

**Invertebrate surveys of
Broadwater Warren RSPB reserve
2007**

by Patrick Roper

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Introduction

In February 2007 Patrick Roper of Patrick Roper Associates was commissioned by the RSPB to undertake invertebrate surveys of the Broadwater Warren reserve that had been recently acquired by their organisation.

The aims of the survey were:

- To assess the conservation value of the mires and wet woodland along the valley.
- To assess the conservation value of areas that are currently classed as 'Ancient Woodland' but comprise a grass/*Calluna* mix in the SW of the reserve.
- To assess the relative value of coniferous woodland in comparison with existing heathy areas, such as along the edge of the main ride running NW across the site.
- To suggest any changes in management which should be considered in order to improve the reserves for Diptera and other wildlife.

Methodology

In 2007 the site was visited on 16 February, 29 May, 12 June, 20 June, 6 July, 28 July, 25 August and 8 September and, on each occasion, several different habitats were surveyed using the marked up map supplied by the RSPB manager Martin Allison.

Most of the insects were netted, or caught by general sweeping, or detailed examination of tree trunks, moss, dead wood etc. Some well-known species were identified in the field, but most taken home by the author for microscopic examination. Many species had to be dissected to confirm identity.

Voucher specimens have been retained of the majority of invertebrates recorded.

Site description

The reserve is in East Sussex and lies to the south of Tunbridge Wells. It comprises 180 hectares of wet and dry heath, grass heath, valley mire, open water and ancient woodland and wood pasture much of which has been planted with conifers now between 4 and 50 years old.

The site almost entirely overlays the Cretaceous Ashdown Beds with a small area of alluvium along the stream immediately to the east of Broadwater Bridge. It rises from just under 55 metres above sea level at this bridge to slightly over 105 metres on the east of the site and straddles a wide, shallow valley with a central stream running from the south east to the north west and fed by several small tributaries. Warren Pond, the largest area of still water, lies just to the east of the centre of the site and there are various other small pools and ponds, mainly close to the central valley or the tributary streams.

For South East England, the site is relatively remote from any major conurbation and the centre of the site is about as far as one can get in the High Weald from roads or agricultural areas. The altitude and the inland situation are likely to give the site a more extreme range of climatic conditions, with warmer temperatures in summer and colder ones in winter than places in the Weald at lower altitudes and closer to the coast. This can have a significant effect on the invertebrate species profile.

Nearly 400 separate records were made comprising 282 species, mostly of invertebrates with an emphasis on diptera (two-winged flies), for which family the author of this paper is Sussex County Recorder. A few plants and vertebrates were also recorded where this seemed worthwhile. The following invertebrates have special status:

<i>Spania nigra</i> , Liverwort snipefly	Nationally notable
<i>Dolichopus virgultorum</i>	Nationally notable
<i>Rhaphium lanceolatum</i>	Nationally notable
<i>Pseudolyciella stylata</i>	RDBK
<i>Limenitis camilla</i>	UK BAP Priority Species

Habitats

Heathland

Broadwater Warren has much heathland along the edges of the wider rides and in some of the younger conifer plantations. The heather (*Calluna*) and associated plants are quickly shaded out by trees but return readily after clear felling. Broadwater Warren is sufficiently large and varied to have allowed continuity of heathland habitat as woodlands of various ages were felled for timber and replanted or allowed to regrow, so heathland invertebrates have been able to move around the area along the rides as habitat opportunities became available.

Areas of permanent, or semi-permanent heathland should be established and managed to optimise biodiversity. It is understood that plans are well advanced for grazing of these and other areas and, in addition to keeping the heaths open and species rich, this will provide a further invertebrate niche through dung-free of Ivermectin and other anti-parasite animal medications.

There are many generalist invertebrates that flourish in heathland but the following are among the more specialist species that were recorded during the survey:

Hemiptera/Auchenorrhyncha

Elasmostethus interstinctus
Kleidocerys trunculatus
Ulopa reticulata

Coleoptera

Ampedus balteatus
Luperus longicornis

Diptera

Tipula cava
Dolichopus atripes
Hercostomus aerosus
Sphaerophoria batava
Sphaerophoria virgata
Suillia dumicola

Wetlands

The wetlands at Broadwater are of considerable significance and are clearly home to a very wide range of species. Habitats like tussock sedge alder carr, sphagnum bogs and mires, Warren pond and the various smaller pools, the streams both permanent and temporary, the marshy areas and even small habitats like ditches and water-filled ruts in the rides all have their own complement of species. Many of these will use nearby flowery areas like grassland and ride sides as feeding areas, so the combination of permanently moist, shady areas and more open places is of great importance.

As has been mentioned above, although many wetland species were recorded, most seem to be mud-dwelling in their early stages rather than species of open water. One would expect many Chironomidae (non-biting midges) in habitats of this quality, but very few were encountered. As the males of many species swarm during the evening, they are easy enough to find, but no swarms at all were seen. While there has been a general decline in aquatic insects everywhere in England over the years, there may be some particular factors affecting the quality of stream water at the survey site and this should be further investigated. Apart from their intrinsic interest, Chironomidae and other insects with airborne adult stages are an extremely important food resource for birds, bats, other mammals and invertebrates.

Most of the wetlands can be managed with minimum intervention, but it is suggested that one of the sphagnum areas is opened up to full sunlight as there is very little that is not in heavy shade. This should be done gradually and with great care, perhaps by reference to open bogs and mires in places like Ashdown Forest.

There should also be more light in at least some of the tussock sedge areas, perhaps best achieved by selective tree thinning. The author of this paper knows of several former tussock sedge colonies in Sussex that died out due to over-shading by trees.

Effort could usefully be made to try and establish the invertebrates that live in the stools of tussock sedge, perhaps through an emergence trapping programme.

Natural England (as English Nature) have, among the future actions for the invertebrate fauna of acid mires in England, recommended “invertebrate surveys of lowland valley mires in Dorset, Hampshire, Surrey, Sussex and Berkshire. Though some sites within these areas have been well surveyed, there are still a number of others for which we have very little invertebrate information. Given the high importance of the lowland valley bogs of southern England for the conservation of acid mire invertebrates, it is important that we improve our knowledge of the overall resource.” (Boyce, 2004).

Broad-leaved woodland

Like the other habitats, the broad-leaved ancient woodland and former wood pasture at Broadwater are rich in characteristic invertebrates. The presence of the white-admiral butterfly, a honeysuckle-feeder, is, for example, a good indication that there are many as yet unrecorded insect species in the woods as this butterfly is almost confined to large woodland blocks where detailed search has revealed considerable biodiversity.

If a more open structure can be achieved, through the recommencement of coppicing or grazing with selected thinning, wildlife should benefit further. A percentage of trees should be selected to grow unimpeded to old age and eventually death and some areas of woodland should be managed by minimum intervention. There should also be liaison with the management at places like Eridge Park and Hargate forest to develop and maintain landscape scale conservation strategies.

Coniferous woodland

At the request of Martin Alison, survey work was conducted deep within some of the mature and sub-mature conifer plantations.

They were relatively species-rich, though biomass poor. Many of the diptera recorded are associated with decaying deciduous stumps, and some, no doubt with decaying conifer wood. Others are fungus specialists and pine woods are usually rich in fungi. Where there were mature quite widely spaced trees there was an understorey of bramble, often summer-flowering, bracken and other plants which allows a greater insect diversity than in a monoculture. While some invertebrates are, no doubt, blown into conifer plantations and wander into them accidentally or while being pursued, many are probably quite at home there. However, the only conifer specialist identified was the brown lacewing, *Hemerobius nitidulus*, associated with Scot's pine.

Species

In general, Broadwater Warren has shown itself through this survey as a very species-rich reserve. While much of this is due to the lack of human impact and the relatively remote location as well as the combination of different habitats, much is due to the synergy between different habitat types and the ecotone effects as these merge from one into the other.

A curious factor is that on none of the survey visits did insects seem particularly abundant. Indeed, on some days they seemed to be decidedly scarce and this did not seem to be because the season was generally poor. One visit was made on a calm, warm evening in mid-June with the express purpose of finding insects, particularly Diptera Nematocera, swarming. No swarms at all were seen and the author of this paper has often been in habitats of far lesser quality where swarms were almost continuous under such conditions. On another occasion it was noted that butterflies were low in numbers: only one meadow brown and two or three gatekeepers were seen on warm, sunny afternoon, but in the garden of the author of this paper and elsewhere they were present in some quantity.

So, though although overall insect biomass may be rather small, species diversity is large and it is difficult to suggest why this might be. In many areas wood ants, *Formica rufa*, are very abundant, their mounded nests occurring within a few metres of one another along the sides of the rides and in other suitable well insulated places. This particular ant is not present in all Wealden woods for reasons that are not clear and they must consume enormous quantities of invertebrates, especially in their early stages, but what effect this has on invertebrate populations generally is not understood. The ant populations seem to be stable year on year, so whatever species they eat, there are clearly enough to renew the supply the following year.

Of particular significance at Broadwater are the assemblages of closely related insect species. Six species of *Dolichopus* were for example, recorded, four *Sphaerophoria* and three of the four British *Phasia* species. Even good quality sites usually do not have such extensive ranges of closely related species. One explanation may be the wide range of niche habitats available (and their long continuity) that meet the precise requirements of each particular species.

There was also, as might be expected, a large number of saproxylic and fungivorous species, particularly in the broad-leaved and coniferous woods. If surveying had continued into October and November, no doubt many more species would have been recorded as autumn is their peak period. Their presence in the coniferous woods may seem to imply that these are more-species rich than commonly imagined, but there are usually both dead wood and fungi in these places and many of the species involved are catholic in their tastes. It is clearly important, in conservation terms, to maintain and increase the volume of dead wood, both standing and fallen, in shade and in sun, throughout the reserve both for the benefit of invertebrates, vertebrates and dead wood plants.

Very few water-breeding non-biting midges were recorded and one would expect these to occur in large swarms both in summer and to a lesser extent in the colder months. Such an abundance does, of

course, provide a major food source for birds, bats and a wide range of other vertebrates and invertebrates, so the low numbers of these insects in a place where they would be expected to occur is of concern. Chironomids and other insects that breed in mud do not seem to have suffered this decline in numbers to the same extent, so the problem may have something to do with water quality and this is an aspect that could merit further investigation.

There were also surprisingly few picture-winged flies (Tephritidae), although various species are usually quite abundant on the flowers of their host plants. The only species recorded was *Tephritis cometa*, associated with creeping thistle, *Cirsium arvense*. This may be to do with the management of the rides along which the flowers with which this family is associated grow.

Some species, e.g. the dance fly (Empididae) *Trichopeza longicornis*, appear to be quite common at Broadwater Warren, but have either not been recorded elsewhere in the Sussex Weald or only from nearby locations such as High Rocks or Nap Wood. This could indicate that they prefer the conditions in this more central, acid part of the Weald.

Other species like *Neurohelea luteitarsis* and *Sphaerophoria virgata* are commoner in the north and west of Britain and at Broadwater may represent a relict fauna of the type found quite widely in the High Weald.

The status of many Diptera found in the region is often difficult to evaluate as there are few people in Sussex recording this family. Apart from the author of this paper, the main recorders in recent years have been Peter Hodge, Steven Falk and Alan Stubbs with a few brief visits from members of the Dipterists Forum. Laurence Clemons has also done much work on the adjacent areas in Kent and many species have been found quite widely by these workers. However, many of the insects recorded at Broadwater have not been encountered in Sussex or nearby Kent by any of these recorders and are therefore likely to be scarce, declining or confined to particular habitats.

Unlike, say, butterflies and moths, many Diptera are too poorly known to be given an official status and there are several species in Sussex that have been recorded as British only once, but do not get an RDB or notable status because they are 'poorly known'. Some of these appear to be endemic.

Much of the literature concerning British Diptera was published in the last century, up to fifty or more years ago. While there have been British and European updates essential for identification purposes, there is often little data concerning distribution and status. Many species that were said to be common in the past may, like the pearl-bordered fritillary butterfly, have undergone declines and an absence of any recent records may indicate a species that is struggling or confined increasingly to favourable areas.

Thus any species that has not been widely recorded elsewhere in Sussex or nearby Kent should be regarded as particularly worthy of conservation at Broadwater.

Many of the species mentioned below were recorded in Sedlescombe, a village a few kilometres north of Hastings. This is where the author of this paper has lived for many years and these records are mostly from his garden (TQ782188) or nearby. This again highlights the fact that many species are simply under-recorded.

Invertebrates

Isopoda: Porcellionidae

Porcellio scaber, A woodlouse

At TQ548368 - heath and pine south east of Broadwater Bridge - on 29/05/2007. Almost certainly common. A systematic investigation of Broadwater woodlice would be likely to reveal many more species.

Collembola: Entomobryidae

Entomobrya nivalis, A springtail

At TQ556364 - immediately south of Warren Pond stream - on 29/05/2007. One of the commonest species and found everywhere in the region.

Odonata: Calopterygidae

Calopteryx virgo, Beautiful Demoiselle

At TQ546369 - peaty pools area south of Broadwater Bridge - on 06/07/2007. A species that breeds in fast-flowing streams. Widespread in the Weald.

Odonata: Cordulegasteridae

Cordulegaster boltonii, Golden-ringed dragonfly

At TQ558365 – open ride north of Warren Pond - on 25/08/2007. Described as a scarce species in Sussex (Belden et al., 2004). Found across the High Weald in East Sussex and Kent. Breeds in lake outlets and moderate to fast flowing streams.

Odonata: Aeshnidae

Aeshna cyanea, Southern Hawker

At TQ546369 - peaty pools area south of Broadwater Bridge - on 06/07/2007. Widespread in southern England.

Note: The migrant hawker, *Aeshna mixta*, was recorded by John Luck, Sussex dragonfly recorder, at Broadwater Warren in August 2007.

Plecoptera: Nemouridae (Stoneflies)

Nemoura cambrica

Along the central stream at TQ556365 and elsewhere on 29/05/2007. A widespread species that breeds in small streams with accumulations of leaves.

Plecoptera: Leuctridae (Stoneflies)

Leuctra nigra,

Along the central stream at TQ556365 and elsewhere on 29/05/2007. A widespread species of small streams where it prefers silty reaches.

Psocoptera: Psocidae (Bark lice)

Metylophorus nebulosus, A bark louse

At TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007. There is only one other Sussex record in the Sussex Biodiversity Record Centre database, from Sedlescombe in 1994 by the author of this report, but it is undoubtedly under-recorded.

Hemiptera: Acanthosomatidae (Shieldbugs)

Elasmostethus interstinctus, Birch shieldbug

At TQ548368 - heath and pine south east of Broadwater Bridge - on 29/05/2007. A widespread species.

Hemiptera: Pentatomidae (Pentatomid plant bugs)

Picromerus bidens

At TQ558366 - north west ride east of cross rides - on 08/09/2007. A predatory shieldbug. Widely distributed in Britain. Shows a preference for places with rich low vegetation - woodland rides and edges and the margins of marshes.

Hemiptera: Rhopalidae (Rhopalid plant bugs)

Rhopalus subrufus, A rhopalid plant bug

At TQ556369 – along open north west ride - on 25/08/2007. A fairly frequent species in southern England. Most commonly associated with perforate St. Johnswort, *Hypericum perforatum*.

Hemiptera: Lygaeidae (Groundbugs)

Kleidocerys truncatulus, A groundbug

At TQ548368 - heath and pine south east of Broadwater Bridge - on 29/05/2007. A heather feeding ground bug. Widely distributed in suitable heathland areas in Sussex

Kleidocerys resedae, A groundbug

At TQ558364 - Warren Pond - on 29/05/2007 and TQ560372 on 16/02/2007. A common species associated with various broadleaved trees.

Hemiptera: Berytinidae (Stiltbugs)

Metatropis rufescens, A stiltbug

At TQ553364 - ancient wet woodland - on 20/06/2007. A stiltbug that feeds on enchanter's nightshade, *Circaea lutetiana*, in woodland. Once very uncommon, it has extended its range in recent decades and is now frequent throughout the southern half of England though still with only 5 other Sussex records in the Sussex Biodiversity Record Centre database in the last hundred years.

Hemiptera: Nabidae (Damselbugs)

Broad Damselbug, *Nabicula flavomarginata*

At TQ556369 - along open north west ride - on 25/08/2007. A common damselbug in the British Isles.

Hemiptera: Cimicidae

Orius niger, A cimicid bug

At TQ558366 - north west ride east of cross rides - on 08/09/2007. A widespread bug associated with low growing plants.

Hemiptera: Miridae (Capsid bugs)

Bracken Bug, *Monalocoris filicis*

At TQ551369 - within mature pine plantation - on 29/05/2007. A common and widely distributed plant bug found throughout Britain wherever bracken, the principal foodplant, and other ferns grow. It feeds chiefly on the sporangia.

Fine Streaked Bugkin, *Miris striatus*

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. An oak-feeding plant bug found throughout Britain. Sometimes regarded as a local species, especially in the south, but probably generally fairly common and often escaping attention by being high in trees. Only recorded from half a dozen other locations in Sussex in the Sussex Biodiversity Record Centre database.

Notostira elongata, a grassbug

At TQ558366 - north west ride east of cross rides - on 08/09/2007. A common and widely distributed, though predominantly southern, grassbug which is found in a wide variety of grassy places.

Auchenorrhyncha: Cercopidae

Cuckoo-Spit Insect, *Philaenus spumarius*

At TQ559364 - ancient wet woodland south east of Warren Pond - on 20/06/2007 and TQ552369 on 06/07/2007. Probably occurs throughout Broadwater – a generally common species in the British Isles.

Neophilaenus lineatus, a froghopper

At TQ556369 - along open north west ride - on 25/08/2007. An abundant grass-feeding species.

Auchenorrhyncha: Cicadellidae

Ulopa reticulata, a leaf hopper

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007 and TQ558366 - north west ride east of cross rides - on 08/09/2007. A widespread hopper associated with *Erica* and *Calluna*. One example has well-developed hindwings (an unusual feature in this species) and is very pale. Further work will be done on this.

Graphocephala fennahi, Rhododendron leaf hopper

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007 and TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007. Abundant at Broadwater wherever its foodplant *Rhododendron ponticum* occurs. An introduced species, now widely distributed and generally common in southern Britain.

Auchenorrhyncha: Cixiidae

Cixius cunicularius, a lace-winged planthopper

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. Often found near streams; nymphs at ground level, adults on low vegetation or overhanging trees and bushes. Widely distributed but local. There are no other records in the Sussex Biodiversity Record Centre database.

Cixius nervosus, A lace-winged planthopper

At TQ556364 - immediately south of Warren Pond stream - on 29/05/2007. The commonest species of the genus. Widely distributed in Sussex and elsewhere in the UK.

Auchenorrhyncha: Cercopidae

Ditropis pteridis, A cercopid planthopper

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. A small black and yellow hopper that lives on bracken. Widespread but with only three Sussex locations recorded in the Sussex Biodiversity Record Centre database.

Auchenorrhyncha: Psyllidae

Psylla peregrina, A jumping plant louse

At TQ558364 - Warren Pond - on 12/06/2007. A common species that lives on hawthorn (*Crataegus*) but with only two previous records in the Sussex Biodiversity Record Centre database – in 1901 and 2001.

Neuroptera: Chrysopidae

Chrysopa perla, A green lacewing

At TQ548368 - heath and pine south east of Broadwater Bridge - on 29/05/2007 and In 1km square TQ5536 on 29/05/2007. Frequent in the undergrowth of deciduous woods throughout Britain. Widely recorded in Sussex.

Chrysopidia ciliata, A green lacewing

At TQ558364 - Warren Pond - on 12/06/2007. A widespread species of deciduous woodland. There are two records in the Sussex Biodiversity Record Centre database from West Sussex, but this is the first for East Sussex.

Neuroptera: Hemerobiidae

Hemerobius micans, A brown lacewing

At TQ558364 - Warren Pond - on 20/06/2007. A widespread species associated with broadleaved woodland. Only a few widely scattered records in the Sussex Biodiversity Record Centre database.

Hemerobius nitidulus, A brown lacewing

At TQ549367 - interior of mature pine plantation - on 06/07/2007. A widely species associated with conifers, apparently with a preference for Scot's pine (*Pinus sylvestris*). The only other Sussex record in the Sussex Biodiversity Record Centre database is from Old Lodge in Ashdown Forest.

Coleoptera: Elateridae

Ampedus balteatus, A click beetle

At TQ546366 - heathy woodland area - on 06/07/2007. A widespread but local species associated with red rotted birch and peat. Scattered records in suitable places in Sussex.

Coleoptera: Coccinellidae

Tytthaspis sedecimpunctata, 16-spot ladybird

At TQ558364 - Warren Pond - on 29/05/2007. A widespread species of marshy places in Sussex.

Coleoptera: Chrysomelidae

Donacia marginata, A reed beetle

In 1km square TQ5536 on 29/05/2007. Larvae feed in nodules on the roots of *Sparganium* and *Carex* in standing water. Widespread in suitable places in Sussex.

Gastrophysa viridula, Green Dock Beetle

In 1km square TQ5536 on 29/05/2007. A species that leaves on docks (*Rumex* sp.). Found locally in wetlands and damp, unimproved meadows but apparently rare in Sussex with records only from

Sedlescombe and the Lewes area, both in East Sussex.

Luperus longicornis, A leaf beetle

In 1km square TQ5536 on 29/05/2007. A common beetle associated with young birch throughout the British Isles. Widespread in Sussex, mostly in ancient heathlands and parkland.

Crepidodera transversa, A flea beetle

At TQ556369 - along open north west ride - on 25/08/2007. A widespread species associated with thistles.

Coleoptera: Attelabidae

Deporaus betulae, Birch Leaf Roller

At TQ558364 - Warren Pond - on 29/05/2007. A species associated with young birch. Widespread but apparently not common in Sussex.

Lepidoptera: Rhopalocera (Butterflies)

Ochlodes faunus, Large Skipper

At TQ558368 - along ride - on 28/07/2007 and elsewhere. Common.

Gonepteryx rhamni, Brimstone

At various locations in Broadwater Warren from spring to autumn. Its foodplant, alder buckthorn (*Frangula alnus*) is exceptionally abundant.

Polyommatus icarus, Common Blue

At TQ558367 - along ride - on 25/08/2007 and other places. Common throughout Sussex.

Limenitis camilla, White Admiral

At TQ553771 - woodland rides in valley bottom - on 06/07/2007. Two or three seen, but only in this area. A UK BAP Species widespread in larger broadleaved woodland in Sussex.

Pyronia tithonus, Hedge Brown

At TQ558367 - along ride - on 25/08/2007 and elsewhere. Common in Sussex.

Maniola jurtina, Meadow Brown

At TQ558366 - north west ride east of cross rides - on 08/09/2007 and elsewhere. A very common grassland species.

Lepidoptera: Micropterigidae

Micropterix aureatella, A micro-moth

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. Adults often occur on flowers of sedge (*Carex* sp.). Widespread in southern England but with no records in the Sussex Biodiversity Record Centre database.

Lepidoptera: Incurvariidae

Nemophora degeerella, A micro-moth

At TQ556364 - immediately south of Warren Pond stream - on 29/05/2007. A common and widespread species. Larvae in leaf litter.

Lepidoptera: Glyphipterigidae

Glyphipterix forsterella, A micro-moth

At TQ558364 - Warren Pond - on 29/05/2007. Larvae feed on seeds of sedges (*Carex* sp.). The only record in the Sussex Biodiversity Record Centre database is from Goring Woods in West Sussex.

Lepidoptera: Tortricidae

Pseudargyrotoza conwagana, A tortrix moth

At TQ556364 - wet woodland - on 20/06/2007. Widespread in Britain but apparently rather scarce in Sussex. Larvae mainly on ash (*Fraxinus*).

Celypha lacunana, A tortrix moth

At TQ559364 - ancient wet woodland south east of Warren Pond - on 20/06/2007. A widespread polyphagous species.

Epinotia ramella, A tortrix moth

At TQ555364 - along path south of stream - on 08/09/2007. The only other record in the Sussex Biodiversity Record Centre database is from the Warnham Nature Reserve near Horsham, West Sussex. Larvae feed in the twigs and catkins of birches (*Betula* spp.)

Lepidoptera: Geometridae

Macaria notata, Peacock Moth

At TQ556364 - immediately south of Warren Pond stream - on 20/06/2007. A woodland species the larva feeding on birch.

Lepidoptera: Notodontidae

Stauropus fagi, Lobster Moth

At TQ554364 - wet woodland along stream from Eridge Rocks - on 28/07/2007. A widespread species in southern England. Found at Broadwater as a larva feeding on oak.

Diptera: Tipulidae (Craneflies)

Dolichopeza albipes, White-Footed Ghost

At TQ558365 – north of Warren Pond on 25/08/2007 and TQ558364 - Warren Pond - on 20/06/2007. A cranefly of shaded situations and streamsides where the larvae occur in liverwort. Occasional in Sussex in suitable localities.

Tipula cava, A cranefly

At TQ546370 - peaty pools area south of Broadwater Bridge - on 06/07/2007. A cranefly associated with acid soils on heaths and dunes, or in light woodland.

Tipula fascipennis, A cranefly

At TQ546370 - peaty pools area south of Broadwater Bridge - on 06/07/2007 A species of woodland edges and hedgerows.

Diptera: Pediciidae (Pediciid crane flies)

Ula sylvatica, (A short-palped cranefly)

At TQ558363 - mature pine plantation south of Warren Pond - on 28/07/2007. A woodland species whose larvae live in fungi. Recorded from only two sites in East Sussex and one in West Sussex in the Sussex Biodiversity Record Centre database but probably widespread.

Diptera: Limoniidae (Short-palped crane flies)

Erioptera flavata, A short-palped crane fly

At TQ558364 - Warren Pond - on 12/06/2007. Larvae semi-aquatic, local but widespread in bogs, marshes and at water margins, including carr. The only other records in the Sussex Biodiversity Record Centre database are from Burton Pond and Amberley Wild Brooks, both in West Sussex.

Erioptera fascipennis, A short-palped crane fly

At TQ558364 - Warren Pond - on 20/06/2007. Associated with muddy areas in marshes and at water margins. In the Sussex Biodiversity Record Centre database there are records only from one site in East Sussex and two in West Sussex.

Erioptera lutea, A short-palped crane fly

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. A species of muddy margins of ditches, ponds and sluggish streams; also found in wet meadows and wet woods. Larvae in wet mud. Widespread in East Sussex.

Molophilus appendiculatus, A short-palped crane fly

At TQ561363 - by stream east of Warren Pond - on 25/08/2007. A crane fly of wet woodlands. Probably widespread but only recorded in the Sussex Biodiversity Record Centre database from High Rocks¹ and Robertsbridge. Larvae presumed to live in wet soil.

Molophilus flavus, A short-palped crane fly

At TQ549369- wet, shady alder carr with tussock sedge - on 29/05/2007. A crane fly of wet woodland and sometimes more open conditions. Especially frequent in acid areas. Larvae presumed to live in wet soil. There are two earlier records in the Sussex Biodiversity Record Centre database, from Brede High Woods in East Sussex and Burton Pond in West Sussex.

Molophilus griseus, A short-palped crane fly

At TQ556364 - immediately south of Warren Pond stream on 29/05/2007 and TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. A common and generally distributed species which frequents hedgerows with ditches and wet woodland. Larvae thought to be in wet mud. Widely recorded in East Sussex, less so in West Sussex.

Molophilus ochraceus, A short-palped crane fly

At TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007; TQ558364 - Warren Pond - on 29/05/2007 and TQ554364 - wet woodland along stream from Eridge Rocks - on 12/06/2007. Another common species of wet woodlands with larvae that are presumed to live in wet soil. The Sussex Biodiversity Record Centre database has a handful of widely scattered records, all from East Sussex.

Ormosia nodulosa, A short-palped crane fly

At TQ558364 - Warren Pond - on 29/05/2007. Occurs in both wet and dry woodland where the larvae are thought to live in the soil. Widely distributed in East Sussex but with only one West Sussex record in the Sussex Biodiversity Record Centre database.

¹ Records from High Rocks, most of which is just over the county border in Kent, are included in records held by the Sussex Biodiversity Record Centre as are some from Pembury and other places close to Tunbridge Wells.

Eloeophila submarmorata, A short-palped crane fly

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. A species with aquatic larvae with adults found beside streams and seepages in shady places. Although it is widespread in Britain and with a number of records from Kent and Surrey, there are no Sussex records in the Sussex Biodiversity Record Centre database.

Euphyllidorea aperta, A short-palped crane fly

At TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007 and TQ558364 - Warren Pond - on 29/05/2007 and 12/06/2007. The only other Sussex records in the Sussex Biodiversity Record Centre database are from Burton Pond and Amberley Wild Brooks in West Sussex.

Neolimnomyia filata, A short-palped crane fly

At TQ556364 - immediately south of Warren Pond stream on 29/05/2007. A slender black crane fly found in carr and marshes. Larvae semi-aquatic especially where there is saturated, black, humic substrate. There are no records on the Sussex Biodiversity Record Centre database, but it has been recorded by the author of this paper from Tudeley Woods to the east of Tunbridge Wells.

Paradelphomyia senilis, A short-palped crane fly

At TQ558364 - Warren Pond - on 29/05/2007 and 12/06/2007. A common crane fly of wet woodlands but with only scattered records in East and West Sussex.

Phyllidorea fulvonervosa, A short-palped crane fly

At TQ558364 - Warren Pond - on 12/06/2007. A wet woodland species. No records on the Sussex Biodiversity Record Centre database but it has been recorded by the author of this paper from Tudeley Woods to the east of Tunbridge Wells.

Pilaria discicollis, A short-palped crane fly

At TQ558364 - Warren Pond - on 29/05/2007. A species of marshes, carr and at water margins. Larvae semi-aquatic. All records held at the Sussex Biodiversity Record Centre are from West Sussex apart from one record from Castle Water at Rye Harbour.

Pseudolimnophila sepium, A short-palped crane fly

At TQ558364 - Warren Pond - on 12/06/2007. Found in situations where there is wet mud with grassy edges, such as carr, wooded streamsides and seepages. Larvae semi-aquatic in marshy soil. The only other record on the Sussex Biodiversity Record Centre database is from Brede High Woods.

Dicranomyia morio, A short-palped crane fly

At TQ558364 - Warren Pond - on 20/06/2007. A widespread wetland species but of low numbers. The only other Sussex records from the Sussex Biodiversity Record Centre database are from Robertsbridge in 1961.

Helius longirostris, A short-palped crane fly

At TQ558364 - Warren Pond - on 29/05/2007, 12/06/2007 and 20/06/2007. Associated with emergent aquatic vegetation in swamps, carr and around ponds and lakes. Larvae aquatic. Widespread, but with only seven records across Sussex.

Limonia macrostigma, A short-palped crane fly

This was found at TQ549369 - wet, shady alder carr with tussock sedge - on 29 May 2007. According to Stubbs this is a specialised species of carr and swamp. Godfrey (2003) citing Hoffmann and Hering (2000) list *L. macrostigma*, as a probable xylophagous species. Widespread in the Weald in suitable localities.

Limonia nubeculosa, A short-palped crane-fly

At TQ559364 - ancient wet woodland south east of Warren Pond - on 20/06/2007, TQ556364 - immediately south of Warren Pond stream - on 29/05/2007, TQ558365 - north of Warren Pond - on 25/08/2007. A very common woodland species.

Limonia phragmitidis, A short-palped crane-fly

At TQ556364 - immediately south of Warren Pond stream on 29/05/2007 and TQ559364 - ancient wet woodland south east of Warren Pond - on 20/06/2007. A common species of lowland deciduous woodland. Larvae normally in soil overlain by leaf-litter but has been reared from various bracket fungi - *Laetiporus sulphureus* and *Inonotus hispidus* for example (Alexander, 2002). Not infrequent in Sussex.

Neolimonia dumetorum, A short-palped crane-fly

At TQ551369 - within mature pine plantation - on 29/05/2007 and TQ553364 - ancient wet woodland - on 20/06/2007. A widespread and common species. The larvae occur in very rotten dead wood of various broadleaves. A woodland and fenland species

Diptera: Ditymyiidae (Ditymyiid fungus gnats)

Symmerus annulatus, A ditymyiid fungus gnat.

At TQ553364 - ancient wet woodland - on 20/06/2007. Larvae usually in rotting timber. Has been reared from *Hypoxylon rubiginosum* (Alexander, 2002) and decaying birch wood (Séguy, 1940). The only records in the Sussex Biodiversity Record Centre database are from Robertsbridge and Sedlescombe.

Diptera: Keroplatidae (Keroplatid fungus gnats)

Orfelia pallida, A keroplatid fungus gnat.

At TQ553364 - ancient wet woodland - on 20/06/2007. This seems to be a scarce species in Britain and there are no previous Sussex records in the Sussex Biodiversity Record Centre database. It is almost certainly, like its congeners, associated with fungi on decaying wood.

Orfelia unicolor, A keroplatid fungus gnat.

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. Has been reared from a pupa suspended in threads on *Trametes versicolor* (Alexander, 2002). The only other records on the Sussex Biodiversity Record Centre database are from Sedlescombe.

Macrocera angulata, A keroplatid fungus gnat.

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. Has been reared from rotten wood (Alexander, 2002). All other Sussex records held in the Sussex Biodiversity Record Centre database are from Sedlescombe, East Sussex. Probably widespread.

Macrocera stigma, A keroplatid fungus gnat

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. There are only two other records held in the Sussex Biodiversity Record Centre database, from Sedlescombe and Battle. Larvae have been found in a web under rotting wood.

Macrocera stigmoides, A keroplatid fungus gnat

At TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007. Has been reared from rotten wood. In the Sussex Biodiversity Record Centre database only from Sedlescombe and Waldron, both in East Sussex.

Macrocera vittata, A keroplatid fungus gnat

At TQ556364 - immediately south of Warren Pond stream - on 29/05/2007 and TQ552370 - by central stream half a km east of Broadwater Bridge - on 12/06/2007. Has been reared from rotten wood. In the Sussex Biodiversity Record Centre database only from Beckley and Sedlescombe, both in East Sussex.

Diptera: Mycetophilidae (Fungus gnats)

Boletina trivittata, A fungus gnat

At TQ558364 - Warren Pond - on 29/05/2007. Has been reared from rotten wood. In the Sussex Biodiversity Record Centre database, only from four sites, all in East Sussex.

Synapha vitripennis, A fungus gnat

At TQ549367 - interior of mature pine plantation - on 06/07/2007. Has been reared from dead wood. In the Sussex Biodiversity Record Centre database only from three locations, all in East Sussex.

Docosia gilvipes, A fungus gnat

At TQ553364 - ancient wet woodland - on 20/06/2007. Has been reared from fungi (polypores and *Auricularia*, as well as terrestrial species). In the Sussex Biodiversity Record Centre database the only records of *D. gilvipes* are from Rye Harbour and Sedlescombe.

Synplasta gracilis, A fungus gnat

At TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007. A generally common fungus-breeding species, but in the Sussex Biodiversity Record Centre database recorded only from Sedlescombe and Brede.

Mycetophila curviseta, A fungus gnat

At TQ561363 - by stream east of Warren Pond - on 25/08/2007. One East Sussex record on the Sussex Biodiversity Record Centre database. Most *Mycetophila* species breed in fungi.

Mycetophila dziedickii, A fungus gnat

At TQ558363 - mature pine plantation south of Warren Pond - on 28/07/2007. No other records in the Sussex Biodiversity Record Centre database.

Mycetophila ocellus, A fungus gnat

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. A widespread species with a number of records on the Sussex Biodiversity Record Centre database, all from East Sussex. Has been reared from a wide range of wood-decaying fungi; considered to have predominantly deadwood associations, although also some terrestrial agarics have been reported (Alexander, 2002).

Mycetophila ornata, A fungus gnat

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. In the Sussex Biodiversity Record Centre database there are only records from High Rocks, Battle and Sedlescombe. In fruiting bodies of various wood decaying fungi, including *Meripilus giganteus*, *Pleurotus ostreatus*, *Stereum* etc. (Alexander, 2002).

Mycetophila ruficollis, A fungus gnat

At TQ560372 on 16/02/2007. Said to be uncommon. In the Sussex Biodiversity Record Centre database recorded only from three sites, all in East Sussex.

Mycetophila unipunctata, A fungus gnat

At TQ556364 - IMMEDIATELY SOUTH OF WARREN POND STREAM on 29/05/2007. In the Sussex Biodiversity Record Centre database recorded only from three sites, all in East Sussex.

Phronia humeralis, A fungus gnat

At TQ561363 - by stream east of Warren Pond - on 25/08/2007. A fungus feeder that has been reared from *Corticium* spp. (Alexander, 2002). In the Sussex Biodiversity Record Centre database it has been recorded from a handful of sites, all in East Sussex but probably widespread and common.

Mycomya annulata, A fungus gnat

At TQ553364 - ancient wet woodland - on 20/06/2007 and TQ563364- mature pine plantation immediately west of quarry - on 26/08/2007. In the Sussex Biodiversity Record Centre database recorded only from Brede High Wood and Beckley. Has been reared from a *Polyporus* sp. (Alexander, 2002).

Mycomya cinerascens, A fungus gnat

At TQ553364 - ancient wet woodland - on 20/06/2007 and TQ559364 - ancient wet woodland south east of Warren Pond - on 28/07/2007. Has been reared from a *Stereum* sp. (Alexander, 2002). In the Sussex Biodiversity Record Centre database there is a scatter of records across East Sussex, but none from West Sussex.

Mycomya neohyalinata, A fungus gnat

At TQ561363 - by stream east of Warren Pond - on 25/08/2007. In the Sussex Biodiversity Record Centre database there are only two records, both from East Sussex. It was recorded by Major C. G. Nurse from Tunbridge Wells in the early part of the 20th century (Edwards, 1924).

Acnemia nitidicollis, A fungus gnat

At TQ558364 - Warren Pond - 29/05/2007, and TQ559364- ancient wet woodland south east of Warren Pond - and TQ554367 - near small pond on dammed stream - on 28/07/2007. A widespread species though all the records in the Sussex Biodiversity Record Centre database are from East Sussex.

Phthinia humilis, A fungus gnat

At TQ553364 - ancient wet woodland - on 20/06/2007. In the Sussex Biodiversity Record Centre database the only record is from Sedlescombe in East Sussex. Associated with dead wood.

Diptera: Sciaridae (Black fungus gnats)

Phytosciara flavipes, A black fungus gnat

At TQ559364 - ancient wet woodland south east of Warren Pond - on 20/06/2007. Widespread and common with many Sussex records including one from Frant, the same parish as Broadwater Warren, in 1887 (Menzel et al., 2006). A catholic species found in woodlands and wetlands.

Sciara hemerobioides, A black fungus gnat

At TQ558367 – along ride - and TQ55369 on 25/08/2007. Very abundant along sunny rides especially on spikes of *Molinia* in anthesis. Females appeared to be feeding on the pollen of the grass, a phenomenon that has not previously been noted (P. J. Chandler, pers. comm.). Has been bred from rotten broadleaved and coniferous wood. Common and widespread in Sussex.

Trichosia glabra, A black fungus gnat

At TQ558363 - mature pine plantation south of Warren Pond - on 28/07/2007. A widespread species but only recorded in the Sussex Biodiversity Record Centre database from Sedlescombe. Has been Reared from larvae in galleries of the beetle *Ischnomera caerulea* (Menzel et al., 2006).

Diptera: Cecidomyiidae (Gall midges)

Rabdophaga rosaria, Camellia gall midge

At TQ560372 on 16/02/2007. Probably widespread in Sussex and Britain, but only one record, from Sedlescombe, in the Sussex Biodiversity Record Centre database. Makes distinctive green leaf 'flowers' like double camellias at the ends of willow twigs.

Diptera: Anisopodidae (Window midges)

Sylvicola cinctus, A window midge

At TQ558364 - Warren Pond - on 29/05/2007 and TQ558365 - north of Warren Pond - on 25/08/2007. Said to breed in decaying hogweed (*Heracleum*) and angelica (*Angelica*) and, probably, other decaying material (the author of this paper has bred it from rotten pumpkin).

Sylvicola fenestralis, A window midge

At TQ560372 on 16/02/2007. Recorded from Sedlescombe and Robertsbridge but otherwise no records on the Sussex Biodiversity Record Centre database. Said to be a declining species and reported as breeding in compost heaps.

Diptera: Ptychopteridae (Ptychopterid crane flies)

Ptychoptera contaminata, A ptychopterid crane fly

At TQ556364 - IMMEDIATELY SOUTH OF WARREN POND STREAM on 29/05/2007. A widespread species in the British Isles with larvae in still or slow moving water with emergent vegetation (Stubbs, 1993). A local species quite widely recorded across Sussex.

Diptera: Culicidae (Mosquitoes)

Aedes punctor, A mosquito

At TQ560366 - heathy ride towards east of survey area - on 25/08/2007. Larvae in more or less acid conditions, often in areas with sandy or gravelly soil. Temporary pools, often lined with dead leaves, are favoured. Adults shelter in dense vegetation and feed mainly on mammalian blood. A vicious and persistent man-biter. The only other record in the Sussex Biodiversity Record Centre database is from Buchan Country Park, but it is probably widespread although other mosquito species seem far commoner in the Weald.

Diptera: Ceratopogonidae (Biting midges)

Neurohelea luteitarsis, A biting midge

At TQ552370 - by central stream half a km east of Broadwater Bridge - on 12/06/2007. A species said to be commoner in the west and north. There are no earlier records in the Sussex Biodiversity Record Centre database.

Culicoides obsoletus agg., A biting midge

At TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007. Common everywhere, often biting people. Abundant across Sussex and the British Isles. Breeds in wet places and decaying vegetation and considered to be a possible vector of bluetongue disease (Defra, 2002).

Palpomyia spinipes, A biting midge

At TQ558364 - Warren Pond - on 12/06/2007. Scattered across Britain but with no earlier records in the Sussex Biodiversity Record Centre database.

Atrichopogon pavidus, A biting midge

At TQ556364 - immediately south of Warren Pond stream - on 20/06/2007. Several examples on honeysuckle flowers (*Lonicera periclymenum*). This species is well-known for its attraction to honeysuckle. The only other record on the Sussex Biodiversity Record Centre database is from Robertsbridge where the author of this paper found it in 1961. He has looked for it regularly every since, but this is the first occasion on which he has come across it again.

Diptera: Chironomidae (Non-biting midges)

Chironomus riparius, A non-biting midge

At TQ556364 - immediately south of Warren Pond stream - on 29/05/2007. A common species that normally breeds in eutrophic waters. Few examples were caught during the survey and there were generally worryingly few water-breeding chironomids as mentioned in the introduction to this paper. Widespread across Sussex and Britain.

Microtendipes chloris, A non-biting midge

At TQ561363 - by stream east of Warren Pond - on 25/08/2007. Another common species that was found only in very low numbers at Broadwater. Widespread across Sussex.

Gymnometriocnemus subnudus, A non-biting midge.

At TQ546370 - peaty pools area south of Broadwater Bridge - on 06/07/2007. A fairly common species in woodlands across Sussex. It is a terrestrial species that, unusually among the non-biting midges, breeds in damp, decaying wood.

Metriocnemus fuscipes, A non-biting midge

At TQ556364 - immediately south of Warren Pond stream - on 29/05/2007. A common species that usually breeds in moss. Widespread in Sussex.

Apsectrotanytus trifascipennis, A non-biting midge.

At TQ552370 - by central stream half a km east of Broadwater Bridge - on 12/06/2007. A species with predatory aquatic larvae found in rivers and streams. Common in Sussex, but only one example at Broadwater.

Diptera: Rhagionidae (Snipeflies)

Rhagio lineola, Small fleck-winged snipefly.

At TQ549367 - interior of mature pine plantation - on 06/07/2007, TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007 and TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. Smallest of our *Rhagio* species and occurring in woodland and scrub. Adults sit low down on the underside of leaves where they feed on small, soft-bodied insects. The larvae are found in woodland soil. Widespread in the Weald and elsewhere.

Spania nigra, Liverwort snipefly

At TQ558364 - Warren Pond - on 29/05/2007. A rather scarce species (nationally 'Notable') associated with patches of liverwort, in which the larvae feed, along streamsides and in more open places. Recorded from a handful of similar sites in East Sussex and Kent.

Diptera: Hybotidae (Hybotid dance flies)

Hybos culiciformis, A hybotid dance fly

At TQ546366 - heathy woodland area - on 06/07/2007 and TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. A widespread species in Sussex and elsewhere with predatory larvae thought to occur in soil round woodland margins and scrub (Smith, 1989).

Drapetis parilis, A hybotid dance fly)

At TQ559364 - ancient wet woodland south east of Warren Pond - on 28/07/2007. Larvae probably develop in decaying wood under bark . The only other records of the Sussex Biodiversity Record Centre database are from Sedlescombe. It has also been recorded from the RSPB Fore Wood and Tudeley Wood reserves.

Platypalpus ciliaris, A hybotid dance fly

At TQ558364 - Warren Pond - on 29/05/2007 and TQ558363 - mature pine plantation south of Warren Pond - on 28/07/2007. Fairly widely recorded in East Sussex and Kent. The larvae are thought to be predatory in soil or leaf litter.

Platypalpus nigratarsis, A hybotid dance fly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. A common species and widely distributed in Sussex

Platypalpus pectoralis, A hybotid dance fly

At TQ552370 - by central stream half a km east of Broadwater Bridge - on 12/06/2007, TQ558363 - mature pine plantation south of Warren Pond - and TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. A widespread species in Britain but the only previous Sussex record in the Sussex Biodiversity Record Centre database is from Nap Wood to the south of Frant about 5km from the current survey site.

Diptera: Emididae (Dance flies)

Clinocera fontinalis, A dance fly

At TQ561363 - by stream east of Warren Pond - on 25/08/2007. Rather few Sussex records in the Sussex Biodiversity Record Centre database, but probably widespread in suitable situations. The larvae are predatory and aquatic.

Empis aestiva, A dance fly.

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007 and TQ560366 - heathy ride towards east of survey area - on 25/08/2007. A common species everywhere. Larvae probably predatory in soil and leaf litter.

Empis praevia, A dance fly

At TQ558364 - Warren Pond - and TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. Like the above, a common species everywhere. Larvae also probably predatory in soil and leaf litter.

Hilara flavipes, A dance fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007 and TQ560366 - heathy ride towards east of survey area -, TQ561363 - by stream east of Warren Pond - and TQ558367 on 25/08/2007. Usually found in damp shady places. Larvae unknown, but related species develop in damp soil, leaf litter or rotten wood. Probably more abundant in the north and west. The only Wealden records are from the RSPB's Fore and Tudeley Woods.

Hilara lurida, A dance fly

At TQ558364 - Warren Pond - on 12/06/2007 and TQ554367 - near small pond on dammed stream - on 28/07/2007. One of the few normally aquatic *Hilara* species that develops in rotten wood (Alexander, 2002). Recorded only from High Rocks, Sedlescombe and Lewes in East Sussex.

Hilara maura, A dance fly

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. A very widespread and common species over still and slow moving water. There are surprisingly few Sussex records (Hastings, Ashdown Forest only).

Rhamphomyia stigmosa, A dance fly

In 1km square TQ5536 on 29/05/2007 A predatory species of damp, well vegetated places. Recorded from Buxted, Heathfield and Ashdown Forest in the Sussex Biodiversity Record Centre database.

Phyllodromia melanocephala, A dance fly

At TQ553364 - ancient wet woodland - on 20/06/2007, and TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007 and TQ554367 - near small pond on dammed stream - on 28/07/2007. Scattered records across Sussex and probably common. The larvae are terrestrial.

Trichopeza longicornis, A dance fly

At TQ558363 - mature pine plantation south of Warren Pond - and TQ554367 - near small pond on dammed stream - on 28/07/2007; TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007 and TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007. The only other Sussex record in the Sussex Biodiversity Record Centre database is from High Rocks.

Bathycranium bicolorillum, A dance fly

At TQ553364 - ancient wet woodland - on 20/06/2007. A species of damp woodland. Elsewhere in the Weald it has been recorded from Tudeley Woods and Buxted Park.

Diptera: Dolichopodidae (Long-headed flies)

Dolichopus atripes, A long-headed fly

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. A widespread species but with rather few Sussex records in the Sussex Biodiversity Record Centre database. Primarily found on acid mires and wet heaths in Britain, though it also occurs in other wetlands and on drier heathland (Boyce, 2004).

Dolichopus discifer, A long-headed fly

In 1km grid square TQ5536 on 29/05/2007 and at TQ561363 - by stream east of Warren Pond - on 25/08/2007. A species of damp meadows and the fringes of marshes. Larvae have been reared from soil. There are records from four Sussex locations in the Sussex Biodiversity Record Centre database.

Dolichopus picipes, A long-headed fly

At TQ554364 - wet woodland along stream from Eridge Rocks - on 12/06/2007. A wetland species. In the Sussex Biodiversity Record Centre database recorded only from Buxted and Battle. Widespread elsewhere.

Dolichopus unguilatus, A long-headed fly

At TQ558364 - Warren Pond - on 12/06/2007. A wetland species. One of the commonest Sussex *Dolichopus* spp. with records across East and West Sussex.

Dolichopus urbanus, A long-headed fly

At TQ554364 - wet woodland along stream from Eridge Rocks - on 12/06/2007. Said to be a common species in Britain (RECORDER 3.3) but apparently with no previous Sussex records.

Dolichopus virgultorum, A long-headed fly

At TQ553364 - ancient wet woodland - on 20/06/2007. A notable, nationally scarce species. Larvae probably semi-carnivores at water margins or in damp situations. In the Sussex Biodiversity Record Centre database the only other record is from the Marline Valley in Hastings.

Hercostomus aerosus, A long-headed fly

Common in all the wetlands from June to August and the commonest Dolichopodid at Broadwater. A very common species throughout Britain, and though it shows a marked preference for acid mire and wet heath habitats, it is also found in a range of other wetlands. (Boyce, 2004). Only six other Sussex locations in the Sussex Biodiversity Record Centre database.

Hercostomus brevicornis, A long-headed fly

At TQ559364 - ancient wet woodland south east of Warren Pond - on 28/07/2007. Apparently a widespread wetland species but there are no other records in the Sussex Biodiversity Record Centre database.

Hercostomus metallicus, A long-headed fly

At TQ554364 - wet woodland along stream from Eridge Rocks - on 12/06/2007. Recorded from six other locations across Sussex in the Sussex Biodiversity Record Centre database. Widespread elsewhere.

Hercostomus nigripennis, A long-headed fly

At TQ553371 - woodland ride north of central stream - on 06/07/2007. A widespread but local species with scattered records across Sussex.

Medetera truncorum, A long-headed fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. A very common species everywhere. The larvae of most *Medetera* occur in beetle tunnels under tree bark.

Rhaphium fasciatum, A long-headed fly

At TQ554366 - by central stream - on 08/09/2007. Widespread but very scarce. In the Sussex Biodiversity Record Centre database there are records only from Buxted and Lewes.

Rhaphium lanceolatum, A long-headed fly

At TQ560366 - heathy ride towards east of survey area - on 25/08/2007. Most records are from Scotland, but it has been reported from Wales and Yorkshire and it has been recorded from Rye Harbour. A notable, nationally scarce species.

Sciapus platypterus, A long-headed fly

At TQ553364 - ancient wet woodland - on 20/06/2007, TQ549367 - interior of mature pine plantation - on 06/07/2007, TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007. A common and often abundant species whose larvae live under bark. Widespread in Sussex.

Sciapus zonatulus, A long-headed fly

At TQ554364 - wet woodland along stream from Eridge Rocks - on 12/06/2007. This is a scarce species and this section of *Sciapus* has been considerably confused taxonomically (Chandler, 1998; Crossley 1998). However, identity was confirmed using Grichanov (2006). In the Sussex Biodiversity Record Centre database there are no other records of this or associated species.

Anepsiomyia flaviventris, A long-headed fly

At TQ556364 - immediately south of Warren Pond stream on 29/05/2007; TQ554364 - wet woodland along stream from Eridge Rocks and TQ552370 - by central stream half a km east of Broadwater Bridge - on 12/06/2007. A southern species whose larvae are likely to live in damp soil. Has been recorded in Sussex from High Rocks, Fore Wood at Crowhurst, Buxted and Burton Pond.

Campsicnemus curvipes, A long-headed fly

At TQ554366 - by central stream - on 08/09/2007. A very common species and widespread in Sussex. The larvae have been recorded from mud (Smith, 1989).

Campsicnemus loripes, A long-headed fly

At TQ558364 - Warren Pond - on 29/05/2007, TQ553364 - ancient wet woodland - on 20/06/2007 and TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007. Another fairly common species found in damp places and on the surface of mud. In the Sussex Biodiversity Record Centre database recorded from five locations in Sussex and also known from the Tudeley Wood RSPB reserve in Kent.

Diptera: Phoridae (Coffin flies)

Diplonevra concinna, A coffin fly

At TQ549367 - interior of mature pine plantation - on 06/07/2007. Has been bred from dead wood by the author of this paper. In the Sussex Biodiversity Record Centre database the only other Sussex record is from Robertsbridge.

Megaselia melanocephala, A coffin fly

At TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007. A widespread species that often occurs indoors and which may breed in bird's-nests. In the Sussex Biodiversity Record Centre database, the only other Sussex records are from Robertsbridge and Sedlescombe.

Diptera: Lonchopteridae (Lonchopterid flies)

Lonchoptera lutea, A lonchopterid fly

At TQ555371 - northern ride area - on 16/02/2007 and TQ558364 - Warren Pond - on 29/05/2007. A very common species occurring everywhere in suitable places in Sussex. Larvae under logs and in decaying vegetable material (Smith, 1989).

Lonchoptera tristis, A lonchopterid fly

At TQ558365 - north of Warren Pond - on 25/08/2007. A local species found on the surface of mud in shady places such as the margins of woodland streams and muddy patches on paths. Widespread in suitable places in the Weald.

Diptera: Syrphidae (Hoverflies)

Cheilosia longula, A hoverfly

At TQ560366 - heathy ride towards east of survey area - and TQ558366 - north west ride east of cross rides - on 08/09/2007. Breeds in fungi such as *Boletus* and truffles. Mainly a southern and western species. In the Sussex Biodiversity Record Centre database there are only three other Sussex records, from Bewl Water, Buxted and Graffham. It has also been recorded from the RSPB's reserve at Tudeley Woods.

Episyrphus balteatus, Marmalade fly

At TQ555371 - northern ride area - on 16/02/2007 and elsewhere. One of the commonest British hoverflies both as a resident and a migrant.

Melanostoma mellinum, A hoverfly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007 and TQ558366 - north west ride east of cross rides - on 08/09/2007. Another very common and widespread species.

Melanostoma scalare, A hoverfly

At TQ558363 - mature pine plantation south of Warren Pond - on 28/07/2007 and TQ560366 - heathy ride towards east of survey area - on 25/08/2007. Also a very common species widespread in the South East.

Paragus haemorrhous, A hoverfly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. A species of sparsely vegetated, sunny ground such as the margins of paths. The larvae are predatory on aphids. Widely recorded from Sussex and Kent.

Platycheirus albimanus, A hoverfly

At TQ560366 - heathy ride towards east of survey area - on 25/08/2007. Probably the commonest *Platycheirus* in Sussex with 94 recorded occurrences.

Platycheirus scutatus, A hoverfly

At TQ560366 - heathy ride towards east of survey area - on 25/08/2007. A species of hedgerows and woodland margins. Widespread in the South East.

Rhingia campestris, A hoverfly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. A common and widespread species whose larvae develop in cow dung (and maybe other substrates). Widely distributed and generally common throughout the South East.

Sphaerophoria batava, A hoverfly

At TQ560366 - heathy ride towards east of survey area - on 25/08/2007. Only recently (1981) recognised as distinct from *Sphaerophoria taeniata*. A species of woodland rides, heathland and dunes. The larvae are predators of aphids. Dissected to confirm identity. In the Sussex Biodiversity Record Centre database, the only other records are from two West Sussex commons.

Sphaerophoria interrupta, A hoverfly

At TQ559369 - northern part of ride from road to Warren Pond - on 28/07/2007. A species of damp grassland and other habitats. Widespread in Sussex and elsewhere, but usually not abundant.

Sphaerophoria scripta, A hoverfly

At TQ557368 - heathy ride - on 20/06/2007 and elsewhere. The commonest *Sphaerophoria* in Sussex with many records.

Sphaerophoria virgata, A hoverfly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. Mainly a northern and western species although it is also known from the New Forest and the Surrey heaths. Apparently associated with heathland, its larvae are predators on aphids. It is on the Sussex Rare Species Inventory and has been recorded from Midhurst and Trotton Commons in West Sussex.

Sphegina elegans, A hoverfly

At TQ558364 - Warren Pond - on 29/05/2007. Larvae develop in accumulations of decaying sap under wet tree bark in damp shady woodlands (Alexander, 2002). It has also been reared from semi-

submerged logs (Godfrey, 2003). A scarce species recorded in the Sussex Biodiversity Record Centre database from three sites in East Sussex and one in west.

Diptera: Conopidae (Thick-headed flies)

Conops quadrifasciatus, A thick-headed fly

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. Parasitic on *Bombus lucorum* (also recorded from Broadwater). Adults are typically found in woodland glades and edges, or hedgerows, visiting flowers where the host is likely to be found. Widespread in Sussex.

Sicus ferrugineus, A thick-headed fly

At TQ559369 - northern part of ride from road to Warren Pond - on 28/07/2007. Larvae are found in the nests of various bumblebees. Uncommon, but widely distributed. Widely recorded from Sussex, including RSPB's Fore and Tudeley Woods and from Calverley Park in Tunbridge Wells.

Diptera: Tephritidae (Picture-winged flies)

Tephritis cometa

At TQ558366 - north west ride east of cross rides - on 08/09/2007. Breeds in the flower head of creeping thistle, *Cirsium arvense*. Occurs in South East England and East Anglia. Rather scarce in Sussex with records from only half a dozen localities. Also recorded from the RSPB's Tudeley Wood reserve.

Diptera: Lauxaniidae (Lauxaniid flies)

Calliopum aeneum, A lauxaniid fly

At TQ556364 - IMMEDIATELY SOUTH OF WARREN POND STREAM on 29/05/2007. A widely distributed and common species. The larvae feed on decaying plant material and occasionally mine leaves of various plants.

Meiosimyza affinis, A lauxaniid fly

At TQ558364 - Warren Pond - on 29/05/2007. Larvae are saprophagous and have been reared from a rotting birch stump. In the Sussex Biodiversity Record Centre database the only records are from Sedlescombe and Rye Harbour.

Meiosimyza illota, A lauxaniid fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. A shade loving saprophage. In the Sussex Biodiversity Record Centre database there are no earlier records of this species though it is probably widespread.

Meiosimyza rorida, A lauxaniid fly

At TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007 and elsewhere between May and late July. One of the commonest lauxaniids and widespread in Sussex. Larvae in decaying vegetable matter.

Minettia longipennis, A lauxaniid fly

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. Larvae in decaying vegetable matter. Recorded in the Sussex Biodiversity Record Centre database only from High Rocks and Sedlescombe.

*Minettia rivos*a, A lauxaniid fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007 and TQ558366 - north west ride east of cross rides - on 08/09/2007. Common and widespread in Sussex and elsewhere amongst shady vegetation in damp places where the larva is a saprophage in decaying vegetable matter.

Pseudolyciella stylata, A lauxaniid fly

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. Breeds in decaying vegetable matter and soil. An RDBK species but seemingly quite widespread in Kent and Sussex as well as elsewhere in southern England (Godfrey, 1994).

Sapromyza sexpunctata, A lauxaniid fly

At TQ549367 - interior of mature pine plantation - on 06/07/2007. A widely distributed species recorded from only two localities in Sussex in the Sussex Biodiversity Record Centre database, but probably widespread.

Diptera: Dryomyzidae (Dryomyzid flies)

Neuroctena anilis, A dryomyzid fly

At TQ561363 - by stream east of Warren Pond - on 25/08/2007. A common and widespread fungus feeding species, with records from many parts of Sussex.

Diptera: Sciomyzidae (Snail-killing flies)

Tetanocera hyalipennis, A snail-killing fly

At TQ557371 - open, heathy, south-facing ride area - and TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007; and TQ561363 - by stream east of Warren Pond - on 25/08/2007. Typically found in *Alnus* or *Salix* swamps. The larvae are predators of aquatic snails. Encountered at three places in Broadwater, but there are only a handful of earlier Sussex records in the Sussex Biodiversity Record Centre database.

Diptera: Sepsidae (Sepsid dung flies)

Sepsis cynipsea, A sepsid dung fly

At TQ556369 - open north west ride - and TQ560366 - heathy ride towards east of survey area - on 25/08/2007, and TQ558366 - north west ride east of cross rides - on 08/09/2007. Found in the vicinity of cattle and on heathland where its larva lives in fresh cow dung. In places like Broadwater where cattle are not locally present, it may breed in other animal dung. Widespread and common in Sussex and elsewhere.

Sepsis fulgens, A sepsid dung fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. Another widespread and often common species in Sussex and elsewhere. Generally more catholic than *S. cynipsea* in the types of dung it uses.

Diptera: Agromyzidae (Leaf-mining flies)

Cerodontha denticornis, A leaf-mining fly

At TQ557371 - open, heathy, south-facing ride area - and TQ559364 - ancient wet woodland south east of Warren Pond - on 28/07/2007. A common species whose larvae mine the leaves of various grasses. Widespread in East Sussex but no West Sussex records in Sussex Biodiversity Record Centre database.

Cerodontha luctuosa, A leaf-mining fly

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007, TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. A scarcer species than the above with only one other record, from Mayfield, East Sussex in the Sussex Biodiversity Record Centre database. Larvae mine the leaves of rushes (*Juncus* spp.).

Cerodontha pygmaea, A leaf-mining fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. A common species but with no previous records in the Sussex Biodiversity Record Centre database. Larvae mine the leaves of a wide range of grasses.

Chromatomyia milii, A leaf-mining fly

At TQ554364 - wet woodland along stream from Eridge Rocks - on 12/06/2007. One of the commonest Agromyzids in Sussex with larvae that mine the leaves of various grasses.

Phytomyza ilicis, Holly Leaf Gall Fly

At TQ546366 - heathy woodland area - on 06/07/2007 and elsewhere. Another very common species with larvae making a blotch mine in the leaves of practically any holly.

Phytomyza ranunculi, A leaf-mining fly

At TQ558364 - Warren Pond - on 20/06/2007. Another very widespread species whose larvae mine the leaves of buttercups (*Ranunculus* spp.).

Phytomyza wahlgreni, A leaf-mining fly

At TQ5536 on 29/05/2007. In the Sussex Biodiversity Record Centre database there are records only from Brighton and Hastings. The larvae mine the leaves of dandelions (*Taraxacum* spp.). Widespread in southern England.

Diptera: Opomyzidae (Grass flies)

Opomyza florum, A grass fly

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. Widespread in Sussex. Larvae are stem borers in grasses.

Opomyza germinationis, A grass fly

At TQ558364 - Warren Pond - on 20/06/2007 and elsewhere. One of the most abundant flies of grassland and found throughout the South East.

Diptera: Anthomyzidae

Anthomyza gracilis, An anthomyzid fly

At TQ556369 - along open north west ride - on 25/08/2007 and elsewhere in grassy places. A very abundant grassland species throughout the region.

Diptera: Chloropidae (Gout flies)

Meromyza ornata, A gout fly

At TQ559364 - ancient wet woodland south east of Warren Pond - on 28/07/2007. A widespread species in England and Wales with larvae associated with grasses. The only previous Sussex record is from the Lewes area in 1869 (Ismay, 1980).

Thaumatomyia rufa, A gout fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. Larvae of species of *Thaumatomyia* are predacious on root-feeding aphids.

Oscinella frit, A gout fly

At TQ556369 - along open north west ride - on 25/08/2007 and elsewhere. A very common grassland species found almost everywhere.

Diptera: Heteromyzidae (Heteromyzid flies)

Heteromyza oculata, A heteromyzid fly

At TQ554367 - near small pond on dammed stream - on 28/07/2007. The only previous record in the Sussex Biodiversity Record Centre database is from Sedlescombe. The species has been reared from a lignicolous fungus (Smith, 1989)

Heteromyza rotundicornis, A heteromyzid fly

At TQ558364 - Warren Pond - on 29/05/2007 and TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007. This species has been bred from bird-droppings. Sussex records are few and include High Rocks and Sedlescombe.

Suillia atricornis, A heteromyzid fly

At TQ552370 - by central stream half a km east of Broadwater Bridge - on 12/06/2007. Recorded from five other East Sussex locations according to the Sussex Biodiversity Record Centre database. Probably breeds in fungi.

Suillia dumicola, A heteromyzid fly

At TQ561363 - by stream east of Warren Pond - on 25/08/2007. Found in woodland and heathland and occasionally on open moorland. Biology unknown, but probably developing in fungi. Few widely scattered records in England and Scotland but none in the Sussex Biodiversity Record Centre database.

Suillia fuscicornis, A heteromyzid fly

At TQ549367 - interior of mature pine plantation - on 06/07/2007 and TQ558363 - mature pine plantation south of Warren Pond - on 28/07/2007. The larvae develop in a wide range of fungi, including stinkhorn, chanterelles, agarics and boletes. There are only three earlier records in the Sussex Biodiversity Record Centre database.

Suillia notata, A heteromyzid fly

At TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007. Like the above, probably a fungus breeder. Recorded from only three localities in the Sussex Biodiversity Record Centre database.

Suillia variegata, A heteromyzid fly

At TQ556364 - immediately south of Warren Pond stream on 29/05/2007. Larvae feed on fungi and are polyphagous on many agarics, boleti, etc. Adults are typically found in humid, shady woodland situations where fungi abound. The most widespread *Suillia*, recorded from many locations across East and West Sussex.

Diptera: Sphaeroceridae (Lesser dung flies)

Copromyza nigrina, A lesser dung fly

At TQ553364 - ancient wet woodland - on 20/06/2007. In the Sussex Biodiversity Record Centre database there are several other records of this probably dung-breeding species, mostly from East

Sussex, but it is a generally widespread species whose larvae are associated with a wide range of animal dung.

Copromyza stercoraria, A lesser dungfly

At TQ554364 - wet woodland along stream from Eridge Rocks - on 12/06/2007. A widespread species associated with animal dung and carrion (Pitkin, 1988). Only three records in the Sussex Biodiversity Record Centre database but probably found across Sussex.

Crumomyia fimetaria, A lesser dungfly

At TQ558364 - Warren Pond - on 29/05/2007. Essentially a woodland species associated with dung, carrion and fungi (Pitkin, 1988). In the Sussex Biodiversity Record Centre database the only previous records are from Sedlescombe.

Pullimosina moesta, A lesser dungfly

At TQ555371 - northern ride area - on 16/02/2007. A widespread species associated with decaying vegetable matter. Abundant in East Sussex and probably common everywhere.

Spelobia parapusio, A lesser dungfly

At TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007 and elsewhere. In the Sussex Biodiversity Record Centre database it is recorded from several locations in East Sussex and is probably widespread.

Diptera: Drosophilidae (Fruit flies)

Drosophila phalerata, A fruit fly

At TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007. The larvae of this species are fungus-breeders (Bächli et al., 2004). In the Sussex Biodiversity Record Centre database the only other records are from Sedlescombe, but it is probably a widespread species.

Drosophila fenestrarum, A fruit fly

At TQ553364 - ancient wet woodland - on 20/06/2007 and at TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007. Species of this group are thought to breed in decaying vegetable material. In the Sussex Biodiversity Record Centre database recorded from five locations and probably widespread in the area.

Drosophila subobscura, A fruit fly

At TQ555371 - northern ride area - on 16/02/2007. One of the commonest fruit flies in South East England and found almost everywhere at all times of the year.

Scaptomyza pallida, A fruit fly

At TQ558366 - north west ride east of cross rides - on 08/09/2007 and frequently elsewhere. A cosmopolitan species usually among grasses. Larvae in decaying vegetable material (Bächli et al., 2004).

Diptera: Diastatidae (Diastatid flies)

Diastata fuscula, A diastatid fly

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. Occasional in East Sussex (3 records in the Sussex Biodiversity Record Centre database) and probably not uncommon.

Diptera: Ephydriidae (Shore flies)

Psilopa nitidula, A shore fly

At TQ556369 - along open north west ride - on 25/08/2007. A widespread species of damp places often found on flowers. Widespread in East Sussex according to the Sussex Biodiversity Record Centre database.

Psilopa pulicaria, A shore fly

At TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007. The biology of this small species is unknown. In the Sussex Biodiversity Record Centre database there are no other records.

Parydra quadripunctata

At TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007. *Parydra* species are waterside flies, often found on bare mud, sometimes on dung heaps. In the Sussex Biodiversity Record Centre database recorded from High Rocks and Brede High Wood.

Parydra coarctata, A shore fly

At TQ558364 - Warren Pond - on 12/06/2007 and elsewhere. One of the commonest *Parydra* species in suitable localities in the region. Larvae are probably semi-aquatic living in waterlogged mud and vegetable detritus.

Parydra littoralis, A shore fly

At TQ554367 - near small pond on dammed stream - on 28/07/2007 and elsewhere. Found in similar situations to the above. Probably equally common.

Athyroglossa ordinata, A shore fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. In the Sussex Biodiversity Record Centre database there are no other Sussex records for this species.

Hydrellia griseola, A shore fly

At TQ554363 - broad-leaved woodland by Warren Pond stream - on 28/07/2007 and elsewhere. One of the commonest *Hydrellia* species in the region and found by many water margins. The larvae are leaf miners of grasses and other plants.

Hyadina guttata, A shore fly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. A small wetland species with five records in the Sussex Biodiversity Record Centre database. Probably widespread across the region. In a case like this probably associated with puddles or water-filled ruts in rides – an important habitat for a wide range of invertebrates.

Philygria interstincta, A shore fly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. No previous records in the Sussex Biodiversity Record Centre database. *Philygria* are generally species of damp grassland.

Diptera: Scathophagidae (Dung flies)

Scathophaga furcata, A yellow dung fly

At TQ561363 - by stream east of Warren Pond - on 25/08/2007 and elsewhere. Has been bred from human and animal dung and from owl pellets (Smith, 1989). Several records across Sussex in the Sussex Biodiversity Record Centre database.

Scathophaga stercoraria, A yellow dung fly.

At TQ555371 - northern ride area - on 16/02/2007 and elsewhere. One of the commonest dung-breeding flies in open situations. Ubiquitous in Sussex.

Diptera: Anthomyiidae (Wood flies)

Hylemya vagans, A wood fly

At TQ560366 - heathy ride towards east of survey area - on 25/08/2007. A very common and widespread species. Recorded from only five localities in Sussex but the Anthomyiidae are generally a difficult and therefore under-recorded family.

Diptera: Fanniidae (Lesser house flies)

Fannia armata, A lesser housefly

At TQ549367 - interior of mature pine plantation - on 06/07/2007. Widely distributed and common in Sussex and elsewhere.

Fannia clara, A lesser housefly

At TQ554367 - near small pond on dammed stream - on 28/07/2007. A rather scarce species that has been reared from nests of little owl and heron (Smith, 1989). There are no previous records in the Sussex Biodiversity Record Centre database.

Fannia coracina, A lesser housefly

At TQ554367 - near small pond on dammed stream - on 28/07/2007. Has been bred from carrion and wasps' and birds' nests. Only two other records in the Sussex Biodiversity Record Centre database – Ewhurst Green and Seaford.

Fannia lustrator, A lesser housefly

At TQ549367 - interior of mature pine plantation - on 06/07/2007. A widely distributed species. In the Sussex Biodiversity Record Centre database only recorded from Brighton and Sedlescombe.

Fannia monilis, A lesser housefly

At TQ556369 - along open north west ride - on 25/08/2007. A fungus-breeding species that has been bred from *Pleurotus* and other species as well as from dog and human excrement and rotten bracken. Generally common and widespread, but with no previous records on the Sussex Biodiversity Record Centre database.

Fannia sociella, A lesser housefly

At TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007. A very common species in the British Isles but only recorded from four localities in the Sussex Biodiversity Record Centre database.

Fannia speciosa, A lesser housefly

At TQ558363 - mature pine plantation south of Warren Pond - on 28/07/2007. Only one other Sussex record in the Sussex Biodiversity Record Centre database, from Sedlescombe. Larvae probably develop in decaying organic matter.

Fannia umbrosa, A lesser housefly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. A widespread but uncommon species with no previous Sussex records in the Sussex Biodiversity Record Centre database. Has been bred from leaf litter and detritus collected from a rotten oak.

Dipt: Muscidae (Muscid flies)

Coenosia dubiosa, A muscid fly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. Larvae have been found in the stems of bulrush (*Typha latifolia*) where they are predatory on other fly larvae (Smith, 1989). The only other record in the Sussex Biodiversity Record Centre database is from Rye Golf Course.

Coenosia femoralis, A muscid fly

At TQ556369- along open north west ride - on 25/08/2007. A widespread and common species in southern England but with no records in the Sussex Biodiversity Record Centre database.

Coenosia pumila, A muscid fly

At TQ559364 - ancient wet woodland south east of Warren Pond - on 28/07/200. A very common widely distributed species. Most of the few Sussex records are from the Rye Harbour area.

Coenosia rufipalpis, A muscid fly

At TQ549369- wet, shady alder carr with tussock sedge - on 29/05/2007; TQ552370 - by central stream half a km east of Broadwater Bridge - and TQ558364 - Warren Pond - on 12/06/2007. Said to be a common species but with no previous records in the Sussex Biodiversity Record Centre database.

Coenosia tigrina, A muscid fly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. The predatory larvae have been reared from cow dung. Adults in grassland, particularly grazed pastures. Widespread and very common. Recorded from a wide range of localities in Sussex.

Lispocephala alma, A muscid fly

At TQ556364 - immediately south of Warren Pond stream -on 29/05/2007. A widespread species but with no previous records in the Sussex Biodiversity Record Centre database. British species of *Lispocephala* are likely to be aquatic (Smith, 1989).

Schoenomyza litorella, A muscid fly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. Found in damp grassy places and has been bred from moss and sedge where it is probably predatory on other invertebrates. Widespread and not uncommon.

Spanochaeta dorsalis

At TQ558364 - Warren Pond - on 12/06/2007 and 20/06/2007. A predatory fly found in reed beds. There are no previous Sussex records in the Sussex Biodiversity Record Centre database despite the fact that there has been much recording of reed bed diptera.

Limnophora maculosa, A muscid fly

At TQ554366 - by central stream - on 08/09/2007. This and its congeners are predators of blackflies (*Simulium* spp.) whose larvae live in streams. The example from Broadwater has some characteristics of *L. olympiae*, a coastal species, and this is being investigated with the help of other dipterists who specialise this group. There is one other Sussex record of *L. maculosa*, from Uckfield.

Spilogona denigrata, A muscid fly

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. A widespread species, but with no earlier records in the Sussex Biodiversity Record Centre database.

Azelia trigonica, A muscid fly

At TQ560366 - heathy ride towards east of survey area - on 25/08/2007. A dung-breeding species. Widespread in Sussex.

Hydrotaea cyrtoneurina,

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007. Larvae are probably soil dwelling predators. Widespread but local with several records in East Sussex in the Sussex Biodiversity Record Centre database.

Morellia aenescens, A muscid fly

At TQ556369 - along open north west ride - on 25/08/2007. Larvae live in dung, especially horse dung and adults are often found around horses. Widespread and locally abundant. Can be a nuisance to humans as sweat flies in warm weather. Rather few Sussex records.

Mydaea humeralis, A muscid fly

At TQ549369- wet, shady alder carr with tussock sedge -on 29/05/2007. A widespread species that breeds in fungi. There are no earlier records for Sussex in the Sussex Biodiversity Record Centre database.

Helina confinis, A muscid fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. Most *Helina* species are predatory on early stages of other invertebrates living in soil, under bark etc. No earlier records in the Sussex Biodiversity Record Centre database.

Helina depuncta, A muscid fly

At TQ561363 - by stream east of Warren Pond - on 25/08/2007 and elsewhere. A fairly common muscid fly with a wide distribution throughout Britain. Larvae develop in moss or humus soil where they are carnivorous on other insect larvae. There are no Sussex records in the Sussex Biodiversity Record Centre database but it was recorded from Tunbridge Wells in 1975.

Helina impuncta, A muscid fly

At TQ549369 - wet, shady alder carr with tussock sedge - on 29/05/2007 and TQ552370 - by central stream half a km east of Broadwater Bridge - on 12/06/2007. Quite widely recorded in East Sussex and elsewhere.

Phaonia magnicornis, A muscid fly

At TQ546370 - peaty pools area south of Broadwater Bridge - on 08/07/2007. A widespread but uncommon species. In the Sussex Biodiversity Record Centre database the only earlier record is from Sedlescombe.

Phaonia pallida, A muscid fly

At TQ561363 - by stream east of Warren Pond - on 25/08/2007 and elsewhere. A fungus-breeding predatory species. In the Sussex Biodiversity Record Centre database it is only recorded from Sedlescombe, but it has also been recorded from the Pembury area east of Tunbridge Wells.

Phaonia tuguriorum, A muscid fly

At TQ563364 - mature pine plantation immediately west of quarry - on 26/08/2007. A widespread and common species with a good spread of records across East Sussex. The larvae are probably predatory on other insect larvae and have been reared from dung.

Diptera: Calliphoridae (Calliphorid flies)

Calliphora vicina, A muscid

At TQ548368 - heath and pine south east of Broadwater Bridge - on 29/05/2007 and elsewhere. The commonest bluebottle in the region. Larvae mostly in carrion. Widely distributed across East Sussex.

Pollenia rudis, A cluster fly

At TQ556369 - along open north west ride - on 25/08/2007 and elsewhere. *Pollenia* sp. are parasitic on earthworms and hibernate in houses, hollow trees and similar sites. In the Sussex Biodiversity Record Centre database there are records from across Sussex.

Diptera: Tachinidae (Tachinid flies)

Cinochira atra, A tachinid fly

At TQ556364 - immediately south of warren pond stream - on 29/05/2007. Larvae are internal parasitoids of Lygaeid bugs. Widely distributed in low vegetation in England. There are no earlier records in the Sussex Biodiversity Record Centre database.

Phasia pusilla, A tachinid fly

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007 and TQ556369 - along open north west ride - on 25/08/2007. Larvae are internal parasitoids of Lygaeid bugs. Widely recorded in East Sussex.

Phasia hemiptera, A tachinid fly

At TQ556369 - along open north west ride - on 25/08/2007. Has been raised from shield bugs in mainland Europe but its British hosts are unknown. Widely recorded in East Sussex.

Phasia obesa, A tachinid fly.

At TQ557371 - open, heathy, south-facing ride area - on 28/07/2007. A parasitoid of a wide range of Hemiptera. Widely recorded in East Sussex

Macquartia viridana, A tachinid fly.

At TQ553371 - woodland ride north of central stream - on 06/07/2007. A southern species that has been recorded in mainland Europe as a parasitoid of beetle larvae. The only other Sussex records in the Sussex Biodiversity Record Centre database are from the Eastbourne area.

Dexiosoma caninum, A tachinid fly

At TQ559364 - ancient wet woodland south east of Warren Pond - on 28/07/2007. A parasitoid of the larvae of cockchafers, *Melolontha melolontha*. In the Sussex Biodiversity Record Centre database there are three Sussex records and two from the Pembury area in Kent.

Siphona geniculata, A tachinid fly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. Very widely recorded in Sussex. This species is a parasitoid of lepidoptera and crane fly (*Tipula*) larvae.

Hymenoptera: Tenthredinidae (Sawflies)

Aneugmenus padi, A sawfly

At TQ546366 - heathy woodland area - on 06/07/2007. A bracken-feeding species. No Sussex records but has been recorded from Pembury Walks to the east of Tunbridge Wells.

Athalia cordata, A sawfly

At TQ558366 - north west ride east of cross rides - on 08/09/2007. In the Sussex Biodiversity Record Centre database there are records from Ewhurst in East Sussex and Barlavington and Arundel in West Sussex. Widespread in Britain. The larvae feed on bugle, *Ajuga reptans*.

Athalia rosae, A sawfly

At TQ560366 - heathy ride towards east of survey area - on 25/08/2007. Larvae on a variety of plants. Said to be scarce, but recorded quite widely in Sussex. Probably under-recorded.

Hymenoptera: Cynipidae

Andricus fecundator, Artichoke gall

At TQ555371 - northern ride area - on 16/02/2007. Common gall wasp which galls oaks . Widely recorded across Sussex.

Andricus kollari, Marble gall

At TQ555371 - northern ride area - on 16/02/2007. A familiar round gall of oak trees. Widely recorded across Sussex.

Andricus lignicola, Cola-Nut Gall

At TQ555371 - northern ride area - on 16/02/2007. A greenish brown 'lumpy' gall of oak. Only three other Sussex records in the Sussex Biodiversity Record Centre database but undoubtedly under-recorded.

Hymenoptera: Sphecidae (Solitary wasps)

Psen equestris, A solitary wasp

At TQ556369 - along open north west ride - on 25/08/2007. A solitary wasp which nests in deep holes in flat firm dry sand and preys on cicadellid leaf hoppers. Most records are from West Sussex commons but there is a cluster from suitable localities in the Tunbridge Wells area.

Hymenoptera: Apidae (Bumble and honey bees)

Bombus lucorum, White-tailed bumble bee

At TQ548368 - heath and pine south east of Broadwater Bridge - on 29/05/2007 (identified from queen) and elsewhere. Widespread and common across Sussex.

Apis mellifera, Honey bee

At TQ546366 - heathy woodland area - on 06/07/2007 and elsewhere. Common across Sussex and Kent.

Flora

Beech bark fungus, *Ascodichaena rugosa*

TQ562364 - dense mixed woodland west of quarry -, 25/08/2007.

Lemon-scented Fern, *Oreopteris limbosperma*

At TQ559363 - ancient woodland south of central stream -on28/07/2007. Occasional patches in the ancient woodland to the south and east of Warren Pond.

Green-ribbed Sedge, *Carex binervis*

At TQ557368 - heathy ride - on 20/06/2007.

Smooth-stalked Sedge, *Carex laevigata*

At TQ556367 - by the central stream - on 20/06/2007.

Wild Service-tree, *Sorbus torminalis*

One example in the mature pine plantation at TQ551369 on 29/05/2007. A young tree about 5 metres high growing well within the plantation. Wild services usually grow on heavy soils, or limestones, in ancient broad-leaved woodlands and ancient hedges. Under modern conditions they rarely reproduce from seed and this tree is an exception to the general rule, though it appears in good health. Throughout the plantation there are similarly aged examples of rowan, *Sorbus aucuparia*, alder buckthorn, *Frangula alnus*, and other species that are frequently bird-sown and this is undoubtedly the origin of this wild service.

Vertebrates

Common Frog, *Rana temporaria*

At TQ554366 - by central stream - on 20/06/2007 and elsewhere along the central stream.

Common Lizard, *Zootoca vivipara*

Noted at TQ562365 (25/08/2007) and TQ558366 - north west ride at cross rides - (08/09/2007).

Probably common.

Adder, *Vipera berus*

One female sunning itself on edge of northern ride at TQ559370 on 28/07/2007.

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Patrick Roper – some background information

Patrick Roper has worked as a consultant ecologist since 1993 within his own business, Patrick Roper Associates, based in Sedlescombe, East Sussex

He is a doctor of business administration, an elected fellow of the Linnean Society and of the Royal Entomological Society and a member of the British Ecological Society. He was on the council of the British Entomological & Natural History Society from 2002 to 2004 and was a director of Butterfly Conservation and editor of its journal from 1990-1998. He is also on the council of the Sussex Amphibian & Reptile Group, edits their newsletter and has a great crested newt handling licence from Natural England (formerly English Nature). He is an active member of the Hastings Badger Protection Society.

He is a listed surveyor for Farm Environment Plans with Natural England's Rural Development Service, in the latter case.

He manages the Rare Species Inventory for the Sussex Biodiversity Record Centre in a professional capacity and edits *Adastra*, their annual review of wildlife recording in Sussex.

He is environmental adviser to the Pestalozzi International Village Trust in Sedlescombe and one of their trustees. As such he is deeply involved in a multi-million pound project to create an international centre with sustainability and biodiversity at its heart. This is being developed in conjunction with the World Wildlife Fund and many other environmental organisations.

Dr Roper is the recorder for two-winged flies (Diptera) in East and West Sussex. He has also studied the wild service tree, *Sorbus torminalis*, for over 30 years during which time he coordinated the national survey of the species for the Botanical Society of the British Isles and the Biological Records Centre. He is author of a book on the tree published in May 2004 and a member of the Sussex Botanical Recording Society.

He is co-author of *Wooded Heaths in the High Weald*, a research report published by the Sussex Record Centre Survey Unit on behalf of the Weald Heathland Initiative (2004) and the subsequent paper *Ancient woodland or ancient heath? Re-examining the importance of wooded heaths in the Weald* (Proceedings of the 8th National Heathland Conference, 2004).

He lectures frequently on a variety of ecological and wildlife topics, has contributed refereed papers to a number of scientific journals and contributes regularly to the Rye and Battle Observer newspapers. He was a member of the working party that revised the national Country Code in 1981 and a member of the committee for the establishment of Sites of Nature Conservation Importance (SNCIs) in East Sussex. He has appeared on wildlife programmes on radio and television on many occasions including the 2007 Springwatch on BBC television..

Recent clients for ecological work have included:

Beauport Park Hotel, BdR Engineering, Bullens, Calverley Park Association, Canopy, CCM, Ecology Consultancy Ltd., David I. Leigh Architects, G & F Pooke, Gemselect Ltd., Hastings Borough Council, Hawkins Brown, Hayland Developments Ltd., High Weald AoNB Unit, J & J Design, Kent Design Partnership, Lseed Ltd., National Trust, Oakdene Homes, Park Lane Homes (South East) Ltd., Rother District Council, Royal Society for the Protection of Birds, Rye Harbour Nature Reserve, Simon Jones Associates Ltd., Southern Water, Sussex Biodiversity Record Centre, Sussex Wildlife Trust, Wardell Armstrong, Wealden District Council, Weekes Consulting, Westridge Construction Ltd., West Sussex County Council and The Wetland Trust, The Woodland Trust. Many of these clients have returned several times with new commissions.

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