

**Bainton Heath  
Invertebrate Survey 2011**

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report to the Wildlife Trust &  
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## Introduction

The greater part of the area known as Bainton Heath has developed on tipped fly ash. The very free-draining ground which results is unusual for the Peterborough area, and developed a characteristic flora which, because of difficult growing conditions and rabbit pressure, was subject to very slow successional change. By 2011, however, the effects of succession have become very visible and a cause for concern. Very open conditions, with bare ground and a wide mix of low-growing herbs were formerly extensive, but are now restricted to relatively small pockets of high rabbit activity. A large area is occupied by floristically poor grassland dominated by wood small-reed *Calamagrostis epigeios*, and scrub, dominated by hawthorn, bramble and rose, is widespread and in places dense, especially towards the edges of the tip. Invertebrate survey was commissioned by the Langdyke Trust in 2011 to inform management of the site.

The 2011 survey area includes only the northern part of the former fly-ash tip, but extends into peripheral habitats. A strip of land along the northern side contains plantation woodland, two pools, and scrub and rough grassland on “native” substrate, and there are planted trees – especially conifers – along the bank which forms the edge of the tip to the east. The plantation woodland is especially noteworthy for large mature black poplars, but also includes other broadleaved and coniferous trees, as well as naturally colonizing scrub, especially of elder and hawthorn. The ground flora, where it is not too shaded to develop, is dominated by stinging nettle *Urtica dioica*. Some large branches and a number of whole trees have fallen, and there is a considerable amount of large diameter dead wood on the ground. The northern edge of the woodland is marked by a narrow drain. One large willow with substantial dead wood grows at the edge of this, within the site, and other willows grow elsewhere within the woodland, the most impressive being a fallen tree at the margin of the larger pool. Scrub is especially dense, and in places impenetrable, immediately to the south of the woodland, so that there tends to be a north-south gradation in woody vegetation from woodland to dense scrub to scattered scrub. There are, however, tracks and patches of more open grassy vegetation within the scrub, partly the result of recent management, providing moderately sunny sheltered conditions with relatively tall growth of grassland and flowering herbs. Though in places quite tall, the scrub is not of great age, and the hawthorns which dominate are not mature. The two pools are of very different character. The larger, to the west, is well-vegetated, with good growth of submerged macrophytes and extensive beds of emergents. It is, however, deep, with mostly quite abruptly sloping sides, contains fish, and is fringed by scrub and trees to the water’s edge round most of its margin. The smaller pool is oddly lacking in submerged and emergent vegetation. It has rather better-developed shallows than the large pool, but they are covered by soft mud and dead leaves and twigs. A small area in the north-east of the survey area supports grassland – without *Calamagrostis* – with large banks of bramble and invading scrub including willow, hawthorn and elder – the latter including dead stumps.

Though, at first sight, its unique character make the open habitats of Bainton Heath a rather isolated site, similar conditions can develop on areas of rail ballast, and locally in areas of gravel and clay pits. The adjoining extensive area of Bainton Pits, though now

fairly mature and well-vegetated, contains open-structured vegetation and patchy grassland with similar or overlapping conditions, and so far as invertebrates are concerned the two areas must be considered part of the same functional site. The linkage with Bainton Pits not only extends the potential habitat area for some species, but also links the heath into a large series of pits in Cambridgeshire and South Lincolnshire which, though not directly connected, are not separated by great distances and which collectively form a large area of land of varied successional stages. Rail lines run immediately to the south and a short distance to the north, and provide potential routes for colonisation: the rail routes close to the site are rather narrow and uninteresting, but active and redundant railway land in and around Peterborough provides better (though diminishing) habitat. These additional areas and corridors are, however, probably peripheral to the development of any invertebrate interest on the site: many of the species most characteristic of brownfield sites of this character are very mobile and can colonise even very isolated sites given sufficient time, and Bainton Heath is large enough to support viable populations of many species in the long term. Recent gravel workings, together with the extensive local drainage system, provides an extensive context for the pools, and the general area is one which is rich in wetland and aquatic invertebrates which are effective colonizers of newly available sites. Woodland is not a prevalent feature in the local landscape, but trees and bushes are: watercourses and hedgerows in the area contain a declining but significant number of old trees, one of which is included within the survey area, and poplars, as well as supporting a rich and interesting invertebrate fauna, have a long history of use as fast-growing screening trees around quarries and other works in the area.

Bainton Heath, and the wider area of Bainton Pits, has been known as a significant site for invertebrates for some time. Dragonflies and butterflies are especially well-known, the former, not surprisingly, for the pits, the latter especially for grizzled skipper, known for some years from the heath. Mark Russell recorded an impressively large number of weevils, including a number of uncommon species, from the heath in the 1980s, and there are records of other groups, including what remains the only record for the Peterborough area of the heath assassin bug *Coranus subapterus*, a flightless species of limited mobility and restrictive habitat requirements. Previous invertebrate work within the 2011 survey area has, however, been of limited extent and very incomplete taxonomic coverage, has concentrated, not surprisingly, on the areas of distinctive open habitat, and has mostly taken place before successional change altered the character of the area to a significant extent.

At the outset of survey work in 2011, therefore, expectations were high that significant invertebrate interest would be present. Apart from the always interesting question of just how valuable the site currently is, in a county and national context, the chief questions requiring answers are:

- To what extent has the fauna of very open habitats survived successional change to date?
- What interest is present in the other, relatively neglected or recently developed, habitats on the site?
- What is the preferred balance between the different habitat components?

- What management might best maintain or improve current interest in each of these habitats?

Survey was undertaken over a series of visits between April and September 2011, examining as wide a taxonomic range of invertebrates as was within the surveyor's ability to identify with confidence. This report describes the survey work undertaken, lists the invertebrates recorded, highlights species of interest, assesses the fauna and the habitats which support it, and suggests management which might maintain or enhance the fauna. It does so single-mindedly. No attempt is made to consider the impacts on other aspects of the fauna (or flora) except insofar as these might directly affect the invertebrates. Though it is recognised that in practice there must be compromise to ensure management considers all groups of interest, it is considered better here to suggest the ideal for invertebrates, and to let others propose the compromises.

## **Methods**

Terrestrial invertebrates were sampled using a small range of active methods, coupled with trapping by window traps and pitfall traps. Details of these methods follow:

### **Sweep-netting**

Two nets were used. In dense, short, or thorny vegetation the net used was a pentagonal sweep-net with a rigid aluminium frame, 48centimetres across, supplied as a sweep net by GB Nets. In taller, softer herbaceous vegetation samples were taken using a net supplied by Marris House Nets, with a lightweight folding circular frame 40 centimetres in diameter and a long and relatively open-weave bag. The net strokes were reasonably rapid, and penetrated as far into the vegetation as was possible without the stroke being seriously slowed by its resistance. Sweeps were counted as single strokes of the net, either from left to right or right to left. A maximum of fifty sweeps was taken before examining the catch. The contents of the net were initially examined in the net, noting or capturing large, fast-moving or readily identified species. The contents were then sifted through a 0.5 centimetre mesh sieve onto a white tray, and the material in the tray examined for smaller and slower animals.

### **Beating**

Samples were taken from tree and shrub foliage by holding a sweep-net under the foliage and tapping the branch or branches above sharply several times with a stout stick. The sweep net currently in use was employed for most low branches and scrub. For higher vegetation and larger branches, a net with a lightweight folding frame 55 centimetres in diameter and a long bag was used: this net has the advantage that substantial amounts of foliage from projecting branches can be inserted into the net, or a substantial length of tall vegetation placed next to the net, before sampling. Material was initially examined in the net, then emptied onto a white tray for further sorting.

### **Brushing of trunks, branches and dead wood.**

A soft nylon-bristled domestic hand-brush was used to brush invertebrates onto a white tray or net where they were examined.

### **Suction sampling**

Suction samples were taken using a petrol-driven garden leaf-blower, modified according to the method of Stewart & Wright (1998), by taping a fine-meshed net in the inlet tube. After three minutes of sampling, the collected material was sifted through a 0.5 centimetre mesh sieve onto a white tray for examination. The coarser material was then placed on the plastic tray and sorted for any larger invertebrates.

### **Active search of other key features of value for invertebrates**

Features of significance to invertebrates which were not sampled, or not necessarily adequately sampled, by sweeping, beating or suction sampling were more closely investigated by close examination, hand searching and, occasionally, sieving of litter through a 0.5 centimetre mesh sieve. Attention was particularly paid to: flowering plants providing an important nectar source; the undersides of stones, wood and other debris; the undersides of plant rosettes; dead wood; fungi; bare wet ground. This method was employed especially where suction sampling was not possible and where there were large pieces of debris.

### **Direct observation**

A small number of relatively large and readily identified species, especially butterflies, dragonflies, some grasshoppers and crickets, larger hoverflies, bees and wasps, were seen without the need for specific search and either identified from sight or individually captured using a sweep-net.

### **Pitfall traps**

Plastic drinking cups, seven centimetres in diameter, were sunk to their rims in the ground. To each was added 30ml. of preservative fluid, composed of equal parts of glycerol and a saturated solution of table salt in 5% acetic acid, with the addition of one drop of bio-degradable washing-up liquid per 100ml.

### **Window traps**

This is a type of interception trap, consisting of a sheet of clear plastic suspended above a collecting tray of preservative fluid: flying insects hit the plastic sheet, and many then fall into the preservative. Plastic trays, 40cm by 30cm across and 9cm deep, were partly filled with glycerol/acetic acid/salt preservative and placed at ground level. A sheet of clear rigid plastic, 60cm tall by 35cm wide, was rested across the tray at its mid-point and held upright between two canes, pushed into the ground, using plastic crocodile clips. Three window traps were used: one in open grassland, close to a transition to hawthorn-dominated scrub; one in the woodland, close to a large fallen willow trunk; and one in the woodland, close to a fallen poplar, and fairly close to the margin of the large pool.

### **Vane and funnel traps**

These traps were constructed from stiff but flexible clear plastic. Two intersecting vanes, each 40 cm by 20 cm, at right angles to one another, were suspended over a plastic funnel leading into a screw-topped plastic bottle containing approximately 30ml. of glycerol/salt/vinegar/detergent preservative. A disc of plastic above the vanes prevented the funnel from catching an excessive amount of rain water. Such traps again work on the interception principle. Each trap was attached to the trunk of a tree by tape held in place with roofing tacks. Five such traps were set: one on an old standing willow; one on a fallen willow trunk near the large pool; and two on standing poplars, live but with visible dead wood.

### **Water traps**

Plastic trays, 30 cm by 20 cm across, 7 cm deep, painted fluorescent yellow, partly filled with glycerol/acetic acid/salt preservative and placed at ground level. Such traps passively capture some invertebrates, but are also attractive to others, especially Diptera and some Hymenoptera.

On servicing and retrieval, traps of all types were emptied by removing larger items of debris and filtering the contents through a fine sieve. The collected material was labelled and sealed in a polythene bag. It was preserved after return to the laboratory by addition of 60% iso-propanol. This material was later cleaned by gentle agitation in a sieve in a bowl of water to remove mud and fine debris, then emptied in small portions into a white tray and covered with a thin layer of water. The material in the tray was sorted under a bright light using a head-band magnifier of 2.5x magnification. Representative individuals for identification were placed in 60% iso-propanol in Petri dishes for closer, microscopic, examination.

In all methods of active sampling, some readily identified species were noted in the field. Representative examples of most species were collected for subsequent identification or confirmation. Most were collected using a pooter. A dry pooter made from a flexible polythene sample bottle and a combination of rigid plastic and flexible polythene tubing was used to capture most insects and retain them alive; for spiders, some soft-bodied insects and predacious species which might do serious damage to other material if collected live into a dry pooter, a spider-pooter was used to gather up individual specimens which were then blown direct into a container of 60% iso-propanol. Dry-pooted material was kept alive until return to the laboratory. Here it was killed using ethyl acetate vapour, then either identified immediately, or layered between sheets of tissue paper and placed in a labelled plastic box for later examination.

Aquatic invertebrates were sampled using:

- a standard pond net of side twenty-four centimetres and mesh size one millimetre in deeper water;
- a plastic sieve of seventeen centimetres diameter with a mesh size of approximately one millimetre in dense vegetation and shallow water;

- a plastic sieve ten centimetres in diameter with a mesh size of 0.5 millimetres at water margins and to take secondary samples from areas disturbed by the larger sieve.

Representative bulk samples obtained by the larger pond net were examined in the net and large and obvious animals extracted immediately. Each sample was then spread on metal grids of mesh size five millimetres suspended over plastic trays, and active animals were allowed to make their own way through the grid for a minimum of ten minutes while the sieves were employed in the capture of additional material from shallower areas and the pond net in a search for additional large and active species. Material remaining on the metal grid was then sorted for less active invertebrates, such as molluscs, and additional larger individuals unable to fit through the mesh of the grid.

Readily identifiable species were noted immediately and released, though voucher specimens of scarce species were taken even if they could be confidently identified in the field. In samples poor in species and individuals, representatives of the remaining fauna were preserved in 70% propanol-2-ol for later examination. In larger and more varied samples, or those containing a large number of individuals requiring microscopic examination or dissection for identification, a portion of the sample was thinned by removal of large and easily identified species, concentrated by pouring through a fine-meshed sieve, and preserved whole in 70% propan-2-ol.

Further samples taken with the large net were placed in trays of water and searched for taxa prone to be overlooked by the preceding methods, particularly small soft-bodied animals, caddis larvae and some molluscs.



## Target groups

The following aquatic invertebrate groups were identified if found:

- Mollusca
- Hirudinea
- Larger Crustacea
- Araneae
- Coleoptera
- Diptera (to family only except for selected groups)
- Ephemeroptera
- Hemiptera
- Lepidoptera
- Megaloptera
- Odonata
- Trichoptera.

The terrestrial survey was taxonomically wide-ranging, but concentrated on those groups considered most likely to be informative as to conservation interest and habitat requirements. The final list of identified groups is based partly on those recommended for survey by Drake *et al.* (2007) for the habitats already established as significant for invertebrates on the site, in part on the abilities of the surveyor, and in part simply in response to what was captured. Since the survey was approached in as open-minded a way as possible, the default position was to identify any group which it was thought might hold interest. However, the selection of groups, and the relative extent of identification of the various groups, has been limited by expertise. The following groups have been identified:

- Mollusca
- Crustacea
- Myriapoda
- Araneae
- Coleoptera    Anobiidae, Anthribidae, Apionidae, Biphyllidae, Buprestidae, Byrrhidae, Byturidae, Cantharidae, Carabidae, Cerambycidae, Cerylonidae, Chrysomelidae, Ciidae, Cleridae, Coccinellidae, Colydiidae, Corylophidae, Cryptophagidae (excluding *Atomaria* and *Cryptophagus*), Curculionidae, Dasytidae, Dermestidae, Elateridae, Endomychidae, Erotylidae, Eucnemidae, Histeridae, Hydrophilidae, Kateretidae, Lampyridae, Latridiidae (selected species), Leiodidae, Lucanidae, Malachiidae, Melandryidae, Monotomidae, Mordellidae, Mycetophagidae, Nanophyidae, Nitidulidae (excluding *Meligethes*), Oedemeridae, Pyrochroidae, Salpingidae, Scarabaeidae, Scirtidae, Scaptiidae, Scydmaenidae, Silphidae, Sphindidae, Staphylinidae (except Aleocharinae)Tenebrionidae, Tetratomidae, Throscidae
- Dermoptera

Diptera	Asilidae, Bibionidae, Bombyliidae, Clusiidae, Conopidae, Ditomyiidae, Dolichopodidae, Empididae, Heleomyzidae, Limoniidae, Lonchopteridae, Mycetophilidae, Odiniidae, Opomyzidae, Pallopteridae, Pediciidae, Piophilidae, Ptychopteridae, Rhagionidae, Scathophagidae, Sciomyzidae, Sepsidae, Stratiomyidae, Syrphidae, Tabanidae, Tachinidae, Tephritidae, Therevidae, Tipulidae, Xylomyidae
Ephemeroptera	
Hemiptera	Auchenorrhyncha, Heteroptera
Hymenoptera	Aculeata, distinctive Symphyta
Lepidoptera	Adult and conspicuous larval Macrolepidoptera, Pyralidae
Mecoptera	
Megaloptera	
Neuroptera	
Odonata	
Orthoptera	
Trichoptera	

Though this list includes a number of groups which might be regarded as essential for the assessment of the invertebrate assemblages, it has been compiled retrospectively from the groups actually identified, and is not, for the most part, a list of target groups selected prior to survey. In practice, any group within the abilities of the surveyor to identify, and which might be of potential interest or value in assessment, was identified. The list thus reflects in part simply what was actually found.

Identification has been to species except in a small number of cases: adults within target groups which could not be identified to species (typically those of which only females were caught and of which only males are identifiable, of which the only examples captured were damaged, or of taxonomically difficult genera where accurate identification to species could not be guaranteed); a small number of taxa are listed as “agg.” where separation of a group of closely related species is both difficult and unrewarding.

## Nomenclature

Checklists and other sources used for names have been selected as far as possible on the basis of easy availability, broad coverage, specific reference to the British fauna, of being reasonably recent, and of their availability in printed form. There are few occasions when all these criteria are met. The following sources have been used:

Mollusca	Anderson, 2005
Hirudinea	Elliott & Mann, 1979
Crustacea	Gledhill et al., 1993; Hopkin, 1991
Myriapoda	Barber, 2009; Lee, 2006
Araneae	Harvey <i>et al.</i> , 2002

Opiliones	Hillyard & Sankey, 1989
Coleoptera	Duff, 2008
Dermaptera	Haes & Harding, 1997
Diptera	Chandler, 1998
Ephemeroptera	Elliott & Humpesch, 2010
Hemiptera Auchenorrhyncha	Biedermann & Niedringhaus, 2009
Hemiptera Heteroptera	Aukema & Rieger, 1995-2006
Hymenoptera Aculeata	Archer, 2004
Lepidoptera	Bradley, 1998; Fox & Spencer, 2011
Mecoptera	Plant, 1997
Megaloptera	Plant, 1997
Neuroptera	Plant, 1997
Odonata	Merritt <i>et al.</i> , 1997
Orthoptera	Haes & Harding, 1997
Trichoptera	Edington & Hildrew, 1992; Wallace <i>et al.</i> , 1990

In the lists, the arrangement is as far as possible alphabetical. Most records are of insects. Within this group, orders are arranged alphabetically, families alphabetically within orders, and species alphabetically within families. No groupings between family and order, or between genus and family, are used. Other invertebrates are listed under larger taxonomic groupings, usually phylum or class.

## Statutes

Each of the species recorded has been assigned at least one status. The better-known groups of invertebrates were assessed for formal conservation status in Red Data Books and National reviews from the mid-1980s onwards, using criteria from the IUCN for the rarest (Red Data Book) species, and defining species believed to occur in 100 or fewer 10-kilometres squares of the National Grid as Nationally Scarce (Notable). The earlier IUCN criteria have been superseded, but only a fraction of the British invertebrate fauna has as yet been assessed, in published reviews, under the newer criteria.

The following statutes and abbreviations from the older system are used in this report:

### **Red Data Book category 2 – Vulnerable (RDB2)**

Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. Included are taxa of which most or all of the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously depleted and whose ultimate security is not yet assured; and taxa with populations that are still abundant but are under threat from serious adverse factors throughout their range. Criteria for inclusion are: species declining throughout their range; species in vulnerable habitats.

### **Red Data Book category 3 – Rare (RDB3)**

Taxa with small populations that are not at present Endangered or Vulnerable, but are at risk. These taxa are usually localised within restricted geographical areas or habitats, or are thinly scattered over a more extensive range. Usually, such taxa are not likely to exist in more than fifteen post-1970 10km squares. This criterion may be relaxed where populations are likely to exist in over fifteen 10km squares but occupy small areas of especially vulnerable habitats.

**Red Data Book category K - Insufficiently Known (RDBK)**

Taxa that are suspected, but not definitely known, because of lack of information, to belong to Red Data Book category 1, 2 or 3. Included are species recently discovered or recognised in Great Britain, which may prove to be more widespread in the future; species with very few or perhaps only a single known locality but which belong to poorly recorded or taxonomically difficult groups; species known from very few localities but which occur in inaccessible habitats or habitats which are seldom sampled; and species with very few or perhaps only a single known locality and of questionable native status, but not clearly falling into the category of recent colonist, vagrant or introduction.

**Nationally Scarce category A (Na)**

Taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and are thought to occur in 30 or fewer hectads of the National Grid or, for less well-recorded groups, within seven or fewer vice-counties.

**Nationally Scarce category B (Nb)**

Taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and are thought to occur in between 31 and 100 10km squares of the National Grid or, for less well-recorded groups, between eight and twenty vice-counties.

**Nationally Scarce (N)**

For some less well-recorded groups and species, it has not been possible to determine which of the Nationally Scarce categories (A or B) is most appropriate for scarce species. These species have been assigned to an undivided Nationally Scarce category.

The following categories from the revised IUCN criteria have been used:

**Vulnerable (VU)**

A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a very high risk of extinction in the wild in the medium-term future, as defined by any of the following criteria [C and D1 omitted]:

- A. Population reduction in the form of either of the following:
  - 1. An observed, estimated, inferred or suspected reduction of at least 20% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

- (a) direct observation
  - (b) an index of abundance appropriate for the taxon
  - (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
  - (d) actual or potential levels of exploitation
  - (e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.
2. A reduction of at least 20%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.
- B. Extent of occurrence estimated to be less than 20,000 km<sup>2</sup> or area of occupancy estimated to be less than 2000 km<sup>2</sup>, and estimates indicating any two of the following:
1. Severely fragmented or known to exist at no more than five locations.
  2. Continuing decline, observed, inferred or projected, in any of the following:
    - (a) extent of occurrence
    - (b) area of occupancy
    - (c) area, extent and/or quality of habitat
    - (d) number of locations or subpopulations
    - (e) number of mature individuals.
  3. Extreme fluctuations in any of the following
    - (a) extent of occurrence
    - (b) area of occupancy
    - (c) number of locations or subpopulations
    - (d) number of mature individuals
- D. Population very small or restricted (only criterion 2 relevant):
2. Population is characterised by an acute distribution in its area of occupancy (typically less than 100 km<sup>2</sup>) or in the number of locations (typically less than 5). Such a taxon would thus be prone to the effects of human activities (or stochastic events whose impact is increased by human activities) within a very short period of time in an unforeseeable future, and is thus capable of becoming Critically Endangered or even Extinct in a very short period.
- E. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.

**Lower Risk (LR)**

A taxon is Lower Risk where it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the LR category can be separated into four subcategories, only two of which are used in this report.

2. **Near Threatened (NT).** Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable - in Britain, defined as occurring in 15 or fewer hectads but not CR, EN or VU. The

absolute count of hectads may be considered subordinate to evidence of decline on an extent not qualifying the species for CR, EN or VU.

3. **Nationally Scarce (NS).** Taxa which do not qualify for Conservation Dependent or Near Threatened - in Britain defined as species occurring in 16 to 100 hectads but not CR, EN or VU. This subcategory associates a level of threat with rarity status, whereas the previous National Scarcity listings were based solely on rarity. Those species, the populations of which occasionally occupy more than 100 hectads can still be listed if it is thought that their baseline populations frequently fall below these thresholds, or if the habitats occupied are considered under threat.

Two conventions have been used in the text in order to simplify technical terms and maintain uniformity. The first is made necessary by the fact that under the older grading system, there was a clear demarcation between Red Data Book and Nationally Scarce species: only statuses higher than Nationally Scarce were included in the Red Data Book, and all took the form of “Red Data Book category ...”). Under the newer criteria, there is no unifying RDB prefix to Red Data Book categories, and the criteria extend down to Nationally Scarce species. For uniformity in reporting, a division is maintained between Nationally Scarce and higher statuses: only the latter are described here as Red Data Book species. The second convention is that although in this section a distinction is made between the Nationally Scarce species defined under the older system and those defined under the newer system, since the two categories are for all usual purposes almost identical they are combined under the name “Nationally Scarce” in assessment and discussion. The different abbreviations are, however, maintained in tables and lists of species, so that their origins are clear.

Shirt (1987) was the first publication to give definitive Red Data Book statuses to insects. Subsequent reviews proposed many changes to these statuses. Because the revised statuses were preceded by a “p” (for proposed) and not actually published in a Red Data Book, they have not been universally used as the formal status, the Shirt (1987) status being retained. Whatever the technicalities, the retention of a manifestly outdated status for a species where a formal published alternative exists is, for purposes of assessment, clearly unhelpful, and in this report the most recent published estimate of status is given, without the use of “p”s.

Species falling into none of these categories have been defined for the purposes of this report as either **local (l)** or **common (c)**. Neither term has a precise definition, and they are used only to distinguish between species of wide distribution and either broad or very commonly met habitat requirements, and those which, because of more specialised habitat requirements, lesser mobility, or other cause, are of less frequent occurrence. These categories have been applied according to personal experience and the opinions of standard texts, and must be considered in part subjective.

Nationally Scarce and Red Data Book statuses have been assigned to the species recorded according to the most conveniently accessible and useful summary of the most recently published statuses, as follows:

Coleoptera	Hyman & Parsons, 1992, 1994
Diptera	Falk 1991b; Falk & Chandler, 2005
Hemiptera	Kirby, 1992
Hymenoptera	Falk, 1991a
Lepidoptera	Fox et al., 2010; Waring & Townsend, 2003
Odonata	Daguet <i>et al.</i> , 2008
Orthoptera	Haes & Harding, 1997

The list has also been checked for any species included in the lists of threatened and declining species in the UK Biodiversity Action Plans (Biodiversity Reporting and Information Group, 2007). Such species are indicated in tables by the abbreviation “BAP”.

## Timetable of work

**Table 1**  
**Summary of work undertaken**

Date	Time	Weather	Work done
23 April	12.00 – 17.00	Warm, sunny, almost windless	Site familiarization; active survey, especially aculeates, species of open grassland
1 May	13.00 – 17.30	Warm, sunny, almost windless	Pitfalls set; aquatic sampling; general active sampling
18 May	10.00 – 16.00	Fine early and late, but with cool rainy conditions in the early afternoon	Window traps and vane traps set; pitfalls removed; suction sampling; general active survey
3 June	11.00 – 18.00	Warm, dry, sunny, light breeze	Survey with C.T.J. Kirby- Lambert. Traps serviced; general active survey
25 June	10.00 – 16.00	Warm, dry, sunny, light breeze	Traps serviced; suction sampling in grassland; general active survey
28 July	10.00 – 16.00	Warm, alternating sun and overcast, fairly warm	Traps serviced; general active survey
19 October	13.00 – 16.30	Warm, dry, initially sunny then overcast	Survey with C.T.J Kirby- Lambert. Suction sampling in grassland; search in woodland and scrub

### Constraints and limitations of survey

Any invertebrate survey, unless of a very small area, a very simple habitat, or of very large scale, records only a fraction of the fauna of a site, and the present survey is no exception. Every effort has been made to ensure that the fraction captured is a substantial and representative one, and that it includes particularly good representation of those groups likely to include uncommon species at a site of this character. However, the exact contents of that fraction of the fauna which has not been caught must remain unknown, and the assessment of interest must contain a margin of possible error.

The range of groups identified has been as wide as possible. However, it has been selective. The sampling methods employed are those most commonly used in sampling, and are able to record a very wide range of species, but they are not exhaustive, and adoption of additional methods might have recorded different species.

All active sampling has been diurnal. Static traps will have captured some nocturnal species, but the nocturnal fauna is likely to be relatively under-represented in the records.



Moth-trapping was considered as an additional recording method, but through the early part of the year nights were persistently clear and moth-trapping generally produced rather poor results, and in the later summer little time was available, so the option was not followed up.

Within the samples obtained, many species belonged either to groups which, because of their obscurity, seemed unlikely to be informative for site assessment, or to groups beyond the identification skills of the surveyor. Specimens of such groups were not retained, and uncommon species could have been amongst them.

The dry, early spring no doubt benefited many species of invertebrates: the numbers of early spring bees were particularly impressive. But on the very dry ground in the most extreme – and potentially amongst the most interesting – parts of Bainton Heath it considerably affected sampling, if not the fauna itself. Invertebrate activity in the most dry, open areas was high on the first visit in April, but had severely declined even by the beginning of May, and remained low throughout the summer. A dry late summer and early autumn meant that the autumn sampling period, which can provide compensatory sampling time when the next generation of insects (especially beetles, bugs) appears was unusually late. The recorded fauna from the driest areas was almost certainly less than would have been found in a more normal year.

Rabbits proved very intolerant of pitfalls set in the areas of open grassland and bare dry ground, where their captures would have been most informative. Only a small fraction of the traps set were successfully recovered. The fauna recorded by these traps was interesting, but almost certainly under-represents what might have been found.

Sampling from the large pool has been difficult. Scrub and trees prevent access, or at least useful access, to much of the margin. The bed, for the most part, slopes rather steeply down after limited areas of shallows, so sampling from within the pool has been largely infeasible; and the density of emergent vegetation means that it is not practical to use a dredge or other thrown sampler over most of the potentially interesting area. The sample of the fauna taken thus comes almost entirely from three small access points and provides poor coverage of the emergent beds. Considering the difficulties of sampling, the recorded fauna is quite substantial and appears a reasonably balanced list, but it must be considered likely that it is incomplete.

The poplars in the plantation are very tall, and very little foliage is within reach of a net or beating stick. The fauna in the crowns remains almost unknown, and even many common poplar-feeding species, which must surely be present, have not been recorded.

## **Results**

The survey has recorded a total of 849 species of invertebrates, of which 64 are Nationally Scarce, six are Red Data Book, and 118 are considered to be of local distribution. Appendix 1 is a complete list of recorded species. A separate spreadsheet

provides full records. Table 2 summarises captures of species with formal status (Red Data Book, Nationally Scarce or national Biodiversity Action Plan priority species), together with a small number of local species considered to be of particular interest. Annotations provide brief information on their habitat requirements and, where relevant, current status and trends. The last column is included because many invertebrates have changed considerably in range and frequency in recent years. Of particular significance for the current assessment is that a number of species of restricted southern distribution have increased considerably, probably in response to global warming, and are no longer technically worthy of their current status, which may have been applied anything up to twenty years ago. Such increased species inevitably occupy a disproportionate part of lists of species with formal conservation status produced by survey work. The “area” column records the habitat or feature on the site where the species was captured.

**Table 2**  
**Summary of key species recorded**

Area abbreviations:

- G *Calamagrostis*-dominated grassland
- O open-structured vegetation, short turf and bare ground
- P the large pool and its margins
- S scrub
- W woodland

Taxon	Status	Area	Habitat	Notes on status
<b>Coleoptera - beetles</b>				
<i>Anobiidae – wood-boring beetles</i>				
<i>Dorcatoma flavicornis</i>	Nb	W	Saproxyllic; large standing trees	
<i>Anthribidae – fungus weevils</i>				
<i>Choragus sheppardi</i>	Na	W	Saproxyllic; especially shaded hawthorn	Under-recorded
<i>Platyrhinus resinosus</i>	Nb	W	Saproxyllic; <i>Daldinia</i> on ash	Doubtfully worthy of status; rather frequent in the area
<i>Apionidae – seed weevils</i>				
<i>Squamapion cineraceum</i>	Na	O	On <i>Prunella vulgaris</i> in short, often grazed or trampled, vegetation	Under-recorded and doubtfully worthy of status
<i>Buprestidae – jewel beetles</i>				
<i>Agrilus sinuatus</i>	Na	S	Larvae burrow in live hawthorn branches and trunks in sunshine	Unworthy of formal status
<i>Trachys scrobiculatus</i>	Na	O	<i>Glechoma hederacea</i> in short vegetation and	Doubtfully worthy of status; rather frequent

Taxon	Status	Area	Habitat	Notes on status
			full sun	in the area
<b><i>Carabidae – ground beetles</i></b>				
<i>Panagaeus bipustulatus</i>	Nb	O	Open-structured short vegetation with bare well-drained ground	
<i>Platyderus depressus</i>	Nb	O	Open-structured vegetation with bare well-drained ground	Doubtfully worthy of status
<b><i>Cerambycidae – longhorn beetles</i></b>				
<i>Glaphyra umbellatarum</i>	Na	S	Saproxyllic; in twigs and small branches of rosaceous shrubs	Local, but current status overstates its rarity
<b><i>Chrysomelidae – leaf beetles</i></b>				
<i>Donacia cinerea</i>	Nb	P	Tall emergents and marginals, usually on <i>Typha angustifolia</i>	
<i>Longitarsus dorsalis</i>	Nb	O	<i>Senecio jacobaea</i> , especially small rosettes in short grazed vegetation	Unworthy of formal status
<b><i>Cleridae – chequer beetles</i></b>				
<i>Opilo mollis</i>	Nb	W	Saproxyllic; predator of wood-boring beetles	Under-recorded
<i>Tillus elongatus</i>	Nb	W	Saproxyllic; predator of wood-boring beetles in standing timber	Doubtfully worthy of status
<b><i>Coccinellidae - ladybirds</i></b>				
<i>Hippodamia variegata</i>	Nb	O	Short to medium open-structured vegetation with bare ground on well-drained soils	Doubtfully worthy of status; rather frequent in the area
<i>Scymnus femoralis</i>	Nb	O,G	Short open-structured vegetation and dry grassland on well-drained soils	
<b><i>Curculionidae – weevils</i></b>				
<i>Acalles ptinoides</i>	Nb	W	Saproxyllic; larvae in fallen twigs amongst leaf litter	Probably under-recorded
<i>Baris picicornis</i>	Nb	O,G	On <i>Reseda lutea</i>	Increased in recent years; doubtfully

Taxon	Status	Area	Habitat	Notes on status
				worthy of status
<i>Ceutorhynchus constrictus</i>	Nb	S	On <i>Alliaria petiolata</i> in scrub, transitions, mosaics and open woodland	
<i>Ceutorhynchus resedae</i>	Nb	O	On <i>Reseda luteola</i> , especially multiple small flowering spikes in very open vegetation	
<i>Cossonus linearis</i>	Na	W	Saproxyllic; heartwood of standing poplars and willows	Doubtfully worthy of current status
<i>Dorytomus ictor</i>	Nb	W	Poplars	Possibly under-recorded
<i>Gronops lunatus</i>	Nb	O	Short open-structured vegetation on well-drained dry soils; on Caryophyllaceae	Doubtfully worthy of status
<i>Gymnetron linariae</i>	Na	O,G	<i>Linaria vulgaris</i> in open-structured vegetation in sun	
<i>Hypera meles</i>	Na	O	On <i>Trifolium</i> spp., perhaps other Fabaceae, in short grassland and other open habitats on dry ground	Increased in recent years and unworthy of current status
<i>Sibinia primita</i>	Nb	O	On Caryophyllaceae, especially <i>Sagina</i> , in short open-structured vegetation in full sun	Doubtfully worthy of status
<i>Trypophloeus asperatus</i>	Na	W	Saproxyllic; beneath bark of poplars	Probably under-recorded
<b><i>Dermestidae - hide beetles, museum beetles</i></b>				
<i>Megatoma undata</i>	Nb	W	Saproxyllic; beneath bark	Doubtfully worthy of status
<b><i>Elateridae – click beetles</i></b>				
<i>Ampedus quercicola</i>	Nb	W	Saproxyllic; standing timber and logs	Seems to have increased locally in recent years, and to be less demanding in habitat
<b><i>Endomychidae</i></b>				

<b>Taxon</b>	<b>Status</b>	<b>Area</b>	<b>Habitat</b>	<b>Notes on status</b>
<i>Symbiotes latus</i>	Nb	W	Saproxyllic	
<b>Lampyridae – glow-worms</b>				
<i>Lampyris noctiluca</i> glow-worm	1	O,G	Open grassland and mosaics	Not unduly scarce in the area, and certainly under-recorded, but a species of some cultural significance
<b>Melandryidae – false darkling beetles</b>				
<i>Orchesia micans</i>	Nb	W	Saproxyllic; <i>Inonotus hispidus</i> on ash	Unworthy of formal status; found in the area wherever the fungus occurs
<b>Mordellidae – tumbling flower beetles</b>				
<i>Variimorda villosa</i>	Nb	G,S	Medium-tall herbaceous vegetation with umbellifers or thistles; especially transitions and mosaics	
<b>Salpingidae</b>				
<i>Lissodema quadripustulata</i>	Nb	W,S	Saproxyllic; small branches and twigs of broadleaved trees and shrubs	Doubtfully worthy of status
<b>Scarabaeidae – dung beetles &amp; chafers</b>				
<i>Aphodius zenkeri</i>	Nb	W	A dung-feeder in shaded places; woodland and pasture-woodland	Doubtfully worthy of status; possibly increasing, perhaps benefiting from increased deer populations
<b>Scraptiidae</b>				
<i>Anaspis thoracica</i>	Na	W	Saproxyllic	Status possibly in need of revision; identification difficulties in the past have led to uncertainty as to status
<b>Scydmaenidae</b>				
<i>Scydmorephes helvolus</i>	N	O,G	Recorded from a fairly wide range of generally open or mosaic habitats	A small and probably under-recorded species
<b>Sphindidae</b>				

<b>Taxon</b>	<b>Status</b>	<b>Area</b>	<b>Habitat</b>	<b>Notes on status</b>
<i>Sphindus dubius</i>	Nb	W	Saproxylic; on slime-moulds on wood	Doubtfully worthy of status
<b>Staphylinidae – rove beetles</b>				
<i>Euplectus kirbyi</i>	N	W	Saproxylic	
<b>Tenebrionidae – darkling beetles</b>				
<i>Eledona agricola</i>	Nb	W	Saproxylic; in <i>Laetiporus sulphureus</i>	Reasonably frequent in the area; expected wherever the host fungus occurs
<b>Tetratomidae</b>				
<i>Hallomenus binotatus</i>	Nb	W	Saproxylic; on bracket fungi	
<b>Diptera - flies</b>				
<b>Asilidae – robber-flies</b>				
<i>Machimus rusticus</i>	RDB2	O,G	Open grassland on well-drained ground	
<b>Dolichopodidae – long-footed flies</b>				
<i>Hercostomus nigrilamellatus</i>	NS	P,W	Shaded wetland?	
<b>Limoniidae – short-palped crane flies</b>				
<i>Gnophomyia viridipennis</i>	N	W	Saproxylic; in rotting poplar, occasionally willow	Doubtfully worthy of status
<i>Limonia masoni</i>	RDB3	S,W	Scrub, open woodland, transitions	Increased in recent years; unworthy of RDB status, and questionably worthy of any formal status at all
<b>Opomyzidae – picture-winged flies</b>				
<i>Geomyza subnigra</i>	N	G	Moderate to tall, often tussocky grassland	Under-recorded; doubtfully worthy of formal status
<b>Rhagionidae – snipe flies</b>				
<i>Ptiolina obscura</i>	N	W	Damp woodland	
<b>Sciomyzidae – snail-killing flies</b>				
<i>Pherbellia annulipes</i>	N	W	Large logs in damp woodland	Usually an ancient woodland species, and a surprising capture here
<b>Stratiomyidae – soldier flies</b>				

<b>Taxon</b>	<b>Status</b>	<b>Area</b>	<b>Habitat</b>	<b>Notes on status</b>
<i>Neopachygaster meromelas</i>	N	W	Saproxyllic; poplars	
<i>Stratiomys potamida</i>	N	P	Swamps and pond margins, often shaded	Local, but unworthy of formal status
<b><i>Syrphidae - hoverflies</i></b>				
<i>Heringia senilis</i>	?	W	Larvae predators of aphids in galls on poplars	A recent addition to the British list; current status uncertain
<i>Mallota cimbiciformis</i>	N	W	Saproxyllic; larvae in rot-holes in trees; adults free-ranging	A wide-ranging species of erratic occurrence; records are not always relevant to site assessment
<b><i>Therevidae – stiletto flies</i></b>				
<i>Thereva plebeja</i>	N	O	Open-structured short vegetation and bare ground on well-drained ground	Doubtfully worthy of status
<b><i>Tipulidae – long-palped craneflies</i></b>				
<i>Ctenophora pectinicornis</i>	N	W	Saproxyllic; especially in large logs and standing timber, but also in smaller scrub	Curiously erratic in occurrence
<b><i>Xylomyidae – wood soldier-flies</i></b>				
<i>Solva marginata</i>	N	W	Saproxyllic; larvae beneath bark of poplars	Unworthy of status; possibly increased, certainly now a frequent species in the area, expected wherever there is dead poplar
<b>Hemiptera – true bugs</b>				
<b><i>Cicadellidae - leafhoppers</i></b>				
<i>Agallia brachyptera</i>	Nb	O,G	Short to medium grassland on dry or seasonally damp ground	Doubtfully worthy of status; possibly increasing
<i>Arthaldeus arenarius</i>	?	G	On <i>Calamagrostis epigeios</i>	Very recently recognised and of uncertain status, but likely to be similar to that of <i>Eurysula lurida</i>
<b><i>Cixiidae – lace-winged planthoppers</i></b>				

<b>Taxon</b>	<b>Status</b>	<b>Area</b>	<b>Habitat</b>	<b>Notes on status</b>
<i>Trigonocranus emmeae</i>	Nb	O	Short or sparse vegetation on well-drained or seasonally dry ground	Possibly increasing – though easily missed – and status possibly in need of examination
<b>Coreidae - squashbugs</b>				
<i>Arenocoris falleni</i>	1	O	On <i>Erodium cicutarium</i> on dry sandy ground	Increased in recent years, especially inland, but habitat requirements very restrictive in this area
<b>Cydnidae – burrower bugs</b>				
<i>Sehirus luctuosus</i>	1	O	On <i>Myosotis</i> spp. on dry, well-drained, partly bare ground	
<b>Delphacidae - planthoppers</b>				
<i>Eurysula lurida</i>	Na	G	On <i>Calamagrostis epigeios</i>	Reasonably frequent in the area, but very scarce nationally
<b>Lygaeidae - groundbugs</b>				
<i>Eremocoris podagricus</i>	1	S	Amongst litter of rosaceous shrubs in partial shade on well-drained ground	
<i>Graptopeltus lynceus</i>	Nb	O	<i>Echium vulgare</i> in open-structured vegetation with well-drained bare ground	Increasing, but still very local
<i>Peritrechus lundi</i>	1	O	Dry well-drained ground with partial vegetation cover	
<b>Rhopalidae – glazier bugs</b>				
<i>Chorosoma schillingi</i>	1	G	Moderate to tall open-structured grassland on seasonally dry ground	
<i>Rhopalus parumpunctatus</i>	1	O	Open-structured dry vegetation; usually on <i>Erodium cicutarium</i>	Increasing but remaining very local; this is probably the first record for the Peterborough area
<b>Hymenoptera – bees, wasps, ants, sawflies</b>				
<b>Apidae - bees</b>				



<b>Taxon</b>	<b>Status</b>	<b>Area</b>	<b>Habitat</b>	<b>Notes on status</b>
<i>Bombus rupestris</i> hill carder bee	Nb	O,G	Flowery grassland and mosaics	Considerably increased in recent years, following an earlier decline; now frequent to common in the area
<i>Hylaeus cornutus</i>	Na	G,S	Especially in mosaic and transition habitats; nests made in dead stems	Unworthy of current status
<i>Hylaeus signatus</i>	Nb	O,G	Open habitats and mosaics; flowers of <i>Reseda</i> essential; nests made in dead stems	
<b><i>Formicidae - ants</i></b>				
<i>Formica cunicularia</i>	I	O	Open dry habitats	
<i>Myrmica schencki</i>	Nb	O	Open dry habitats	
<b><i>Pompilidae – spider-hunting wasps</i></b>				
<i>Arachnospila minutula</i>	Nb	O	Open dry habitats with bare ground	
<b><i>Sphecidae – digger wasps</i></b>				
<i>Nysson dimidiatus</i>	Nb	O	Open dry habitats with bare ground	Doubtfully worthy of status
<i>Nysson trimaculatus</i>	Nb	O	Open dry habitats with bare ground	Doubtfully worthy of status
<b><i>Vespidae – social and potter wasps</i></b>				
<i>Dolichovespula media</i> median wasp	Na	S,W	Open woodland, scrub, mosaics, transitions; aerial nests usually amongst woody vegetation	A recent arrival in Britain, greatly increased in recent years, now widely common and of no conservation significance
<i>Dolichovespula saxonica</i> Saxon wasp	RDBK	S,W	Open woodland, scrub, mosaics, transitions; aerial nests usually amongst woody vegetation	A recent arrival in Britain, greatly increased in recent years, under-recorded because of identification difficulties but unworthy of formal status
<b>Lepidoptera – moths and butterflies</b>				
<b><i>Arctiidae – tigers and footmen</i></b>				

<b>Taxon</b>	<b>Status</b>	<b>Area</b>	<b>Habitat</b>	<b>Notes on status</b>
<i>Tyria jacobaeae</i> cinnabar	c BAP	O	<i>Senecio jacobaea</i>	Remains a common species despite recent national decline
<b><i>Geometridae - loopers</i></b>				
<i>Chiasmia clathrata</i> latticed heath	l BAP	O,G	Dry grassland	Remains a frequent species despite recent national decline
<b><i>Hesperiidae - skippers</i></b>				
<i>Pyrgus malvae</i> grizzled skipper	VU BAP	O	Open-structured dry vegetation; on herbaceous Rosaceae	
<b><i>Noctuidae - owlets</i></b>				
<i>Chortodes extrema</i> concolorous	RDB3 BAP	G	On <i>Calamagrostis epigeios</i>	
<b><i>Nymphalidae – browns, fritillaries, vanessids</i></b>				
<i>Coenonympha pamphilus</i> small heath	NT BAP	O,G	Short dry grassland	Remains reasonably frequent despite national decline
<b><i>Sesiidae - clearwings</i></b>				
<i>Sesia apiformis</i> hornet moth	Nb	W	Poplars; larvae burrow in trunks	Doubtfully worthy of status; rather a regular associate of large poplars in the area
<b>Odonata - dragonflies</b>				
<b><i>Coenagriidae - damselflies</i></b>				
<i>Coenagrion pulchellum</i> variable damselfly	NT	P	Well-vegetated ponds with good water quality	
<b>Orthoptera – grasshoppers and crickets</b>				
<b><i>Tettigoniidae – bush-crickets</i></b>				
<i>Metrioptera roeselii</i> Roesel's bush-cricket	Nb	G	Moderate to tall dry or seasonally damp grassland	Greatly increased in recent years, now widely common and of negligible conservation significance

## Assessment of the invertebrate fauna

The expectation of significant invertebrate interest has been more than realised by survey work. It has been a useful guideline in site assessment for invertebrates that lists derived from general recording in which Nationally Scarce and Red Data Book species collectively comprise in excess of 10% of the total are rare, and indicative of exceptional faunas; and that 5% of such species in a list is a convenient cut-off point for “good” sites, at least in southern England. This guideline is becoming less useful as real statuses drift further from formal statuses, and as more groups are re-assessed under new criteria. However, the figure for this site – Red Data Book and Nationally Scarce species comprise 8.49% of the recorded fauna – seems a reasonably accurate estimate of the position of the overall fauna on the scale of possible interest.

Interest has been recorded from all habitat components investigated. It is highest, however, in what may be regarded as the successional extremes: open-structured vegetation with bare ground; and mature woodland.

Recorded interest is lowest in hawthorn-dominated scrub. The records in Table 1 arguably under-estimate the value of the scrub: it supports a considerable number of commoner species; its flowers – especially of hawthorn, bramble and rose – provide a valuable source of nectar and pollen; and it provides shelter and possible hibernation sites for species breeding in more open habitats. Nonetheless, the scrub must be considered a minor feature of the site, and much can be regarded as disposable.

It is encouraging to find that the very open-structured and partly-vegetated ground, though greatly reduced in area from recent historical levels, retains a substantial fauna. It is impossible to say with confidence that the fauna has not declined in quality, but equally there is little to suggest that it has. The heath assassin bug *Coranus subapterus* was not re-recorded, despite specific search, and some scarce weevils previously recorded were not found, but the 2011 survey did not cover the whole of the heath, and it would not be expected, with any reasonable level of survey work, that all previously recorded species would be re-found, even if still present. Amongst the groups closely investigated in the open habitats, only solitary bees and wasps proved somewhat disappointing; only 57 species were recorded (out of 81 aculeates – bees, wasps and ants – in total). Well-drained dry ground should provide good habitat for a wide range of ground-nesting species, and quite small areas of suitable habitat can provide sufficient nesting space for large populations of a good number of species. The group is no doubt under-recorded – it is a relatively labour-intensive group to record thoroughly – but substantial numbers of individuals were found; only diversity was lacking.

The smaller of the two pools proved extremely species-poor and uninteresting, as was rather expected from its general character. The larger pool was interesting without, apparently, being exceptional, but this assessment comes with the caveat that the fauna may be under-recorded because of sampling difficulties. The recorded fauna of the large pool is sufficient to qualify it as a Priority Pond under the national Pond Biodiversity Action Plan (Fairclough & Nicolet, 2008), both on species richness (the threshold for qualification is 50 aquatic species; the pool contains at least 63) and, assuming that variable damselfly is breeding (this was not definitively established), on its content of rare species.

Uncommon species recorded from the woodland are mostly saproxylic (associated with dead wood). This is usually the case in any area of woody vegetation sufficiently mature for significant dead wood to have formed. Table 1 includes several uncommon saproxylic flies, and saproxylic members of several other groups were recorded, but the majority of saproxylic species found, and especially the majority of local and scarce saproxylic species, are beetles. Again, this is a usual finding in habitats with mature woody vegetation.

There are two widely used methods for assessing the interest of the saproxylic beetle fauna of a site. Alexander (2004) provides the most recent version of an Index of Ecological Continuity (IEC), based on species associated with habitat continuity, assessed on a three-point scale: Group 1 are species which are known to have occurred in recent times only in areas believed to be ancient woodland, mainly pasture woodland; Group 2 are species which occur mainly in areas believed to be ancient woodland with abundant dead-wood habitats, but which also appear to have been recorded from areas that may not be ancient or for which the locality data are imprecise; Group 3 are species which occur widely in wooded land, but which are collectively characteristic of ancient woodland with dead-wood habitats. A score of one is given to species in Group 3, a score of two to those in Group 2, and a score of 3 to those in Group 1. The index is calculated by summing the scores for all species recorded. Because this score is cumulative, it is heavily dependent on recording effort. A score of 15-24 is suggested by Alexander to be indicative of regional value, and 25-79 of national importance.

The second scoring system (Fowles et al., 1999) calculates a Saproxylic Quality Index which is intended to be less dependent on recording effort than the Index of Ecological Continuity. Scores are assigned to saproxylic species according to their national status rather than the extent of their association with sites of long ecological continuity. Fowles et al. (1999) provide a complete list of species and their scores. Summation of the scores for all species provides the Saproxylic Quality Score (SQS): dividing this score by the number of scoring species (N) and multiplying by 100 gives the Saproxylic Quality Index (SQI). A minimum of forty scoring species is recommended for the calculation of a reliable SQI. A score of 500 has been provisionally set as a threshold for national significance.

Table 3 lists the saproxylic Coleoptera recorded in 2011, together with their scores on the two systems. Note that some species have no scores in either system: these are either recent arrivals in Britain, or are not invariably saproxylic.

**Table 3**  
**Saproxylic Coleoptera recorded in 2011**

Taxon	Status	Scores	
		SQI	IEC
<b>Anobiidae</b>			
<i>Anobium fulvicorne</i>	c	1	
<i>Anobium punctatum</i>	c	1	
<i>Dorcatoma flavicornis</i>	Nb	8	1
<i>Dryophilus pusillus</i>	c	2*	
<i>Ernobius mollis</i>	c	2*	
<i>Ptilinus pectinicornis</i>	c	1	
<b>Anthribidae</b>			
<i>Choragus sheppardi</i>	Na	16	
<i>Platyrhinus resinosus</i>	Nb	4	1
<b>Biphyllidae</b>			
<i>Biphyllus lunatus</i>	l	4	1
<b>Buprestidae</b>			
<i>Agrilus sinuatus</i>	Na	4	
<b>Cantharidae</b>			
<i>Malthinus flaveolus</i>	c	1	
<i>Malthodes minimus</i>	c	1	
<b>Cerambycidae</b>			
<i>Clytus arietis</i>	c	1	
<i>Glaphyra umbellatarum</i>	Na	16	
<i>Grammoptera ruficornis</i>	c	1	
<i>Pogonocherus hispidulus</i>	l	2	
<i>Pogonocherus hispidus</i>	l	2	
<i>Rhagium mordax</i>	l	1	
<i>Rutpela maculata</i>	c	1	
<i>Stenurella melanura</i>	l	1	
<i>Tetrops praeustus</i>	l	2	
<b>Cerylonidae</b>			
<i>Cerylon ferrugineum</i>	c	2	
<b>Ciidae</b>			
<i>Cis bilamellatus</i>	c		
<i>Cis boleti</i>	c	1	
<i>Cis nitidus</i>	c	2	
<i>Orthocis alni</i>	l	2	
<b>Cleridae</b>			
<i>Opilo mollis</i>	Nb	8	1
<i>Tillus elongatus</i>	Nb	8	1
<b>Curculionidae</b>			
<i>Acalles misellus</i>	l	2	

Taxon	Status	Scores	
		SQI	IEC
<i>Acalles ptinoides</i>	Nb		
<i>Cossonus linearis</i>	Na	16	
<i>Euophryum confine</i>	c		
<i>Magdalis ruficornis</i>	l	2	
<i>Trypophloeus binodulus</i>	Na	16	
<b><i>Dermestidae</i></b>			
<i>Megatoma undata</i>	Nb	8	
<b><i>Elateridae</i></b>			
<i>Ampedus quercicola</i>	Nb	8	3
<i>Denticollis linearis</i>	c	1	
<i>Melanotus villosus</i>	c	1	
<i>Stenagostus rhombeus</i>	l	4	1
<b><i>Endomychidae</i></b>			
<i>Symbiotes latus</i>	Nb	8	1
<b><i>Erotylidae</i></b>			
<i>Dacne bipustulata</i>	l	2	
<i>Dacne rufifrons</i>	l	2	
<b><i>Eucnemidae</i></b>			
<i>Epiphanis cornutus</i>	l	8	
<b><i>Latridiidae</i></b>			
<i>Enicmus testaceus</i>	l	2	
<b><i>Leiodidae</i></b>			
<i>Agathidium nigripenne</i>	c	2	
<i>Anisotoma humeralis</i>	c	2	
<b><i>Lucanidae</i></b>			
<i>Dorcus parallelepipedus</i>	l	2	
<i>Sinodendron cylindricum</i>	l	2	
<b><i>Malachiidae</i></b>			
<i>Malachius bipustulatus</i>	c	1	
<b><i>Melandryidae</i></b>			
<i>Orchesia micans</i>	Nb	4	
<b><i>Monotomidae</i></b>			
<i>Rhizophagus cribratus</i>	l	2	
<i>Rhizophagus dispar</i>	c	1	
<i>Rhizophagus parallelocollis</i>	l	2	
<b><i>Mordellidae</i></b>			
<i>Mordellochroa abdominalis</i>	l	4	
<b><i>Mycetophagidae</i></b>			
<i>Mycetophagus multipunctatus</i>	l	2	
<i>Mycetophagus quadripustulatus</i>	l	2	
<i>Pseudotriphyllus suturalis</i>	l	4	1
<b><i>Pyrochroidae</i></b>			

Taxon	Status	Scores	
		SQI	IEC
<i>Pyrochroa serraticornis</i>	c	1	
<b><i>Salpingidae</i></b>			
<i>Lissodema quadripustulata</i>	Nb	8	
<i>Salpingus planirostris</i>	c	1	
<b><i>Scraptiidae</i></b>			
<i>Anaspis frontalis</i>	c	1	
<i>Anaspis thoracica</i>	Na	8	
<b><i>Sphindidae</i></b>			
<i>Aspidiphorus orbiculatus</i>	l	2	
<i>Sphindus dubius</i>	Nb	8	
<b><i>Staphylinidae</i></b>			
<i>Euplectus kirbyi</i>	N	8	
<i>Euplectus piceus</i>	c	2	
<i>Sepedophilus lusitanicus</i>	l	2	
<b><i>Tenebrionidae</i></b>			
<i>Eledona agricola</i>	Nb	4	1
<b><i>Tetratomidae</i></b>			
<i>Hallomenus binotatus</i>	Nb	8	1
<b>Number of species</b>	<b>69</b>	<b>66</b>	<b>11</b>
<b>Index of Ecological Continuity</b>			<b>13</b>
<b>Saproxylic Quality Score</b>		<b>258</b>	
<b>Saproxylic Quality Index</b>		<b>390.9</b>	

The IEC is quite close to the threshold considered to justify regional significance. It is admittedly arguable that the threshold values given by Alexander (2004) are rather low: some worryingly ordinary places can pass the threshold with sufficient recording. However, there is equally little doubt that the saproxylic fauna of Bainton Heath remains only partly recorded, and it is entirely possible that the IEC could be raised significantly, though probably not hugely.

The Saproxylic Quality Index is, considering the character of the site, quite high. A list of 157 evaluated sites is available at <http://thasos.users.btopenworld.com/sqi.htm>, made up largely of sites which might be expected or hoped to be of significance for their saproxylic fauna, and arranged in order of their SQI. If Bainton Heath were placed in this list it would be at position 66 (63 if conifer-associated species are excluded). This is a very respectable position, and rather surprisingly high for a recent plantation. It is a higher score than some ancient woodlands and parklands. From a local perspective, it is perhaps of particular interest that it is a little higher than that for Bedford Purlieus.

Of course, too much cannot be read into the details of positioning in the middle rankings of a list of sites subjected to different amounts and characters of recording by different

people over a substantial period of time, but these results are sufficient to show that there is considerable saproxylic interest at Bainton Heath, and that it is worthy of conservation. The unexpectedly high interest of the saproxylic fauna reflects in part the fact that poplars support a rich, and often under-appreciated, saproxylic fauna, which the trees at Bainton Heath are at just the right age and condition to support; but it also reflects the interest of old willows, which provide continuity with pre-existing woody vegetation, and perhaps provide a least a partial explanation for the quite high score for habitat continuity, not otherwise expected in a recent plantation.

For the most part, the invertebrate species recorded at Bainton Heath are individually unsurprising, given the habitats and site location. Some increasing species would have been of considerable interest only a few years ago, and a few such species (such as the bugs *Graptopeltus lynceus* and *Arenocoris falleni*) are still scarce and sporadic this far north and inland, but for the most part they are of interest chiefly as components of a larger assemblage. There are, however, a few species of individually high interest and value which it is important to maintain on the site:

***Chortedes extrema* (Lepidoptera, Noctuidae)**

The concolorous. The Peterborough area, and adjoining parts of Northamptonshire and Huntingdonshire, form a hot-spot for this rare moth, which has few proven breeding localities. It is well-established at Ring Haw NR, occurs in good numbers in at least one brick-pit, and light trap records suggest that it is more widely established. Its foodplant is *Calamagrostis epigeios*, and in view of the abundance of this plant on the site, and its geographical location, its presence is not a complete surprise. Only one individual was captured, in a window trap (and, considering the method of capture, in surprisingly good condition, though it was sufficiently bedraggled that identity was confirmed using male genitalia) so it is not definitively established that a viable breeding population occurs. However, it is extremely unlikely that the individual captured had not grown up on site, and there is sufficient habitat for a substantial population, so it can be confidently assumed to be established.

The concolorous is part of a small but important assemblage of species associated with *Calamagrostis* at Bainton Heath, which also includes the Nationally Scarce planthopper *Eurysula lurida*, a species with a distribution strongly concentrated in and near Peterborough and Huntingdonshire; and the leafhopper *Arthaldeus arenarius*, not recognised in Britain until 2010, and currently known from fewer than a dozen sites in this same area. This assemblage is interesting when considering the preferred balance of habitats. Coarse *Calamagrostis*-dominated grassland has increased at the expense of more open-structured and floristically rich vegetation. The more open-structured vegetation undoubtedly supports a more diverse invertebrate assemblage with many uncommon species, but similar assemblages are widespread, even if local and uncommon, in southern counties; the *Calamagrostis* assemblage is a more geographically restricted one for which the Peterborough area has a particular responsibility.



***Coenagrion pulchellum* (Odonata, Coenagriidae)**

The variable damselfly. No proof of breeding was obtained for this species, but it was found in moderate numbers in the immediate vicinity of the large pool, and it seems likely that it is breeding there. However, there is undoubtedly a great deal of drift of dragonflies from the adjoining pits, so certainty is not possible. This is arguably the least significant of the individually selected species. Dragonflies are, by invertebrate standards, well known; their statuses based on good data and have been recently reviewed, so the Red Data Book status given to the variable damselfly must be taken seriously. The variable damselfly has, however, done very well in the Peterborough area in recent years, has been recorded from a rather high proportion of wetland sites with reasonable water quality which have been subjected to intensive survey, and has on occasion been the commonest dragonfly in some brickpits.

***Machimus rusticus* (Diptera, Asilidae)**

This large robberfly is perhaps the most interesting single species recorded. *M. rusticus* is predominantly a species of southern chalk and limestone grassland and the brecks. An isolated population has been known for some years at Barnack Hills and Holes NNR. It appears to be a reasonably frequent species in the most open areas at Bainton Heath. It seems most likely that this population has formed from colonists from Barnack. It is valuable not only because it is a very rare species of individual worth, but also because it provides a second Peterborough population, and evidence that the species can colonise new sites over moderate distances.

***Pyrgus malvae* (Lepidoptera, Hesperiiidae)**

The grizzled skipper. The importance of a population of grizzled skipper arguably needs little emphasis. No counts were made, but it appears that a quite reasonable, though not very large population remains, despite the apparently rather limited area of suitable habitat.

**Management suggestions**

**Maintain poplars.** For immediate purposes, this requires merely leaving them alone. There is a good population of poplars, most appear to be in reasonably good health, interest is greatest when they are old to moribund, further tree falls are likely to increase interest, or at least help to maintain existing interest, and it will be some time and many trees before losses are so great that continuity is threatened. However, that point of threat will come: the mature trees appear to be of uniform age, and there are no younger replacements. The level of concern is somewhat diminished if the wider landscape is considered: there are younger poplars within Bainton Pits, for example, and the invertebrate species recorded here, and more widely associated with poplars, appear to be good colonists at least over short distances. Nonetheless, measures to ensure continuity, by the planting of young replacement poplars when gaps open up, and a long-term policy

to maintain a more varied age structure, would be useful and would free the site from dependence on the wider landscape.

**Maintain willow trees.** This overlaps with the consideration for poplars: willows and poplars have a broadly overlapping, though far from identical, fauna. Willows are a less dominant feature of the site than poplars, but an important one which provides a substantial part of the recorded saproxylic fauna, may be the key feature in providing historical continuity, and one which certainly provides continuity with the very large population of willows on the adjoining Bainton Pits. It is again a feature which is less significant for the site itself if the wider landscape is considered: there are so many developing willows in the Pits that those within the survey area could be considered relatively trivial, but those already present include valuable examples. At the least, existing trees should be maintained.

**Retain dead wood.** At its simplest, this requires merely leaving things alone, letting dead and dying trees stand and allowing dead wood to rot where it falls. If it is necessary to cut or move dead wood it should be kept in pieces as large as possible and moved as small a distance as possible. Wood from management, especially of scrub, could provide additional habitat, but it is important that the amount retained does not damage other habitats, and there is little point in accumulating large amounts of fine material. Burning of most cut material is preferred. A proportion can be retained to provide dead wood habitat, and preference should then be given to relatively large-diameter pieces of wood, though finer material can usefully be included. Retained cut material should ideally be kept in large pieces, only roughly trimmed, and either left scattered or placed in loose heaps, not neat stacks. Killing scrub but leaving it standing can produce useful results but is not always easy. Herbicide treatment may be more effective than cutting or ring-barking. Some bushes could be cut down but left whole in situ, and bramble can be managed by cutting major stems close to the base and treating re-growth with herbicide. Such measures leave broken or cut ends for stem-nesting bees and wasps and fine material in sunny situations for specialist saproxylic beetles, but it is easy to generate more material than is useful.

**Allow a proportion of the dense hawthorn scrub to age naturally.** Old hawthorn scrub supports more invertebrate interest than young scrub. It is of greatest interest when it is sufficiently large and old that it shades out its own lower branches, becomes open enough to walk through, and the crown becomes open-structured through partial die-back (typically mediated by the jewel beetle *Agrilus sinuatus*). Such scrub (or hawthorn woodland) supports a good range of saproxylic species while maintaining a supply of flowers and fruits and providing good shelter and hibernation sites. Its disadvantages are that intermediate states of middle-aged scrub which precede it are very dull, and that the final preferred state is floristically poor and structurally limited. For these reasons, it is not proposed that the extent of such scrub should be large; only that a proportion of the existing dense scrub, preferably in a single continuous block contiguous with the plantation woodland, should be allowed to develop in this way.

**Thin or remove 75% of scrub.** Though scrub is a useful habitat component, there is too much of it, and left unchecked it will occupy a considerably greater area (even without further invasion, through growth of existing bushes). The preferred structure for the site is of a thin band of dense scrub alongside the plantation in the north, then a band where relatively dense scrub provides 50% cover in mosaic with grassland, then scattered scrub, mostly as individual bushes or small banks of bramble, over the greater part of the grassland. The scattered scrub can be of varied sizes, ages and species, but the preference is for moderate-sized shrubs or bramble patches, sufficient to provide a habitat feature and a small area of shelter without taking up too much space or casting significant shade.

**Encourage rabbits.** Rabbits are critical in maintaining the most open areas of habitat on the site at present, and will always be the preferred agent of management for such places. Cutting and ground disturbance can maintain open conditions of similar character, but produce conditions of generally lower quality at considerable expense and labour, and without supporting the additional invertebrates associated with rabbit dung, burrows and corpses. At present, the impression gained on site was that rabbit population is reasonably healthy, and that rabbits are pushing back denser vegetation and increasing the extent of open ground. This would certainly correspond with observations elsewhere in the Peterborough area. Myxomatosis and predation pressure could quickly alter this situation, however. Simply ensuring that rabbits are left alone may be sufficient, or indeed all that can usefully be done. However, avoiding damage to existing burrows would be helpful; and concentrating any grassland management in the vicinity of existing rabbit-grazed areas might encourage more nutritious turf and enhance rabbit populations.

**Increase the area of short and open-structured turf with bare ground.** Encouraging – or ensuring the continued presence – of rabbits is part of this, and the preferred long-term aim is that at far as possible any management in favour of short turf should be to facilitate maintenance by rabbits. To some extent, the methods used to achieve the desired structure must be experimental. Increase in open-structured ground must be mostly at the expense of *Calamagrostis*-dominated grassland, to a lesser extent at the expense of scrub. *Calamagrostis* is intolerant of regular cutting or grazing, so simply cutting areas of *Calamagrostis* – perhaps several times during a single growing season – will discourage it and encourage a more varied and probably shorter sward, and one which may be more palatable to rabbits. It is possible that improving food quality for rabbits may encourage a build-up of numbers and more effective rabbit management, but this cannot be relied on. If rabbits do not take on additional management responsibilities, it may be desirable to undertake ground disturbance as well. Any such disturbance should be small-scale and piecemeal, at least in the early stages. A considerable increase in the area of such habitat is desirable: a long-term aim of increasing it to 50% of the current grassland and grass/scrub area would be reasonable, but a gradual change is likely to be preferable to sudden drastic management. It is important that no more short grassland is created than can be maintained in the long term, and gradual change is more likely to be effective in encouraging an increase in rabbit activity.

**Maintain a substantial area of grassland dominated by *Calamagrostis epigeios*.** In principle, this should be easy. There is a large area of such grassland, and the overall

management aims for the site – especially the increase in open-structured grassland and bare ground – will see its area diminished. Clearance of some of the scrub will increase its area, and when established *Calamagrostis* grassland is sufficiently dense to inhibit further scrub invasion to some extent, so keeping on top of such invasion should be relatively easy. There is a theoretical possibility of loss, or significant reduction, to either scrub invasion or increased rabbit pressure, and it will probably be useful to put limits on the permissible extent of loss: as a broad-brush figure, for current purposes, it is suggested that a 50% reduction in such grassland, in favour of shorter vegetation and bare ground, would be acceptable before the situation would need to be re-assessed.

**Remove woody vegetation from 50% of the margin of the larger pool.** It would be unfortunate to change the character of this pool too much, since it is interesting and attractive in its current state, but invertebrate interest in such pools tends to be concentrated in the margins, and there is little doubt that the margins are currently under-achieving. Opening up the marginal fringe, particularly on the northern and western sides, would encourage the development of more varied vegetation and better structure. It is important that such management does not damage existing mature trees or too greatly diminish the amount of scrub willows; a 50% clearance should enable interests to be kept in balance.

It would be pleasing at this point to suggest some positive management for the currently very uninteresting smaller pool. None is, because it is not immediately obvious why it is so poor. Reduction in shading might improve it, but this could only be done at the expense of woody vegetation which is already interesting, in the interests of pursuing uncertain results. It may be that in the long term the best option will be to leave the pool to fill with leaf litter and woody fragments until it forms a shallow, perhaps seasonally flooded, shaded wetland. There is already a damp woodland fauna on the site which should benefit, and might gain further species.

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**Appendix 1**  
**Complete list of recorded species**

<b>Taxon</b>	<b>Status</b>
<b>Araneae - spiders</b>	
<b>Agelenidae</b>	
<i>Agelena labyrinthica</i>	c
<b>Anyphaenidae</b>	
<i>Anyphaena accentuata</i>	c
<b>Araneidae</b>	
<i>Araneus diadematus</i>	c
<i>Araniella cucurbitina</i>	c
<i>Hypsosinga pygmaea</i>	l
<i>Nuctenea umbratica</i>	c
<b>Clubionidae</b>	
<i>Clubiona compta</i>	c
<b>Gnaphosidae</b>	
<i>Drassyllus pusillus</i>	l
<i>Haplodrassus signifer</i>	l
<i>Micaria pulicaria</i>	c
<b>Linyphiidae</b>	
<i>Gonatium rubens</i>	c
<i>Microlinyphia pusilla</i>	c
<i>Nerienne montana</i>	c
<i>Oedothorax fuscus</i>	c
<i>Oedothorax gibbosus</i>	c
<b>Liocraniidae</b>	
<i>Phrurolithus festivus</i>	c
<b>Lycosidae</b>	
<i>Alopecosa accentuata</i>	c
<i>Alopecosa pulverulenta</i>	c
<i>Arctosa leopardus</i>	l
<i>Arctosa perita</i>	l
<i>Pardosa amentata</i>	c
<i>Pardosa nigriceps</i>	c
<i>Pardosa palustris</i>	c
<i>Pardosa prativaga</i>	c
<i>Pardosa pullata</i>	c
<i>Pirata piraticus</i>	c
<b>Mimetidae</b>	
<i>Ero cambridgei</i>	c
<b>Philodromidae</b>	
<i>Philodromus aureolus</i>	c
<i>Tibellus oblongus</i>	c

<b>Taxon</b>	<b>Status</b>
<b>Pisauridae</b>	
<i>Pisaura mirabilis</i>	c
<b>Salticidae</b>	
<i>Euophrys frontalis</i>	c
<i>Heliophanus flavipes</i>	c
<i>Salticus scenicus</i>	c
<b>Segestriidae</b>	
<i>Segestria senoculata</i>	c
<b>Tetragnathidae</b>	
<i>Metellina mengei</i>	c
<i>Pachygnatha clercki</i>	c
<i>Pachygnatha degeeri</i>	c
<i>Tetragnatha extensa</i>	c
<i>Tetragnatha nigrita</i>	c
<b>Theridiidae</b>	
<i>Achearanea lunata</i>	l
<i>Anelosimus vittatus</i>	c
<i>Theridion mystaceum</i>	c
<i>Theridion pallens</i>	c
<i>Theridion sisyphium</i>	c
<b>Thomisidae</b>	
<i>Xysticus cristatus</i>	c
<b>Zoridae</b>	
<i>Zora spinimana</i>	c
<b>Coleoptera - beetles</b>	
<b>Anobiidae</b>	
<i>Anobium fulvicorne</i>	c
<i>Anobium punctatum</i>	c
<i>Dorcatoma flavicornis</i>	Nb
<i>Dryophilus pusillus</i>	c
<i>Ernobius mollis</i>	c
<i>Ptilinus pectinicornis</i>	c
<b>Anthribidae</b>	
<i>Bruchela rufipes</i>	l
<i>Choragus sheppardi</i>	Na
<i>Platyrhinus resinosus</i>	Nb
<b>Apionidae</b>	
<i>Apion frumentarium</i>	c
<i>Apion haematodes</i>	c
<i>Apion rubens</i>	c



<b>Taxon</b>	<b>Status</b>
<i>Ceratapion gibbirostre</i>	c
<i>Ceratapion onopordi</i>	c
<i>Ischnopterapion virens</i>	c
<i>Perapion curtirostre</i>	c
<i>Protapion fulvipes</i>	c
<i>Squamapion cineraceum</i>	Na
<i>Taeniapion urticarium</i>	l
<b><i>Biphyllidae</i></b>	
<i>Biphyllus lunatus</i>	l
<b><i>Buprestidae</i></b>	
<i>Agrilus sinuatus</i>	Na
<i>Trachys scrobiculatus</i>	Na
<b><i>Byrrhidae</i></b>	
<i>Byrrhus pilula</i>	c
<i>Cytilus sericeus</i>	c
<i>Syncalypta maritima</i>	l
<b><i>Byturidae</i></b>	
<i>Byturus tomentosus</i>	c
<b><i>Cantharidae</i></b>	
<i>Cantharis cryptica</i>	c
<i>Cantharis decipiens</i>	c
<i>Cantharis lateralis</i>	c
<i>Cantharis nigra</i>	c
<i>Cantharis nigricans</i>	c
<i>Cantharis pellucida</i>	c
<i>Cantharis rufa</i>	c
<i>Cantharis rustica</i>	c
<i>Malthinus flaveolus</i>	c
<i>Malthodes minimus</i>	c
<i>Rhagonycha fulva</i>	c
<i>Rhagonycha lignosa</i>	c
<i>Rhagonycha limbata</i>	c
<b><i>Carabidae</i></b>	
<i>Acupalpus dubius</i>	c
<i>Agonum emarginatum</i>	c
<i>Agonum fuliginosum</i>	c
<i>Amara aenea</i>	c
<i>Amara bifrons</i>	c
<i>Amara communis</i>	c
<i>Amara familiaris</i>	c
<i>Amara lunicollis</i>	c
<i>Amara similata</i>	c
<i>Amara tibialis</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Badister bullatus</i>	c
<i>Bembidion assimile</i>	c
<i>Bembidion biguttatum</i>	c
<i>Calathus fuscipes</i>	c
<i>Calodromius spilotus</i>	c
<i>Demetrias atricapillus</i>	c
<i>Dromius quadrimaculatus</i>	c
<i>Elaphrus cupreus</i>	c
<i>Harpalus affinis</i>	c
<i>Harpalus rubripes</i>	c
<i>Harpalus rufipes</i>	c
<i>Harpalus tardus</i>	c
<i>Loricera pilicornis</i>	c
<i>Microlestes maurus</i>	c
<i>Nebria brevicollis</i>	c
<i>Notiophilus biguttatus</i>	c
<i>Panagaeus bipustulatus</i>	Nb
<i>Paradromius linearis</i>	c
<i>Philorhizus melanocephalus</i>	c
<i>Platyderus depressus</i>	Nb
<i>Pterostichus diligens</i>	c
<i>Pterostichus madidus</i>	c
<i>Pterostichus melanarius</i>	c
<i>Pterostichus minor</i>	l
<i>Pterostichus niger</i>	c
<i>Pterostichus nigrita</i>	c
<i>Stenolophus mixtus</i>	c
<i>Syntomus foveatus</i>	c
<i>Syntomus truncatellus</i>	c
<b><i>Cerambycidae</i></b>	
<i>Clytus arietis</i>	c
<i>Glaphyra umbellatarum</i>	Na
<i>Grammoptera ruficornis</i>	c
<i>Pogonocherus hispidulus</i>	l
<i>Pogonocherus hispidus</i>	l
<i>Pseudovadonia livida</i>	l
<i>Rhagium mordax</i>	l
<i>Rutpela maculata</i>	c
<i>Stenurella melanura</i>	l
<i>Tetrops praeustus</i>	l
<b><i>Cerylonidae</i></b>	
<i>Cerylon ferrugineum</i>	c
<b><i>Chrysomelidae</i></b>	

<b>Taxon</b>	<b>Status</b>
<i>Aphthona euphorbiae</i>	c
<i>Bruchus rufimanus</i>	c
<i>Cassida rubiginosa</i>	c
<i>Cassida viridis</i>	l
<i>Chrysolina hyperici</i>	l
<i>Chrysolina polita</i>	c
<i>Crepidodera aurata</i>	c
<i>Crepidodera aurea</i>	c
<i>Crepidodera fulvicornis</i>	c
<i>Cryptocephalus fulvus</i>	l
<i>Cryptocephalus labiatus</i>	c
<i>Cryptocephalus moraei</i>	l
<i>Donacia cinerea</i>	Nb
<i>Lochmaea crataegi</i>	c
<i>Longitarsus dorsalis</i>	Nb
<i>Longitarsus melanocephalus</i>	c
<i>Neocrepidodera transversa</i>	c
<i>Oulema melanopa</i> agg.	c
<i>Phyllotreta atra</i>	c
<i>Phyllotreta nigripes</i>	c
<i>Phyllotreta nodicornis</i>	l
<i>Phyllotreta ochripes</i>	l
<i>Phyllotreta undulata</i>	c
<i>Phyllotreta vittula</i>	c
<i>Psylliodes napi</i>	c
<b>Ciidae</b>	
<i>Cis bilamellatus</i>	c
<i>Cis boleti</i>	c
<i>Cis nitidus</i>	c
<i>Orthocis alni</i>	l
<b>Cleridae</b>	
<i>Opilo mollis</i>	Nb
<i>Tillus elongatus</i>	Nb
<b>Coccinellidae</b>	
<i>Adalia bipunctata</i>	c
<i>Adalia decempunctata</i>	c
<i>Aphidecta oblitterata</i>	c
<i>Calvia quattuordecimguttata</i>	c
<i>Chilocorus renipustulatus</i>	c
<i>Coccinella septempunctata</i>	c
<i>Exochomus quadripustulatus</i>	c
<i>Halyzia sedecimpunctata</i>	c
<i>Harmonia axyridis</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Harmonia quadripunctata</i>	c
<i>Hippodamia variegata</i>	Nb
<i>Nephus redtenbacheri</i>	c
<i>Propylea</i> <i>quattuordecimpunctata</i>	c
<i>Psyllobora</i> <i>vigintiduopunctata</i>	c
<i>Rhizobius litura</i>	c
<i>Scymnus femoralis</i>	Nb
<i>Scymnus frontalis</i>	c
<i>Subcoccinella</i> <i>vigintiquattuorpunctata</i>	c
<i>Tytthaspis sedecimpunctata</i>	c
<b>Corylophidae</b>	
<i>Sericoderus lateralis</i>	c
<b>Cryptophagidae</b>	
<i>Antherophagus pallens</i>	l
<b>Curculionidae</b>	
<i>Acalles misellus</i>	l
<i>Acalles ptinoides</i>	Nb
<i>Anthonomus pedicularius</i>	c
<i>Anthonomus rubi</i>	c
<i>Archarius pyrrhoceras</i>	c
<i>Archarius salicivorus</i>	c
<i>Baris picicornis</i>	Nb
<i>Barypeithes pellucidus</i>	c
<i>Ceutorhynchus assimilis</i>	c
<i>Ceutorhynchus constrictus</i>	Nb
<i>Ceutorhynchus contractus</i>	c
<i>Ceutorhynchus pallidactylus</i>	c
<i>Ceutorhynchus picitarsis</i>	c
<i>Ceutorhynchus</i> <i>pyrrhorhynchus</i>	c
<i>Ceutorhynchus resedae</i>	Nb
<i>Ceutorhynchus turbatus</i>	c
<i>Ceutorhynchus typhae</i>	c
<i>Cossonus linearis</i>	Na
<i>Dorytomus ictor</i>	Nb
<i>Dorytomus longimanus</i>	c
<i>Euophryum confine</i>	c
<i>Gronops lunatus</i>	Nb
<i>Gymnetron linariae</i>	Na
<i>Hadroplontus lituratus</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Hypera arator</i>	
<i>Hypera meles</i>	Na
<i>Magdalis ruficornis</i>	l
<i>Mecinus pascuorum</i>	c
<i>Mecinus pyraster</i>	c
<i>Mogulones asperifoliarum</i>	l
<i>Nedyus quadrimaculatus</i>	c
<i>Otiorhynchus ovatus</i>	l
<i>Otiorhynchus singularis</i>	c
<i>Parethelcus pollinarius</i>	c
<i>Phyllobius maculicornis</i>	c
<i>Phyllobius pomaceus</i>	c
<i>Phyllobius pyri</i>	c
<i>Phyllobius roboretanus</i>	c
<i>Polydrusus pterygomalis</i>	c
<i>Rhamphus oxyacanthae</i>	c
<i>Rhinoncus castor</i>	l
<i>Rhinoncus pericarpus</i>	c
<i>Sibinia primita</i>	Nb
<i>Sitona lineatus</i>	c
<i>Tanysphyrus lemnae</i>	c
<i>Trichosirocalus troglodytes</i>	c
<i>Trypophloeus asperatus</i>	Na
<i>Tychius picirostris</i>	c
<b>Dermestidae</b>	
<i>Dermestes murinus</i>	l
<i>Megatoma undata</i>	Nb
<b>Dytiscidae</b>	
<i>Agabus bipustulatus</i>	c
<i>Dytiscus marginalis</i>	c
<i>Hydroporus angustatus</i>	c
<i>Hydroporus palustris</i>	c
<i>Hydroporus planus</i>	c
<i>Hygrotus inaequalis</i>	c
<i>Hyphydrus ovatus</i>	c
<i>Ilybius fenestratus</i>	l
<i>Ilybius quadriguttatus</i>	c
<i>Laccophilus minutus</i>	c
<i>Liopterus haemorrhoidalis</i>	c
<b>Elateridae</b>	
<i>Agriotes acuminatus</i>	c
<i>Agriotes obscurus</i>	c
<i>Agriotes sputator</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Ampedus quercicola</i>	Nb
<i>Aplotarsus incanus</i>	c
<i>Athous bicolor</i>	c
<i>Athous haemorrhoidalis</i>	c
<i>Dalopius marginatus</i>	c
<i>Denticollis linearis</i>	c
<i>Hemicrepidius hirtus</i>	c
<i>Melanotus erythropus</i> agg.	c
<i>Prosternon tessellatum</i>	l
<i>Stenagostus rhombeus</i>	l
<b>Endomychidae</b>	
<i>Symbiotes latus</i>	Nb
<b>Erotylidae</b>	
<i>Dacne bipustulata</i>	l
<i>Dacne rufifrons</i>	l
<b>Eucnemidae</b>	
<i>Epiphanis cornutus</i>	l
<b>Gyrinidae</b>	
<i>Gyrinus marinus</i>	c
<b>Halipidae</b>	
<i>Halipus immaculatus</i>	c
<i>Halipus lineatocolis</i>	c
<i>Halipus ruficollis</i>	c
<b>Hydraenidae</b>	
<i>Ochthebius minutus</i>	c
<b>Hydrophilidae</b>	
<i>Anacaena limbata</i>	c
<i>Cercyon sternalis</i>	c
<i>Enochrus testaceus</i>	c
<i>Hydrobius fuscipes</i>	c
<i>Laccobius bipunctatus</i>	c
<i>Laccobius minutus</i>	c
<i>Laccobius bipunctatus</i>	c
<b>Kateretidae</b>	
<i>Brachypterus glaber</i>	c
<i>Brachypterus urticae</i>	c
<b>Lampyridae</b>	
<i>Lampyris noctiluca</i>	l
<b>Latridiidae</b>	
<i>Aridius bifasciatus</i>	c
<i>Aridius nodifer</i>	c
<i>Enicmus testaceus</i>	l
<b>Leiodidae</b>	

<b>Taxon</b>	<b>Status</b>
<i>Agathidium nigripenne</i>	c
<i>Anisotoma humerale</i>	c
<i>Catops tristis</i>	c
<i>Choleva agilis</i>	l
<i>Choleva angustata</i>	c
<i>Colon brunneum</i>	c
<i>Leiodes litura</i>	c
<i>Leiodes polita</i>	c
<i>Nargus anisotomoides</i>	c
<i>Ptomophagus subvillosus</i>	c
<i>Sciodrepoides watsoni</i>	c
<b>Lucanidae</b>	
<i>Dorcus parallelepipedus</i>	l
<i>Sinodendron cylindricum</i>	l
<b>Malachiidae</b>	
<i>Cordylepherus viridis</i>	c
<i>Malachius bipustulatus</i>	c
<b>Melandryidae</b>	
<i>Orchesia micans</i>	Nb
<b>Monotomidae</b>	
<i>Rhizophagus cribratus</i>	l
<i>Rhizophagus dispar</i>	c
<i>Rhizophagus parallelocollis</i>	l
<b>Mordellidae</b>	
<i>Mordellistena pumila</i>	l
<i>Mordellochroa abdominalis</i>	l
<i>Variimorda villosa</i>	Nb
<b>Mycetophagidae</b>	
<i>Mycetophagus multipunctatus</i>	l
<i>Mycetophagus quadripustulatus</i>	l
<i>Pseudotriphyllus suturalis</i>	l
<b>Nitidulidae</b>	
<i>Epuraea unicolor</i>	c
<i>Glischrochilus hortensis</i>	c
<i>Meligethes aeneus</i>	c
<i>Pocadius ferrugineus</i>	l
<b>Noteridae</b>	
<i>Noterus clavicornis</i>	c
<b>Oedemeridae</b>	
<i>Oedemera lurida</i>	c
<i>Oedemera nobilis</i>	c

<b>Taxon</b>	<b>Status</b>
<b>Pyrochroidae</b>	
<i>Pyrochroa serraticornis</i>	c
<b>Rhynchitidae</b>	
<i>Lasiorrhynchites caeruleus</i>	c
<i>Neocoenorrhinus aequatus</i>	c
<b>Salpingidae</b>	
<i>Lissodema quadripustulata</i>	Nb
<i>Salpingus planirostris</i>	c
<b>Scarabaeidae</b>	
<i>Aphodius equestris</i>	l
<i>Aphodius prodromus</i>	c
<i>Aphodius rufipes</i>	c
<i>Aphodius zenkeri</i>	Nb
<i>Oxyomus sylvestris</i>	l
<b>Scirtidae</b>	
<i>Cyphon coarctatum</i>	c
<b>Scraptidae</b>	
<i>Anaspis frontalis</i>	c
<i>Anaspis maculata</i>	c
<i>Anaspis regimbarti</i>	c
<i>Anaspis thoracica</i>	Na
<b>Scydmaenidae</b>	
<i>Scydmorephes helvolus</i>	N
<i>Stenichnus collaris</i>	c
<b>Silphidae</b>	
<i>Nicrophorus vespilloides</i>	c
<i>Silpha atrata</i>	c
<b>Sphindidae</b>	
<i>Aspidiphorus orbiculatus</i>	l
<i>Sphindus dubius</i>	Nb
<b>Staphylinidae</b>	
<i>Anotylus rugosus</i>	c
<i>Anotylus sculpturatus</i>	c
<i>Astenus lyonessius</i>	c
<i>Euplectus kirbyi</i>	N
<i>Euplectus piceus</i>	c
<i>Lesteva longolytra</i>	c
<i>Metopsia clypeata</i>	c
<i>Omalium caesum</i>	c
<i>Philonthus decorus</i>	c
<i>Philonthus micans</i>	c
<i>Quedius boops</i>	c
<i>Quedius semiobscurus</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Sepedophilus lusitanicus</i>	l
<i>Sepedophilus nigripennis</i>	c
<i>Tachinus signatus</i>	c
<i>Tachyporus chrysomelinus</i>	c
<i>Tachyporus hypnorum</i>	c
<i>Tachyporus nitidulus</i>	c
<i>Xantholinus linearis</i>	c
<b>Tenebrionidae</b>	
<i>Eledona agricola</i>	Nb
<i>Isomira murina</i>	c
<i>Lagria hirta</i>	c
<b>Tetratomidae</b>	
<i>Hallomenus binotatus</i>	Nb
<b>Throscidae</b>	
<i>Trixagus carinifrons</i>	c
<b>Crustacea – woodlice, water-llice, shrimps</b>	
<b>Armadillidiidae</b>	
<i>Armadillidium vulgare</i>	c
<b>Asellidae</b>	
<i>Asellus aquaticus</i>	c
<b>Crangonyctidae</b>	
<i>Crangonyx pseudogracilis</i>	c
<b>Philosciidae</b>	
<i>Philoscia muscorum</i>	c
<b>Porcellionidae</b>	
<i>Porcellio scaber</i>	c
<b>Trichoniscidae</b>	
<i>Trichoniscus pusillus</i>	c
<b>Dermaptera - earwigs</b>	
<b>Forficulidae</b>	
<i>Forficula auricularia</i>	c
<b>Diptera - flies</b>	
<b>Asilidae</b>	
<i>Dioctria atricapilla</i>	c
<i>Dioctria baumhaueri</i>	c
<i>Dioctria rufipes</i>	c
<i>Leptogaster cylindrica</i>	c
<i>Machimus atricapillus</i>	c
<i>Machimus rusticus</i>	RDB2
<b>Bibionidae</b>	
<i>Bibio anglicus</i>	c
<i>Bibio lepidus</i>	l

<b>Taxon</b>	<b>Status</b>
<i>Bibio marci</i>	c
<i>Dilophus febrilis</i>	c
<i>Dilophus femoratus</i>	c
<b>Bombyliidae</b>	
<i>Bombylius major</i>	c
<b>Clusiidae</b>	
<i>Clusiodes albimana</i>	c
<i>Clusiodes gentilis</i>	c
<b>Conopidae</b>	
<i>Sicus ferrugineus</i>	c
<i>Thecophora atra</i>	c
<b>Ditomyiidae</b>	
<i>Symmerus annulatus</i>	c
<b>Dolichopodidae</b>	
<i>Dolichopus plumipes</i>	c
<i>Dolichopus unguatus</i>	c
<i>Hercostomus aerosus</i>	c
<i>Hercostomus nigrilamellatus</i>	NS
<i>Hercostomus parvilamellatus</i>	l
<i>Medetera abstrusa</i>	l
<i>Medetera truncorum</i>	c
<i>Neurigona quadrifasciata</i>	c
<i>Scellus notatus</i>	c
<i>Sciapus platypterus</i>	c
<i>Sybistroma obscurella</i>	c
<i>Sympycnus desoutteri</i>	c
<i>Xanthochlorus ornatus</i>	c
<b>Empididae</b>	
<i>Dolichocephala irrorata</i>	c
<i>Empis albohirta</i>	c
<i>Empis scutellaris</i>	c
<i>Empis tessellata</i>	c
<i>Empis trigramma</i>	c
<i>Rhamphomyia atra</i>	c
<i>Rhamphomyia crassirostris</i>	c
<i>Rhamphomyia sulcata</i>	c
<b>Heleomyzidae</b>	
<i>Suillia affinis</i>	c
<i>Suillia variegata</i>	c
<b>Limoniidae</b>	
<i>Austrolimnophila ochracea</i>	c
<i>Dicranomyia chorea</i>	c
<i>Epiphragma ocellare</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Gnophomyia viridipennis</i>	N
<i>Helius longirostris</i>	c
<i>Limonia masoni</i>	RDB3
<i>Limonia nigropunctata</i>	l
<i>Limonia nubeculosa</i>	c
<i>Limonia phragmitidis</i>	c
<i>Pilaria discicollis</i>	c
<b>Lonchopteridae</b>	
<i>Lonchoptera lutea</i>	c
<b>Mycetophilidae</b>	
<i>Docosia sciarina</i>	c
<b>Oдиниidae</b>	
<i>Odinia boletina</i>	l
<b>Opomyzidae</b>	
<i>Geomyza balachowskii</i>	c
<i>Geomyza subnigra</i>	N
<i>Geomyza tripunctata</i>	c
<i>Opomyza florum</i>	c
<i>Opomyza germinationis</i>	c
<b>Pallopteridae</b>	
<i>Palloptera trimacula</i>	c
<b>Pediciidae</b>	
<i>Pedicia immaculata</i>	c
<b>Piophilidae</b>	
<i>Parapiophila vulgaris</i>	l
<b>Ptychopteridae</b>	
<i>Ptychoptera contaminata</i>	c
<b>Rhagionidae</b>	
<i>Chrysopilus cristatus</i>	c
<i>Ptiolina obscura</i>	N
<i>Rhagio lineola</i>	c
<i>Rhagio scolopacea</i>	c
<b>Scathophagidae</b>	
<i>Nanna fasciatum</i>	c
<i>Norellisoma spinimanum</i>	c
<i>Scathophaga stercoraria</i>	c
<b>Sciomyzidae</b>	
<i>Coremacera marginata</i>	l
<i>Pherbellia annulipes</i>	N
<i>Pherbellia cinerella</i>	c
<i>Pherbina coryleti</i>	c
<i>Tetanocera ferruginea</i>	c
<i>Tetanura pallidiventris</i>	l

<b>Taxon</b>	<b>Status</b>
<i>Trypetoptera punctulata</i>	c
<b>Sepsidae</b>	
<i>Themira annulipes</i>	c
<b>Stratiomyidae</b>	
<i>Beris chalybeata</i>	c
<i>Beris vallata</i>	c
<i>Chloromyia formosa</i>	c
<i>Chorisops tibialis</i>	c
<i>Microchrysa polita</i>	c
<i>Neopachygaster meromelas</i>	N
<i>Pachygaster atra</i>	c
<i>Pachygaster leachii</i>	c
<i>Stratiomys potamida</i>	N
<b>Syrphidae</b>	
<i>Baccha elongata</i>	c
<i>Brachyopa scutellaris</i>	l
<i>Cheilosia lasiopa</i>	l
<i>Cheilosia pagana</i>	c
<i>Chrysotoxum bicinctum</i>	c
<i>Chrysotoxum cautum</i>	l
<i>Criorhina floccosa</i>	l
<i>Epistrophe eligans</i>	c
<i>Episyrphus balteatus</i>	c
<i>Eristalinus sepulchralis</i>	c
<i>Eristalis horticola</i>	c
<i>Eristalis intricarius</i>	c
<i>Eristalis tenax</i>	c
<i>Eupeodes luniger</i>	c
<i>Helophilus pendulus</i>	c
<i>Heringia senilis</i>	?
<i>Mallota cimbiciformis</i>	N
<i>Melanostoma mellinum</i>	c
<i>Melanostoma scalare</i>	c
<i>Myathropa florea</i>	c
<i>Paragus haemorrhous</i>	c
<i>Pipiza noctiluca</i>	c
<i>Pipizella viduata</i>	c
<i>Rhingia campestris</i>	c
<i>Sphaerophoria scripta</i>	c
<i>Sphegina clunipes</i>	l
<i>Syritta pipiens</i>	c
<i>Syrphus ribesii</i>	c
<i>Volucella bombylans</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Volucella pellucens</i>	c
<i>Xanthogramma citrofasciatum</i>	l
<i>Xanthogramma pedissequum</i>	c
<i>Xylota segnis</i>	c
<b>Tabanidae</b>	
<i>Chrysops relictus</i>	c
<b>Tachinidae</b>	
<i>Ceromya bicolor</i>	l
<i>Cylindromyia interrupta</i>	l
<i>Eriothrix rufomaculatus</i>	c
<i>Gymnochaeta viridis</i>	c
<i>Phasia pusilla</i>	c
<b>Therevidae</b>	
<i>Thereva nobilitata</i>	c
<i>Thereva plebeja</i>	N
<b>Tipulidae</b>	
<i>Ctenophora pectinicornis</i>	N
<i>Nephrotoma quadrifaria</i>	c
<i>Tipula lateralis</i>	c
<i>Tipula lunata</i>	c
<i>Tipula oleracea</i>	c
<i>Tipula varipennis</i>	c
<i>Tipula vernalis</i>	c
<b>Xylomyidae</b>	
<i>Solva marginata</i>	N
<b>Ephemeroptera - mayflies</b>	
<b>Baetidae</b>	
<i>Cloeon dipterum</i>	c
<b>Hemiptera - bugs</b>	
<b>Anthocoridae</b>	
<i>Anthocoris confusus</i>	c
<i>Anthocoris nemoralis</i>	c
<i>Anthocoris nemorum</i>	c
<i>Cardiastethus fasciiventris</i>	c
<i>Orius niger</i>	c
<i>Orius vicinus</i>	c
<i>Temnostethus gracilis</i>	c
<b>Aphrophoridae</b>	
<i>Aphrophora alni</i>	c
<i>Neophilaenus campestris</i>	c
<i>Neophilaenus lineatus</i>	c
<i>Philaenus spumarius</i>	c

<b>Taxon</b>	<b>Status</b>
<b>Aradidae</b>	
<i>Aradus depressus</i>	l
<b>Cercopidae</b>	
<i>Cercopis vulnerata</i>	c
<b>Cicadellidae</b>	
<i>Acericerus heydeni</i>	c
<i>Adarrus ocellaris</i>	c
<i>Agallia brachyptera</i>	Nb
<i>Agallia consobrina</i>	c
<i>Agallia ribauti</i>	c
<i>Alnetoidea alneti</i>	c
<i>Anoscopus albifrons</i>	c
<i>Anoscopus serratulae</i>	l
<i>Aphrodes makarovi</i>	c
<i>Arboridia parvula</i>	l
<i>Arthaldeus arenarius</i>	?
<i>Arthaldeus pascuellus</i>	c
<i>Athysanus argentarius</i>	l
<i>Edwardsiana crataegi</i>	c
<i>Edwardsiana rosae</i>	c
<i>Eupelix cuspidata</i>	c
<i>Eupteryx aurata</i>	c
<i>Eupteryx florida</i>	c
<i>Eupteryx notata</i>	c
<i>Eupteryx stachydearum</i>	c
<i>Eupteryx urticae</i>	c
<i>Eupteryx vittata</i>	c
<i>Eurhadina loewii</i>	c
<i>Eurhadina pulchella</i>	c
<i>Euscelis incisus</i>	c
<i>Evacanthus acuminatus</i>	c
<i>Evacanthus interruptus</i>	c
<i>Grypotes puncticollis</i>	c
<i>Iassus lanio</i>	c
<i>Idiocerus stigmaticalis</i>	c
<i>Lamprotettix splendidulus</i>	c
<i>Macustus grisescens</i>	c
<i>Megophthalmus scabripennis</i>	c
<i>Mocydia crocea</i>	c
<i>Mocydiopsis attenuata</i>	l
<i>Populicerus confusus</i>	c
<i>Psammotettix confinis</i>	c
<i>Zygina flammigera</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Zygina hyperici</i>	l
<i>Zyginidia scutellaris</i>	c
<b>Cixiidae</b>	
<i>Cixius nervosus</i>	c
<i>Tachycixius pilosus</i>	c
<i>Trigonocranus emmeae</i>	Nb
<b>Coreidae</b>	
<i>Arenocoris falleni</i>	l
<i>Coreus marginatus</i>	c
<i>Coriomeris denticulatus</i>	c
<i>Syromastes rhombeus</i>	l
<b>Corixidae</b>	
<i>Corixa panzeri</i>	l
<i>Corixa punctata</i>	c
<i>Hesperocorixa sahlbergi</i>	c
<i>Sigara dorsalis</i>	c
<b>Cydnidae</b>	
<i>Legnotus limbosus</i>	c
<i>Sehirus luctuosus</i>	l
<i>Tritomegas bicolor</i>	c
<b>Delphacidae</b>	
<i>Conomelus anceps</i>	c
<i>Eurysula lurida</i>	Na
<i>Hyledelphax elegantulus</i>	c
<i>Javesella pellucida</i>	c
<i>Megamelodes quadrimaculatus</i>	l
<i>Stenocranus minutus</i>	c
<b>Gerridae</b>	
<i>Gerris lacustris</i>	c
<i>Gerris odontogaster</i>	c
<b>Hydrometridae</b>	
<i>Hydrometra stagnorum</i>	c
<b>Lygaeidae</b>	
<i>Drymus ryei</i>	l
<i>Drymus sylvaticus</i>	c
<i>Eremocoris podagricus</i>	l
<i>Gastrodes grossipes</i>	c
<i>Graptopeltus lynceus</i>	Nb
<i>Ischnodemus sabuleti</i>	c
<i>Megalonotus chiragra</i>	l
<i>Peritrechus geniculatus</i>	c
<i>Peritrechus lundi</i>	l

<b>Taxon</b>	<b>Status</b>
<i>Peritrechus nubilus</i>	l
<i>Scolopostethus affinis</i>	c
<i>Scolopostethus thomsoni</i>	c
<i>Stygnocoris fuliginus</i>	c
<i>Stygnocoris sabulosus</i>	c
<i>Taphropeltus contractus</i>	l
<b>Microphysidae</b>	
<i>Loricula elegantula</i>	c
<b>Miridae</b>	
<i>Alloeotomus gothicus</i>	c
<i>Atractotomus magnicornis</i>	c
<i>Atractotomus mali</i>	c
<i>Blepharidopterus diaphanus</i>	c
<i>Campyloneura virgula</i>	c
<i>Capsus ater</i>	c
<i>Closterotomus norwegicus</i>	c
<i>Deraeocoris flavilinea</i>	c
<i>Deraeocoris lutescens</i>	c
<i>Deraeocoris ruber</i>	c
<i>Dicyphus errans</i>	c
<i>Dicyphus stachydis</i>	c
<i>Fieberocapsus flaveolus</i>	l
<i>Grypocoris stysi</i>	c
<i>Harpocera thoracica</i>	c
<i>Heterotoma planicornis</i>	c
<i>Leptopterna dolabrata</i>	c
<i>Leptopterna ferrugata</i>	c
<i>Liocoris tripustulatus</i>	c
<i>Lygocoris pabulinus</i>	c
<i>Lygocoris viridis</i>	c
<i>Lygus rugulipennis</i>	c
<i>Macrotylus horvathi</i>	l
<i>Megaloceraea recticornis</i>	c
<i>Miris striatus</i>	c
<i>Notostira elongata</i>	c
<i>Orthonotus rufifrons</i>	c
<i>Orthops kalmii</i>	c
<i>Orthotylus marginalis</i>	c
<i>Orthotylus ochrotrichus</i>	c
<i>Orthotylus tenellus</i>	c
<i>Phoenicocoris obscurellus</i>	c
<i>Phytocoris ulmi</i>	c
<i>Phytocoris varipes</i>	c



<b>Taxon</b>	<b>Status</b>
<i>Plagiognathus arbustorum</i>	c
<i>Plagiognathus chrysanthemi</i>	c
<i>Psallus varians</i>	c
<i>Stenodema laevigata</i>	c
<i>Stenotus binotatus</i>	c
<i>Trigonotylus coelestialium</i>	c
<i>Tytthus pygmaeus</i>	l
<b>Nabidae</b>	
<i>Himacerus apterus</i>	c
<i>Himacerus major</i>	c
<i>Himacerus mirmicoides</i>	c
<i>Nabis ferus</i>	c
<i>Nabis flavomarginatus</i>	c
<i>Nabis limbatus</i>	c
<i>Nabis rugosus</i>	c
<b>Naucoridae</b>	
<i>Ilyocoris cimicoides</i>	c
<b>Nepidae</b>	
<i>Ranatra linearis</i>	l
<b>Notonectidae</b>	
<i>Notonecta glauca</i>	c
<b>Pentatomidae</b>	
<i>Aelia acuminata</i>	c
<i>Dolycoris baccarum</i>	l
<i>Neottiglossa pusilla</i>	l
<i>Palomena prasina</i>	c
<i>Pentatoma rufipes</i>	c
<i>Troilus luridus</i>	c
<b>Pleidae</b>	
<i>Plea minutissima</i>	c
<b>Rhopalidae</b>	
<i>Chorosoma schillingi</i>	l
<i>Corizus hyosecyami</i>	l
<i>Myrmus miriformis</i>	l
<i>Rhopalus parumpunctatus</i>	l
<i>Rhopalus subrufus</i>	l
<b>Tingidae</b>	
<i>Acalypta parvula</i>	c
<i>Derephysia foliacea</i>	l
<i>Tingis ampliata</i>	c
<i>Tingis cardui</i>	c
<b>Veliidae</b>	
<i>Microvelia reticulata</i>	c

<b>Taxon</b>	<b>Status</b>
<b>Hirudinea - leeches</b>	
<b>Erpobdellidae</b>	
<i>Erpobdella octoculata</i>	c
<b>Glossiphoniidae</b>	
<i>Helobdella stagnalis</i>	c
<i>Theromyzon tessulatum</i>	c
<b>Hymenoptera – bees, wasps, ants</b>	
<b>Apidae</b>	
<i>Andrena bicolor</i>	c
<i>Andrena chrysoceles</i>	c
<i>Andrena cineraria</i>	c
<i>Andrena haemorrhoa</i>	c
<i>Andrena minutula</i>	c
<i>Andrena nigroaenea</i>	c
<i>Andrena scotica</i>	c
<i>Apis mellifera</i>	c
<i>Bombus hortorum</i>	c
<i>Bombus lapidarius</i>	c
<i>Bombus pascuorum</i>	c
<i>Bombus pratorum</i>	c
<i>Bombus rupestris</i>	Nb
<i>Bombus terrestris</i>	c
<i>Bombus vestalis</i>	c
<i>Halictus tumulorum</i>	c
<i>Hylaeus annularis</i>	c
<i>Hylaeus brevicornis</i>	c
<i>Hylaeus confusus</i>	c
<i>Hylaeus cornutus</i>	Na
<i>Hylaeus signatus</i>	Nb
<i>Lasioglossum albipes</i>	c
<i>Lasioglossum morio</i>	c
<i>Lasioglossum smeathmanellum</i>	c
<i>Nomada fabriciana</i>	c
<i>Nomada flava</i>	c
<i>Nomada flavoguttata</i>	c
<i>Nomada goodeniana</i>	c
<i>Nomada marshamella</i>	c
<i>Nomada ruficornis</i>	c
<i>Osmia leiana</i>	c
<i>Osmia rufa</i>	c
<i>Sphecodes ephippium</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Sphecodes monilicornis</i>	c
<b>Chrysididae</b>	
<i>Chrysis ignita</i> agg.	c
<i>Hedychridium ardens</i>	l
<i>Trichrysis cyanea</i>	c
<b>Formicidae</b>	
<i>Formica cunicularia</i>	l
<i>Formica fusca</i>	c
<i>Lasius flavus</i>	c
<i>Lasius fuliginosus</i>	l
<i>Lasius niger</i>	c
<i>Myrmica rubra</i>	c
<i>Myrmica ruginodis</i>	c
<i>Myrmica sabuleti</i>	l
<i>Myrmica scabrinodis</i>	c
<i>Myrmica schencki</i>	Nb
<b>Pamphilidae</b>	
<i>Pamphilus sylvaticus</i>	c
<b>Pompilidae</b>	
<i>Anoplius nigerrimus</i>	c
<i>Arachnospila anceps</i>	c
<i>Arachnospila minutula</i>	Nb
<i>Caliadurgus fasciatellus</i>	l
<i>Dipogon subintermedius</i>	l
<i>Evagetes crassicornis</i>	c
<b>Sphecidae</b>	
<i>Ammophila sabulosa</i>	l
<i>Argogorytes mystaceus</i>	l
<i>Cerceris rybyensis</i>	c
<i>Crossocerus podagricus</i>	c
<i>Ectemnius continuus</i>	c
<i>Ectemnius dives</i>	c
<i>Ectemnius rubicola</i>	c
<i>Harpactus tumidus</i>	l
<i>Nysson dimidiatus</i>	Nb
<i>Nysson trimaculatus</i>	Nb
<i>Passaloecus singularis</i>	c
<i>Pemphredon inornata</i>	c
<i>Pemphredon lugubris</i>	c
<i>Psenulus pallipes</i>	c
<i>Rhopalum clavipes</i>	c
<i>Rhopalum coarctatum</i>	c
<i>Stigmus solskyi</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Tachysphex pompiliformis</i>	l
<i>Trypoxylon attenuatum</i>	c
<i>Trypoxylon clavicerum</i>	c
<b>Vespidae</b>	
<i>Ancistrocerus trifasciatus</i>	c
<i>Dolichovespula media</i>	Na
<i>Dolichovespula saxonica</i>	RDBK
<i>Dolichovespula sylvestris</i>	c
<i>Gymnomerus laevipes</i>	c
<i>Vespa crabro</i>	l
<i>Vespula germanica</i>	c
<i>Vespula vulgaris</i>	c
<b>Lepidoptera – moths, butterflies</b>	
<b>Arctiidae</b>	
<i>Tyria jacobaeae</i>	c
<b>Geometridae</b>	
<i>Cabera pusaria</i>	c
<i>Chiasmia clathrata</i>	l
<i>Ematurga atomaria</i>	l
<i>Epirrhoe alternata</i>	c
<i>Lampropteryx suffumata</i>	c
<i>Lomaspilis marginata</i>	c
<b>Hesperiidae</b>	
<i>Ochlodes sylvanus</i>	c
<i>Pyrgus malvae</i>	VU
<i>Thymelicus lineola</i>	c
<b>Lycaenidae</b>	
<i>Aricia agestis</i>	l
<i>Celastrina argiolus</i>	c
<i>Lycaena phlaeas</i>	c
<i>Polyommatus icarus</i>	c
<b>Noctuidae</b>	
<i>Apamea monoglypha</i>	c
<i>Autographa gamma</i>	c
<i>Chortodes extrema</i>	RDB
<i>Ectidea glyphica</i>	l
<i>Euclidimera mi</i>	l
<i>Noctua pronuba</i>	c
<i>Orthosia incerta</i>	c
<i>Panolis flammea</i>	c
<b>Nymphalidae</b>	
<i>Aglais urticae</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Aphantopus hyperantus</i>	c
<i>Coenonympha pamphilus</i>	NT
<i>Inachis io</i>	c
<i>Maniola jurtina</i>	c
<i>Melanargia galathea</i>	l
<i>Pararge aegeria</i>	c
<i>Polygonia c-album</i>	c
<i>Pyronia tithonus</i>	c
<i>Vanessa atalanta</i>	c
<b>Pieridae</b>	
<i>Anthocharis cardamines</i>	c
<i>Gonepteryx rhamni</i>	c
<i>Pieris brassicae</i>	c
<i>Pieris napi</i>	c
<i>Pieris rapae</i>	c
<b>Pyralidae</b>	
<i>Pyrausta cespitum</i>	c
<b>Sesiidae</b>	
<i>Sesia apiformis</i>	Nb
<b>Mecoptera - scorpionflies</b>	
<b>Panorpidae</b>	
<i>Panorpa communis</i>	c
<i>Panorpa germanica</i>	c
<b>Megaloptera - alderflies</b>	
<b>Sialidae</b>	
<i>Sialis lutaria</i>	c
<b>Mollusca – snails, slugs, mussels</b>	
<b>Acroloxidae</b>	
<i>Acroloxus lacustris</i>	c
<b>Bithyniidae</b>	
<i>Bithynia tentaculata</i>	c
<b>Clausiliidae</b>	
<i>Clausilia bidentata</i>	c
<b>Cochlicopidae</b>	
<i>Cochlicopa lubrica</i>	c
<b>Discidae</b>	
<i>Discus rotundatus</i>	c
<b>Enidae</b>	
<i>Merdigera bullata</i>	l
<b>Helicidae</b>	
<i>Arianta arbustorum</i>	c
<i>Cepaea hortensis</i>	c

<b>Taxon</b>	<b>Status</b>
<i>Cepaea nemoralis</i>	c
<b>Hygromiidae</b>	
<i>Monacha cantiana</i>	c
<i>Trichia plebeja</i>	c
<b>Limacidae</b>	
<i>Limax maximus</i>	c
<b>Lymnaeidae</b>	
<i>Lymnaea stagnalis</i>	c
<i>Radix balthica</i>	c
<b>Milacidae</b>	
<i>Milax budapestensis</i>	c
<b>Oxychilidae</b>	
<i>Oxychilus alliarius</i>	c
<b>Planorbidae</b>	
<i>Anisus vortex</i>	c
<i>Gyraulus albus</i>	c
<i>Planorbis planorbis</i>	c
<b>Punctidae</b>	
<i>Punctum pygmaeum</i>	c
<i>Pisidium</i> sp.	
<i>Sphaerium corneum</i>	c
<b>Vertiginidae</b>	
<i>Vertigo pygmaea</i>	l
<b>Zonitidae</b>	
<i>Zonitoides nitidus</i>	c
<b>Myriapoda – millipedes, centipedes</b>	
<b>Blaniulidae</b>	
<i>Proteroiulus fuscus</i>	c
<b>Cryptopsidae</b>	
<i>Cryptops hortensis</i>	c
<b>Geophilidae</b>	
<i>Geophilus carpophagus</i>	c
<b>Glomeridae</b>	
<i>Glomeris marginata</i>	c
<b>Julidae</b>	
<i>Cylindroiulus punctatus</i>	c
<i>Ommatoiulus sabulosus</i>	c
<i>Ophiulus pilosus</i>	c
<i>Tachypodiulus niger</i>	c
<b>Lithobiidae</b>	
<i>Lithobius forficatus</i>	c
<b>Polydesmidae</b>	

<b>Taxon</b>	<b>Status</b>
<i>Polydesmus angustus</i>	c
<b>Neuroptera - lacewings</b>	
<b><i>Chrysopidae</i></b>	
<i>Chrysopa perla</i>	c
<i>Chrysoperla carnea</i> agg.	c
<b><i>Coniopterygidae</i></b>	
<i>Coniopteryx tineiformis</i>	c
<b><i>Hemerobiidae</i></b>	
<i>Micromus variegatus</i>	c
<b>Odonata - dragonflies</b>	
<b><i>Aeshnidae</i></b>	
<i>Aeshna cyanea</i>	c
<i>Aeshna grandis</i>	c
<i>Brachytron pratense</i>	l
<b><i>Coenagriidae</i></b>	
<i>Coenagrion puella</i>	c
<i>Coenagrion pulchellum</i>	NT
<i>Enallagma cyathigerum</i>	c
<i>Erythromma najas</i>	c
<i>Ischnura elegans</i>	c
<i>Pyrrhosoma nymphula</i>	c
<b><i>Libellulidae</i></b>	
<i>Libellula quadrimaculata</i>	c
<i>Sympetrum striolatum</i>	c

<b>Taxon</b>	<b>Status</b>
<b>Orthoptera – grasshoppers, crickets</b>	
<b><i>Acrididae</i></b>	
<i>Chorthippus albomarginatus</i>	c
<i>Chorthippus brunneus</i>	c
<i>Chorthippus parallelus</i>	c
<b><i>Tetrigidae</i></b>	
<i>Tetrix subulata</i>	c
<b><i>Tettigoniidae</i></b>	
<i>Leptophyes punctatissima</i>	c
<i>Metrioptera roeselii</i>	Nb
<i>Pholidoptera griseoaptera</i>	c
<b>Trichoptera - caddisflies</b>	
<b><i>Leptoceridae</i></b>	
<i>Athripsodes aterrimus</i>	c
<i>Leptocerus tineiformis</i>	c
<b><i>Limnephilidae</i></b>	
<i>Glyptotaelius pellucidus</i>	c
<i>Limnephilus flavicornis</i>	c
<i>Limnephilus lunatus</i>	c
<b><i>Phryganeidae</i></b>	
<i>Phryganea bipunctata</i>	c
<b><i>Polycentropidae</i></b>	
<i>Holocentropus dubius</i>	c