07	3.85	0.12	1	Silver Birch	3.53	0.10	4.10	0.15
2	Oak	2.32	0.06	2.82	0.08	2	Oak	1.71	0	2.07	0.05
3	Oak	2.57	0.06	3.22	0.09	3	Hornbeam	2.31	0.06	2.75	0.09
4	Silver Birch	2.25	0.04	3.20	0.07	4	Oak	0.79	0	0.87	0
5	Oak	1.82	0.03	2.34	0.06	5	Silver Birch	1.98	0.02	2.56	0.05
6	Hornbeam	2.00	0.03	2.29	0.04	6	Oak	2.27	0.06	2.83	0.09
7	Oak	1.90	0.03	2.29	0.05	7	Hornbeam	1.63	0	1.82	0.03
8	Silver Birch	3.87	0.09	4.63	0.13	8	Oak	1.62	0.05	2.09	0.05
9	Oak	1.95	0.03	2.40	0.06	9	Hornbeam	1.97	0.04	2.46	0.06
10	Hornbeam	1.86	0.04	2.15	0.05	10	Oak	1.00	0	1.13	0
11	Oak	1.58	0.07	2.75	0.11	11	Silver Birch	3.55	0.10	4.45	0.16
12	Silver Birch	3.05	0.06	3.95	0.09	12	Oak	2.10	0.05	2.35	0.08
13	Oak	2.54	0.11	2.80	0.14	13	Hornbeam	1.88	0.05	2.41	0.09
14	Tree Missing					14	Oak	2.20	0.06	2.58	0.05
15	Hornbeam	1.75	0.02	2.20	0.04	15	Oak	1.73	0.04	1.93	0.14
16	Oak	2.02	0.06	2.73	0.09	16	Silver Birch	4.20	0.10	5.08	0.11
17	Silver Birch	2.98	0.06	3.76	0.08	17	Oak	2.87	0.07	3.47	0.11
18	Oak	2.22	0.05	2.85	0.09	18	Hornbeam	2.00	0.05	2.53	0.07
19	Silver Birch	Tree Missing	Tree Missing			19	Oak	2.30	0.07	2.63	0.09
20	Oak	2.18	0.06	2.6	0.09	20	Silver Birch	4.20	0.10	5.15	0.16
21	Oak	2.64	0.09	3.2	0.14	21	Silver Birch	3.73	0.08	4.53	0.12
22	Hornbeam	2.12	0.06	2.74	0.06	22	Oak	2.84	0.08	3.22	0.13
23	Oak	2.33	0.05	2.69	0.08	23	Hornbeam	2.33	0.04	2.70	0.06
24	Tree Missing					24	Oak	1.87	0.05	2.12	0.06
25	Oak	2.40	0.06	2.82	0.09						

Table F.2.4

Measurements of Tree Heights & Circumferences – D8 & D9

Grid Code D8		Feb – 96 (for 95)		Jan – 97 (for 96)	
Tree No.	Type	Height	Circ.	Height	Circ.
1	Silver Birch	3.40	0.07	4.07	0.10
2	Oak	2.26	0.06	2.85	0.09
3	Hornbeam	1.40	0	1.76	0.03
4	Oak	1.98	0.06	2.43	0.09
5	Silver Birch	3.78	0.10	4.52	0.15
6	Oak	1.65	0.04	1.79	0.06
7	Hornbeam	2.43	0.05	3.00	0.07
8	Oak	2.10	0.05	2.65	0.09
9	Tree Missing				
10	Oak	2.47	0.08	3.04	0.11
11	Silver Birch	3.90	0.08	4.46	0.10
12	Oak	2.60	0.08	3.25	0.13
13	Hornbeam	1.69	0	1.97	0.03
14	Oak	2.03	0.06	2.43	0.10
15	Silver Birch	2.90	0.05	3.74	0.09
16	Oak	2.10	0.04	2.57	0.07
17	Oak	2.85	0.10	3.18	0.15
18	Silver Birch	2.27	0.05	2.46	0.07
19	Oak	2.36	0.07	2.80	0.10
20	Hornbeam	2.59	0.05	3.09	0.08
21	Oak	2.25	0.06	2.83	0.09
22	Hornbeam	1.95	0.02	2.30	0.05
23	Silver Birch	2.95	0.06	3.66	0.10
24	Not Listed				

Grid Code D9		Feb – 96 (for 95)		Jan – 97 (for 96)	
Tree No.	Type	Height	Circ.	Height	Circ.
1	Oak	2.19	0.05	2.60	0.06
2	Hornbeam	1.92	0.03	2.43	0.05
3	Oak	1.77	0.05	2.27	0.06
4	Silver Birch	3.05	0.07	3.80	0.10
5	Oak	2.00	0.10	2.60	0.15
6	Hornbeam	2.38	0.05	2.85	0.08
7	Oak	1.86	0.04	2.39	0.05
8	Hornbeam	2.50	0.06	3.14	0.10
9	Oak	1.85	0.03	2.00	0.05
10	Silver Birch	3.07	0.07	3.79	0.12
11	Oak	1	0	1.25	0
12	Hornbeam	2.40	0.06	3.03	0.08
13	Silver Birch	3.02	0.11	3.38	0.12
14	Oak	2.82	0.08	3.48	0.12
15	Hornbeam	1.95	0.03	2.22	0.05
16	Oak	1.80	0.05	2.38	0.07
17	Silver Birch	4.13	0.12	4.73	0.14
18	Oak	2.50	0.08	3.03	0.11
19	Oak	2.27	2.27	2.50	0.12
20	Hornbeam	2.27	2.27	2.64	0.06
21	Oak	2.46	2.46	3.16	0.09
22	Tree Missing				
23	Oak	1.40	0.04	1.76	0.06
24	Hornbeam	1.57	0.01	1.85	0.02

Table F.2.5

Measurements of Tree Heights & Circumferences – E8 & F9

Grid Code E8		Feb – 96 (for 95)		Jan – 97 (for 96)	
Tree No.	Type	Height	Circ.	Height	Circ.
1	Oak	1.94	0.04	2.74	0.09
2	Hornbeam	2.24	0.10	2.44	0.13
3	Hornbeam	1.83	0.04	2.37	0.06
4	Oak	2.45	0.09	3.12	0.13
5	Silver Birch	2.41	0.08	4.08	0.13
6	Oak	1.58	0.04	2.32	0.06
7	Hornbeam	1.90	0.04	2.32	0.06
8	Oak	1.96	0.05	2.93	0.09
9	Hornbeam	1.66	0.02	2.01	0.04
10	Oak	2.40	0.07	2.97	0.10
11	Silver Birch	3.13	0.06	3.83	0.10
12	Oak	2.32	0.06	2.92	0.10
13	Silver Birch	2.80	0.07	3.42	0.10
14	Oak	1.58	0.07	3.14	0.12
15	Hornbeam	1.85	0.05	2.39	0.09
16	Oak	2.65	0.08	2.90	0.14
17	Silver Birch	2.38	0.05	3.05	0.07
18	Oak	2.60	0.10	3.07	0.11
19	Hornbeam	2.30	0.05	2.89	0.07
20	Oak	2.67	0.08	3.22	0.12
21	Hornbeam	1.70	0.04	2.14	0.06
22	Oak	1.60	0.04	1.75	0.05
23	Not Listed				
24	Not Listed				

Grid Code F9		Feb – 96 (for 95)		Jan – 97 (for 96)	
Tree No.	Type	Height	Circ.	Height	Circ.
1	Silver Birch	3.55	0.09	4.37	0.12
2	Hornbeam	2.47	0.07	2.87	0.10
3	Oak	2.97	0.07	3.72	0.12
4	Silver Birch	2.32	0.07	4.12	0.11
5	Oak	2.47	0.06	2.77	0.09
6	Hornbeam	2.47	0.06	2.84	0.08
7	Oak	2.10	0.04	2.77	0.08
8	Silver Birch	4.18	0.11	4.80	0.14
9	Oak	1.99	0.05	2.52	0.08
10	Hornbeam	2.58	0.05	3.06	0.09
11	Oak	2.41	0.06	2.73	0.10
12	Oak	2.70	0.08	3.01	0.13
13	Silver Birch	3.73	0.07	4.47	0.11
14	Oak	2.61	0.07	2.90	0.11
15	Hornbeam	2.46	0.06	3.02	0.09
16	Oak	3.16	0.07	3.36	0.09
17	Silver Birch	3.00	0.05	3.47	0.09
18	Oak	1.78	0.05	2.00	0.09
19	Silver Birch	2.54	0.04	3.41	0.07
20	Oak	2.34	0.05	2.50	0.10
21	Hornbeam	1.96	0.05	2.22	0.08
22	Oak	2.14	0.04	2.77	0.07
23	Oak	2.53	0.06	3.12	0.11
24	Oak	2.52	0.07	3.00	0.13

Table F.2.6

Summary of Tree Heights

Date & Grid Code	OAK				SILVER BIRCH				HORNBEAM			
	No.	Shortest	Tallest	Mean	No.	Shortest	Tallest	Mean	No.	Shortest	Tallest	Mean
<u>1995</u>												
A6	10	1.32	3.12	2.39	5	2.19	3.52	2.81	7	0.36	2.33	1.58
B5	11	1.40	2.83	2.04	6	2.37	2.86	2.63	4	1.62	2.16	1.80
B6	10	1.2	3.01	2.44	4	1.81	3.13	2.43	5	1.58	2.50	2.11
C7	13	1.63	3.30	3.51	5	2.07	4.10	3.50	3	1.99	2.26	2.10
C10	13	1.58	2.64	2.19	5	2.25	3.87	2.99	4	1.75	2.12	1.93
D6	12	0.79	2.87	1.94	6	1.98	4.20	3.53	6	1.63	2.33	2.02
D8	11	1.65	2.85	2.24	6	2.27	3.90	3.20	5	1.40	2.59	2.01
D9	12	1.00	2.82	1.99	4	3.02	4.13	3.32	7	1.57	2.50	2.14
E8	11	1.58	2.67	2.16	4	1.66	3.13	2.68	7	1.66	2.30	1.92
F9	13	1.78	3.15	2.44	6	2.32	4.18	3.22	5	1.96	2.58	2.39
Summary	116			2.22	51			3.05	53			1.99
<u>1996</u>												
A6	10	1.68	3.52	2.77	5	2.76	4.24	3.39	7	1.02	2.67	1.91
B5	11	1.75	3.42	2.40	6	3.06	3.68	2.82	4	1.80	2.60	2.13
B6	10	1.57	3.42	2.90	4	2.52	3.57	3.03	5	1.96	2.90	2.46
C7	13	1.67	3.72	2.84	5	2.87	4.65	4.09	3	2.32	2.85	2.54
C10	13	2.29	3.22	2.73	5	3.76	4.63	3.88	4	2.15	2.74	2.35
D6	12	0.87	3.47	2.27	6	2.56	5.15	4.34	6	1.82	2.75	2.44
D8	11	1.79	3.25	2.71	6	2.46	4.52	2.82	5	1.76	3.09	2.42
D9	12	1.25	3.48	2.45	4	3.38	4.73	3.92	7	1.85	3.14	2.60
E8	11	1.75	3.22	2.82	4	3.05	4.08	3.60	7	2.01	2.89	2.37
F9	13	2.00	3.72	2.86	6	3.41	4.80	3.53	5	2.22	3.06	2.80
Summary	116			2.65	51			3.65	53			2.39
% increase 96/95				19				20				20

Table F.2.7

Summary of Tree Circumferences

Date & Grid code	OAK		SILVER BIRCH		HORNBEAM	
	Number	Mean	Number	Mean	Number	Mean
<u>1995</u>						
A6	10	0.059	5	0.046	7	0.025
B5	11	0.050	6	0.050	4	0.025
B6	10	0.063	4	0.048	5	0.038
C7	13	0.078	5	0.100	3	0.044
C10	13	0.054	5	0.064	4	0.028
D6	12	0.044	6	0.083	6	0.040
D8	11	0.063	6	0.068	5	0.024
D9	12	0.053	4	0.093	7	0.039
E8	11	0.066	4	0.065	7	0.049
F9	13	0.059	6	0.071	5	0.058
Summary	116	0.059	51	0.069	53	0.036
<u>1996</u>						
A6	10	0.090	5	0.072	7	0.039
B5	11	0.083	6	0.080	4	0.053
B6	10	0.103	4	0.070	5	0.072
C7	13	0.113	5	0.140	3	0.077
C10	13	0.083	5	0.098	4	0.048
D6	12	0.071	6	0.125	6	0.067
D8	11	0.098	6	0.102	5	0.044
D9	12	0.079	4	0.120	7	0.063
E8	11	0.101	4	0.100	7	0.073
F9	13	0.100	6	0.107	5	0.088
Summary	116	0.092	51	0.102	53	0.063
% increase 96/95		56		48		75

F.3 BRYOPHYTES

1995, 1996 & 1997

by

Frances Higgs

1995

SUMMARY

Progress with sample sites was very limited but useful observations were made elsewhere. The number of identified taxa continues to grow.

1. INTRODUCTION

One previously unworked sampling site B4 was located and surveyed. Further points could not be located or, if found, not identified.

2. SURVEY METHODS

As the sampling points proved a problem, time was spent on South Glade, South-east ride, North Bucks Way Hedge, North Hedge and corner, East Hedge, Cross Hedge, Cropside and East Path, as highlighted on Map F.3.1. It was my first foray into hedges and ditches.

3. SITE VISITS

One visit was made on March 10th with Clare Mahaddie. Some areas were still flooded and the site was generally very wet.

4. RESULTS

- Exploration of hedges, hedge-bottoms and ditches proved to be fruitful.
- Epiphytic species are established in these sites including the first liverwort to be recorded – *Lophocolea heterophylla*.

- The species list grew considerably.
- *Weissia* species continue to appear on patches of bare soil.
- *Tortula muralis* var. *muralis* was found growing on hard packed soil.
- No bryophytes were established on the Cropside mound but casual observations were made along the first tree row on the opposite edge of the path.
- *Weissia* material from C10 in 1993 has since been interpreted as *W. microstoma* var. *brachycarpa*.

Table F.3.1 – Results - 1995

	B4	A	B	C	D	E	F&G	H	L	Casual
<i>Amblystegium riparium</i>	*									
<i>A. serpens</i> var. <i>serpens</i>							*			
<i>Aulacomnium androgynum</i>		*					*	*		
<i>Barbula unquiculata</i>	*	*		*	*					*
<i>Brachythecium rutabulum</i>		*		*			*		*	
<i>Bryum bicolor</i>										*
<i>B. rubens</i>										*
<i>Caliergon cuspidatum</i>	*	*								
<i>Ceratodon purpureus</i>						*				*
<i>Crataneuron filicinum</i> var. <i>filicinum</i>			*							
<i>Dicranoweissia cirrata</i>		*					*		*	
<i>Dicranella schreberana</i>										*
<i>Eurhynchium praelongum</i> var. <i>praelongum</i>	*	*					*		*	*
<i>E. swartzii</i> var. <i>swartzii</i>		*								
<i>Fissidens taxifolius</i> ssp. <i>taxifolius</i>	*									*
<i>Hypnum cupressiforme</i> var. <i>cupressiforme</i>		*					*	*	*	
<i>H. cupressiforme</i> var. <i>lacunosum</i>									*	
<i>H. cupressiforme</i> var. <i>resupinatum</i>		*						*	*	
<i>Lophocolea heterophylla</i>		*					*	*	*	
<i>Orthodontium lineare</i>									*	
<i>Pottia truncata</i>										*
<i>Phascum cuspidatum</i> var. <i>cuspidatum</i>										*
<i>Rhynchostegium confertum</i>		*					*		*	
<i>Tortula muralis</i> var. <i>muralis</i>										*
<i>Weissia longifolia</i> var. <i>augustifolia</i>										*
<i>W. sp. sterile material</i>										*

Key

A	North Bucks Way	D	South-east Ride	G	North West Hedge
B	South Glade	E	East Path	H	Cross Hedge
C	Cropside	F	North Hedge	L	East Hedge

5. CONCLUSION

The site is quite rich in moss species, especially acrocarps and there are likely to be yet more to find.