Wyre Forest Study Group

Entomology Day 2010

Entomology, a Wider Perspective – Saturday 6th November 2010
Chairman for the day: Brett Westwood

MIKE BLOXHAM

The little things that make the world go around:
A wider Perspective on Entomology
by JON SADLER

There are a variety of obstacles in the path of entomological studies in today's world. One of the salient ones is that it is perceived to be the preserve of the Middle Class. Its narrow roots are readily seen as soon as the student looks into its history. Wealthy individuals and scholarly elites such as clergymen abound as authors during the relatively short period since it sprang to life. The modern student finds it very difficult to identify with their large collections of insects slumbering in imposing but increasingly neglected institutions. There are no longer enough taxonomists around.

The public at large care little about this situation and why should they? The field has been largely consigned to amateur endeavour. The emphasis of professionals has been largely focused on systematics in association with applied entomology, with an interest in conservation taking hold fairly recently. The seeds of a crisis were apparent in 1992 when most institutions of higher education saw a focus on systematics as the main game and abandoned taxonomy. A review of the volume of taxonomic papers since 1910 starkly illustrates the situation with both the number of authors and the number of papers in steady decline (Fig 1). However amateur entomologists still beaver away and, in fact, provide a larger proportion of papers than professionals as time passes (Fig 2).

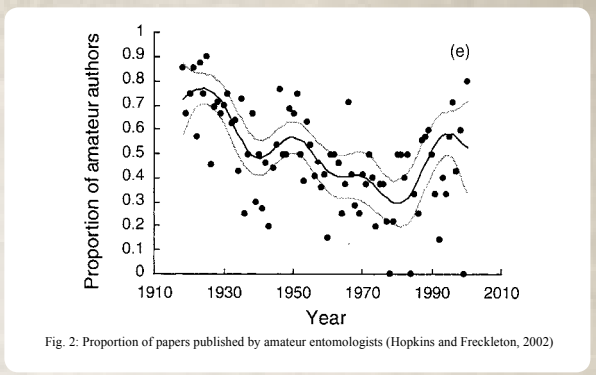


Fig. 2: Proportion of papers published by amateur entomologists (Hopkins and Freckleton, 2002)

One pointer to the problem is to be found in the significantly reduced support given by NGOs to insects in comparison with other things. Some have found their voices. Buglife is vociferous in flagging up the abundant threats to individual insects and goes further to paint a picture familiar to insect ecologists – a nightmare where numerous invertebrates will go extinct with no one having had a chance to discover either their ecological roles or any additional potential they may have possessed as allies of mankind. The ecosystem services provided by insects are profoundly important. They process detritus everywhere and representatives pollinate 13% of human foodplants.

These essential agents are under threat from many sides. Habitat degradation and fragmentation combined with climate change hit them hard - as do chemical treatments of crops and veterinary treatment of farm animals, which can profoundly affect the developmental stages of recycling dung beetles.

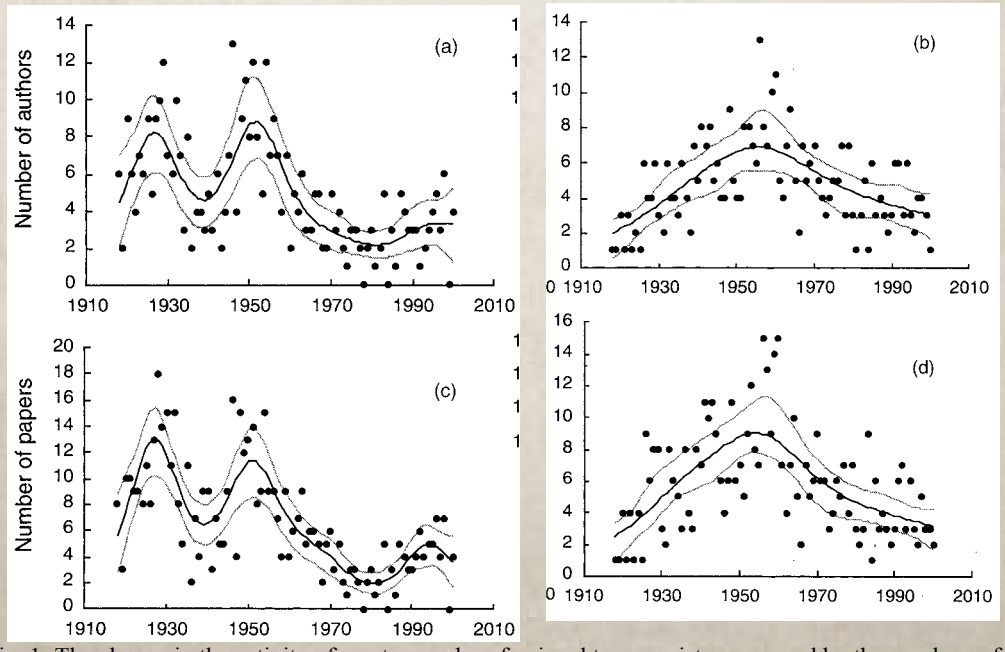


Fig. 1: The change in the activity of amateur and professional taxonomists, measured by the numbers of amateur (a) and professional (b) authors publishing annually, the numbers of papers published annually by amateurs (c) and professionals (d) (Hopkins and Freckleton, 2002)

Buglife has estimated 15% of the UK invertebrate fauna to be at risk – some 4500 species in decline!

It is little wonder that *Drosophila* - the fly that gave to humans so many clues to their genetic identity will probably never be adequately acclaimed in contemporary minds! People today are living in an increasingly degraded environment providing fewer links to the riches of the natural world. 80 percent of us live in cities where greenspace and brownfield sites alike are being inexorably reduced in area. Research has shown the latter to be remarkably biodiverse but this pool of species is rapidly degraded when unsympathetic treatment of surfaces takes place. Gardens (which used to be larger) are under threat, and are also frequently subjected to 'makeovers' unfriendly to wildlife. The whole business of the network of spaces available for invertebrate colonisation has to be reviewed.

To the entomologist, recognition of both the aesthetic and the actual importance of these different sorts of open spaces (and also of existing woodland) goes with the territory.

The task lies in convincing others of this, so that the trends mentioned previously can at least in part be halted. Both the gathering and effective dissemination of sound scientific information are essential here. Brownfield studies have, as previously mentioned, revealed that a surprisingly large number of scarce species reside in these often disturbed habitats providing that the network of these retain their essentially open and unmanaged status. The woodland areas in some of our larger urban parks and open spaces, is also of critical importance to the survival of ground beetles. The ecology of these is being increasingly well investigated and factors such as woodland size will decide if populations of specialized beetles are retained. *Cychrus caraboides* (Large Snail-hunting Beetle) will be lost to woodland habitats that are substantially reduced in area. Being wingless, it is at a disadvantage in the dispersal stakes in comparison with others of the family that also fly.

The place of gardens in urban ecosystems has come under increasing scrutiny in recent times and provides encouraging entry routes for public engagement. In particular the business of having floral diversity has come into focus, but promotion of different systems for attracting solitary bees (currently popular) has met with mixed results because insects are not necessarily attracted to commercially produced accommodation provided for them – making your own versions with garden canes, reed stalks and the like is much more successful. It is more desirable that people experiment with the real lives of garden creatures- they may find that nettles in the garden and log piles have variable success in attracting invertebrates.

Whilst significant markers such as *Cychrus* give important messages, they do not generally capture the public attention so it is often the job of much more conspicuous insects such as moths to raise public awareness. The Garden Moth Scheme pioneered by David Grundy provides members of the public with a solid practical route into insect study. Adequate information is available to participants via a number of avenues and grants are available to assist with the supply of trapping equipment. A scheme that specifies 36 trapping dates together with effective routes of communication is becoming steadily more popular in Britain and now has over 300 participants. The quantity of data and the systematic manner of its collection brings meaningful statistical analysis into play and already a number of hypotheses concerning the lives of garden moths are able to be provisionally tested. Preliminary examination of data suggests that factors such as the presence of street lamps at night can affect catch numbers in nearby gardens (Fig 4). The presence of certain vegetation can also have an effect. Gardens with plants such as ivy and honeysuckle tend to attract more moths.

Ultimately higher education has to produce more entomologists and commit to raising the profile of the subject, because universally insects are the drivers in so many diverse ecosystems. Convincing promotional activity by NGOs is of key importance as is the engagement of the curiosity of the general public, to the extent that involvement with our invertebrates is no longer an eccentricity, but a mark of the Citizen Scientist who can discern that we ignore small creatures helping to make the world function at our peril.

The Wyre Forest Study Group must continue to assist with this struggle. It must participate in every way it can to promote the study of insects in as many different ways at possible - experts should be prepared to mentor and 'buddy'; 'Bio blitzes' should be encouraged and supported. No opportunities to engage the public should be overlooked. For too many insects, the prospects for conservation are already pretty grim.

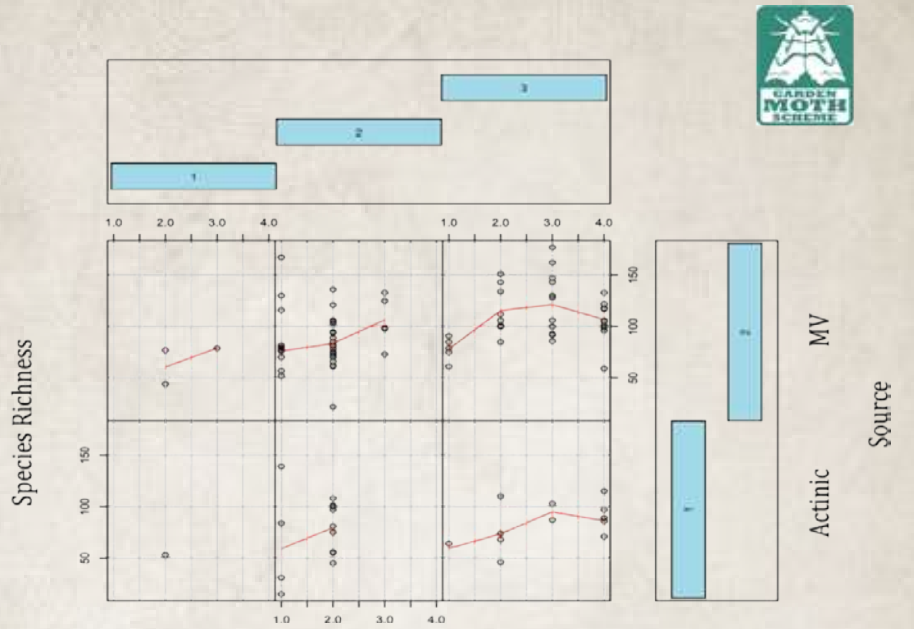
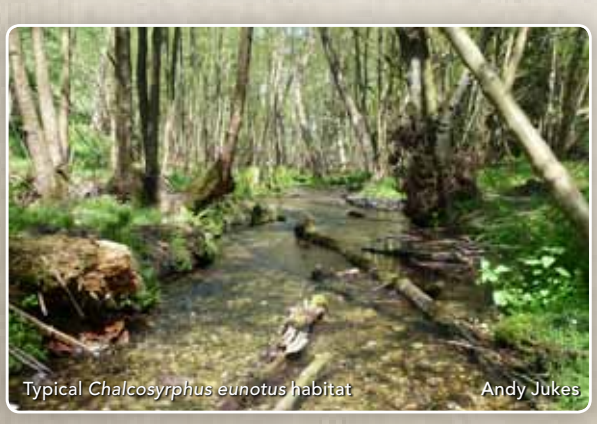


Fig. 4: GMS moth data from urban, suburban and rural gardens showing the influence of lights on catches.

Chalcosyrphus eunotus - its ecology and conservation
by ANDY JUKES

Hoverflies are certainly one of the better studied families of Diptera (Two-winged flies). An impressive amount of data on general distribution and ecology has been recently accumulated. Larval studies have played a large part in this and have provided a useful starting point for a number of informative projects. Indeed, a wide range of larval adaptations have been key to success in the colonisation of a variety of distinctive habitats where concentration of effort can enable much to be discovered.

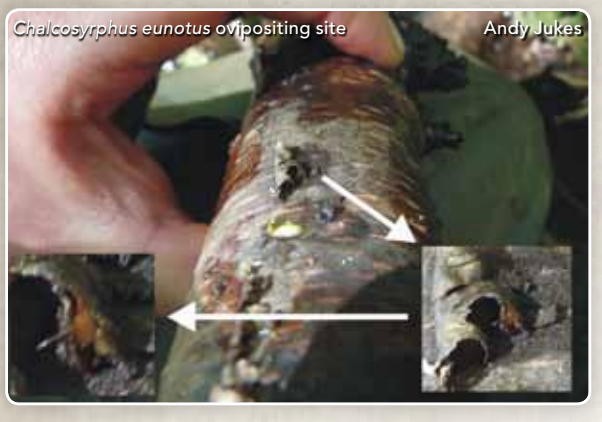
The Study Group has heard recently about studies of craneflies associated with semi-saturated woody debris and it is therefore appropriate that a wider look should be taken at other flies that appear to operate in these situations. It has been known for many years that *Chalcosyrphus eunotus* is such a species. A number of observations of its behaviour were recorded by Hammond in 1953, and subsequently other workers managed to gather general information pinpointing likely larval habitat more closely.


Typical *Chalcosyrphus eunotus* habitat Andy Jukes

Using this information a number of likely habitats in Staffordshire were investigated for adult presence and a surprisingly large number of new sites for the fly were discovered. This was encouraging and also enabled the selection of target sites most suitable for extended studies.


Chalcosyrphus eunotus Andy Jukes

On one such (a medium sized partially-shaded stream containing semi submerged logs), the behaviour of *C.eunotus* could be readily observed. A number of specimens (both male and female) were captured and marked using minute spots of Tipp-Ex. It was soon discovered that the species was much more mobile than might have been expected and observation of males showed use of any feature that provided a good vantage point and also the holding of territory. Females would enter this territory looking for oviposition sites on logs



and would be intercepted by a male - mating lasting for around 15 seconds.

Ovipositition took place on semi-submerged logs, with a good photographic record of the process being obtained at one location on a semi-submerged, semi-saturated birch (*Betula species*). As the project unfolded, the observer also became experienced enough to locate

and describe the eggs. There appeared to be evidence that the eggs undergo a colour change as they mature and that developing larvae favoured certain wood fibre and rot areas, the younger ones probably feeding on sap accumulations under bark or in surface areas, whilst older larvae could be found deeper in fibrous white matter of the saturated substrate. Further observation indicated that mature larvae move to drier portions of the substrate (eg to the topmost areas of logs) where cylindrical pupae may be found. These particular studies found the adults to be on the wing from late April to Mid May.

It is well known that the conservation of habitat is of crucial importance in most wildlife conservation. This is most certainly the case for *C. eunotus*, where a combination of factors leads to successful retention of the species.

Dappled light seems important. Thus semi-shaded situations should be favoured on a variety of good quality headwater streams where there is a substantial enough flow of water to provide riffles and pools and potential for influx of new woody debris on a fairly regular basis.

The discovery of inhabited sites should result in managers doing their best to ensure continuity of a deadwood resource being inputted into the watercourse. Continuity of all key characteristics should govern any conservation practice. The introduction of artificial weirs should be avoided, because the introduction of such features will almost certainly adversely affect dynamic systems of a stream including deposition and scour, input of deadwood and mobility of aquatic species. A stream hosting this species will almost certainly have considerable general wildlife value and therefore the welfare of the entire stream system supporting *C. eunotus* populations should always be an important conservation priority.

Honeybees: do they belong here and can they survive?

By SUSAN LIMBREY

It was long supposed that honeybees were introduced to Britain by the Romans, archaeologists and entomologists indulging in mutual predation without either group having evidence. Susan Limbrey, soil scientist, environmental archaeologist and beekeeper, proposed 30 years ago that honeybees arrived along with the lime trees while Britain was still part of the European land mass, before the southern part of the north sea basin was inundated by rising sea levels before 7000BC. The question has arisen again recently, with a few entomologists seeking to exclude these 'aliens' from nature reserves to protect bumblebees from competition.

The honeybee in question is the dark coloured northern European *Apis mellifera mellifera*. Other European sub-species are *ligustica*, in Italy, *iberica*, Spain and Portugal, *carnica*, Greece and the Balkans, and *caucasica*, the Caucusus, all thought to be descended from the circum-Saharan *lehzeni*. In Britain, following the loss of many colonies from Isle of Wight disease (still of uncertain diagnosis), a lot of Italian bees were imported in the 1920s, and beekeepers continue to import colonies and queens from southern Europe and elsewhere for 'improvement' or to get new queens early in spring, so we have a very mixed and hybridised population, but *Apis mellifera mellifera* does still exist in Britain.

By 7000BC, the climate was suitable, the migration route was available, but the question is whether the full range of resources was available to sustain colonies

which, unlike other nectar feeders, have to store enough food to support them through the winter and to begin producing new bees to exploit the spring flowers. A sequence of plants is needed, in large dense patches producing nectar of sufficient concentration to support the energy requirements of foraging and conversion to honey as well as to feed brood. Nectar production and concentration depends on temperature and soil moisture, and varies with time of day. Colonies can starve in the midst of abundant flowers if the weather is wrong. In order to build up the numbers to exploit the flowering limes (which can produce more than half a ton of honey per acre) as a main storage resource the forested landscape had to have enough spring and early summer nectar producers: willow; rosaceous trees bushes, of which apple and cherry can yield abundantly, while Blackthorn and hawthorn usually produce nectar that is too dilute; holly; field maple. The current view, from pollen analysis and coleoptera sequences, of the nature of the forest in pre-agricultural times, is of a mosaic, with clearings, thorny thickets and natural 'hedgerows', so there is room for the nectar-producers. Herbs such as Dandelion and White Clover, important resources in the agricultural landscape, would have been sparse, though.

Honeybee exoskeletons, being less sclerotised than those of beetles, are not so readily preserved in waterlogged deposits, but remains have been found in deposits of the Bronze Age, when we can in any case be confident that they were present in Britain because of the use of beeswax for lost-wax casting of fine metalwork. Prior to that, traces of beeswax have been found on artefacts from the Neolithic and Mesolithic periods. The value of wax, and of propolis, which bees make from the resins they collect from plant sources, as adhesives, waterproofing, leather and wood treatment etc., is obvious, and of course people had no other source of concentrated sugars, for direct use and for preserving fruits and making alcoholic beverages.

Hazards faced by honeybees include predation by bears, Badgers, Green Woodpeckers, Great Tits, Hornets and wasps, and damage to combs and brood by the Greater and Lesser Wax Moths, *Galleria mellonella* and *Achroia grisella*. The bacteria brood diseases, European and American foul brood are very serious, the microsproridium *Nosema apis* can reduce the life of adult bees and so weaken colonies, and the acute paralysis virus can destroy colonies. Nevertheless, honeybees have survived, with the help of, and perhaps despite, the activities of beekeepers, over the millennia. Swarms moving into fresh sites, and wax moths destroying old combs, must have helped limit disease, as did skep beekeeping, in which bees and combs were destroyed in taking the honey, only each year's swarms being kept, but has left us with bees with an annoyingly strong swarming habit.

Newer hazards include pests and pathogens transferred to *Apis mellifera* from the Asian honeybees *Apis cerana*, *Apis dorsata* and *Apis florea*, which have long evolved resistance to them, and carried to Europe by import of colonies. The mite *Varroa destructor* came from the giant honeybee, *A. dorsata*, and arrived in Britain in 1992, since when it has spread throughout the country, in spite of embargos on both import and movement of bees being imposed when the threat became apparent. The mite breeds in the brood cells, and it is though that it carries and increases susceptibility to viral diseases. A new form of *Nosema*, already in Europe, is causing concern.

Future potential threats include a more virulant form of paralysis virus; the very destructive small hive beetle, *Aethina tumida*, from southern Africa, arrived in Portugal with bees imported from USA, and was eliminated before it could spread, but causes great concern; bee mites *Tropilaelaps clareae* and *T. koenigerum* infest primarily *Apis dorsata* and are likely to arrive here. 'Colony collapse disorder' to which serious losses in the areas of intensive migratory beekeeping in USA are attributed, has not been definitively diagnosed but appears to be associated with viruses. It is not thought to have impacted honeybees in Britain.

New hazards have already had the effect of improving beekeeping practice, and will continue to do so: we are obliged to become better beekeepers. Climate change will have an impact, and we are nervously watching for the establishment of breeding populations of Bee-eaters.

Honeybee queen with attendant workers Rosemary Winnall

Photographing and Recording Longhorn Beetles in the Wyre Forest. By JOHN BINGHAM

John Bingham's reputation as one of Wyre's leading naturalists has been further enhanced during recent times by his flexibility in adding other areas of expertise to his wildlife repertoire and his capacity to make valuable contributions to existing knowledge in those areas was well demonstrated during this lecture, when he spoke of his encounters with the Wyre longhorn beetles (Cerambycidae). Readers of the Wyre Forest Review (2009) will be familiar with his work, but this is the first time he has been given the opportunity to speak on the subject to a large and receptive audience.

There are some 60 species of British longhorn beetles and the speaker has recorded details of 24 of these in Wyre. They are usually associated with our Ancient Semi-Natural Woodlands, especially wood pasture. Wyre may indeed be characterized as having possessed considerable areas both of pasture woodland with mature trees and managed coppice over the course of time. Coppice stools remaining act as important reservoirs of biodiversity. A history of woodland cover is perhaps as important as the retention of an ancient timber resource. Currently management trends are sympathetic to these concepts and areas of the forest will be managed back towards this former state (and its appeal as longhorn beetle habitat will be further enhanced).

The evaluation of older woodlands by examination of the beetle fauna has been an important development in recent years, and the speaker (together with other Study Group members) has been working to establish the current status of Wyre in this context. The gathering of data for this purpose has been time-consuming. It is noteworthy that 11 longhorn species were discovered in the Orchard Survey at Bowcastle Farm and these, plus additional saproxylic species also found during this work, enable a provisional Saproxylic Quality Index value (Fowles et al 1999) to be calculated for the Forest. Currently this sees Wyre occupying 75th place in the national listings (21st in the Central England section).

The study of longhorn beetles has been greatly facilitated by several recent publications. A most useful contribution appears in 'British Wildlife' where Andrew Duff provides a key (illustrated by Richard Lewington). There is also a useful Swedish publication in the series Encyclopedia of the Swedish Flora and Fauna, Coleoptera: Cerambycidae, Bengt Ehnstrom (2007). Older illustrated volumes such as the Field Guide in Colour to British Beetles by K.W.Harde and P.M.Hammond (several editions have appeared) retain their value.

The speaker commenced the descriptive part of his talk with a very common and familiar beetle *Grammoptera ruficornis*. This little black longhorn is almost universally distributed in woodland, the larvae developing in the twigs of deciduous trees. Another longhorn frequently encountered on flowers in the forest glades was *Stenurella melanura*, being a species whose larvae can develop in deciduous and coniferous timber. A group of common species likely to be encountered in similar situations included *Rutpela maculata* (with its very variable yellow and black elytral markings), *Rhagium bifasciatum, R. mordax* (which is not easily disturbed by human presence and will give plenty of photographic opportunities) and the unmistakable wasp beetle *Clytus arietes.*

Other Wyre beetles are rather more distinctive in their national distribution, *Pachytodes cerambyciformis* being a case in point. This beetle tends to have a predominantly Western distribution, there being many Welsh records.

The larger longhorn *Stenocorus meridianus* can appear in various colour forms. It is found in a variety of woodland habitats. *Tetrops praeustus* (the Plum Longhorn) is one of the species recorded at Bowcastle, the latter is in its typical orchard habitat. Widely distributed in Britain, it could very easily be adversely affected by the loss of old orchards.

The speaker moved on to consider two smaller and well camouflaged species *Pogonocherus hispidus* and *P. hispidulus*, the former seemingly associated with smaller damaged oak twigs and the latter with a wider range of preferences, including Holly, Ivy and apple. Only vigilant observers notice these in the field and sweeping /beating is going to give a better chance for these overlooked insects to be recorded.

Some species which are relatively common elsewhere in Britain have very few Wyre records. *Alosterna tabacicola* is a small longhorn that may be easily mistaken for other Coleoptera especially *Stenurella melanura*. It was recorded at Bowcastle as was the attractive *Anaglyptus mysticus.*

Longhorns in coniferous plantations was emphasized by the discovery of *Tetropium gabrieli* on log piles. This seems to be crepuscular and so evening searching may be worthwhile. Its congener *T. castaneum* (Black Spruce Longhorn) was discovered on a felled Norway Spruce and we may discover that we have several populations of this national rarity. Anyone searching such plantations should also be alert for the Spruce Shortwing *(Molorchus*

minor) an introduced species probably common here. They may also see *Leptura quadrifasciata* – another more conspicuous introduction in such situations but with larvae developing in deciduous trees such as birch.

It can be seen that inspection of any log piles in the Forest area may reward the coleopterist. Two rather special longhorns were recorded when oak logs at Uncllys Farm were examined. The Tanbark Beetle *(Phymatodes testaceus)* was bred from one log and *Pyrrhidium sanguineum* (the bright red Welsh Oak Longhorn) was seen crawling over the wood pile, probably on logs destined for the wood burning stove. It is likely that there has always been some depletion of saproxylic beetle populations by humans for fires, but at least we are now been alerted to the dangers of this and some residents may at least take a second look at logs before they burn them!

Two longhorns associated with willows and poplars were mentioned. These were *Aromia moschata* – the Musk Beetle – a spectacular insect with metallic colouration (breeding in old willows perhaps within the Roxel site where the Study Group found it) and *Saperda populnea*. The latter is probably most likely to be found when Aspens are searched for the fairly conspicuous galls containing larvae on smaller twigs.

Perhaps two of the most difficult species to find because of their cryptic colouration were the rare *Mesosa nebulosa* (Black-clouded Longhorn) and *Leiopus nebulosus* (White-clouded Longhorn). The former has been recorded but twice whilst the latter has been recorded at Longdon Wood and more recently at Bowcastle where the surveyor coverage was particularly good.

The final species mentioned were those not recorded recently in the general area of Wyre. *Stenurella nigra* (the Small Black Longhorn) found by Norman Hickin has still not been seen in recent times. It may be lost to the Forest, but its size and dark colouration make it possible that it is overlooked. *Agapanthia villosoviridescens* (Golden-bloomed Grey Longhorn) is often associated with Hogweed and ought to appear perhaps near the River Severn – it is pretty conspicuous. Can anybody come up with a record for it?

With regard to the best month to find the adults beetles, that doyen of Wyre coleopterists Norman Hickin had told him that 'around July was a pretty good time for everything' (but perhaps June is also a good month)!

John concluded with some general tips for photographing longhorn beetles using both standard digital cameras (that can give excellent results) and more specialist DSLR camera and macro lens techniques.

Longhorn beetle note from MIKE BLOXHAM

John Bingham, in his article about longhorn beetles of the Wyre Forest in the 2009 Review, provides an illustrated description of *Asemum striatum*. Although this species is so far unrecorded in Wyre, it will almost certainly be present. I recorded this in the Hednesford Hills at Cannock on 8th June 2004. Several newly emerged specimens were seen at 12 p.m. on a standing pine trunk remnant that had been damaged some 3 years earlier. The chances of finding it by day are therefore present, but the trunks/stumps probably need to be relatively fresh in terms of time since the forestry operations took place. This longhorn is also recorded from Cannock Chase by Eric Brown.

Shropshire Environmental Data Network by PETE BOARDMAN

Pete Boardman, who works for the Field Studies Council delivering the Biodiversity Training Project, gave a talk looking at the progress made in Shropshire with the virtual local records centre – SEDN (Shropshire Environmental Data Network). He explained that the records centre was set up following continued frustration by planners, naturalists and organisations such as the local authority and Natural England to fill the obvious gap that existed. A virtual centre was deemed the way forward due to problems with finance, but also data quality issues that some Local Records Centres have. It was recognised that if a number of reputable naturalists became responsible for input into the database as funded 'species tsars' then it would improve the quality of records. This pretty much has happened over a two year period and the records centre currently has a dataset approaching 400,000 records. Pete is Shropshire's 'invertebrate tsar' and has been responsible for pulling together VC40 data from county recorders, recording schemes and individual naturalists. The invertebrate database now stands at around 250,000 and is growing and he interrogated it to show a variety of invertebrate groups and species, showing good or poor coverage to reflect the situation with recorders. Amongst groups looked at were shieldbugs, and he recognised how inspirational Gary Farmer's 2009 talk was at the Worcestershire Entomology Day. Pete explained how this talk had led to Shropshire naturalists surveying and gathering information of Shropshire shieldbugs, and he showed maps of the most popular and rare species.

Wyre Forest Study Group

Pete expressed hope that the Wyre Forest VC40 dataset would soon be submitted to SEDN and that outline discussions had taken place to this end.

He went on to talk about the Biodiversity Training Project, a 5 year project funded by the Heritage Lottery Scheme. During its lifetime the project ran 206 events, training 849 individual people over 2660 individual training days and was responsible for around 40,000 biological records being generated. Finally he heralded a new project that the Field Studies Council had got training for – the Invertebrate Challenge – due to launch in January 2011. This is a 3 year project, again funded by the Heritage Lottery Scheme, aimed at improving species identification over several groups of invertebrates by training small groups of people, offering tutors as mentors and other support.

Entomology Day speakers from left: Jon Sadler, Pete Boardman, John Bingham, Susan Limbrey, Brett Westwood, Andy Jukes Rosemary Winnall

Entomology Day, new Community Discovery Centre Rosemary Winnall