

S 153

Volume 26 Part 3

The Lincolnshire Naturalist

Transactions of the Lincolnshire Naturalist
for 2005 published 2006

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ISSN 0963-0961

Printed by Cupits, The Ropewalk, 23 Louth Road, Horncastle, Lincolnshire, LN9 5ED
Edited by Nick Tribe and Phil Porter

THE FRESHWATER INVERTEBRATE COMMUNITIES OF THE RIVER WITHAM: A JOURNEY FROM SOURCE TO SEA

Richard P. Chadd

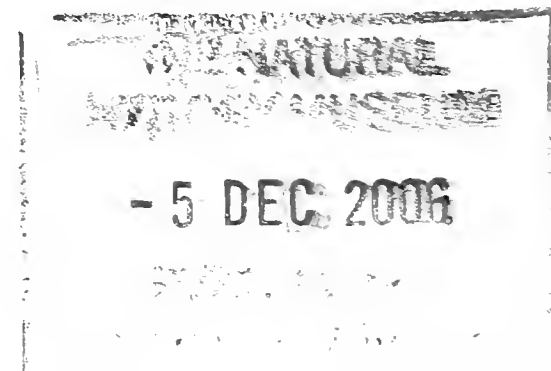
Introduction

The River Witham is a geological oddity; one glance at a map of Lincolnshire will reveal the peculiarity of its course. It rises near the village of South Witham, south of Grantham and runs generally northwards to Lincoln. At this point it turns directly eastwards, through the Witham Gap (a break in the long north-south limestone ridge known as The Cliff, which divides the upper and lower river) then turns southwards to enter The Wash at Boston. Consequently, the river meets the sea at almost the same latitude as its source, despite flowing northwards for half of its course.

The Witham follows this unusual course because, historically, it was a tributary of the River Trent. The latter previously flowed from the Newark area to The Wash via the land where Lincoln now stands and was itself the erosive force which cut the Witham Gap, but became disconnected from the Witham when the land rose to the west of the city. The Upper Witham - the entire course upstream of Lincoln - has, therefore, always been the same river. The Lower Witham, from Lincoln to The Wash is, in effect, the old course of the Trent and has deep deposits of Trent gravels, composed of Derbyshire and Nottinghamshire rock materials unknown in Lincolnshire, within and adjacent to the channel.

In addition to an unusual geological history, the Witham cuts its course through rock formations of many types. Most of its spring sources, including the primary sources near Grantham and the western tributaries of the Lower Witham, rise in the hard limestone aquifers of the Lower Oolite. It is this which forms the high ridge known as The Cliff to the east of the Upper Witham. The Upper River also runs to Lincoln over lime-rich Lias clays, which give rise to two main tributaries: the River Brant and the River Till. As the river swings southwards, it picks-up waters from eastern aquifers, including the soft limestones of the Upper and Middle Oolite, the Lower Greensand and, further east, the chalk of the Lincolnshire Wolds. In its lowest reaches, the Witham flows over glacial drift, to become part of the Fenland of South Lincolnshire.

The Witham is generally, therefore, a calcareous limestone/clay river, but with the calcareous element derived from a broad variety of sources. With the addition of sandstone, chalk, Trent gravels and a Fenland element, it is rich in geological diversity and structure. It is this which gives rise to a similarly diverse aquatic invertebrate community, which changes profoundly as one progresses downstream. The following will give a flavour of this rich and interesting fauna, placing the species in context and deriving conclusions on the factors which dictate community structure.



The Witham Head, Cringle Brook and Wyville Brook

The primary source of the Witham is somewhat indeterminate. On the map, it rises near South Witham around SK885189, but is often dry at its head. A constant flow of water is, however, provided by Motherford's Spring at SK929224 and Foxhole Spring at SK927233, near North Witham, which is where we begin our journey.

Both springs support the caddisfly *Apatania muliebris* McLachlan, 1866. This is a recently evolved glacial relic species, regarded as Regionally Notable in East England (Wallace, 1991), as it is scarce or absent from much of this part of the country. The most interesting feature of the species is, however, related to its reproductive biology, unusual among caddisflies, in that it is parthenogenetic. Added to this, the adult is a weak flier and the larva favours permanent springs (where it is only found in close proximity to the source), usually on a 'blocky' substratum and surrounded by pasture. All of these restrictions to its distribution, and its parthenogenetic lifestyle, mean that each population may be genetically and morphologically distinct. A number of forms are described, with one (*A. nielsenii*) proposed as a separate species. Barnard and O'Connor (1987) state, however, that the morphological boundaries between segregate micro-species are insufficiently resolved to fully describe (subtly different forms can be found at the same locations at the same time). Nevertheless, the species remains an evolutionary curiosity, worth future scrutiny in the study of the genetics of restricted populations and relative expressions of phenotype. Bizarrely, the species has been found on St. Kilda; astonishing for a parthenogenetic weak flier!

Motherford's Spring also supports the eyeless subterranean shrimp *Niphargus aquilex* Schiödte. Another glacial relic, *N. aquilex*, together with other British Niphargidae, inhabits sub-surface groundwaters in caves and fissures in water-bearing rocks, as well as hyporheic waters in riverine gravels (the shallow, subterranean zone in the river bed). In Lincolnshire, it is at the northernmost extent of its known UK distribution (the limit of the prehistoric ice sheet is thought to have restricted the northerly distribution of *Niphargus*), although a recent record from the north of England may have extended its distribution a little further (Paul Wood, pers. comm.). *N. aquilex*, of all the British niphargids, is thought to be the species which favours the most superficial habitats. A study by Gledhill (1977) of gravels in a watercress bed showed the species to rise in abundance when flow from the supplying borehole was relatively low, whereas other species (*N. fontanus* and *N. kochianus*) decreased, indicating their preference for deeper (phreatic) groundwater zones. Thus, the species is to be found, infrequently, at the surface, very close to spring heads, or in recently flooded gravels in streams which periodically dry up.

All *Niphargus* species are generally saprophagous, eating both plant and animal detritus, although they will also predate other invertebrates (aquatic oligochaete worms, copepods and larvae of Diptera), as well as juveniles of their own species and terrestrial invertebrates washed into subterranean habitats in the summer. Some populations have also been shown to depend on silt and clay (with its associated bacterial component) as a food source. They can be caught in traps baited with meat or cheese.

Being at, or near to, the northerly limit of this species makes any records highly important in a national context. Examination of springs and flushes to add to the known recordset is, therefore, to be encouraged. The species is transparent and only 5 mm long, so care must be taken!

A major source of water to the upper reaches of the Witham enters the river via Cringle Brook at Great Ponton. This rises as a number of very important spring sources, such as Larches Spring at SK882296 (Plate 1) (on Wyville Brook, the main tributary of Cringle Brook) and several springs at Stoke Rochford Golf Course (around SK922290).

Among the species present at these sites is the caseless caddisfly larva *Wormaldia occipitalis* (Pictet), which is especially abundant at Larches Spring (Plate 2). This species, which inhabits the fast water of miniature rapids and waterfalls, is a filter feeder on very fine detritus, such as diatom cells, which it catches using a silken net of very fine mesh, constructed in the shape of a blind-ended, twisted horn or funnel. The Family: Philopotamidae, to which it belongs, are unique among caddis larvae in possessing a membranous, brush-like labrum ('upper lip'). This is used in downward sweeping movements within the net to collect its food items. Wallace (1991) noted: "I have no records for the south-east and east of England", and so regards the species as Regionally Notable if found in south-east England and East Anglia. It is certainly a great rarity in Lincolnshire, known from a total of only five sites, three of which are at the head of chalk streams in the Wolds. These two spring sites are its only known location in the Witham catchment.

Both sites also support larvae of the hill soldier fly *Oxycera pardalina* Meigen, 1822. This is a Nationally Notable species, regarded as having a generally northerly distribution in the UK, and being associated with calcareous springs and streams in hilly country. The larva inhabits submerged moss beds (it has a closer association with moss than any of the other *Oxycera* spp.), but will stray into trickles over rocks, and the adult seems to favour scrubby habitats (Stubbs and Drake, 2001). At both Stoke Rochford and The Larches, the spring sites are surrounded by old scrubby woodland of ash, larch, elder and hazel and the springs themselves support rich growths of the moss *Rhynchostegium riparioides* (Hedw.) C. Jens. Both sites are situated on low limestone hills in the expanded southern end of The Cliff. I am not aware of any previous records of the species in the county and this may represent its southerly/easterly limit.

Further downstream from Larches Spring, a series of springs enter Wyville Brook at Pasture Farm (around SK899286). Two support *Apatania muliebris* (discussed above). The third, known locally as The Cold Spring, supports larvae of the trickle midge *Thaumalea testacea* Ruthé (Plate 3). This species is characteristic of spring heads on limestone, but can also be found in vertical trickles on bridges and walls with lime-rich mortar (Disney, 1999). Like *O. pardalina*, it is regarded as a generally northern and western species, with only sporadic records from elsewhere (I have also found it in chalk springs near to The Humber Estuary) and so is a rare species in Lincolnshire. It is known to live in cracks in stone and migrates diurnally, moving towards the surface at night. The Cold Spring had been boxed-in with limestone slabs in the distant past (to facilitate its use as a domestic water supply to the farm). This slabby, cracked structure, in association

with the highly calcareous spring water, may have favoured the establishment of a population of *T. testacea*.

Virtually all of the spring sources forming the headwaters of the Witham support two locally restricted species, the flatworm *Crenobia alpina* (Dana) and stonefly *Nemurella picteti* Klapálek. These are present throughout Lincolnshire, but, being stenothermic species, associated with cool waters in upland areas of northern and western Britain, are restricted in the lowlands to spring-fed sites. Neither can survive water temperatures in excess of 15°C, which means that both retreat towards the spring head in the summer months (*Crenobia* can be found below ground). Their dependence on cooled groundwaters mean that, although widespread in the county, both are highly important elements of the Lincolnshire fauna, existing, as they do, in delicate habitats, potentially threatened by ever increasing pressure on water resources and physical degradation of the spring sites.

Crenobia is a vigorous predator, engulfing other small invertebrates whole, but can also feed on dead specimens of larger animals, pulling pieces of flesh from the carrion by means of an eversible pharynx. *Nemurella*, on the other hand, is herbivorous, feeding as a shredder of macroscopic detritus. For this reason, the latter has a close association with leaf litter, especially in weedy deadwaters, but can also be found in mossy trickles. At some sites, *Nemurella* was replaced by the related stonefly species *Nemoura erratica* Claassen, which, though not stenothermic, fills a similar niche, is also associated with headwaters and is regarded as somewhat localised in its national distribution. It is, therefore, an important species in its own right.

Having discussed individual species in some detail, it is important to look at the whole community structure of the spring feeds to the headwaters of the Witham. The species list obtained from Larches Spring early in 2002 is shown below.

LARCHES SPRING, SPRING HEAD

SK882296 R03BFLARS010S
Sample date 22/02/2002

BMWP: 80 TAXA: 14 ASPT: 5.71 LIFE (F): 7.15 LIFE (S): 8.46 LQI: A+
CCI (N): 19.1

<i>Polycelis felina</i>	A
<i>Crenobia alpina</i>	A
OLIGOCHAETA	A 1
<i>Eiseniella tetraedra</i>	A
<i>Gammarus pulex</i>	B
<i>Baetis rhodani</i>	A 1
<i>Nemoura erratica</i>	B
<i>Elodes</i> sp.	A
<i>Elmis aenea</i>	A
<i>Agapetus fuscipes</i>	A
<i>Wormaldia occipitalis</i>	B

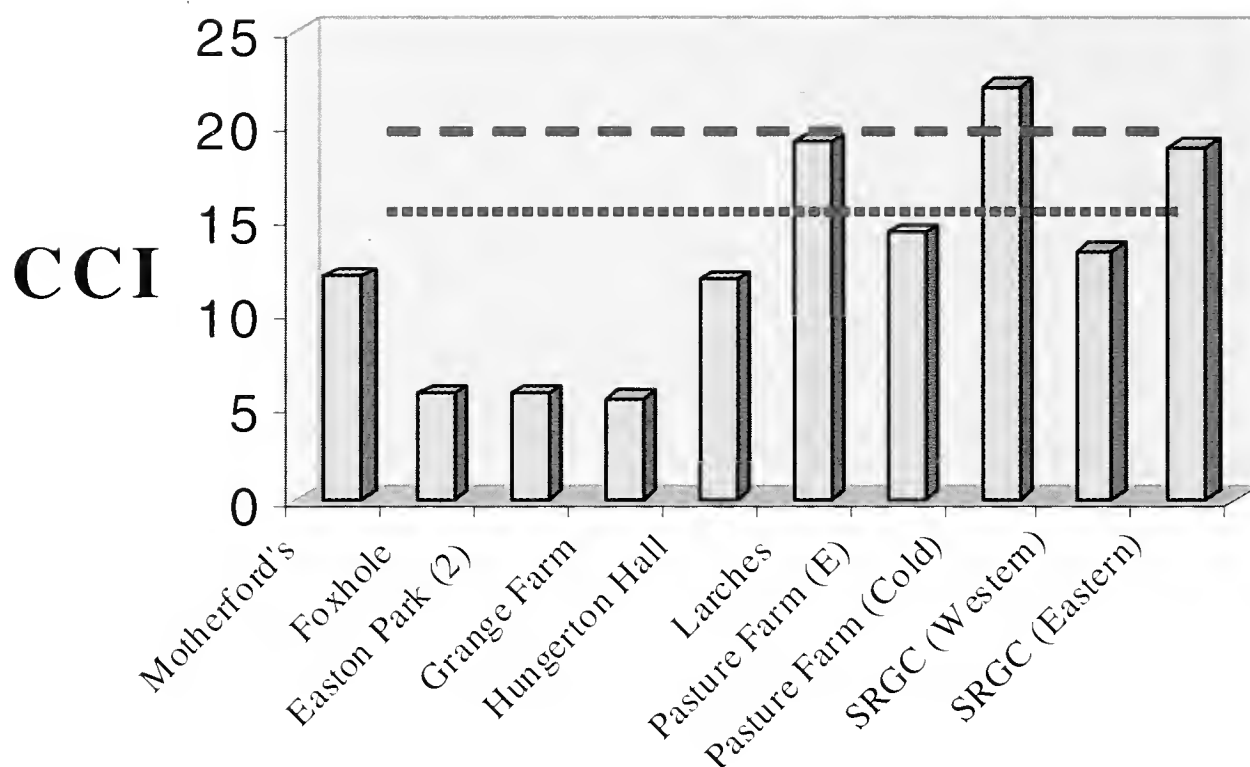
<i>Lype reducta</i>	A
<i>Plectrocnemia conspersa</i>	A
<i>Plectrocnemia geniculata</i>	B
<i>Micropterna sequax</i>	A
<i>Tipula</i> sp.	A
<i>Hexatoma</i> sp.	A 1
<i>Dixa submaculata</i>	A
<i>Simulium costatum</i>	A
<i>Oxycera pardalina</i>	A

The letters following each item indicate their relative abundance in the sample, on a logarithmic scale (where A1 = 1 specimen, A = 2 to 9 specimens and B = 10 to 99 specimens). Species restricted to spring heads and headstreams are emboldened.

Interestingly, the site supports two pairs of related species, which tend to occupy different zones in headstream sites. *Crenobia*, as has been discussed, is restricted to the zone near to the spring head (and also shows such zonation even in upland areas, where it occupies the upper reaches of mountain streams). Another flatworm, *Polycelis felina* (Dalyell), although a headstream species, occurs further downstream, partly through a higher tolerance of summer water temperatures and partly through preference for more sluggish flows (in upland areas it replaces *Crenobia* in shallower gradients). This appears to be a behavioural phenomenon rather than the result of interspecific competition, as shown by Lock (1975) and Lock and Reynoldson (1976). A similar zonation occurs in the caddisflies *Plectrocnemia conspersa* (Curtis) and *P. geniculata* McLachlan, where the latter occupies the zone close to the spring head and the former occurs further downstream. In this case, the zonation may be due to competition, as both species are net-spinning predators, which use silk nets to capture other instream invertebrates, or may relate to flow-velocity preferences; the nets of *P. conspersa* are inclined to disintegrate above velocities of 20 cm s⁻¹ (Edington and Hildrew, 1995).

Whatever the controlling factors may be, an apparent zonation of a stream invertebrate fauna in a stretch which was only 10-15 m in length (see Plate 1) is fascinating, and may justify further study of microdistribution of species at this site.

The relative importance of communities such as this can be put in a national context by means of a simple index; the Community Conservation Index or CCI (Chadd and Extence, 2004). The index operates by scoring British freshwater species on a scale of 1 to 10 (Conservation Score or CS), where the top three scores apply to species which are on the national Red Data list (10 applies to RDB 1 species). A score of 7 applies to Nationally Notable species, 6 applies to Regionally Notable species and 5 to locally distributed species. Scores from 4 to 1 indicate progressively more common species. An average score per taxon is calculated for the list obtained and this is applied to a multiplier, based either on the highest CS for the list (*ie.* the presence of a rare species in the community) or on a simple scale of taxon richness, so that rich communities of common species can still obtain relatively high scores. A score in excess of 10 is considered to indicate a fairly high conservation status for the community. In excess of 15, the



site is high status and may be worthy of local protection or careful management. Scores in excess of 20 indicate a site which may be of national importance, for which statutory protection may be sought. The bar graph above summarises CCI scores for the primary sources of the Upper Witham.

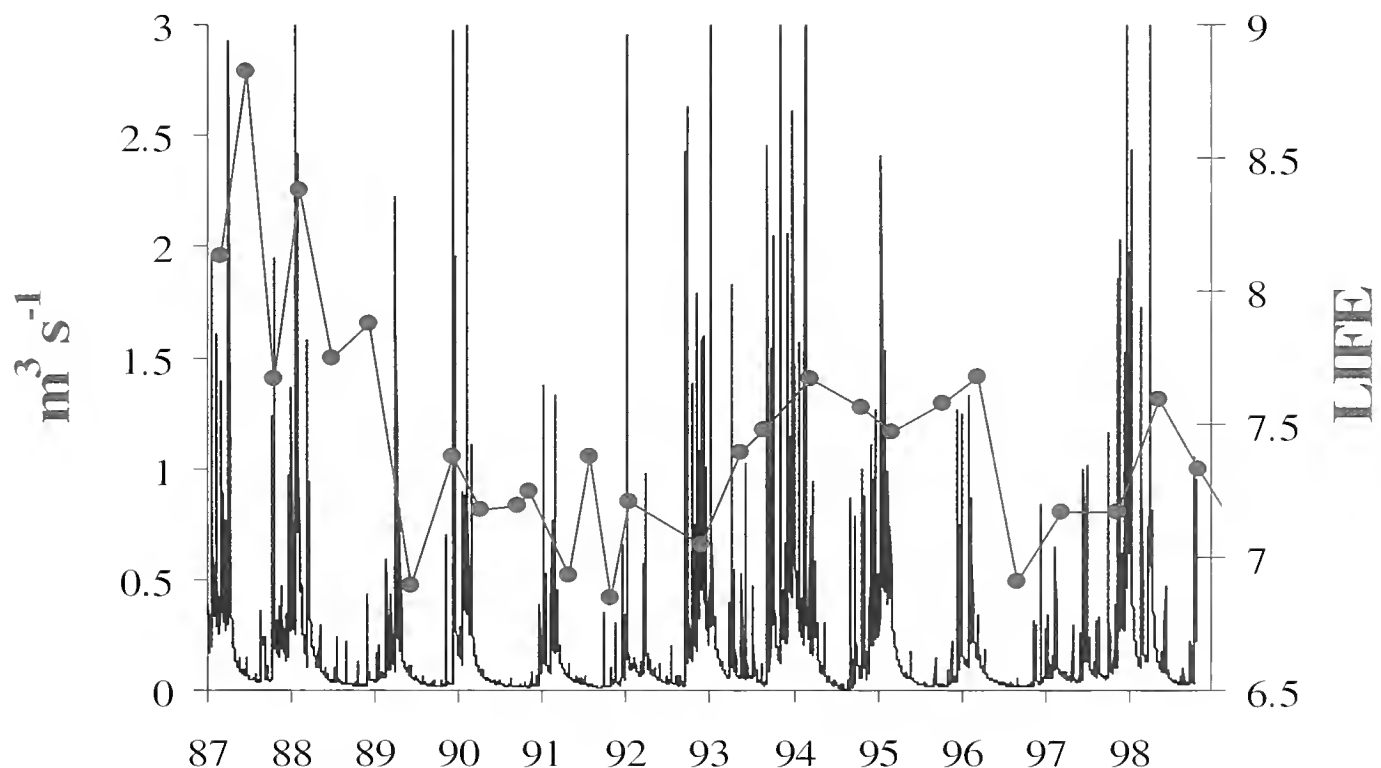
The first four bars to the left apply to the springs on the main River Witham and the six to the right are all sources on the Cringle Brook/Wyville Brook system. As can be seen very readily, the latter sources appear to be more valuable, in a conservation sense, than those on the main river. Three sites (Larches Spring, Pasture Farm Cold Spring and Stoke Rochford Golf Course Eastern Spring) are at or very near to a CCI of 20, indicating sites which are potentially of national importance. The rest all exceed a CCI of 10. With the exception of Motherford's Spring, which is of fairly high value, the rest of the main river sites, though supporting regionally uncommon species such as *Crenobia*, *Nemurella* and *Apatania*, appear to be of little value in a national context.

The reasons for this are unclear. It is possible that agricultural practices on the two catchments differ and are less sympathetic to spring sources situated in the valley of the main Witham. A more likely explanation, however, is that the main river suffers greater pressure on the water resource, with abstraction pressures on underlying aquifers causing damage to the invertebrate fauna.

Analysis of a series of invertebrate datasets from the Witham at Easton Park using the Lotic-invertebrate Index for Flow Evaluation or LIFE score (Extence *et al*, 1999), an index which summarises response of the invertebrate community to flow velocities, reinforces this assertion.

The graph below shows the response of LIFE (indicated by the line graph) to flow volume (indicated by hydrographic data - the 'spiky' line) between 1987 and 1999. It is clear that, since the early 1990's, average LIFE score has been consistently lower than it was in the 1980's. In part, this resulted from two deep droughts over the period (in 1990/91 and 1996/97), which are likely to have had profound effects in non-drought years, through reduction in breeding capacity during droughts impacting on recruitment to larval and adult phases when flows recovered. The trend has, however, continued into the early 2000's and long-term analysis against models of expected ecological state indicates clear deviation from the norm. The headwaters of the main channel of the Upper Witham appear, therefore, to be strongly flow-compromised, which may, at least in part, explain the lower conservation status of spring sources.

Witham - Colsterworth/Easton Park



Grantham to Lincoln.

Similar analysis of invertebrate community response to flow in the reach downstream of Grantham shows that pressures on water resources in the Witham are significantly reduced. In part this results from input of water from Cringle Brook, Foston Beck and other tributaries, but is also because of input of high quality treated sewage effluent from Marston sewage treatment works. The works previously caused profound and extensive reductions in dissolved oxygen in the river, but large-scale modifications in the early 1990's reversed this impact, so that the input is now generally beneficial.

This, together with reductions in the impact of other discharges from vegetable processing, light industry in Grantham, urban runoff, and so on, has led to expansion in the resident population of Atlantic stream crayfish *Austropotamobius*

pallipes (Lereboullet). This is a species protected by law, threatened as it is by expansion in distribution of invasive non-native crayfish, most notably the American signal crayfish *Pacifastacus leniusculus* (Dana). The threat partly stems from competitive exclusion by the larger and more aggressive alien, but also from a fungal disease (*Aphanomyces astaci*) carried by *Pacifastacus*, which is rapidly fatal to *A. pallipes*, but to which *P. leniusculus* is resistant.

Austropotamobius pallipes, in common with all crayfish and most crustaceans, is an omnivore. It is predatory on many invertebrate species, but will also feed on carrion, plant material and fish. There is a strong association of the species with tree root-masses, which the juveniles use to avoid predation by fish and adult crayfish, so the presence of many trees lining much of the Upper Witham is beneficial to its survival and expansion. Interestingly, the Witham population appears to form burrows in the riverbank - behaviour which was not previously associated with the species.

The population of *A. pallipes* is very extensive, inhabiting the Upper Witham from Colsterworth to around Claypole (some 30 km). At most sites, the species is present in large numbers, so this population probably represents one of the most important in eastern England. Sadly, populations of signal crayfish are present in the River Eye in the Trent catchment to the west and in an isolated gullet within the Witham valley itself. The River Bain, a primary tributary of the Lower Witham is now infested with *Pacifastacus* (a population of *A. pallipes* was previously resident in the Bain, but is now extinct), so it is likely that the population in the Witham will become extinct in the next few decades. In the meantime, we, together with the angling community and regulatory bodies, must do all we can to protect and conserve this interesting and important native species in the Witham.

A primary component of the invertebrate fauna in this stretch of the Witham (Plate 4) is the mayfly *Serratella ignita* Poda, 1761. Highly sensitive to reductions in flow or water quality, the species shows close associations with water crowfoot (*Ranunculus* spp.), which is, in turn, sensitive to reducing flows. The species suffered substantial decline during the droughts in the 1990's and has become one of the main species perceived by the angling community to be suffering a national decline in recent decades. To a considerable degree, this relates to the impact of droughts, but also to abstraction pressures and pollution by careless use of pesticides, such as sheep dip. *S.ignita* is classed as a 'clinger/sprawler', clinging closely to the surface of stones or flattening down on sedimented surfaces, and a 'collector/gatherer' of fine organic detritus, with a particle size of <1 mm. It has a very short larval phase, developing from egg to adult in around a month, and so spends much of its lifecycle as an egg. The species can overwinter as tiny larvae, however, extending the larval phase to up to 6 months, but only in 10-15% of the population.

Also present in large numbers in this stretch is the cased caddisfly *Silo pallipes* (Fabricius). Characterised by having large stones built into its mobile case to act as ballast to resist the flow, the larva is also associated with fast-moving water of high quality, where it grazes on algal films on the surface of stones. It is parasitised by the ichneumon *Agriotypus armatus* Curtis.

In much of the stretch, but particularly in the lower end where the Upper Witham approaches Lincoln, large numbers of larvae and adults of the banded demoiselle damselfly *Calopteryx splendens* Harris (Plate 5) may be seen. An ambush predator, particularly common as a larva in marginal fringes of grasses, such as reed sweet grass *Glyceria maxima* (Hartm.) Holumb., the species has shown a considerable range expansion in Lincolnshire in the last decade or so (Chadd and Hiley, 2004). This may be the result of raised average temperatures in summer and mild winters, favouring survival and breeding success of the species.

Also present in the more sluggish flows toward Lincoln is the cased caddisfly *Molanna angustata* Curtis, 1834. Characterised by a broad, flanged case, shaped somewhat like a kite, the species sprawls on gravel and sand surfaces, where it grazes on algae and plant fragments. Although preferring sluggish, non-turbulent water and therefore little affected by low flows, the species is highly intolerant of poor water quality.

Also sensitive to poor water quality is the mayfly *Ephemera vulgata* Linnaeus. Like the closely related species *E. danica* Müller, which dominates the upper reaches of the Witham, *E. vulgata* is a filter-feeder which burrows in the substratum, and uses the beating action of its gills to capture particulate matter on which it feeds. It prefers a muddy substratum in which to burrow (*E. danica* prefers sand and gravel), hence the zonation of the two species into upper and lower reaches of the Upper Witham.

Similar zonation is also shown by the slipper limpet *Theodoxus fluviatilis* Müller, which dominates the sluggish lower reaches, replacing the river limpet *Ancylus fluviatilis* Müller. Both feed on hard substrata, where they graze algal mats and, though they can coexist, seem not to do so in the Upper Witham. *Ancylus* favours faster flows, whereas *Theodoxus* is far less exacting and can live in still or flowing water.

Lower Witham: Lincoln to Langrick.

The river changes its character drastically downstream of Lincoln. The channel is completely modified and heavily managed, with hard-engineered margins of boulder rip-rap and the whole lower river has a fairly significant passage of boats on it. Despite this rather bleak habitat (Plate 6), this stretch supports very important populations of molluscs, especially bivalves.

All species on the British list of the larger freshwater mussels of the Family: Unionidae exist in large numbers here. The swan mussel *Anodonta cygnaea* (Linnaeus, 1758) (Plate 7), duck mussel *A. anatina* Nilsson, 1823 and painter's mussel *Unio pictorum* (Linnaeus, 1758) all dominate the fauna, but the rarer *U. tumidus* Philipsson, 1788 is also present in much smaller numbers, as is the protected Biodiversity Action Plan species known as the depressed river mussel *Pseudanodonta complanata* Holandre, 1836. All of these species disperse by means of swimming larvae, called glochidia, which attach to fish gills, then fall off after a period of time, so as to be redistributed throughout the river.

Smaller bivalves of the Family: Sphaeriidae are also present in large numbers. Among these, the so-called Witham orb mussel *Sphaerium solidum* (Normand,

1844), classed as 'Endangered' in the UK (RDB1), is the most significant. It has also been found in the tributary Delphs in the Nocton/Timberland stretch, along with the 'Vulnerable' (RDB2) false orb mussel *Pisidium pseudosphaerium* Favre, 1927.

Both species, however, have always been present in small numbers. The dominant species in this stretch of the Witham includes the nut orb mussel *Sphaerium rivicola*, which favours canals and large canalised rivers such as this. It also seems to prefer deeper water than all other *Sphaerium* species (Killeen *et al*, 2004). All burrow in soft substrata and filter feed, so a heavy silt load and high primary productivity favour sphaeriid communities.

The Lower Witham is also dominated by bugs of the Family: Corixidae, in which up to 12 species may be found. Many of the nymphs (especially those of the Genus: *Micronecta*) appear to favour the artificial boulder margins as resting platforms.

Though superficially poor, the habitat in the Lower Witham is, therefore, still of considerable significance in a national context. Much recent engineering works have attempted to mitigate some of the bleaker areas in the hope that the species outlined here will be maintained, and perhaps expand their distribution in the river.

Langrick to The Haven.

Downstream of Langrick Bridge, the resident fauna of the Lower Witham is broadly similar to that in the stretch upstream to Lincoln, being dominated by unionid and sphaeriid bivalves, corixid bugs and freshwater shrimps.

Being at the seaward end of the Witham, this stretch can, however be characterised by invasion by estuarine species, especially in drought years, partly through leakage of the tidal sluice and partly through concentration of underlying saline deposits by reducing flushing flows.

One of the earlier colonisers is the tube-dwelling shrimp *Corophium multisetosum* Stock, which lives in a flimsy tube, constructed of detritus and mucus, in muddy substrata or on wood or brick surfaces. Characterised by greatly enlarged second antennae and a prominent extension to the uropods, this species can survive for extended periods in fresh water. It is always, however, found at the seaward end of rivers and drains, never too far from the sea. Its tolerance of freshwater allows it to become a pioneer estuarine coloniser as freshwater flows decline.

The same is also true of another amphipod, the gammarid shrimp *Gammarus zaddachi* Sexton, which replaces the 'true' freshwater species *G. pulex* (Linnaeus) and *Crangonyx pseudogracilis* Bousfield, as drought conditions progressively deepen. When the drought breaks, *G. pulex* and *C. pseudogracilis* tend, in turn, to replace the estuarine species. The crangonyctid is, incidentally, a North American species, which invaded (initially in the London area) in the 1930's and is now widespread, generally in sluggish and still water systems, throughout the UK.

In extreme drought flows, two large estuarine shrimps, the decapod ghost shrimp *Palaemonetes varians* (Leach) and mysid opossum shrimp *Neomysis integer* (Leach) become established in the lowest reaches of the Witham. The former can tolerate full freshwater for a period of time, but must return to brackish conditions to breed. The latter cannot survive in full fresh water for any length of time, but will push upstream under low salinities. Large numbers of both species were present in the Lower Witham near Boston in the deep drought of 1990/91.

Thus our journey ends. The rich and varied geology, giving rise, in turn, to a rich and varied invertebrate ecology which characterises the River Witham and its tributaries, is one of the jewels in the crown of Lincolnshire's natural history. More sympathetic management of its associated habitats (especially in the lower river), along with statutory enhancement of the whole riverine ecology, through EU and UK legislation designed to improve water quality and reduce abstraction pressures, can only help increase its value still further. The task will become harder as global pressures on ecosystems increase, but, for the River Witham, the work will be entirely worth the effort.

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LEPTOGASTER GUTTIVENTRIS – DASHED SLENDER ROBBERFLY – NEW TO THE COUNTY

Annette Binding

Whilst carrying out survey work at The Pingle in Coningsby on the 7th July 2004 we swept a slender robberfly from long grasses at the western end of the site. I identified the fly as *Leptogaster guttiventris*. This identification was later

confirmed by Derek Whiteley (Diptera Recorder, Sorby Natural History Society). The fly which is generally scarce, is particularly adapted to life amongst long grasses where it hunts small insects. I contacted Jill Mears who confirmed that this was the first time that the species had been recorded in Lincolnshire although it has been found in the adjacent counties of South Yorkshire and Nottinghamshire.

RE-ASSESSING A FORMER PRESIDENT: THE REVEREND FRANCIS LINLEY BLATHWAYT

Dr Trevor Kerry

Introduction

While wardening the Hartsholme Country Park, Lincoln in 1977, I was compiling an historical list of local species from sources such as the *Transactions* when I stumbled on a paragraph about a crossbill irruption there in 1910. The note was contributed by the Revd F.L. Blathwayt, and I filed away in the memory for later investigation the fact that he might have been a typical parson-naturalist in the Gilbert White tradition (Plate 8).

I did not know then that Francis had been an early LNU member and its President. In 2005, in tracing his career these facts came to light. Moreover, when I consulted ornithological books, his name kept re-appearing. Anyone whose work is seminal enough to last a hundred years must be worth investigating, and my researches were widened. The story that unfolded (Kerry, 2005), was not easy to unravel. But since publication yet more data has emerged, mainly from a number of family archives kindly loaned to me.

This paper has three intentions: to provide a synopsis of Francis' life; to indicate some of his contributions to birding, especially in Lincolnshire; to introduce some discoveries that post-date the publication of Kerry (2005).

An outline life of F.L. Blathwayt

So what is known about Blathwayt? There are three phases to his life (1875-1953): the early years, the Lincolnshire period, and the Dorset period. Each deserves description.

Francis was born in the Raj; his father, Charles, was in the Indian Civil Service and his uncle, Linley, a Lieutenant-Colonel. His mother, Alice (née Fowler), was a feisty lady, on record as looking forward to climbing a tree and seeing a tiger shot (Letter dated 13th February 1877 from Alice to H.N. Fowler, a relative). Francis was a rather sickly child, enjoying books, learning English and Hindustani with facility, and with a precocious interest in wildlife (Letter to Francis' maternal grandmother from his father, 29th October ?1878).

Alice died when Francis was three, so he was repatriated. He attended Malvern and Oxford University, where, surprisingly for the times, he read Indian woods

and forests. (Hertford College had an arrangement to train people in forestry for the Indian Civil Service from 1871). Graduating in 1899, he arrived at Lincoln Theological College to train as a clergyman.

Ordained in 1900, he assumed a curacy at St Swithin's, Lincoln, progressed to MA, and became a member of the British Ornithologists' Union (K.B. Rooke's obituary, in 1953, for Francis in *British Birds* records the latter's pride in a 50-year membership). In 1904 he moved to All Saints, Monks Road, as curate. This was a new mission church, bordering the riverside slums; 1904 was the year of the infamous typhoid outbreak in the city. A parchment in the records of All Saints church, Monks Road, Lincoln records the high regard in which he was held by the parishioners.

By 1909 he was seeking a living of his own. Offered the Rectorship of Doddington, he stayed until 1916, marrying his wife Marjorie (née Dennys) in 1910 in Devon. At the end of that year the family moved to Melbury, Dorset, for he had been head-hunted by the Earl of Ilchester (owner of the Abbotsbury Swannery) on account of his birding prowess. His final move in 1929 involved another rural parish, Dyrham, where he remained for the rest of his life.

This was a busy period for Francis who produced the Lincolnshire County Bird List in 1915 (Blathwayt, 1914) and was appointed President of the LNU in 1918 (Blathwayt, 1918). He remained active in collecting zoological and bird records for Lincolnshire until 1920; he retained his LNU membership; he read *Transactions* avidly; and he corresponded by sending periodic wildlife notes (Blathwayt, 1940). He was President of the Ornithological Section of the Somerset Archaeology and Natural History Society, a role he held for 30 years, and was bird recorder for Dorset, and Vice President of the Dorset Natural History and Archaeological Society. He was working on the County List for Dorset (Blathwayt, 1933, 1939 and 1945), which he maintained until his death in 1953.

This brief history contains just a few salient facts about Francis, yet tells us nothing of his character. The Blathwayt family had owned Dyrham Park, Gloucestershire, so Francis was of aristocratic lineage. His father had been comfortable but not rich; his line did not inherit Dyrham Park even though he served as Rector of the adjacent church. Those who remember him usually describe a quiet man, self-effacing, who went everywhere by bicycle or on foot and actively sought out those of the parish who needed support.

Blathwayt's birding

Despite his sickly childhood, by teen age Francis was very fit, addicted to the outdoors and an indefatigable birder. Later he would cycle from Doddington to the coast and back in a day in mid-winter. These Lincolnshire forays produced a number of published papers. Even while at St Swithin's he had published papers in *The Zoologist* about the birds of the Cairngorms, Lundy and the Farnes, so he was an accomplished writer.

In Kerry (2005) his four contributions to *Transactions* are recorded. He wrote about Lincolnshire birds in *The Zoologist* too. One publication was a fund-raiser for the City and County Museum (*Owls and Hawks of Lincolnshire with special*

reference to the collection in the City and County Museum, 1909). He compiled a string of notes for *British Birds*. These papers can be readily accessed, so let two things be said of this out-pouring. First, his County List (1915) was acknowledged generously by Smith and Cornwallis (1955) when it was finally up-dated. A copy of their book was sent to his widow in acknowledgement. Second, his Presidential Address (1918) ended with a masterly, forward-looking agenda for bird research in the county.

Blathwayt's birding was exceptional for the era, based on observation rather than on collecting and the gun. His distinctive approach depended on using prismatic glasses, a new technology. Later, those who knew him said he had two pairs of different optical powers. As well as observing, Blathwayt sought sources of bird information, using historical records to track previous sightings. He conversed with woodsmen, keepers, and plover-catchers to pick their brains about recent and past sightings. He urged the systematic collection of such 'local history'. He haunted the 'bird-stuffers' shops in the city, asking about origins of specimens, sometimes demonstrating that the given information was false. He adopted 'patches' that were watched regularly, notably The Ballast Pits (probably Boultham Mere) near the city, Scotton Common and Skellingthorpe woods. Above all, he recorded, keeping diaries throughout his life running to twenty-two volumes. These show a concern for absolute accuracy, and for the common-place as well as the rare.

Since this paper began with an observation about Hartsholme, the theme can be illustrated with an example from that location. His diaries mention interesting occurrences there; but when his awareness of something important is raised, he visits tenaciously. When crossbills irrupted there on 7th April 1910 they sparked a chain of visits: 8th, 9th, 11th, 12th, 16th, 18th April, 5th and 12th May, and 30th July. He sustains his interest in the area, recording a pair of great crested grebes with young on 20th July 1916 – a rare sight at that time. He also pursued the 'living history' of the location, as this entry shows, applying his critical approach to the investigation:

'31st January 1916...went to see Mrs Charles Watson, North Hykeham...daughter of the late Mr Potts who died some 8 years ago, formerly keeper at Hartsholme to Mr Shuttleworth...His daughter... had in his house, a cormorant, immature white-breasted, shot there 30 years ago by her father on Hartsholme lake. A great crested grebe from the same locality and probably about the same date. No dates on the cases but both set up by Barber of Lincoln. She remembers her father told her he had shot an 'eagle' at Hartsholme, more than 30 years ago...probably the osprey recorded in the *Zoologist* by J F Muskhams, Barber's assistant, 1887, page 70, shot early in 1883.'

In Kerry (2005) an attempt was made to establish that Francis Blathwayt, as well as being a critical recorder and detailed chronicler, also had an appreciation of birds that might be labelled 'descriptive', or 'aesthetic'. While not detracting from his science, this tendency can lead him to write more expansive prose. It has been suggested that we would have been the richer if he had done this more often.

So it was with some excitement that, following the publication of Kerry (2005), Francis' grand-daughter offered a collection of documents that had come into her possession when one of Francis' daughters died in the late 1990s. As well as making more intimate the portrait of the man, these sources suggest that his writing took other forms than those available to us now from journals and annual reports. To this issue we now turn.

More recent information: two 'lost' sources re-discovered

Among the archives was a group of newspaper cuttings; they had been collected together by Francis himself, and he had dated and indicated the source of some of the items. Two were written as columns for a local paper (The Nottingham Guardian) during his period at Doddington. They were 'Pageant of early summer' printed on 6.6.11, and 'Migration of birds: the great autumn movement as observed on the Lincolnshire coasts' printed on 20.9.12. These items add two important insights into Blathwayt's birding. The first relates to writing style and the second to his overall output of writing.

i) Writing style

It was pointed out in Kerry (2005) that Francis was capable of producing bird literature that went beyond mere listing. The two cuttings provide further examples of that very different approach. The first column describes the 'orchestra of nature':

'The warblers fill the woodlands with song, and on a bright warm morning the blended notes of a dozen different species form a beautiful harmony. The plaintive chime of the willow wren, the ecstasy of the tree pipit as he shoots into the air and descends like a parachute, singing the while, to his perch; the joyous ring of the blackcap's song, and the bubbling warble of the garden warbler, each in turn strike the ear of the listener with familiar recognition year after year...'

The passage has the immediacy of personal experience and aesthetic appreciation. But there are other descriptive elements in the same article:

'Nature is lavish with her yellows, and soon the flame of the dandelions gives way to the enamelled gold of the buttercups. A meadow, at the end of May, set ablaze by the rays of the sinking sun striking a sheet of golden buttercups, is a treat which nature offers us ... The whole countryside seemed...to be covered with a shining cloth of gold...'

The second cutting, like the first, contains the same elements of excitement, and from the long and detailed descriptions of migration and its causes just one passage will illustrate the point:

'What is this great autumn migration of birds? What is the nature of this impulse, which to a greater or lesser extent quickens in all birds, and sets them on the move at the fall of the year? The autumn migration is, in short, a great return movement. In spring the greatest impulse a bird feels is to get to its breeding haunts. There is little or no unnecessary delay...The autumn migration is...a more leisurely return to winter quarters. The winter sun draws birds southwards

after the advancing cold and diminishing food supply has impelled them to start...'

So here we step away from listing, and even from reporting, into a world of enjoyment. These brief quotations whet the appetite for more, which hopefully time and patient research will reveal.

ii) Overall output

So given Blathwayt's capacity as a writer of a different *genre*, the question insinuates: where is such material to be found?

The cuttings offer both a clue and a partial answer. They suggest that Francis wrote for both local and national papers, and not necessarily under his own name. One of my urgent tasks is to explore those, often cryptic, clues.

But the search and the clues are suggestive that the Blathwayt corpus may be considerably enlarged in the future. For the cuttings described in the previous section are not mere 'notes', they are substantial: the first 1500 words, the second c3000. Modern newspapers, national and local, might consider 250 words an adequate column, and that expressed in a relatively superficial mode. Not so newspapers of the early 1900s. So any substantial find of newspaper columns would rapidly expand the known bird writing of Francis Blathwayt exponentially! Such expansion would have implications for the overall perception and interpretation of his work.

Summary

In Kerry (2005) I suggest that Blathwayt has been under-valued, not least in Lincolnshire; and I have suggested a theory to explain this. The evidence that came to light in the research for that book justifies that claim; but the newly emerging data intensifies the need to re-appraise this pioneer naturalist. The LNU can count itself privileged to have had him as its President.

Author biography

Dr Trevor Kerry is Emeritus Professor in the University of Lincoln, and a life-long birder. He was volunteer warden at various nature reserves: Hartsholme, Burton Pits, Whisby, and Attenborough (Notts). He is well known as a writer and speaker, and produces a regular wildlife column under a pseudonym.

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TWO RARE FLIES FROM MOOR FARM LWT RESERVE

Annette Binding

The robberfly *Eutolmus rufibarbis* RDB3 (Plate 9) was the rarer of the two flies. Also called the golden-tabbed robberfly, this large fly was found on bramble close to the trees at the edge of the western heathland on the 13th July 2004. Although not a woodland species, it has been found near trees at the edge of open heathland in other areas. The adult robberflies are predatory and in Britain the prey species include blowflies *Sarcophaga* sp. and stiletto flies *Thereva* sp. There was only one previous record for Lincolnshire by E & G Mason at Mumby in 1886. There are recent records for the south eastern counties and East Anglia.

The second species was the conopid fly *Conops strigatus* Nb which was found feeding on ragwort flowers at the edge of the western heathland on 29th July 2004. This species has a scattered distribution mainly across the southern counties and East Anglia. This was the second county record. The species was new to the county in 1994 when Jill Binding (Mears) recorded it at Newball Wood. There is also an old record shown on the NBN Gateway from the Stapleford Wood area in 1899 on the Lincolnshire and Nottinghamshire border, recorder unknown.

I am grateful to Jill Mears for information regarding previous county records of the above species.

THE WASPS (HYMENOPTERA: ACULEATA) OF WATSONIAN LINCOLNSHIRE. 3. Solitary Wasps, SPHECIDAE.

Michael Archer

This is the third paper on the wasps of Lincolnshire and deals with the family Sphecidae. An introduction to these solitary wasps is given in Yeo & Corbet (1995), which also contains illustrated keys to species, Gauld & Bolton (1996) and O'Neill (2001). The current major sources of species information are the Provisional Atlases of the Bees, Wasps and Ants Recording Society (BWARS). These atlases provide a national distribution map and detailed natural history for each species. These atlases are not yet complete, but the relevant atlas will be indicated as each species is considered.

This paper considers 1610 records of 71 species where a record represents a specimen differing in one of the following three variables: name, sex and day-date of capture or observation. These records were made by 30 recorders from

54 sites. The recorders were: K. Alexander (KA), M.E. Archer (MEA), F.W. Britten (FWB), H. Britten (HB), J.W. Carr (JWC), Cordeaux (C), A. Faulkner (AF), J.P. Flynn (JPF), C.F. George (CFG), A. Godfrey (AG), Goulding (G), M.W. Graham (MWG), J.R. Hardy (JRH), L.W. Hardwick (LWH), S.J. Hayhow (SJH), D.S. Hill (DSH), W.G. Hoff (WGH), H.P. Jones (HPJ), H.W. Kew (HWK), R.S. Key (RSK), A.S. Lazenby (ASL), W. Lewington (WL), W.W. Mason (WWM), E.A.W. Peacock (EAWP), P. Porter (PP), S.P.M. Roberts (SPMR), A. Thornley (AT), R.W.J. Uffen (RWJU), C. Watson (CW), R.F. Yeo (PFY). The sites with grid references and Natural Areas (Weaver, 1988) are given in the appendix. The sites are distributed among the Natural Areas as follows: North Lincolnshire Coversands and Clay Vale (21 sites), Lincolnshire Coast and Marshes (10), Lincolnshire Wolds (10), The Fens (5), Lincolnshire and Rutland Limestone (3), Trent Vale and Rises (4), and Humberhead Levels (1).

For each species the records are given in site alphabetical order. Abbreviations are used for the following sites: Messingham Sand Quarry (MSQ), Rauceby Warren (RAW), Gibraltar Point (GP), Risby Warren (RIW), Old Bolingbroke (OB), Saltfleetby-Theddlethorpe Dunes (STD), Grantham (G), Kirkby Moor (KM), Woodall Spa (WS), Tattershall Sand Pits (TSP) and Manton & Twigmoor (MT). The year of some of the records of M.W. Graham are not known so are given as 1941, the year in which these records were published. The Red Data Book (Shirt, 1987) and National Notable or Scarce (Lists Na and Nb) (Falk, 1991) statuses with Archer National Statuses (ANS) (Archer, 2002) are given, as appropriate, for each species. The Archer National Statuses updates the statuses of Shirt and Falk besides giving a status to each of the common and widespread species. The Very Rare ANS is equivalent to Red Data Book status, the Rare ANS to Na status and the Scarce ANS to Nb status. The ANS Universal and Widespread statuses refers to the common and widespread species. Small size refers to species about 3-6mm in length, medium-size species about 6-10mm in length and large species over 10mm in length.

Of the 71 species on the Lincolnshire list, 32 species have a Universal status, 25 species a Widespread status, six species a Scarce status, two species a Rare status, one species a Very Rare status and five species that are considered extinct in Lincolnshire (*Cerceris ruficornis*, *Ectemnius lituratus*, *Crossocerus vagabundus*, *Mellinus crabroneus* and *Nysson interruptus*).

Family SPHECIDAE

All sphecid wasps have a solitary life-history in that each female makes her own nest (if a nest is made) and provides food for her offspring. Each group of species specialises in a particular type of prey, e.g. spiders, aphids, caterpillars. The prey may be permanently paralysed or killed. Usually after a cell has been mass provisioned, an egg is laid and the female leaves. Some species of solitary wasps make their individual nests close to each other, maybe because of a shortage of appropriate nesting space, so that the nests appear as an aggregation. The nests may be underground or aerial in hollow stems, old beetle borings in wood, nail holes in fence posts, or exposed on plants or hard surfaces. The burrow may lead to a single or several cells. A few species are cleptoparasitic on other solitary wasp species. Hunting for prey and nest building is carried out by the females.

Genus **Dryudella** Spinola, 1843

Small black and red wasps. Subterranean nesters in sandy banks exposed to the sun. A slightly sloping burrow ends in a single cell which is provisioned with nymphs of Lygaeidae (heteropteran bugs). Nationally: 1 species.

Dryudella pinguis (Dahlbom, 1832) Edwards, 1998. ANS Universal. 17 records. 27 May-31 August. MSQ, 1990, MEA. RIW, 1984, 1985, 1986, MEA, 1985, 1987, RSK, 1993, AG. STD, 1984, MEA. Skegness, 1900, JWC. TSP, 1995, AG.

Genus **Tachysphex** Kohl, 1883

Medium-size wasps coloured black or black and red. Subterranean nesters in sandy soils exposed to the sun. The burrow of *T. pompiliformis* is short, leading to a few cells. The burrow of *T. nitidus* is long, ending in a single cell. Cells are provisioned with grasshopper nymphs. Nationally: 5 species (2 species restricted to the Channel Islands), with 2 species in Lincolnshire.

Tachysphex pompiliformis (Panzer, 1805) Edwards, 1998. ANS Universal. 35 records. 26 May-16 September. GP, 1993, 1996, 1997, MEA. G, 1942, HB. KM, 1993, 1995, 1996, MEA. MT, 1988, MEA. MSQ, 1989, 1990, 1992, 1993, 1996, 2000, MEA. OB, 1941, MWG. RAW, 1990, 1993, 1996, 1997, 2002, MEA. RIW, 1984, 1985, MEA, 1987, RSK. STD, 1984, 1998, MEA. Scotton Common, 1988, MEA. Skegness, 1900, JWC. TSP, 1995, AG.

Tachysphex nitidus (Spinola, 1805). Edwards, 1998. ANS Scarce. 17 records. 27 May-9 August. KM, 1995, MEA. MT, 1989, MEA. RIW, 1984, 1985, MEA, 1985, RSK. Scotton Common, 1988, MEA. Skegness, 1900, JWC. TSP, 1994, 1995, AG. WS, 1941, MWG.

Genus **Trypoxylon** Latreille, 1796

Medium-size black wasps with the anterior tarsus and tibia in *T. clavicerum* largely reddish. Crevice nesters usually in aerial sites, e.g. hollow plant stems, beetle burrows in dry wood, but also in cavities in the soil. Cells separated by mud partitions. Cells provisioned with immature spiders. Parasites are *Pseudomalus* spp. and *Trichrysis cyanea*. Nationally 5, species with 4 species in Lincolnshire.

Trypoxylon attenuatum Smith, 1851. ANS Universal. 8 records. June-26 August. Blankney Fen, 1991, ASL. Freshney Bogs, 1898, AT. GP, 1991, 1996, MEA. Grimsby, 1989, JPF. MSQ, 2000, MEA. OB, 1941, MWG. STD, 1984, MEA.

Trypoxylon clavicerum Lepeletier & Serville, 1828. ANS Widespread. 6 records. 29 June-21 August. GP, 1991, 1992, 1993, MEA. G, 1952, HB. OB, 1941, MWG. RAW, 2002, MEA.

Trypoxylon figulus (Linnaeus, 1758). ANS Universal. 14 records. 14 May-17 July. Blankney Fen, 1996, ASL. GP, 1996, MEA. G, 1952, HB. Grimsby, 1980, JPF. Hagnaby, 1994, AG. KM, 1995, 1996, MEA. Mavis Endeley SSSI, 1997, AG. MSQ, 1992, MEA. OB, 1938, 1939, MWG. RAW, 1994, MEA. TSP, 1994, AG.

Trypoxylon medium de Beaumont, 1945. ANS Universal. 1 record. 26 May. RAW, 1990, MEA.

Genus **Crabro** Fabricius, 1775

Large black wasps with yellow bands on the gaster. Subterranean nesters usually in sandy soils fully exposed to the sun. The side branches of the burrow lead to several cells which are provisioned with flies. Nationally: 3 species, with 2 species in Lincolnshire.

Crabro cribrarius (Linnaeus, 1758). Edwards, 1997. ANS Universal. 49 records. 12 June-22 August. Donnington-on-Bain, 1886, HWK. G, 1942, 1950, 1952, HB. KM, 1995, MEA. Kirton-in-Lindsey, 1888, CFG. Laughton Common, 1996, LWH. MSW, 1989, 1990, 1992, 1993, 1999, 2000, 2001, MEA. OB, 1938, MWG. Raithby, 1941, MWG. RAW, 1989, 1992, 1996, 1997, 2001, 2002, MEA. RIW, 1984, 1985, MEA, 1987, RSK. STD, 1984, 1998, MEA. Sausthorpe, 1941, HMG. Scunthorpe, 1902, EAWP. WS, 1899, WL, 1941, 1947, MWG.

Crabro peltarius (Schreber, 1784). Edwards, 1997. ANS Universal. 37 records. 26 May-16 August. Belton Park, 1984, KA. GP, 1994, RWJU, 1995, MEA. G, 1942, 1943, HB. KM, 1990, 1995, 1996, MEA. Kirton-in-Lindsay, 1888, CFG. MT, 1988, 1989. MEA. MSQ, 1988, 1989, 1992, 1993, MEA. OB, 1941, MWG. Raithby, 1939, MWG. RAW, 1990, 1993, 1995, 1996, 2001, 2002, MEA. STD, 1984, MEA. Sausthorpe, 1941, MWG. Skegness, 1900, JWC. TSP, 1994, 1995, AG. WS, 1939, MWG.

Genus **Crossocerus** Lepeletier & Brullé, 1834

Small to medium-size wasps. Usually black, but a few species have yellow markings. Nationally: 22 species, with 17 species in Lincolnshire.

Subgenus **Crossocerus** s.str.

Usually subterranean nesters in sandy, sometimes clayey soils, but also in cavities in brickwork. Burrows lead to one (*C. ovalis*, *C. palmipes*), a few (*C. tarsatus*) or several (*C. pusillus*, *C. wesmaeli*) cells which are provisioned with small flies.

Crossocerus elongatulus (Vander Linden, 1829). Edwards & Broad, 2005. ANS Universal. 14 records. 24 May-4 August. Blankney Fen, 1992, ASL. GP, 1990, 1996, MEA. G, 1942, 1950, HB. Hameringham, 1935, HPJ. KM, 1996, MEA. Moor Farm NR, 1990, ASL. OB, 1941, MWG. RAW, 1990, MEA. Salmonby, 1948, MWG.

Crossocerus ovalis Lepeletier & Brullé, 1834). ANS Universal. 7 records. 27 May-30 July. KM, 1990, 1995, MEA. MT, 1989, MEA. MSQ, 1999, 2000, MEA. OB, 1941, MWG. Welton-le-Wold, 2000, MEA.

Crossocerus palmipes (Linnaeus, 1767). Nb, ANS Scarce. 4 records. 28 July-27 August. OB, 1938, MWG. Salmonby, 1947, MWG. WS, 1948, 1949, MWG.

Crossocerus pusillus Lepeletier & Brullé. ANS Universal. 11 records. 17 June-16 September. Brumby Common, 1980, RSK. G, 1942, 1950, HB. MSQ, 1989, 1992, 1995, 1996, 1999, 2000, MEA. OB, 1941, MWG. WS, 1948, MWG.

Crossocerus tarsatus (Shuckard, 1837). ANS Universal. 35 records. 26 May-29 September. Belton Park, 1984, KA. GP, 1990, 1995, MEA, 1994, CW, 1994,

RWJU, 1994, PFY. G, 1942, HB. KM, 1989, 1990, 1995, MEA. MT, 1989, MEA. MSQ, 1988, 1990, 1994, 2000, 2001, MEA. OB, 1938, MWG. Raithby, 1941, MWG. RAW, 1990, 1991, 1993, 1995, MEA. RIW, 1984, 1985, 1987, MEA. STD, 1984, 1989, 1995, MEA. WS, 1941, 1948, MWG.

Crossocerus wesmaeli (Vander Linden, 1829). ANS Universal. 46 records. 27 May-29 September. GP, 1989, 1990, 1992, 1993, MEA. KM, 1996, 1997, MEA. Kirkby-on-Bain, 1991, ASL. Lincoln, 1942, MWG. MT, 1988, 1989, MEA. MSQ, 1988, 1989, 1990, 1992, 2000, MEA. RAW, 1995, MEA. RIW, 1984, 1985, 1986, 1987, MEA, 1985, 1987, RSK. STD, 1984, 1986, 1995, MEA. Scotton Common, 1988, MEA. Skegness, 1900, JWC. TSP, 1995, 1996, AG. Theddlethorpe, 1948, MWG. WS, 1948, MWG.

Subgenus **Blepharipus** Lepeletier & Brullé, 1835

Aerial nesters in hollow stems and rotten dry wood. Burrows lead to one or several cells which are provisioned with small flies, except for *C. annulipes* which are provisioned with hemipterans, and *C. walkeri* with mayflies.

Crossocerus annulipes, (Lepeletier & Brullé). ANS Universal. 10 records. 15 June-21 August. GP, 1991, 1995, MEA. Hameringham, 1935, HPJ. MSQ, 1993, MEA. OB, 1941, MWG. RAW, 1991, 1992, 2001, MEA. Redbourne, 1994, AG. Spalding, 2003, AF.

Crossocerus capitosus (Shuckard, 1837). ANS Universal. 2 records. 30 July-11 August. Crowle, 1980, RSK. OB, 1939, MWG.

Crossocerus cetratus (Shuckard, 1837). ANS Widespread. 3 records. 10 June-2 August. Grimsthorpe Park, 1995, AG. Linwood Warren, 1989, MEA. OB, 1941, MWG.

Crossocerus megacephalus (Rossi, 1790). ANS Universal. 16 records. 25 May-19 August. Blankney Fen, 1992, 1993, 1997, 2003, ASL. GP, 1990, 1993, MEA, 1994, RWJU. Linwood Warren, 1989, MEA. Mavis Endeley SSSI, 1994, AG. OB, 1941, MWG. RAW, 1990, 1991, 2001, MEA. Scotton Common, 1988, MEA. Theddlethorpe, 1991, JPF.

Crossocerus nigritus (Lepeletier & Brullé, 1834) ANS Widespread. 3 records. 26 May-13 July. OB, 1941, MWG. RAW, 1990, MEA. Salmonby, 1948, MWG.

Crossocerus styrius (Kohl, 1892) ANS Widespread, 1 record. 15 July. Tetford Hill, 1948, MWG.

Subgenus **Ablepharipus** Perkins, 1913

Aerial nesters in decayed dry wood. Cells provisioned with small flies.

Crossocerus podagricus (Vander Linden, 1829) ANS Universal. 13 records. 25 June-15 September. GP, 1993, 1996, MEA. KM, 1996, MEA. Laughton Common, 1996, AG. OB, 1941, MWG. RAW, 1989, 1990, 2001, 2002, MEA. Salmonby, 1947, MWG.

Subgenus **Hoplocrabro** Thomson, 1874

Subterranean nester in sandy soils. Cells usually provisioned with flies, but sometimes with moths and caddis-flies.

Crossocerus quadrimaculatus (Fabricius, 1793) Edwards & Telfer, 2001. ANS Widespread. 43 records. May-16 September. GP, 1992, 1995, 1996, 1997, MEA. G, 1943, HB. Grimsby, 1989, JPF. KM, 1991, 1992, 1997, MEA. Messingham Heath, 1989, MEA. MSQ, 1992, 1993, 1994, 1996, 1999, 2000, 2001, MEA. OB, 1930, 1939, MWG. RAW, 1997, 2001, MEA. RIW, 1984, 1985, 1986, MEA, 1987, RSK. STD, 1995, MEA. Skippingdales, 1992, RSK.

Subgenus **Acanthocrabro** Perkins, 1913

Aerial nester in rotten wood. Cells provisioned with crane flies often with legs removed.

Crossocerus vagabundus (Panzer, 1798) Edwards & Telfer, 2001. RDB1, ANS Very Rare. 1 record. No date. Kirton-in-Lindsay, 1889, CFG.

Subgenus **Cuphopteris** Morawitz, 1864

Aerial nesters in decaying dry wood. Cells provisioned with flies.

Crossocerus binotatus Lepeletier & Brullé, 1834 Na. ANS Scarce. 1 record. August. Hagnaby, 1996, AG.

Crossocerus dimidiatus (Fabricius, 1781) Edwards & Broad, 2005. ANS Universal. 2 records. 11-24 July. OB, 1940, MWG. Scunthorpe, 1902, EAWP.

Genus **Ectemnius** Dahlbom, 1845

Large black wasps with yellow markings. Aerial nesters in decaying dry wood. Burrow leads to several cells which are provisioned with flies. Nationally: 10 species with 6 species in Lincolnshire.

Ectemnius cavifrons (Thomson, 1870) Edwards, 1997. ANS Universal. 29 records. 10 June-26 August. Belton Park, 1984, KA. Blankney Fen, 1994, 1995, 2004, ASL. GP, 1990, 1996, DSH, 1991, 1992, 1993, 1995, MEA, 1996, SPMR. G, 1950, HB. Grebby, 1991, 1992, WGH. Grimsby, 1990, 1991, JPF. Grimsthorpe Park, 1995, AG. Laughton Common, 1996, LWH. OB, 1941, MWG. RAW, 1990, 1995, MEA. STD, 1984, 1998, MEA. Spalding, 1999, 2003, AF.

Ectemnius cephalotes (Olivier, 1792) Edwards, 1998. ANS Widespread. 5 records. 11 June-3 August. Grebby, 1992, WGH. Hameringham, 1935, HPJ. Kirton-in-Lindsay, 1888, CFG. Moor Farm NR, 1993, ASL. Torksey, 1901, EAWP.

Ectemnius continuus (Fabricius, 1804) Edwards, 1998. ANS Universal, 19 records, 28 May-6 September. GP, 1990, 1993, 1997, MEA, 1994, CW, 1994, PFY, 1996, SPMR. MSQ, 1989, 1994, 1999, 2000, 2001, MEA. WS, 1948, MWG.

Ectemnius lapidarius (Panzer, 1804) Edwards, 1998. ANS Universal. 7 records. 25 June-26 August. Marret House Complex, 2002, AF. OB, 1942, MWG. STD, 1984, 1995, 1998, MEA.

Ectemnius lituratus (Panzer, 1804) Edwards, 1998. ANS Restricted. 2 records. 18-20 July. WS, 1947, MWG.

Ectemnius sexcinctus (Fabricius, 1775) Edwards, 1998. ANS Widespread. 6 records. 25 June-1 August. GP, 1990, DSH. Grimsby, 1990, 1991, JPF. Horncastle, 1995, AG. MSQ, 1999, MEA. OB, 1941, MWG.

Genus **Lindenius** Lepeletier & Brullé, 1834

Medium-size black wasps with a slight bronze sheen and yellow markings. Subterranean nesters, usually in sandy soils. Burrows with several branches each ending in a cell. Cells provisioned with heteropteran bugs or flies. Nationally: 3 species with 1 species in Lincolnshire.

Lindenius albilabris (Fabricius, 1793) ANS Universal. 8 records. 24 June-18 August. G, 1942, HB. Laughton Common, 1996, LWH, 1996, AG. MSQ, 1988, 1990, 2000, MEA. OB, 1941, MWG. WS, 1899, WL.

Genus **Entomognathus** Dahlbom, 1844

Small black wasps with restricted yellow markings. Subterranean nesters in sandy soils. Burrow with several branches each ending in a cell. Cells provisioned with larvae of chrysomelid beetles. Nationally: 1 species.

Entomognathus brevis (Vander Linden, 1829) Edwards & Telfer, 2001. ANS Widespread. 23 records. 18 May-18 August. G, 1942, 1943, 1950, HB. MSQ, 1993, 1995, 1999, 2000, 2001, MEA. OB, 1941, MWG. Raithby, 1939, MWG. RAW, 1996, 2001, 2002, MEA. RIW, 1984, MEA, 1987, RSK. WS, 1949, MWG.

Genus **Rhopalum** Stephens, 1829

Small black wasps with reddish and yellow markings. Aerial nesters in hollow plant stems and beetle burrows in dry dead wood. Burrows lead to several cells which are provisioned mainly with small flies, but also homopteran bugs, psocids and psyllids. Nationally: 3 species with 2 species in Lincolnshire.

Rhopalum clavipes (Linnaeus, 1758) ANS Universal. 7 records. 11 June-8 September. Blankney Fen, 2003, ASL. Kirton-in-Lindsay, 1888, CFG. Laughton Forest, 1979, RSK. OB, 1938, MWG. Salmonby, 1948, MWG. Torksey, 1901, EAWP. Tydd St. Mary, 1992, RSK.

Rhopalum coarctatum (Scopoli, 1763) ANS Universal. 7 records. 13 June-29 August. MSQ, 1990, 1993, 1999, MEA. Salmonby, 1947, MWG. TSP, 1994, AG.

Genus **Oxybelus** Latreille, 1796

Small black wasps with ivory-white spots. Subterranean nesters usually in sandy soils. Cells provisioned with flies which are carried on the sting. Nationally: 3 species with 1 species in Lincolnshire.

Oxybelus uniglumis (Linnaeus, 1758) ANS Edwards, 1997. Universal. 70 records. 27 May-16 September. GP, 1989, 1992, 1993, 1995, 1996, 1997, MEA, 1994, RWJU, 1996, SPMR. G, 1942, HB. Grimsby, 1981, SJH. KM, 1992, 1997, MEA. Laughton Common, 1996, LWH, 1996, AG. Linwood Warren, 1989, MEA. MT, 1989, MEA. MSQ, 1988, 1990, 1992, 1993, 1995, 1996, 1999, MEA. OB, 1941,

MWG. RAW, 1989, 1993, 1994, 1995, 1996, 1997, 2001, 2002, MEA, 1993, ASL. RIW, 1984, 1985, 1986, MEA. STD, 1984, 1986, 1995, 1998, MEA. Scotton Common, 1988, MEA. Skegness, 1900, JWC. TSP, 1994, 1995, AG.

Genus **Mimumesa** Malloch, 1933

Medium-size black wasps. Aerial nesters in beetle holes in dry dead wood. Cells provisioned with homopteran bugs. Nationally: 5 species with 1 species in Lincolnshire.

Mimumesa dahlbomi (Wesmael, 1852) Edwards & Broad, 2005. ANS Widespread. 8 records. 25 May-14 July. Blankney Fen, 1992, ASL. KM, 1995, MEA. MT, 1989, MEA. RAW, 1990, 2002, MEA. RIW, 1984, MEA. WS, 1950, MWG.

Genus **Mimesa** Shuckard, 1837

Medium-size black wasps with red markings on the gaster. Subterranean nesters in sandy soils. Burrow leads to several cells which are provisioned with homopteran bugs. Parasitized by *Elampus panzeri*. Nationally: 4 species with 3 species in Lincolnshire.

Mimesa bicolor (Jurine, 1807) Edwards & Broad, 2005. RDB2, ANS Very Rare. 4 records. 17 August-20 August. OB, 1939, MWG. Salmonby, 1948, MWG. WS, 1939, MWG.

Mimesa equestris (Fabricius, 1804) Edwards & Broad, 2005. ANS Universal. 17 records. 1 July-31 August. KM, 1989, MEA. Laughton Common, 1996, AG. Linwood Warren, 1989, MEA. MT, 1988, MEA. MSQ, 1988, 2001, MEA. OB, 1941, MWG. RIW, 1984, 1985, 1986, MEA, 1987, RSK. Salmonby, 1948, MWG.

Mimesa lutaria (Fabricius, 1787) Edwards & Broad, 2005. ANS Widespread. 11 records. 6 July-24 August. KM, 1996, MEA. MT, 1988, MEA. Messingham Heath, 1989, MEA. MSQ, 1993, 1995, 2001, MEA. Raithby, 1941, MWG. WS, 1941, 1948, MWG.

Genus **Psenulus** (Dahlbom, 1843)

Medium-size black wasps. Aerial nesters in plant stems and dry, decaying wood. Cells provisioned with homopteran bugs. Nationally: 3 species with 2 species in Lincolnshire.

Psenulus concolor (Dahlbom, 1843) ANS Widespread. 2 records. 13 June-23 July. OB, 1940, MWG.

Psenulus pallipes (Panzer, 1798) ANS Widespread. 3 records. 14-29 July. OB, 1941, MWG. RAW, 2002, MEA. STD, 1984, MEA.

Genus **Spilomena** Shuckard, 1838

Very small black wasps. Aerial nesters in plant stems and beetle holes in dry dead wood. Cells provisioned with thrips and possibly aphids. Nationally: 4 species with 2 species in Lincolnshire.

Spilomena curruca (Dahlbom, 1843) ANS Widespread. 1 record. 4 September. Tetford Hill, 1948, MWG.

Spilomena troglodytes (Vander Linden, 1829) ANS Widespread. 2 records. 30 June-August. OB, 1938, MWG.

Genus **Stigmus** Panzer, 1805

Small black wasps. Aerial nesters in plant stems and beetle holes in dry dead wood. Tunnel leads to several cells which are provisioned with aphids. Nationally: 2 species with 1 species in Lincolnshire.

Stigmus solskyi Morawitz, 1864 ANS Widespread. 4 records. 18-21 August. OB, 1941, MWG. RAW, 2001, MEA. Salmonby, 1947, MWG. WS, 1947, MWG.

Genus **Pemphredon** Latreille, 1796

Medium-size black wasps. Aerial nesters in plant stems and beetle holes in dry dead wood. Tunnel leads to several cells which are provisioned with aphids.

Trichrysis cyanea could be a parasite of *P. inornata* and *P. lethifera*. Nationally: 6 species with 4 species in Lincolnshire.

Pemphredon inornata Say, 1824 ANS Universal. 11 records. 17 June-11 September. GP, 1989, MEA. G, 1942, HB. Hameringham, 1936, HPJ. MSQ, 1992, MEA. OB, 1941, MWG. RAW, 1989, 2001, 2002, MEA. Spalding, 1999, AF.

Pemphredon lethifera (Shuckard, 1837) ANS Universal. 10 records. 26 May-9 August. GP, 1996, 1997, MEA. MSQ, 1992, MEA. OB, 1941, MWG. RAW, 1989, 1990, 1995, MEA. RIW, 1984, 1985, MEA. STD, 1984, MEA.

Pemphredon lugubris (Fabricius, 1793) (Plate 10) ANS Universal. 22 records. 26 May-21 August. Blankney Fen, 1991, 1992, ASL. GP, 1989, 1990, 1991, 1992, 1993, 1995, 1997, MEA. G, 1952, HB. Grebby, 1988, WGH. Grimsby, 1990, JPF. Kirton-in-Lindsay, 1888, CFG. OB, 1941, MWG. RAW, 1990, 1992, 2001, MEA. Salmonby, 1947, MWG.

Pemphredon morio Vander Linden, 1829 RDB3, Nb, ANS Scarce. 1 record. No date. OB, 1938, HMG.

Genus **Diodontus** Curtis, 1834

Small to medium-size black wasps. Subterranean nesters in sandy soils. Burrows with side branches lead to several cells which are provisioned with aphids.

Nationally: 4 species with 3 species in Lincolnshire.

Diodontus luperus Shuckard, 1837 Edwards & Telfer, 2002. ANS Widespread. 13 records. 9 May-29 September. G, 1942, 1943, HB. Kirton-in-Lindsay, 1888, CFG. MSQ, 1988, MEA. OB, 1948, MWG. RAW, 1992, 1997, MEA. RIW, 1985, MEA.

Diodontus minutus (Fabricius, 1793) Edwards & Telfer, 2002. ANS Widespread. 14 records. 26 May-26 September. G, 1942, HB. Raithby, 1938, MWG. RAW, 1990, 1995, 1996, 1997, 2001, 2002, MEA. WS, 1939, 1948, 1949, MWG.

Diodontus tristis (Vander Linden, 1829) Edwards & Telfer, 2002. ANS Scarce. 16 records. 13 June-16 September. Messingham Heath, 1989, MEA. MSQ, 1996, 1999, 2000, 2001, MEA. OB, 1941, MWG.

Genus **Passaloecus** Shuckard, 1837

Small black wasps. Aerial nesters in plant stems and beetle holes in dry dead wood. Cells are separated by resin, or more rarely, mud partitions. Cells provisioned with aphids. *P. corniger* steals prey from other *Passaloecus* nests. Nationally: 8 species with 4 species in Lincolnshire.

Passaloecus corniger Shuckard, 1837. Edwards & Telfer, 2002. ANS Widespread. 6 records. 10-29 June. GP, 1992, 1993, MEA. Grimsthorpe Park, 1995, AG. OB, 1938, 1939, MWG. RAW, 1995, MEA.

Passaloecus gracilis (Curtis, 1834) Edwards & Telfer, 2002. ANS Widespread. 4 records. 24 June-16 August. GP, 1992, MEA. MSQ, 1992, MEA. OB, 1938, 1939, MWG.

Passaloecus insignis (Vander Linden, 1829) Edwards & Telfer, 2002. ANS Widespread. 4 records. 29 June-5 August. OB, 1938, 1939, 1950, MWG.

Passaloecus singularis Dahlbom, 1844 Edwards & Telfer, 2002. ANS Widespread. 3 records. May-2 August. Blankney Fen, 1996, ASL. OB, 1939, MWG. RIW, 1987, RSK.

Genus **Ammophila** Kirby, 1798

Large black wasps with red markings on the gaster, which has an elongate petiole. Subterranean nesters in sandy soils. Short burrow ends in a single cell which is provisioned with the caterpillars of moths and sawflies. Nationally: 3 species, with 1 species restricted to the Channel Islands and with 1 species in Lincolnshire.

Ammophila sabulosa (Linnaeus, 1758) Edwards, 1997. ANS Widespread. 65 records. 23 May-16 September. Cleethorpes, JRH. Crowland, 1996, RSK. GP, 1993, 1995, 1996, 1997, MEA, 1994, CW, 1994, PFY. KM, 1989, 1990, 1992, 1993, 1994, 1995, 1996, 1997, MEA. Kirton-in-Lindsay, 1888, CFG. Mablethorpe, 1908, WWM. MT, 1988, 1989, MEA. MSQ, 1992, 1993, 1994, 1995, 1996, 1999, 2000, 2001, MEA. Moor Farm NR, 1989, MEA. North Somercotes, 1996, AG. OB, 1941, MWG. RAW, 1996, 2001, 2002, MEA. STD, 1989, 1995, 1998, MEA. Skippingdales, 1992, RSK. Sutton-on-Sea, 1936, HPJ. TSP, 1995, AG. Whisby Nature Park, 1992, PP. WS, 1936, HPJ, 1941, MWG.

Genus **Podalonia** Fernald, 1927

Large black wasps with red markings on the gaster. Subterranean nesters in sandy soils. Burrow ends in a single cell which is provisioned with a single moth caterpillar. Nationally: 3 species, with 1 species restricted to the Channel Islands and with 1 species in Lincolnshire.

Podalonia affinis (Kirby, 1798) Edwards, 1997. RDB3, ANS Rare. 5 records. 30 May-18 August. STD, 1996, 1998, MEA. Scotton Common, 1898, C. WS, 1948, MWG.

Genus **Mellinus** Fabricius, 1790

Large black wasps with yellow or whitish-yellow markings. Subterranean nesters in sandy soils. Burrow leads to several cells which are provisioned with flies. Nationally 2: species (1 probably extinct) both known from Lincolnshire.

Mellinus arvensis (Linnaeus, 1758) Edwards, 1998. ANS Universal. 58 records. 6 July-30 September. GP, 1989, 1992, MEA. G, 1942, HB. KM, 1989, 1991, 1992, 1994, MEA, 1997, AG. Kirton-in-Lindsay, 1888, CFG. Linwood Warren, 1898, AT, 1989, MEA. MT, 1988, MEA. Messingham Heath, 1989, MEA. MSQ, 1988, 1994, 1996, 1999, 2001, MEA. OB, 1941, MWG. Osgodby, 1991, JPF. RAW, 1991, 1994, 1997, 2001, MEA. RIW, 1984, 1985, 1986, MEA, 1987, RSK. STD, 1984, 1986, 1989, 1995, MEA, 1995, ASL. Scunthorpe, 1901. Skippingdales, 1992, RSK. Sutton-on-Sea, 1936, HPJ. WS, 1936, HPJ.

Mellinus crabroneus (Thunberg, 1791) Edwards, 1998. RDB1⁺, ANS Very Rare (Extinct). 4 records. 10-20 August. OB, 1941, MWG. Raithby, 1941, MWG. Salmonby, 1948, MWG.

Genus **Nysson** Latreille, 1796

Medium-size black wasps with yellow markings. Cleptoparasites laying an egg on the host's prey. The larva, on hatching, first destroys the host's egg. Nationally: 4 species with 4 species in Lincolnshire.

Nysson dimidiatus Jurine, 1807 Edwards & Telfer, 2001. Nb, ANS Scarce. 6 records. 26 June-29 August. GP, 1996, SPMR. Hameringham, 1936, HPJ. MSQ, 2001, MEA. OB, 1941, MWG. RAW, 2001, MEA.

Nysson interruptus (Fabricius, 1798) Edwards & Telfer, 2001. RDB3, RDB2, ANS Very Rare. 1 record. 11 June. Torksey, 1901, G.

Nysson spinosus (Forster, 1771) Edwards & Telfer, 2001. ANS Universal. 3 records. 11-13 June. Horncastle, 1900, EAWP. MT, 1989, MEA. OB, 1941, MWG.

Nysson trimaculatus (Rossi, 1790) Edwards & Telfer, 2001. ANS Widespread. 8 records. 17 June-2 August. G, 1950, HB. MSQ, 1992, 1993, 1995, MEA. STD, 1984, 1995, MEA.

Genus **Gorytes** Latreille, 1804

Medium-size black wasps with yellow markings. Subterranean nesters in a variety of soil types. Burrow leads to several cells which are provisioned with frog hopper nymphs. Nationally: 2 species with 1 species in Lincolnshire.

Gorytes quadrifasciatus (Fabricius, 1804) Edwards & Telfer, 2001. ANS Widespread. 28 records. 17 June-26 August. GP, 1994, PFY, 1995, 1997, MEA. G, 1943, 1950, HB. MSQ, 1992, 1999, 2000, 2001, MEA. RAW, 1990, MEA. RIW, 1984, MEA. STD, 1984, 1986, 1995, MEA, 1995, ASL. WS, 1941, MWG.

Genus **Harpactus** Shuckard, 1837

Medium-size black wasps with white markings and partially red gaster. Subterranean nesters in sandy soils. Burrow leads to several cells which are provisioned with froghoppers. Nationally: 1 species.

Harpactus tumidus (Panzer, 1801) Edwards & Telfer, 2001. ANS Universal. 3 records. 25 June-21 August. OB, 1941, MWG. RAW, 2001, MEA.

Genus **Argogorytes** Ashmead, 1899

Large black wasps with yellow markings. Subterranean nesters in dry sunny situations. Burrow leads to several cells which are provisioned with froghopper nymphs. Nationally: 2 species with 2 species in Lincolnshire.

Argogorytes fargeii (Shuckard, 1837) Edwards & Telfer, 2001. RDB3, Na, ANS Rare. 2 records. 11 June. OB, 1941, MWG. Torksey, 1901, G.

Argogorytes mystaceus (Linnaeus, 1761) Edwards & Telfer, 2001. ANS Universal. 9 records. 24 May-16 July. Horncastle, 1900, EAWP. KM, 1995, 1996, MEA. MT, 1989, MEA. MSQ, 1999, 2001, MEA. OB, 1941, MWG. Scunthorpe, 1902, EAWP. Whisby Nature Park, 1994, PP.

Genus **Cerceris** Latreille, 1802

Large black wasps with yellow markings. Subterranean nesters usually in sandy soils. Burrow leads to several cells which are provisioned with beetles, usually weevils, and solitary bees. Nationally: 6 species with 1 species in Lincolnshire.

Cerceris ruficornis (Fabricius, 1793) Edwards, 1997. ANS Scarce. 1 record. No date. WS, 1941, MWG.

Genus **Philanthus** Fabricius, 1790

Large wasps. Black with yellow markings. Subterranean nesters in sandy soils. Burrow leads to several cells which are provisioned with honey bee workers. Nationally: 1 species.

Philanthus triangulum (Fabricius, 1775) Edwards, 1997. RDB2, ANS Widespread. 10 records. 20 July-11 September. GP, 1996, SPMR, 1997, MEA. KM, 2002, RSK. MSQ, 1999, MEA. RAW, 1997, 1999, 2001, MEA.

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Appendix – The grid references and natural areas of sites. The actual location of some sites by some recorders (4,7,8,10,13,15,16,19,22,24,32,34,38,39,42,43,48,49,50,54) are unknown, so the grid references for these sites can only be approximate.

1. Belton Park. SK9338. Lincs. & Rutland Limestone.
2. Blankney Fen. TF1262. The Fens.
3. Brumby Common. SE8709. North Lincs. Coversands & Clay Vale.
4. Cleethorpes. TA3008, Lincs. Coast & Marshes.
5. Crowland. TF2309. The Fens.
6. Crowle. SE7711. Humberheads Levels.
7. Donington-on-Bain. TF2382. Lincs. Wolds.
8. Freshney Bogs TA2409. Lincs. Coast & Marshes.
9. Gibraltar Point. TF5557. Lincs. Coast & Marshes.
10. Grantham. SK9136. Trent Valley & Rises.
11. Grebby. TF4368. Lincs. Wolds.
12. Grimsby TA2709. Lincs. Coast & Marshes.
13. Grimsthorpe Park. TF0320. Lincs. & Rutland Limestone.
14. Hagnaby TF3462. North Lincs. Coversands & Clay Vale.
15. Hameringham. TF3167. Lincs. Wolds.
16. Horncastle. TF2669. Lincs. Wolds.
17. Kirkby Moor. TF2262. North Lincs. Coversands & Clay Vale.
18. Kirkby-on-Bain. TF2462. North Lincs. Coversands & Clay Vale.
19. Kirton-in-Lindsey. SK9398. North Lincs. Coversands & Clay Vale.
20. Loughton Common. SK8599. North Lincs. Coversands & Clay Vale
21. Loughton Forest. SK8799. North Lincs. Coversands & Clay Vale.
22. Lincoln. SK9771. Trent Valley & Rises.
23. Linwood Warren. TF1387. North Lincs. Coversands & Clay Vale.
24. Mablethorpe. TF5085. Lincs. Coast & Marshes.
25. Manton & Twigmoor. SE9305. North Lincs. Coversands & Clay Vale.
26. Marret House Complex. TF4323. The Fens.
27. Mavis Endeley SSSI. TF3667. Lincs. Wolds
28. Messingham Heath. SE8703. North Lincs. Coversands & Clay Vale.
29. Messingham Sand Quarry. SE9103. North Lincs. Coversands & Clay Vale.
30. Moor Farm NR. TF2263. North Lincs. Coversands & Clay Vale.
31. North Somercotes. TF4496. Lincs. Coast & Marshes.
32. Old Bolingbroke. TF3564. North Lincs. Coversands & Clay Vale.
33. Osgodby. TF0792. North Lincs. Coversands & Clay Vale.
34. Raithby (Spilsby). TF3767. Lincs. Wolds.
35. Rauceby Warren. TF0343. Lincs. & Rutland Limestone.
36. Redbourne. SK9799. North Lincs. Coversands & Clay Vale.
37. Risby Warren. SE9313. North Lincs. Coversands & Clay Vale.
38. Salmonby. TF3273. Lincs. Wolds.
39. Sausthorpe. TF3869. Lincs. Wolds.
40. Saltfleetby-Theddlethorpe Dunes. TF4791. Lincs. Coast & Marshes.
41. Scotton Common. SK8698. North Lincs. Coversands & Clay Vale.
42. Scunthorpe SE8910. North Lincs. Coversands & Clay Vale
43. Skegness. TF5663. Lincs. Coast & Marshes.
44. Skippingdales. SE8812. North Lincs. Coversands & Clay Vale.
45. Spalding. TF2421. The Fens.
46. Sutton-on-Sea. TF5281. Lincs. Coast & Marshes.
47. Tattershall Sand Pits. TF1959. North Lincs. Coversands & Clay Vale.
48. Tetford Hill. TF3275. Lincs. Wolds.
49. Theddlethorpe. TF4888. Lincs. Coast & Marshes.
50. Torksey. SK8378. Trent Valley & Rises.
51. Tydd St. Mary. TF4418. The Fens
52. Whisby Nature Park. SK9167. Trent Valley & Rises.
53. Welton-le-Wold. TF2787. Lincs. Wolds
54. Woodhall Spa. TF1963. North Lincs. Coversands & Clay Vale.

AN INTERESTING BUG SPECIES FOR THE COUNTY

Annette Binding

In 2005 a small number of bugs were recorded which have limited known distribution in the county and there was one species, *Metatropis rufescens*, which appears to be new to the county.

Metatropis rufescens was found at Kenwick Park Golf Course by Roger Labbett on the 6th May. The species is common in Britain and is more or less ubiquitous on enchanter's nightshade *Circaea lutetiana* (Dr Bernard Nau, pers. comm.) so it may be more widespread in the county.

Whilst carrying out survey work at Mareham Pastures Local Nature Reserve at Sleaford on the 19th July, Allan swept a single specimen of *Rhopalus subrufus*. This was the second record of this species in Lincolnshire. It was new to the county in 2001 when one was swept, again by Allan, at Porter's Lodge Meadow. In Britain the bug is found mainly on St. Johns-wort, *Hypericum* sp.

At Cove Farm Old Quarry (Birds Wood) Haxey on the 9th August we found *Chorosoma schillingi*. This very elongate linear species of bug is mainly found on coastal sand dunes among tall grasses although in Lincolnshire it only has an inland distribution. Cove Farm Quarry is the most northerly site on the eastern side of England and as far as we are able to ascertain this was the 3rd county record.

Also on the 9th August at Cove Farm Old Quarry Allan swept a specimen of *Berytinus minor*, one of the stiltbugs. This is a ground dwelling species which is mostly found in dry habitats. This was the first time we had recorded this species in the county although there are a few previous records.

SLUGS ON THE MOVE

Chris du Feu

Sluggish is a rather derogatory term, derived from the rate of motion of one of our most unloved animal groups. Curiously, sluggish is not a word that applies to the changing distribution of slug species either nationally or locally. Our recorded slug distributions are changing fast, indeed the rate of expansion of some species is comparable to that of some of our recent bird colonisers such as the collared dove. This appears quite surprising - no slug can, without assistance, match the 60 kilometres per hour cruising speed of a bird in flight, yet some species have spread as far north as central Scotland within 20 years of becoming established in southern England.

Of the 40 or so species of slug in Britain, 24 have been recorded in Lincolnshire and, of these, 5 have been newly recorded over the last decade. For example, *Boettgerilla pallens*, the worm slug, was first recorded in Britain in 1972. The first

mollusc atlas, in 1976, showed only five 10-km records. The subsequent 1999 atlas has about 300 records (including the first in Lincolnshire) and today it has been recorded in at least 4 of Lincolnshire's 10-km squares. Like most slug species, it is under-recorded and it is likely that it occurs in very many more places than these four. There are three major reasons why recorded slug distributions do not reflect the actual distributions.

First is that slugs, as a group, do not seem to engender the same enthusiasm for recording as do other, more charismatic groups such as birds, butterflies, orchids or even snails. Even amongst conchologists, interest in slugs is relatively limited.

Second is that there has been some splitting and reclassification of species. For example, garden slug records before the 1970s do not separate the two species *Arion distinctus* (which is common in the county) and *Arion hortensis* (which is present but far less common). The old map for the combined species shows almost complete coverage of the county, but for the common, separated species there are only a dozen 10-km dots in the 1999 atlas.

The third reason is that slug distributions are, in fact, changing. Most species are spreading, although at least two (neither likely to be present in Lincolnshire) are retreating nationally. We might ask why and how are these species spreading. First, before reaching for the slug pellets, it is worth noting that not all species are pests. Some are benign and some positively beneficial to mankind. *Limax maximus*, the tiger slug, for instance has a diet which generally avoids unpalatable green plants like hostas. It concentrates on the far more edible decaying plant or animal matter, lichen, fungus and some animal prey (including pestilential slugs and snails). It is quite capable of destroying slugs as large as *Arion ater* (the black slug).

The mechanism of spreading is easy enough to explain. Slug eggs can become attached to various animals and move with them. The main animal culprit is *Homo sapiens*. This creature indulges in moving plants from one place to another, often accumulating large caches in places which scientists call 'garden centres'. Other members of the species then remove plants from these places to their own home territory, complete with slugs or their eggs in the soil around the roots. Sometimes the distances between home territory and garden centres may be tens of kilometres. Even more dramatic, *Homo sapiens* sometimes undertakes long migrations (which scientists call 'holidays') and, again, slugs can be carried with them inadvertently. This movement by the human species cannot alone explain the spread of species. If it could, we would have far more species in the north of Scotland. The second factor, I believe, is climate change.

Some species must have been imported since, perhaps, the Iron Age when trade was established between Britain and southern Europe. One species, the Spanish slug, *Lehmanna valentiana*, must have been introduced to us many times over the past 2000 years. Yet it was only in 1948 that it was first found in Britain in a hothouse in a botanic garden. The first free-living, outdoor record came only in 1981. By the time of the 1999 atlas publication, there were no mainland records further north than Gainsborough's known colony. Now, we have records reaching a few kilometres north of Edinburgh. Other species have spread more slowly. *Tandonia budapestensis*, the Budapest slug, and a major pest of potatoes has



Plate 1. Larches Spring, at the head of Wyville Brook, supporting larvae of *Wormaldia occipitalis* (Pictet) and *Oxycera pardalina* Meigen (page 139).

photo R.Chadd



Plate 2. *Wormaldia occipitalis* (Pictet), a caseless caddisfly larva, which is rare in Lincolnshire (page 139).

photo R.Chadd



Plate 3. Larva of *Thaumalea testacea* Ruthé, a trickle midge. The species is nationally uncommon and very rare in Lincolnshire (page 139).

photo A.Hiley



Plate 4. The Upper Witham at Little Ponton, supporting rich growths of batrachian water crowfoot (*Ranunculus* sp.), and a rich associated fauna, including native crayfish, mayflies and caddis (page 144).

photo R.Chadd



Plate 5. Larva of the Banded Demoiselle Damselfly *Calopteryx splendens* Harris, becoming increasingly abundant in the Witham (page 145). photo J. Figures



Plate 6. The Lower Witham at Tattershall Bridge: heavily engineered, but with a surprisingly good aquatic fauna (page 145). photo R. Chadd



Plate 7. A very impressive specimen of the swan mussel *Anodonta cygnaea* (Linnaeus, 1758), an abundant species in the Lower Witham. This one may be 25 to 30 years old (page 145).

photo R Chadd



Plate 8. The Revd Francis Linley Blathwayt at about the time of his ordination, c. 1900 (page 148)

Photo Mrs Lucy Morrill



Plate 9. The golden-tabbed robberfly *Eutolmus rufibarbis* found at Moor Farm in 2005. Last recorded in Lincolnshire at Mumby in 1886 (page 153)

photo Allan Binding



Plate 10. *Pemphredon lugubris*. An aphid feeding wasp which builds aerial nests in plant stems and beetle holes in dry, dead wood (page 161).

photo Roger Key



Plate 11. *Riccia beyrichiana*, a thalloid liverwort new for the county in 2005. Usually found in coastal areas, it was found in a quarry at Langholme (page 184). Photo Christine Rieser

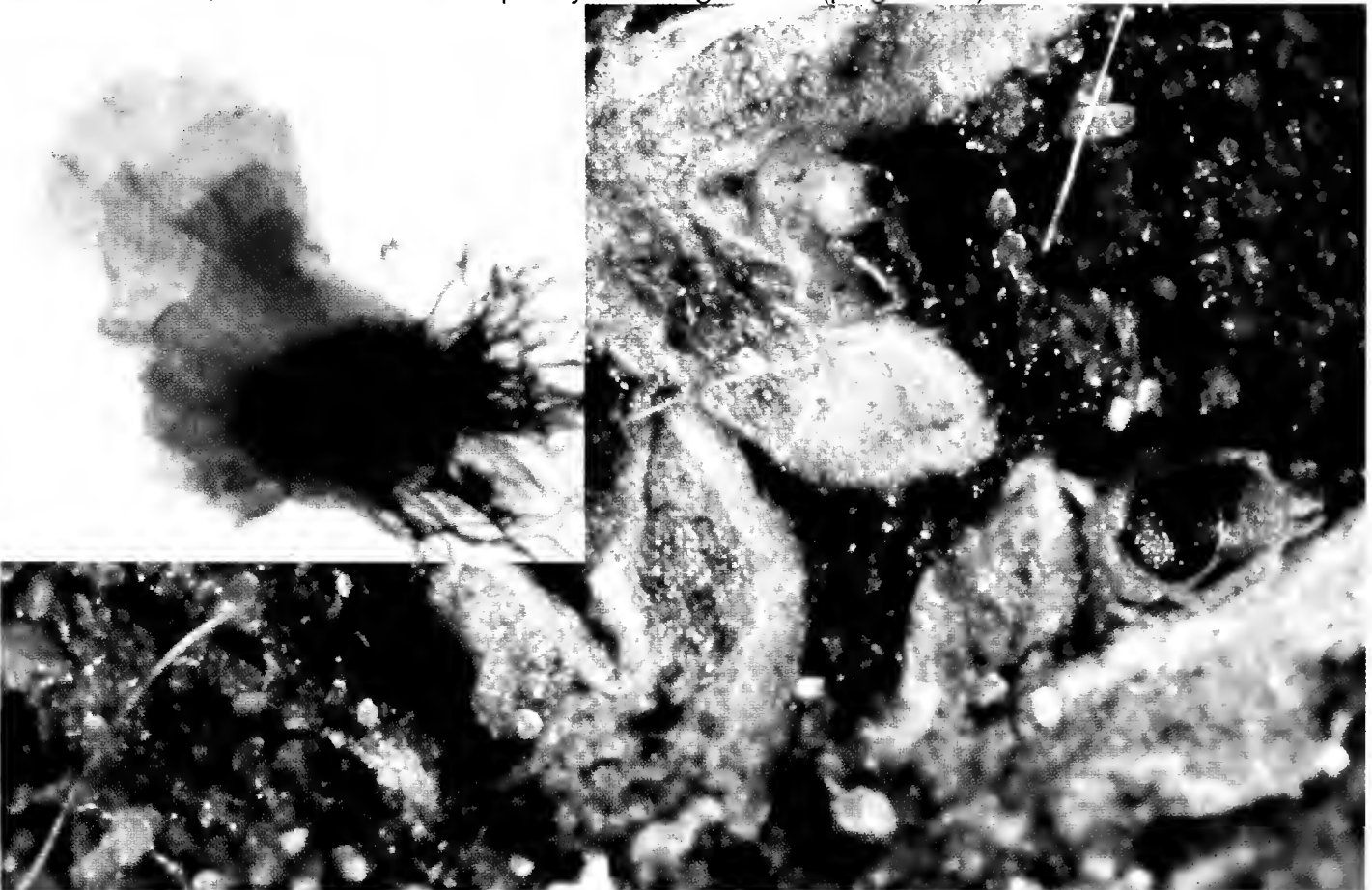


Plate 12. *Fossombronia incurva*, an uncommon liverwort nationally found alongside *R. beyrichiana* (Plate 11) (page 184). Inset – close up of plant. photo Christine Rieser



Plate 13. *Cheiracanthium erraticum*. Recorded at three new sites in 2005. There are nine county records in total (page 192). photo Roger Key



Plate 14. The water spider *Argyroneta aquatica* capturing a water boatman *Corixd* sp. underwater. The only spider to live underwater most of the time (page 193) photo Roger Key



Plate 15. *Epipactis phyllanthes* green-flowered helleborine at Whisby Nature Park. An unpredictable plant only recorded once before in Lincolnshire at Hartsholme Country Park (page 197).

Photo Paul Kirby



Plate 16. *Alisma lanceolatum* narrow-leaved water plantain (left) growing alongside its commoner relative *A. plantago-aquatica* water plantain near Marton (page 200).

Photo Brian Hedley

taken more like a century to spread to northern Scotland and is still consolidating its hold there. Other changes are less easy to explain. *Arion flagellus*, for instance (the only slug species known only from Britain), seems to be spreading from the west.

There is undoubtedly much scope for the would-be slug recorder in the county. Many of the new, recent records in the county have resulted from communal efforts. For about ten years I ran a general studies group at Queen Elizabeth's High School in Gainsborough. We called the group Slug Safari and its educational aim was to make students aware of many issues and skills related to the recording of distributions of our fauna. The wide catchment area of the school ensured that we were not just targeting a single 10 km square. Rarely a week passed without a new 10 km record appearing on the map. Since retirement, I have given some talks to various groups in the county about slugs. These have all included a workshop where we looked at specimens brought in by members of the audience. All these have resulted in new 10 km records and one has even provided the first county record for a species (*Arion vulgaris*).

The notes below give a quick outline of Lincolnshire's (known) species. Keep looking and recording. And, for those of you with a good free church upbringing, recall the words of the hymn 'Raise the stone and thou shalt find me, cleave the wood and I am there.' It is good advice.

Arion ater agg Great black slug, great red slug
Common everywhere in suitable places in the county. Two species are now recognized: *Arion ater* and *Arion rufus*. Both species may be of almost any colour. Both are present in the county, *A. rufus* (which is probably of continental origin) may be more associated with human activity and, the probably native, *A. ater* more common in less inhabited parts.

Arion vulgaris
Very similar in appearance to *A. ater* and, until recently, known as *A. lusitanicus*. One recent record in the county but it is likely to be found elsewhere, probably in gardens. It is difficult to separate from *A. ater* without a good deal of practice.

Arion flagellus
As yet, known with certainty only from the British Isles. We now have a handful of county records. The first was from a garden in Walesby in 2000 and it has since been found in Willoughby and Lincoln. It is spreading, most likely by human agency but its distribution is also seriously under-recorded because of early confusion with other larger *Arion* species.

Arion subfuscus
Widespread in the county but not abundant. It is a large, but not very large, *Arion* species and can easily be recognised by stroking it gently. The mucus is bright orange and has a consistency rather like moisturising cream - quite unlike the unpleasant stickiness from the other large *Arion* species.

Arion circumscriptus
The darkest and dullest of a trio of similar species and widespread in the county. It is found in moist, sheltered places of all kinds, under litter in woods, by

roadsides, in waste ground and, only occasionally, in gardens. It is mainly a lowland species and less common than the closely related *A. silvaticus* in exposed, acid, upland terrain.

Arion silvaticus

Similar in appearance to *A. circumscriptus*. This species lives in moist, sheltered places of all kinds, in herbage and under ground litter. It is a slug tolerant of poor, non-calcareous habitats, such as acid woodland, heathland and sea cliffs. Widespread, but not usually found in gardens which will have richer soils.

Arion fasciatus

A medium sized, rather flattish *Arion*, always with clearly defined black and yellow side-stripes. Larger than the previous two species, it is more often found in gardens. Widespread but not massively abundant in the county.

Arion hortensis Garden slug

The less common of the two garden slugs in the county. There are only a handful of 10 km records. It is undoubtedly present in more places and is not too difficult to separate from *A. distinctus* in the hand. Unlike the larger *Arion* species, which spend a good deal of time recycling decaying matter rather than attacking live plants, this species is a pest, as are other small *Arion* species.

Arion distinctus Garden Slug

Very common almost everywhere, especially in gardens. It can be a serious agricultural and horticultural pest. There are only a handful of records in the county because of its separation from *A. hortensis* 40 years ago. I would be surprised if there were any 10 km squares in the county where it was not present.

Arion intermedius Hedgehog slug

Widespread and very common in most habitats, although not usually common in gardens or other places with richer soils. It is often overlooked or mistaken for young of larger species. The 'prickles' which give it its name, though hard to describe, are diagnostic (but do not make it look anything like a real hedgehog).

Milax gagates Smooth jet slug

This species has a rather local occurrence. It is most often found in gardens and waste ground, although may be found in wild places relatively more frequently than the other common keeled slugs (*Tandonia* species). It can be a pest where it is abundant. It may be our only native species in the family. Its occurrence may also be rather sporadic, with few individuals seen in some years with many more in others. There are only half a dozen recent Lincolnshire records.

Tandonia sowerbyi Sowerby's slug

Generally associated with human habitats, this slug can be found under moist ground litter or in crevices in the soil etc. It can be a pest although it is not often found in large numbers. It is probably not native but is long established and still may be spreading northwards slowly. There are only a handful of county records, but these are spread widely within the county.

Tandonia budapestensis Budapest slug

A species associated with human disturbance. It can be found under soil litter and in crevices underground. It will burrow even in heavy soils. It is a serious agricultural and horticultural pest, potatoes being a favourite food. It was first recorded in Britain in 1921 although it may have been present for many years before that. It is the smallest, slimmest, most widespread, most abundant and by far the most pestilential British keeled slug. With only about 20 Lincolnshire dots in the atlas, it must be grossly under-recorded. Recognise it by its keel, its black central portion of the sole and its revoltingly sticky and unpleasant mucus.

Boettgerilla pallens Worm slug

Never seen in great numbers in any one place, it is probably a predator of very small invertebrates. Only a handful of county records but it is likely to be widespread. It can be mistaken for a small, lilac or grey worm being relatively slimmer than other slugs.

Limax maximus Tiger, leopard or great grey slug

Unmistakable with its striped or camouflaged brown colouration. It is never abundant but is widespread and, probably only a little under-recorded because of its striking appearance. Its colouration is variable so that individuals may be recognised by their markings. Definitely a species to be enjoyed and encouraged. Widespread in the county.

Limax flavus Yellow slug

A fairly common but grossly under-recorded slug. It is strongly associated with man being more common in some city centres than in the countryside. It is often found on walls, in drains, cellars, old sinks etc. and regularly comes indoors. However, it is strongly nocturnal and rarely seen because of this. Torchlight searches of most towns and villages should find *L. flavus*. It is a vigorous climber and may be found high up trees or on the roofs of buildings. It is probably an introduced species although it has been here for over 300 years. Where it is found, it may be found in abundance. When you find some, at night or in your compost bin, you will be amazed that there are only half a dozen recent records in the 1999 atlas. It always appears at slug workshops and is a most attractive species in all ways. Not in the least a pest, it feeds on lichen, algae and decaying matter.

Limax maculatus Irish yellow slug

This could well be a native species which has been largely replaced, centuries ago, by *L. flavus*. There are a handful of British mainland sites so far, mostly in the north-west but it could turn up anywhere. It has now been recorded in three 10 km squares in the county and often lives in association with *L. flavus*. It tends to be a little smaller and more olive-green rather than yellow.

Lehmanna marginata Tree slug

In the eastern counties, this species is more-or-less restricted to large, old woodlands. The few Lincolnshire records are from the north of the county. It would be hard to find anywhere in the fenland. This species requires damp, hard surfaces on which to graze on algae and lichens. Where it does occur it can be abundant.

Lehmannia valentiana Spanish slug

This species is superficially similar to *L. marginata* but generally less watery and does not climb far above ground level. It is mainly found in disturbed, urban habitats. It usually appears in slug workshops. The best places to search seem to be in garden centres, compost heaps and under damp, discarded sheets of plywood or chipboard on brownfield sites. It has now been recorded in six 10 km squares but is likely to be present in all towns and larger villages. Like its cousin, *L. marginata*, it is benign, feeding on algae in preference to green plants.

Deroceras laeve Marsh slug

A small, brown native beast which is widespread and common, mostly in damp habitats (marshes or woodland). It can survive prolonged flooding although sometimes may be found in wet woodlands away from permanent water. Less common in the south than the north of the county.

Deroceras reticulatum Netted slug

The commonest slug, ubiquitous, in almost all habitats. It can be a serious pest. This is the slug which lurks in the lettuce which has not been washed well enough. TF06 is the only 10 km square in the county where it was not recorded in the 1999 atlas.

Deroceras panormitanum

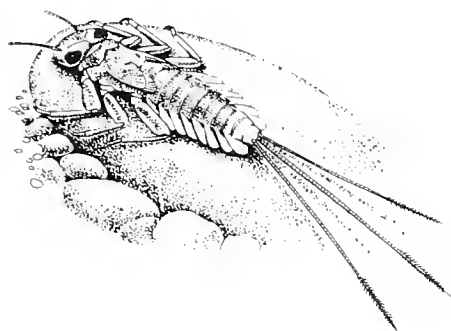
This was first found in Britain only in 1931 but is often the most abundant slug in gardens. It can be a pest and its colonisation is remarkable. The half dozen records in the county are, undoubtedly, a massive understatement of its real distribution. There have always been new records at workshops. For the keen gambler, put your money on this slug at the slug races. It is always first off the mark, accelerates rapidly and maintains a high speed to the end.

Testacella haliotide Common shelled slug

The 1999 atlas shows only one very old record of the species. We have one more recent record in Gainsborough (one hundred years after the previous record). It is a carnivorous, subterranean and nocturnal species. Surely a recipe for under-recording? It is not likely to be common but the known distribution must under-represent the true state of affairs.

KERNEY, M. 1999. *Atlas of the Land and Freshwater Molluscs of Britain and Ireland*. Harley Books.

Chris du Feu is always willing to help with slug identification. Contact him at chris@chrisdufeu.force9.co.uk



LINCOLNSHIRE NATURAL HISTORY IN 2005

WEATHER 2005

Phil Porter, John Walker, Nick Tribe and Annette Faulkner

A dry year with rainfall totals significantly below the long term average. All Saint's Church, Moulton had three-quarters of the lead removed from its roof by a tornado on 28 July.

Whisby Nature Park (1998 -2001 not fully recorded therefore excluded)(mm)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2005	21.9	42.9	22.8	47.2	50	44.7	49.8	65.9	38.4	72.8	45.4	24.5	526.3
1950-2005 mean	50.4	38.8	41.7	41.2	44.3	49	56.4	60.8	46.7	49	56.9	54.1	589.3

Saltfleetby-Theddlethorpe National Nature Reserve (mm)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2005	16.9	41	27	31.4	58.8	30.7	40.5	98	51	55	39.2	35.5	525
1950-2005 mean	53.3	39	33.6	43.8	45.6	45.6	50	56.2	61.8	65	63.1	56.2	613.1

ACKNOWLEDGEMENT OF RECORDS

Where possible, and in order to save space, the editor has grouped the names of contributors to several articles together.

Allan Binding, Annette Binding, Roger Labbett, Colin Smith, Annette Faulkner, Colin Foster, Phil Porter, E. Gaunt, Alan H Dale, Jonathon Bills, Derek Whiteley, Richard Chadd, Frank Brufton, Adrian Royle, Ken Skelton, Heather Nicholl, Ken Rowland, Dean Eades

BATS

Annette Faulkner

Hibernation site surveys take up more and more time each winter as new sites are discovered and added to the monitoring list. In addition some of these sites are entered for the National Bat Monitoring Programme (NBMP), which necessitates two counts, one in January and one in February.

The most important NBMP site is the two disused railway sites near Louth, where a total of 140 bats of five species were recorded in January. However at both counts in 2005 a solitary pipistrelle *Pipistrellus* sp. was recorded, a first for the site for this common species, which is not often associated with underground sites, except at Toft Tunnel near Bourne, where around 10-12 bats are recorded in a horizontal crack at the very cold east end every year.

In addition to the 13 regular sites which were surveyed, Lincoln Castle was surveyed for the first time in early March and two hibernating Natterer's bats *Myotis nattereri* were found in the transportation cells. This site has now been added to the NBMP list for annual survey.

The most unusual new site to be discovered, however, was also in central Lincoln, when three dead Natterer's bats were found alongside a well that could have been sunk by many hundreds of years ago. They were found in mid-April and it was concluded that the family cat had picked them off as they emerged from hibernation.

Other research projects for both the NBMP and the National Bat Colony Survey (NBCS) were carried out by Lincolnshire Bat Group members (for the NBMP) and members of the public (NBCS). Both the NBMP and NBCS involve counting the number of bats emerging from maternity roosts in June, but additional NBMP surveys include surveying for noctules *Nyctalus noctula* and pipistrelles across a fixed transect in July, and for Daubenton's *Myotis daubentonii* along a 1km stretch of river or drain in August. Interestingly, noctules were recorded at sites at Surfleet and Bulby where they have never been recorded before in seven years of recording. These latter surveys are carried out by experienced Bat Group members, and the number of sites and participants is slowly increasing.

One of the policies of the Bat Group is to try to increase our presence at shows and events, where we can meet the public, answer questions, solve problems and collect records. For some years we have attended the Lincolnshire Show, thanks to the generosity of the Farming and Wildlife Advisory Group, who give us space free in their marquee, and at a more modest level at the Crowland Show. For the last two years we have been invited to a wildlife weekend at the Baytree Garden Centre at Weston, which is always very successful and in 2005, for the first time, we attended the Revesby Show, where we had a very busy day and collected a massive 160 new records, equal to two days at the Lincolnshire Show!

The Bat Group has been as busy as ever dealing with bat calls of all types, but including many grounded bats, virtually all of which are in trouble of one sort or another, and which have to be taken into care either temporarily or permanently. Most of the bats that come to us are either common or soprano pipistrelles *P pipistrellus* or *P pymaeus*, and a few brown long-eared *Plecotus auritus*, but on 27 September 2005 a grounded bat at West Pinchbeck turned out to be a male barbastelle *Barbastella barbastellus*, the third to turn up in the Fens in the last five years, always at this time of year and, so far, always males. The tentative conclusion as to why these woodland animals are turning up in such a conspicuously unwooded habitat is that they are migrating to hibernation quarters. This bat was fed up for a week and released.

The following week a bat call from Bourne, regarding a bat found on bedroom curtains and a nervous finder, turned out not to be the anticipated pipistrelle, but an adult male Leisler's bat *Nyctalus leisleri*. He was in superb condition and was released that night, soon to be seen high above the roof tops heading back to Bourne Woods, from whence he had no doubt come.

BUTTERFLIES

Allan Binding

At the time of writing not all records for 2005 had been entered onto the database, but so far the most interesting results are as follows. Small skipper had a very good year in the county; hundreds were seen at Mareham Pastures LNR and many other locations. Essex skipper was also quite common in southern Lincolnshire and a few were seen in the north of the county. In recent years it has been seen in a few south Yorkshire locations. The most unusual sighting in 2005 was that of a male orange tip at Greetwell Quarry near Lincoln on the 30th August. It is very rare to see a second brood of this species. Small copper was very common on many heathlands in 2005 but small heath is still struggling to survive, probably due to the lack of good habitat. Green hairstreak was recorded in good numbers in Lincolnshire with a small colony being seen in Greetwell Hollow. White admiral continue to do well in the Lincolnshire woodlands with one being seen in Mr K D Robertson's garden in Roughton. This species has been found in Lincolnshire gardens before. We believe the species is trying to find new woodlands to colonise. Very few painted lady were seen in the county in 2005 compared with the red admiral which was very common. Red admiral were seen as late as December in this and many other counties.

FLIES

Andy Godfrey

Peter Wilson recorded the tachinid *Alophora hemiptera* from College Wood near Bardney several times in August 2005 (pers. comm.). I reared this impressive fly outside the county in Clumber Park in 2004 and I saw a record for Duncombe Park, North Yorkshire in 2005, but it is definitely local.

Phil Withers also sends leafmines or photos of these from time to time (from Whisby Nature Reserve). He sent a photo of a blotch mine on elder which was produced by the locally common agromyzid fly *Liriomyza amoena*. Fortunately, this is the only leafmining insect we have on elder so its determination is simple.

During 2005 Bill Hoff handed me four storeboxes of named Diptera material collected from around Skendleby and Scremby. Bill has previously provided me with lists of material collected from this area where he has found interesting and rare species. The records from the vouchers in the storeboxes need to be taken down and I will do this for the next account.



FRESHWATER INVERTEBRATES

Richard Chadd

Much of the work early in 2005 concentrated on the North Lincolnshire Blow Wells - groundwater-fed ponds formed by artesian pressure, forcing water from the chalk aquifer through weaknesses in the coastal cap of glacial drift. These wells are present at Barton (NGR: TA012228), Barrow (TA073221), Tetney (TA319007, 322007 and 323008), Humberston (TA315045), Laceby (TA225074) and North Thoresby (TF319992). Those present in other locations are now, sadly, gone or damaged beyond recovery.

Species associated with the Blow Wells included the caseless caddisfly larva *Lype reducta* (Hagen), present at Barton, Barrow, Tetney and North Thoresby. This is a common species, associated with submerged rotting wood on which it feeds. It is, however, normally associated with flowing water, generally in small streams, so its presence in an essentially stillwater habitat is unusual.

Another caddisfly, the cased larva *Beraea pullata* (Curtis) was present at Tetney Blow Wells 2 and 3. This is, again, not an especially uncommon species, but the larva is difficult to find, as it lives among the dense, fibrous root masses of aquatic vegetation and shrubs close to water.

A bivalve, the porous-shelled pea mussel *Pisidium obtusale* (Lamarck) was also found at Tetney and North Thoresby Blow Wells. *P. obtusale* is a widespread species, but I have not found it often in Lincolnshire. At Tetney, it was inhabiting the boggy margins of the wells.

Two new records for the stenothermic stonefly *Nemurella picteti* Klapálek were obtained from North Thoresby and Humberston Blow Wells (it was previously known from Tetney and was again found there in the 2005 survey).

In other habitats, there were two new records for the county: a larva of the predatory caseless caddis *Polycentropus irroratus* (Curtis), was found in Cringle Brook at Stoke Rochford Golf Course (SK920287) and the mayfly *Procladius pennulatum* (Eaton) was inhabiting Buck Beck on the south-western edge of Cleethorpes (TA298064). The latter site is highly urbanised and somewhat damaged, so the record is particularly unusual. It may be worth searching for the species in more favourable habitats upstream of the town.

LIVERWORTS

Christine Rieser

We do not have a rich flora of liverworts in Lincolnshire so it was with delight that two new species were found by F.Lammiman and C.Rieser at Langholme sand quarry this year and a third found by Nick Hodgetts last year but only now recorded. In the quarry at Langholme an area of about 3 square metres in the flat

damp sand where standing water sometimes lies, had been colonised by the thalloid liverwort *Riccia beyrichiana* (Plate 11), a species having only a few scattered recorded sites nationally, mostly coastal. Also present nestling between the *Riccia* thallus branches was a minute plant, *Fossombronia incurva* (Plate 12). This is also a very uncommon liverwort nationally. The identity of both plants was confirmed by the microscopic examination of spores in the ripe capsules present. The third liverwort *Sphaerocarpos michelii* was found on arable soil near Barton. This is a very unusual form in which the thallus is obscured by the many female involucre. The species is uncommon nationally and becoming more so as arable land is more quickly ploughed after harvest and suitable habitat lost.

MAMMAL AND HERPTILES

Colin Faulkner

The most curious records were of Ring-tailed racoons *Procyon lotor* in Lincolnshire; one was reported first hand by the observer who saw it at the Deepings Lakes LWT nature reserve at the end of August. Two others were reported in local Newspapers one dated 18th of October where an animal was found dead on the A1073 between Cowbit and Peak Hill, the other was found in a shed of pigeons and killed by their owner near Louth, the date is not shown on the cutting. Other exotic species during year was a terrapin seen in the river Witham at Washingborough on the first of May, a re-eared terrapin at Hartsholme Country Park and a wallaby in Bourne on the 24th March.

Water vole records *Arvicola terrestris* are all confined to the first half of the year, the first being on January 21st on the River Lymn at Spilsby and the last being at Branston Booths on the 4th of June and Dunham Bridge on June 5th; four of the nine sightings were in April. Two records came from Spalding, Arnold's Meadow and the Coronation Channel, the rest from Scothern, Greetwell Hollow, Atterby and the River Witham at Lincoln. Of the eight records of field vole *Microtus agrestis*, three from Haven Bank, Coningsby were cat kills, three were seen alive; the others were presumably living as it is not recorded in what condition they were found. Three bank vole *Clethrionomys glareolus* sightings were reported, one at Roughton feeding under a bird feeder. Two house mice *Mus domesticus* were found at Rigsby and Tattershall. Four wood mice *Apodemus sylvaticus* were recorded, a dead one at Low Hameringham, a live one at Roughton and two not specified. The brown rat *Rattus norvegicus* had fourteen records, five were dead, and three killed on the road; John Walker recorded opening up his compost bin and seeing six adult size rats looking at him at Saltfleetby.

The one pygmy shrew *Sorex minutus* record this year was found on the Crowland Washes on the river bank, this and the common shrew *Sorex araneus* found at the same site were lying a matter of yards from each other. Other records of *S. araneus* came from Whisby Nature Park (two records) and Hammerington, (one record). There were two records of water shrew *Neomys fodiens* both from Whisby Nature Park

Nine records of mink *Mustela vison* were given; three came from Whisby Nature Park, one of four sightings seen on two separate days. There was one road casualty near Kirkby-on-Bain Gravel Pits. There were three records of otter *Lutra lutra* from Hagworthingham, Spilsby and Messingham (all from Brian Hedley) and all identified by spraints. Sixteen records of stoat *Mustela erminea* ranging from Lincoln in the north to Tongue End in the south. One was recorded as being chased by a coot and another was observed catching a water vole on the ice on a drain; there were seventeen sightings of weasel *Mustela nivalis*, nearly all of them were seen crossing the road, but one was seen near patio doors. Of the thirty one records of foxes *Vulpes vulpes* four were found dead on the road while eleven were reported alive.

Half the sixteen hedgehog *Erinaceus europaeus* sightings were found dead on the road; a young one was seen in February at Nettleham and was unlikely to survive the winter. Of the forty records of moles *Talpa europaea* thirty were from one observer who recorded twenty six sites of mole hills. Brian Eke watched one going round in circles on a taxiway at RAF Waddington, presumably waiting for clearance from air control.

Brown hares *Lepus capensis* were the most commonly seen animal with seventy five sightings and only thirty seven rabbits *Oryctolagus cuniculus*, one showing signs of myxomatosis. A white grey squirrel *Sciurus carolinensis* was seen at Grimoldby and fifty were counted at Hartsholme Country Park on 22nd January.

Four sightings were made of fallow deer *Dama dama*, a group of eighty six and another of twenty one of which was a white form doe. Ten records of roe *Capreolus capreolus*; four from Saltfleetby-Theddlethorpe Dunes and eight records of muntjac *Muntiacus reevesi*.

Adders *Vipera berus* were recorded at Kirkby Moor L.W.T.N.R. and one at Crowle Moor which was predated a wren's nest. Common lizard *Lacerta vivipara* and slow-worm *Anguis fragilis* were also found at Kirkby Moor L.W.T.N.R. with common lizard also being seen at Boulton Mere, Donna Nook, and Messingham.

Three sites were recorded for great crested newt *Triturus cristatus*, at Gosberton, Carlton-le-Moorland and Lincoln while there were seven records from Roughton at different times throughout the year of smooth newt *Triturus vulgaris*. Of the twenty four records for common frog *Rana temporaria*, six came from Roughton again and four records of common toad *Bufo bufo*. Other records came from various places around the county including an allotment site where they were sheltering from the heat of summer under a piece of old carpet put down to suppress weeds.

MOSSES, LIVERWORTS AND LICHENS

M. R. D. Seaward

All bryophyte records listed below, namely four new county (*Bryum gemmilucens*, *Fossombronina incurva* and *Riccia beyrichiana*, *Sphaerocarpos michelii*), two vice-

county (*Bryum gemmilucens* and *Ephemerum recurvifolium*) and 25 divisional records, have been provided by Frank Lammiman, Christine Rieser and Nick Hodgetts. As regards the county's lichen flora, two new county (*Diploschistes muscorum* and *Lecanora persimilis*), two new vice-county (*Caloplaca lactea* and *Lecanora carpinea*), 50 divisional and innumerable grid square records were added to our registers this year. These records are additional to those listed in Seaward (A checklist of Lincolnshire lichens, 2004, *Trans.Lincs.Nat.Un.* **26**: 26-30 & 39-40). A further 30 churches or churchyards with demolished churches were investigated for the first time by the author in 2005 as part of the British Lichen Society's churchyard survey; to date, 464, representing more than 68% of the Church of England churches/churchyards in the county, have been researched.

The continued response to atmospheric amelioration in terms of sulphur dioxide pollution is apparent throughout much of the county as reflected in the recolonisation by epiphytic liverworts, mosses (particularly *Cryphaea heteromalla* and species of *Orthotrichum*, *Ulota* and *Zygodon*) and lichens; of particular lichenological interest is the noticeable increase in fruticose species (*Evernia prunastri*, *Ramalina farinacea* and *Usnea subfloridana*) on trunks of mature trees and elevated biodiversity counts on young trees, particularly by species of *Lecanora*. However, many epiphytic assemblages, particularly those dominated by lichens (mainly *Phaeophyscia*, *Physcia* and *Xanthoria* species), are responding to eutrophication, or indeed hypertrophication, resulting from agrochemical and animal husbandry practices. The importance of golf courses and parks as refugia for lichens and bryophytes has been demonstrated by recent studies in the county.

The moss and liverwort records were contributed by N.G.Hodgetts (NGH) in 2004, and F.R.Lammiman (FRL) and C.Rieser (CR) in 2005. The lichen records, unless otherwise stated, were contributed by the author in 2005, who is most grateful to Dr B.J.Coppins, Royal Botanic Garden, Edinburgh, for his identification/confirmation of the more critical material. The nomenclature is according to T.L.Blockeel and D.G.Long (1998) *A Check-list and Census Catalogue of British and Irish Bryophytes* and to B.J.Coppins (2002) *Checklist of Lichens of Great Britain and Ireland*. I am most grateful to N.G.Hodgetts, F.R.Lammiman, K.Palmer and C.Rieser for providing me with their records.

Mosses

Bryum gemmilucens R.Wilczek & Demaret + 3 (Barrow upon Humber, 2004, NGH, **NCR**), 14 (S of Osbournby, 2004, NGH, **VCR**)
B. ruderale Crundw. & Nyholm + 8, 10
B. subapiculatum Hampe + 9
Dicranella schreberiana (Hedw.) Dixon + 9
Ditrichum cylindricum (Hedw.) Grout + 14 (2004, NGH)
Drepanocladus aduncus (Hedw.) Warnst. + 8
Ephemerum recurvifolium (Dicks.) Boulay + 14 (W of Kelby, 2004, NGH, **VCR**)
Leskea polycarpa Hedw. + 16
Orthotrichum lyellii Hook. & Taylor + 9
O. pulchellum Brunt. + 16
Pogonatum aloides (Hedw.) P.Beauv. + 9
Pseudocrossidium revolutum (Brid.) R.H.Zander + 3

Rhytidiadelphus loreus (Hedw.) Warnst. + 8
Syntrichia ruraliformis (Besch.) Cardot + 14
Warnstorfia exannulata (Bruch, Schimp. & W.Gümbel) Loeske + 7
Zygodon conoideus (Dicks.) Hook. & Taylor + 7

Liverworts

Fossombronia foveolata Lindb. + 7
F. incurva Lindb. + 1 (Langholm Wood, 2005, CRL & CR, **NCR**)
Lophocolea semiteres (Lehm.) Mitt. + 7
Marchantia polymorpha ssp. *ruderalis* Bischl. & Boisselier + 3, 16
Riccia beyrichiana Hampe ex Lehm. + 1 (Langholm Wood, 2005, CRL & CR, **NCR**)
Sphaerocarpos michelii Bellardi + 3 (Barrow upon Humber, 2004, NGH, **NCR**)

Lichens

Amandinea punctata (Hoffm) Coppins & Scheid. + 4
Belonia nidarosiensis (Kindt) P.M.Jørg. & Vězda + 1, 4
Buellia ocellata (Flot.) Körb. + 6
Caloplaca chlorina (Flot.) H.Olivier + 1
C. flavocitrina (Nyl.) H.Olivier + 1, 17
C. lactea (A.Massal.) Zahlbr. + 15 (Boothby Pagnall church, 1995, K.Palmer, **VCR**)
C. ruderum (Malbr.) J.R.Laundon + 17
C. vitellina forma *flavovirella* (Nyl.) A.Henderson + 11
Collema auriforme (With.) Coppins & J.R.Laundon + 11
Diploschistes muscorum (Scop.) R.Sant. + 15 (Burton Coggles church, 1994, K.Palmer, **NCR**)
D. scruposus (Schreb.) Norman + 8
Flavoparmelia soredians (Nyl.) Hale + 8, 11
Hyperphyscia adglutinata (Flörke) H.Mayrhofer & Poelt + 13
Hypocenomyce scalaris (Ach. ex Lilj.) M.Choisy + 17
Hypogymnia tubulosa (Schaer.) Hav. + 13
Lecanora carpinea (L.) Vain. + 13 (on *Acer*, Temple Bruer, 2005, MRDS, **VCR**)
L. chlarotera Nyl. + 4, 6, 14
L. persimilis (Th.Fr.) Nyl. + 13 (on *Salix*, Lincoln University campus, 2005, MRDS, **NCR**)
Lecidella elaeochroma (Ach.) M.Choisy + 6, 11, 13
Lepraria lobificans Nyl. + 4, 10, 11, 17
Melanelia fuliginosa (Fr. ex Duby) Essl. + 6
M. subaurifera (Nyl.) Essl. + 6
Micarea lignaria (Ach.) Hedl. + 8
Neofuscelia verruculifera (Nyl.) Essl. + 4
Ochrolechia androgyna (Hoffm.) Arnold + 8
Opegrapha niveoatra (Borrer) J.R.Laundon + 15 (2002, MRDS), 17
Parmotrema perlatum (Eschw.) M.Choisy + 8 (the only other record for the county (VC 54, unlocalized, c.1879) appears in Lees, F.A. (1892) *The Botany of Lincolnshire*, in White's *History, Gazetteer and Directory of Lincolnshire*, William White, Sheffield, p.61)
Phlyctis argena (Spreng.) Flot. + 17

Physcia dubia (Hoffm.) Letau + 1
Polysporina simplex (Davies) Vězda + 15
Porpidia crustulata (Ach.) Hertel & Knoph + 11
Punctelia ulophylla (Ach.) Herk & Aptroot + 13
Ramalina farinacea (L.) Ach. + 1
R. lacera (With.) J.R.Laundon + 8
R. pollinaria (Westr.) Ach. + 8
Schismatomma decolorans (Turner & Borrer ex Sm.) Clauzade & Vězda + 11
Usnea subfloridana Stirt. + 8
Verrucaria baldensis A.Massal. + 1
Xanthoria ucrainica S.Kondratyuk + 11

MOTHS

Colin Smith

Although 2005 was another rather poor year for moths In excess of 17,000 records have so far been sent in for 976 species, 444 Macro's and 532 Micro's. Most Lincolnshire recorders agree that there is a national decline in both moth numbers, and the number of species. The increase in records is due to more mothing activity. There are several new recorders and I have had significant lists from over 30 people, some of them only visitors to Lincolnshire. These totals represent something in the region of 400,000 specimens having been examined.

Migrants

Migrants were once again low in numbers but there were more about than last year, a very interesting one was the waved black in Mr. C Dobson's garden at Langworth on 11th August the fourth county record and second for Vice county 54. This follows one caught there at a similar time last year and it seems possible that the species may have bred.

There were 12 reports of hummingbird hawk which is about average. Interestingly one of these day-flying species was caught at night in a light trap by Mr. G Wright in his garden at Muckton.

He also caught several convolvulus hawks with Mr. P French and Mrs. M E Dawson also reporting one each at Frampton on 11th September and Dalby on the 12th September respectively.

I caught the only bedstraw hawk In Willingham Woods on 26th June.

Other migrants of note were:

A single bordered straw found at Dalby by Mrs. M E Dawson on 29th June;

3 pearly underwings at Frampton by Mr. J Badley in September.

John also caught a gem at Frampton on 28th October.

Large ear was seen at Gibraltar Point by Mr. R Labbett and myself on 5th August and at Mogg's Eye on the 12 August by Mr. R Labbett and Mr. G Wright.

Several large thorns were seen around the county including 9 at Frampton.

The smaller migrants like the rusty dot pearl and rush veneer were in very short supply.

Macromoths

The cold weather curtailed activities in the first part of the year but a group of us took advantage of a mild night on 1st of April and were rewarded by the appearance of 3 small brindled beautys at New Park Wood a species not seen very often; the last one occurring in 2000.

Three records of the red sword-grass is more than any previous year. I caught one at Wickenby Wood 16th March, Mr. G Wright caught one at Muckton 27th April and Mr. and Mrs. R Harvey found one on their window 10th December at Grasby. Mr. A McGowan reported a pinion-spotted pug from Caistor on 25th May.

The marsh moth was found at its usual haunts and also at Gibraltar Point where it has not been seen since 1997.

The only forester reported in the year was one at Kirby Moor on 24th June which was caught in a light trap which is very unusual for this day flying species.

A visit to Stainfield Wood proved that the orange moth was still surviving in the county with six individuals seen.

Mr. B Hedley had a cloaked pug in his garden at Marton on the 17th of July the first one seen since 1986.

Three records of the delicate is exceptional with a single specimen in 1999 being the only other one in the last 40 years. Two were seen at Gibraltar Point by Mr. P Troake and the other by Mr. J Jaines.

The autumn was very poor but the streak did better than usual with a good number of records.

Several moth recorders paid a visit to Messingham Sand Quarry on National Moth Day to try to find lunar hornet but only managed to find the hatched pupae; at least we know it is still there. We did find several other species one of which was *Stathmopoda pedella* which was on almost every alder, this is only the second site in the county where this pretty little moth has been found.

Micromoths

There have been thirteen new species for the county and five new vice county records during the year as well as many other interesting records some of which are listed below.

Lampronia luzella at Morkery Wood by Mr. R Goff on 29th May a new VC53 record.

Phyllonorycter strigulatella beaten from grey alder at Snakeholme by Mr. C Smith 15th July and checked the leaf mines on 9th October; a new county record.

The leek moth *Acrolepiopsis assectella* was seen by Allan Drewitt at Market Deeping on 2nd and 19th August; a new county record.

Coleophora deauratella at Kate's Bridge by Mr. R Goff on 1st July; a new county record.

Coleophora tamesis was found at Roughton by Mr. K Robertson on 11th July and at Snakeholme by Mr. C Smith 15th July; a new county record.

Perittia obscurepunctella at Rand Wood by Mr. C Smith on 10th April. A new VC54 record, the last being in about 1900 in VC53.

Stephensia brunnichella at Linwood by Mr. C Smith on 15th May; a new county record.

Biselachista scirpi at Gibraltar Point by Mr. C Smith on 5th August; a new county

record.

Luquetia lobella at Halton Holgate by Mr. C Smith on 23rd June; a new county record.

Chionodes fumatella the 3rd County record and *Chionodes distinctella*. A new county record both caught at Whisby Nature Reserve by Mr. P Porter on 12th July. The potato tuber moth *Phthorimaea operculella* at Caenby by Mr. C Smith on 6th October; a new county record.

Anarsia spartiella at Willingham Forest by Mr. C Smith on 9th July; a new VC54 record.

Oegoconia quadripuncta recorded at four places across both VC's; new to the County.

Endothenia nigricostana at Woodhouse by Mr. C Smith on 30th May. A new VC54 record last seen about 1900 in VC53.

Endothenia ustulana at College Wood by Mr. C Smith on 19th June; a new county record.

Thisanotia chrysonuchella at College Wood by Mr. C Smith on 19th June. The only other record is a note by Mr. R E M Pilcher seen in TF49.

Vine moth *Eupoecilia ambiguella* and *Cochyliodia implicitana* at Gibraltar Point by the Leicestershire Moth Group on 27th May; both new county records.

Cacao moth *Ephestia elutella* at Marton by Mr. B Hedley on 17th June and on several occasions at Roughton by Mr. K Robertson; last seen in VC54 about 1900.

The rice moth *Corcyra cephalonica* at Far Ings by Mr. A McGowan on 15th and 27th June; a new county record.

The Indian meal moth *Plodia interpunctella* at Rippingale by Mr. J Lamin on 20th June and Kate's Bridge by Mr. R Goff on 1st August. A new VC53 record and 2nd and 3rd county record.

Capperia britanniodactyla at Morkery Wood by Mr. R Goff on 22nd June; a new VC53 record.

MYCOLOGY

Ken Rowland

This year again was frustrating for me it being early October before I was allowed to drive but still with some restrictions on wandering off into the woods. Hence, another short report. However I did manage to attend one or two forays and Phil Porter kindly arranged the LNU Annual Foray for Skellingthorpe Old Wood, this proved quite an interesting afternoon, not overly well attended but enthusiastically; some 72 species were recorded most interesting being *Ganoderma lucidum*, the lacquered bracket (the mushroom of immortality "Ling Chi" or "Reishi" in China and Japan I understand, specimen still available!) and quite a large specimen of *Tremella foliacea* turned up. Overall a very good meeting in the weather conditions prevailing at that time. There were no new records as this wood has been worked very thoroughly in the past by the late Jack Houghton and John Rowe, myself and the B.M.S.

Various forays for other organisations only yielded some 60 to 70% of the number of species one would expect and nothing unusual turning up although there did

seem to be a distinct lack of the *Russula* and *Lactarius* species in fact at Snipe Dales during a four hour public foray only one *Russula* and one *Lactarius* were found and the total species recorded only 44 when I would normally expect at least a hundred. This lack of fungi I have put down to the dry period we had in the late summer. If you are a fungus, why waste precious resources on fruiting when what moisture is available is better used in the root system for survival?

Only three new county records were recorded in the year, funnily enough all three were found in my own garden. *Micromphale brassicolens* is a small insignificant cap type fungus which smells of rotting cabbage growing in the lawn and *Uromyces apendiculatus* is a fairly rare rust found on kidney beans, although I am sure this must occur more often but goes unnoticed. The third one, another inconspicuous fungi *Spilocaea pyracanthae* on firethorn *Pyracantha coccinea*. It shows that ones own garden can provide some interesting things when you look for them. Hopefully better results in the field for 2006.

My thanks have to go again to Phil Porter, David Knight and Keith Bradshaw for keeping me occupied with specimens brought in. also to Keith Robertson, Ray Halstead and others for lists from other sites.

SHIELDBUGS

Annette Binding

In 2005 a new species of shieldbug was added to the county list when Allan Binding swept a single specimen of *Dolycoris baccarum* in a clearing at Skellingthorpe Wood on 16th October LNU Meeting. *Dolycoris baccarum* is unique among the British Pentatomidae in having a covering of long hairs. These hairs are present on specimens of all stages making it quite easy to identify. The adult bugs are purple and yellow-green with the antennae and connexivum banded with black but this colouring fades to dull brown prior to hibernation in the autumn. Our specimen was in autumn coloration.

Dolycoris baccarum brings the number of species recorded in Lincolnshire up to twenty. Eighteen of these were recorded in 2005.

Allan Binding swept a single specimen of the negro bug *Thyreocoris scarabaeoides* from grasses during our survey at Cove Farm Old Quarry (Birds Wood), Haxey on the 12th September. This was the second record of the species which was new to the county in 2003 when Allan swept two specimens from reeds at an adjacent ditch at Cove Farm, Haxey.

The grassland species *Neottiglossa pusilla* was also found at Cove Farm Old Quarry. There were only six previous records of this species in the county from four other sites.

I found two specimens of the grassland species *Podops inuncta* dead on pathways at Mareham Pastures Local Nature Reserve at Sleaford, one on the

17th June and the other one on the 19th July, again while carrying out survey work. These were the 7th and 8th records for the county.

Sehirus luctuosus continues to turn up at Whisby Nature Park where I found three dead specimens on a path on the 24th April LNU meeting. On the 17th of July two live specimens were found in the same area. These were the 5th and 6th records for the county.

In February, Colin Smith found *Elasmostethus tristriatus* at Chapel Hill Farm at Willingham Forest. This was the only record of this species in 2005.

The only species with no records in 2005 were *Rhacognathus punctatus* and *Legnotus picipes*, although the former has been recorded from Linwood Warren in recent years. As stated in the 2004 report, *Legnotus picipes* was known from only a single record at Mablethorpe in 1865 and so is probably now extinct in the county.

SPIDERS

Annette Binding

There were no new county records in 2005. However there were a number of species found which had few previous county records.

I found the crab spider *Ozyptila praticola* in leaf litter in the coniferous woodland at Mareham Pastures Local Nature Reserve, Sleaford on the 17th June. This was the 9th county record of this species.

I also found the related species *Ozyptila atomaria* at Moor Farm LWT Reserve on the 11th April. Although there are twelve previous records, these only cover seven sites. The species has only been recorded at three sites post 2000, Kirkby Moor LWT Reserve, Linwood Warren LWT Reserve and Moor Farm LWT Reserve. All these reserves have the more mature heathlands which this species seems to favour.

Cheiracanthium erraticum (Plate 13), a member of the family *Clubionidae* and the commonest of the three species of *Cheiracanthium* found in Britain turned up at three new sites in 2005. We recorded it at Whisby Nature Park on the 24th April, Mareham Pastures LNR on 9th July and Cove Farm Sand Quarry (Birds Wood) near Haxey on the 12th September. Prior to this there were only six county records.

Theridion impressum was found at Mareham Pastures LNR and Cove Farm Sand Quarry in 2005, the 6th and 7th county records. The spider is very similar to the much commoner *Theridion sisyphium* so it may be under-recorded in the county.

Also at Cove Farm Sand Quarry we recorded *Haplodrassus signifera*. A member of the family *Gnaphosidae*, this spider is often found in dry sandy places including heathland and dunes. It had previously been recorded from three coastal and four

inland sites in Lincolnshire. The spiders are ground dwelling nocturnal hunters which spend the day in silken cells under stones or other debris. The one I found on the 12th September was the 12th county record.

Another species recorded from Cove Farm Sand Quarry was *Alopecosa barbipes*. This was the 11th site and 15th county record for this species which has been described in the Provisional Atlas of British Spiders as rare in Southern England and very rare in the north of Britain. The spider occurs on heathland and unimproved open grassland preferring areas of sparse vegetation, short turf or lichen heath. In Britain it has been recorded from only 125 10km squares post-1980 and is decreasing (Peter Harvey, pers.comm.). Ten of the Lincolnshire sites have post-1980 records.

I recorded the large *Aranied*, *Larinioides patagiatus* from Whisby Nature Park on the 18th of September. This was only the 4th county record for this species. It had previously been recorded at Whisby Nature Park in 1999 and the only other known site in the county is Boultham Moor where George W. Whatmough recorded it in 1957 and 1959.

Colin Smith again sent me a number of spiders which he had collected across the county. Among them was the *Linyphiid* spider, *Gonatium rubellum* which he found at Usselby Plantation on the 18th of March. Although it is widespread throughout Britain, it had only been recorded once before in Lincolnshire by Mr E. C. Riggall at Rippingale in 1965.

At Linwood Warren LWT Reserve on the 27th February Colin found *Hahnia helveola*. It is a tiny spider, only about 2.5mm long, which makes a small sheet-web at ground level in moss or leaf litter. It had been recorded at Linwood Warren before in 1962 and 1971. This was the 5th county record and the first record since 1971.

Also on 27th February at Linwood Warren, Colin found another *Linyphiid* species, *Erigonella hiemalis*. This was the 10th county record and the first since 1983.

Two more records of *Euryopis flavomaculata*, a member of the family *Theridiidae*, were added in 2005. One was found by Colin Smith at Linwood Warren on the 27th February and the second one was from Owlet Plantation. The latter specimen had been collected in May 2000 but was identified in 2005. This brings the number of records of this species in the county to five.

Araneus triguttatus was recorded again from both Whisby Nature Park on the 17th May and Kirkby Moor LWT Reserve on the 12th of May. The species is rather uncommon in the county and has been recorded from only three locations post-2000, the two sites already mentioned and Legsby Wood.

Richard Chadd and R. Merritt contributed fifty-three records of the water spider *Argyroneta aquatica* (Plate 14). It is the only spider known to live almost permanently below water and is probably under-recorded due to its habitat. There were only four records prior to this data.

Finally, 2005 saw the import of records from the National Spider Recording Scheme which has boosted the number of records for many species. For example *Drassyllus pusillus*, a member of the family *Gnaphosidae* which when we recorded it from Cove Farm Sand Quarry in August had only thirteen other records from five other sites in the county, now has twenty-four records from eight sites.

Allan and I are also currently researching old Lincolnshire spider lists and I have begun to identify material collected by J Francis in pitfall traps during her survey work in Lincolnshire in 1995 so these sources will also add to the county list in due course.

Reference

HARVEY, Peter R., NELLIST, David R. and TELFER, Mark G. 2002 *Provisional Atlas of British Spiders* JNCC 2 Vols

BIRDS

Anne Goodall

The full list includes all those species which regularly breed in Lincolnshire and fall into one or more of the following categories:

- Included on Schedule 1 of the Wildlife and Countryside Act;
- Have a 5-year mean of <300 breeding pairs in UK;
- Included on the national Red List because their UK breeding population or range has declined by 50% or more in the last 25 years; or
- Are rare or very scarce (<50 breeding pairs) in Lincolnshire.

All Lincolnshire breeding season records of birds in the first two categories are reported annually to the Rare Breeding Birds Panel, which monitors these species on behalf of JNCC. This report therefore summaries recent trends for birds in the last two categories only. 'RL' indicates birds on the Red List for a population decline; 'LR/S' denotes county rare/scarce breeders; 'AES' refers to all forms of agri-environment stewardship; *. – all breeding season records required please!

Grey Partridge RL. Probably always commoner in the north and still widespread there but now extinct in large parts of south Lincolnshire. Stewardship and Game Conservancy projects have begun to increase populations in some areas but the impact of red-leg partridge releases is equivocal.

Snipe LR/S*. Extinct as a breeder in most of the county, hanging on in the north-west. Targeted AES projects are keeping migrants steadily later into the spring and drumming has been heard again in some former river valley haunts.

Turtle Dove RL. 60-80% decline since 1980 and worryingly, has all but disappeared from some apparently unchanged woodland habitats and AES farmland, so climate change and migration effects are implicated.

Nightjar RL, LR/S*. County breeding numbers have always related to heathland/forestry management, and with recent improvements in both, the current trend is upwards.

Lesser Spotted Woodpecker RL, LR/S*. Widespread but with a fragmented and 'thin' distribution. The steady increase through the 1990s has slowed but still continues; now found in all large blocks of broad-leaved woodland.

Skylark RL. Still a very common resident and holding its distribution. Density appears to be higher on AES farmland, but sample plots are affected by crop rotation making it difficult to gauge trends.

Tree Pipit LR/S?*. Still breeds in some traditional sites but has declined steadily since the 1980s and this trend is not apparently slowing. More information needed on this species.

Grey Wagtail LR/S*. Began to breed regularly in the early 1990s (formerly sporadic only) and is now increasing in both north and south Lincolnshire, certainly helped by Environment Agency schemes to 're-naturalise' rivers and wetlands.

Song Thrush RL. The national decline has also happened in Lincolnshire, but probably to a lesser extent than elsewhere. 80-90% of gardens in the Lincolnshire garden bird survey still record this species both summer and winter, though numbers have certainly dropped and the critical period for garden use has shifted from winter to late spring/early summer. Numbers seemed to stabilise in the late 1990s and even began to climb again, but the last two years have both shown declines.

Grasshopper Warbler RL. LR/S*. Relies on early successional habitats, so never a widespread breeder. Declined through the 1970s and 1980s but seemed to stabilise at a low level in the 1990s, and with an increase in scrub habitats and better hedgerow management through AES, may even be increasing again very slowly.

Spotted Flycatcher RL*. As for turtle dove, the severe and widespread decline has included areas with unchanged, apparently 'good' habitat, implicating other factors beyond our control.

Marsh Tit RL. LR/S?*. Previously confined to the south-west and never common here, but ringing has shown cyclical changes in the population of this species in Lincolnshire. A small upswing which began in the late 1980s and continued through the 1990s appears to be flattening off, but in the meantime the population has certainly spread north. Confusion with willow tits doesn't help!

Willow Tit RL. This species has always been the more widespread of the pair in Lincolnshire but ringing also shows cyclical population changes. Of recent years these cycles have lasted about ten years and there were peaks in the mid-1980s and mid-1990s, but each peak is lower than the last. Currently numbers are reasonable again, but these changes don't appear to relate to habitat. In large blocks of woodland this species appears to be doing well.

Starling RL. Still very widespread and appearing in almost 100% of gardens, summer and winter, but average peak counts have halved in the 20 years of the Lincolnshire garden bird survey. The decline was very sharp through the late 1980s and has slowed since but the trend is still downwards. Breeding birds have disappeared from or become very scarce in, many areas.

House Sparrow RL. The decline in this species parallels that of starling through the 1980s and 1990, but in the last few years it seems to have flattened off and numbers are probably now fairly steady. Breeding birds are certainly much scarcer than they were 25 years ago, but they have begun to reappear in some areas.

Tree Sparrow RL. Ringing in Lincolnshire shows a very severe population decline from a peak in the mid-1980s to perhaps only 20% of this by the end of the decade. There have been smaller swings through the 1990s but generally the population seems to have been stable at this lower level for the last 15 years. AES does appear to benefit this species and where it does best, in the western half of the county, it may now be increasing again.

Linnet RL. As for the tree sparrow, the decline in Lincolnshire occurred in the 1980s and was of similar magnitude. Since then the population appears to have been stable, and with increasingly sensitive targeting on AES farmland, there is some evidence of a small increase over the last few years.

Bullfinch RL. This is a species of woodland and woodland edge, rather than farmland, so it isn't surprising that its pattern of population change is different. This shows two periods of decline in the 1970s and late 1980s, with the population since then steady at about half the 1970s level. Again unsurprisingly, there is no sign that AES is benefiting this species.

Yellowhammer RL. Another farmland species showing a closely similar pattern to tree sparrow and linnet: a rapid decline in the 1980s, some swings but generally stable at this lower level – perhaps half to a third its former totals - through the 1990s, and a possible small increase over the last 3 years or so.

Reed Bunting RL. Although the population surge of the 1960s took this species into dryer habitats, including the tops of the Wolds at its peak, its preferred habitat is wetlands and the population decline has mirrored land-drainage. The early 2000s population was around 20% that of 15-20 years before and has not yet begun to improve.

Corn Bunting RL. This species differs from most of our farmland birds in that the population decline which started in the 1970s has continued ever since. AES doesn't yet appear to be helping, and it has been lost as a breeding species from perhaps 75% of the tetrads occupied in the 1980s.

BOTANY

I Weston and P Kirby

2005 has been a bumper year for recording. Eight field meetings were held and lists acquired for most of them.

Whisby Nature Park. April 14. SK96. The early April meeting (list from N. Lamming and Z. Harris) was a good prelude to the later annual report from the warden Phil Porter which listed seven orchid species with mind boggling numbers. *Ophrys apifera* c.1015 plants, *Dactylorhiza fuchsii* c.500 spikes, *D. praetermissa* 7,637 + spikes, *Listera ovata* a few, *Anacamptis pyramidalis* 2 spikes, *Epipactis helleborine* 31 spikes and c. 30 spikes of the nationally scarce *Epipactis phyllanthes* green-flowered helleborine (Plate 15). This last species, new to the Reserve was found by Jan Rousseau and identified by Grahame Hopwood. It has only been recorded once before in Lincolnshire, at Hartsholme a few years ago. A dry specimen sent to Michael Foley, the referee for the genus, could not be determined to subspecies level (there are 5 different varieties) but hopefully this can be done in 2006 from fresh material. It is plant of sporadic and unpredictable occurrence. Other records include *Gnaphalium sylvaticum* near Thorpe Lake in quantity, an uncommon and nationally declining species (PP). *Trifolium ornithopodioides* fenugreek (I. Weston and R. Nickerson). *Orobanche minor* over 100 spikes near Thorpe peninsula (PP). *Catapodium rigidum* new to the Reserve (Richard Davidson). *Carex curta* identified by the Bradford Botany Group and which is most likely to have been introduced in peat. *C. curta* is normally found in peat bogs and very acid habitats and is restricted in Lincolnshire to areas like Crowle Waste, Laughton Forest, Linwood and Woodhall Spa. *Moehringia trinervia* and *Hypericum androsaemum* (PP). Whisby moves from strength to strength.

The Pingle. May 8. TF25. Allan Binding sent in a good list from this suburban site.

Tetford Hill. May 29. TF37. Lists from IW, PK. The limestone grassland and woodland sites at Hillside Farm were rich. A large number of *Dactylorhiza fuchsii* near the stream and much *Anthoxanthum odoratum* and some woodland species. The second contrasting site near the sewage works had stands of horsetail, (*E. palustre* and *arvense*), rushes and a small list of marshy plants.

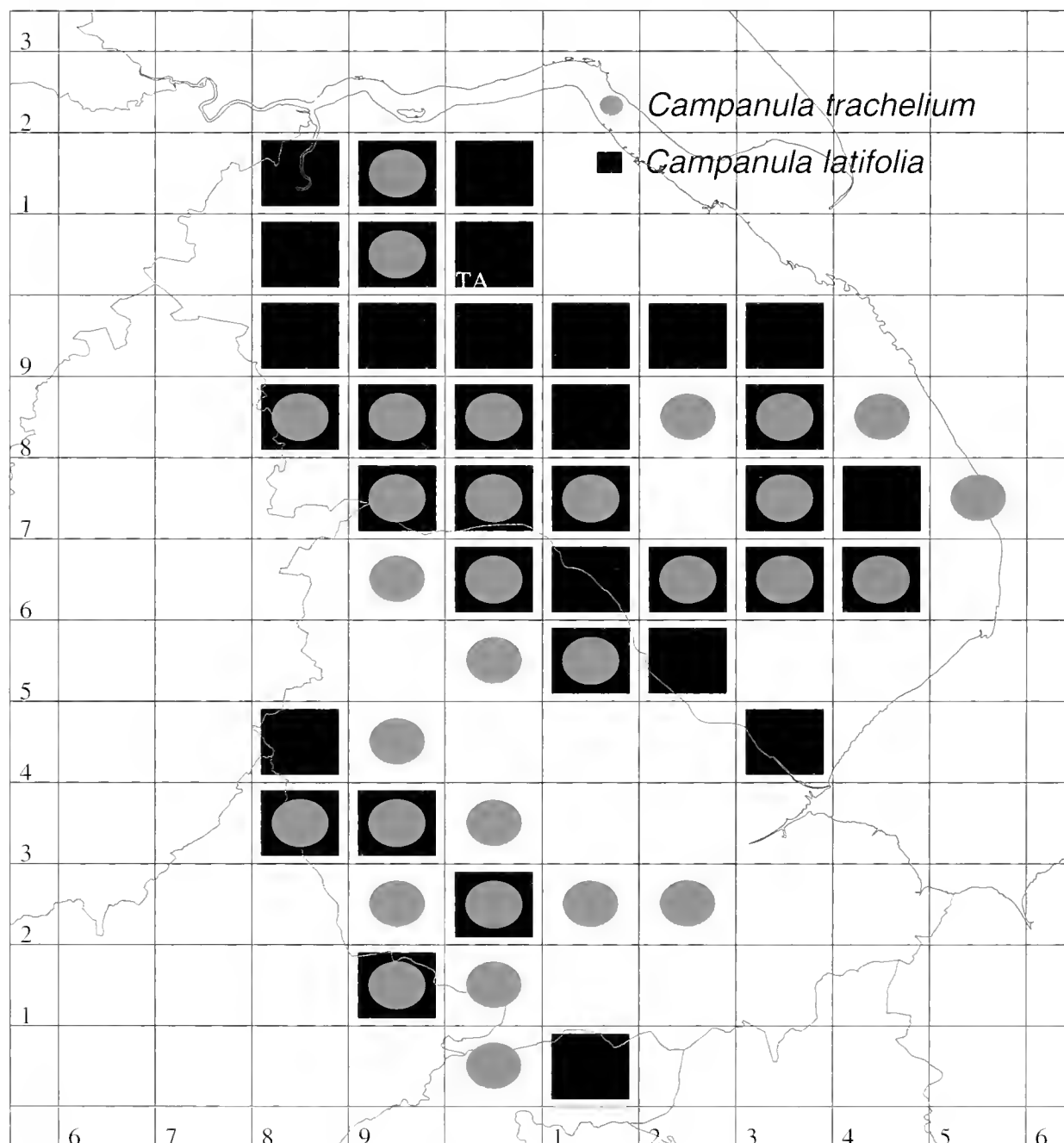
Kenwick Park Golf Course. July 10. TF38. Lists from IW, PK. A variety of habitats, including woodland, ponds and grassland. In the old woodland, *Epipactis helleborine*, *Convallaria majalis*, *Primula vulgaris* and *Orchis mascula*. The ponds and wet spots had *Acorus calamus*, *Cyperus longus*, *Elodea nuttallii* and *Dactylorhiza fuchsii*. A dry area supported *Galium saxatile* and *Hypericum pulchrum* and the short turf *Trifolium micranthum* slender trefoil, a species probably much overlooked in Lincolnshire.

The meeting on the Golf Course was organised by Roger Labbett who also arranged for the recording group (PK, IW, ZH & VW) to survey the Hotchkin and Bracken Golf Courses at Woodhall Spa. An early meeting produced a good list of ephemeral species including *Teesdalia nudicaulis* as well as *Vicia lathyroides*,

Viola canina, *Ceratocarpus claviculata* and *Hypochaeris glabra*. On later visits *Gentiana pneumonanthe*, a small colony of *Convallaria majalis*, many ferns and sedges and *Daucus carota* were seen.

Moor Closes. August 21, SK94. Records from A. Faulkner and J. Rackham included *Hydrocotyle vulgaris* and *Hypericum humifusum* as well as *Armeria maritima* subspecies *elongata* the Ancaster thrift which is now confined to Lincolnshire. It is not to be confused with *Armeria maritima* subsp. *maritima* which is the thrift found extensively around the British coast and occasionally inland on mountains. Much has been written in the local popular press this last year indicating a complete misunderstanding of the national importance of the Ancaster plant. It is a Red Data Book species meriting a high profile conservation programme and should be highly valued.

Map of all records of *Campanula latifolia* and *C. trachelium*



Lists were sent to PK from the Southrey and Linwood meetings.

Fungus Foray. Old Wood, Skellingthorpe. October 16, SK97. Although late for flowers, many ancient woodland species were recorded. Of particular note were the two woodland grasses *Hordelymus europaeus* and *Milium effusum* (B. Hedley) and giant bellflower *Campanula latifolia* (IW). There are records of both *C. trachelium* (a plant of southern Britain) and *C. latifolia* (a plant of northern Britain) in Skellingthorpe Woods. Lincolnshire straddles the northern and southern limits of distribution of these two species (see map above).

Orchids

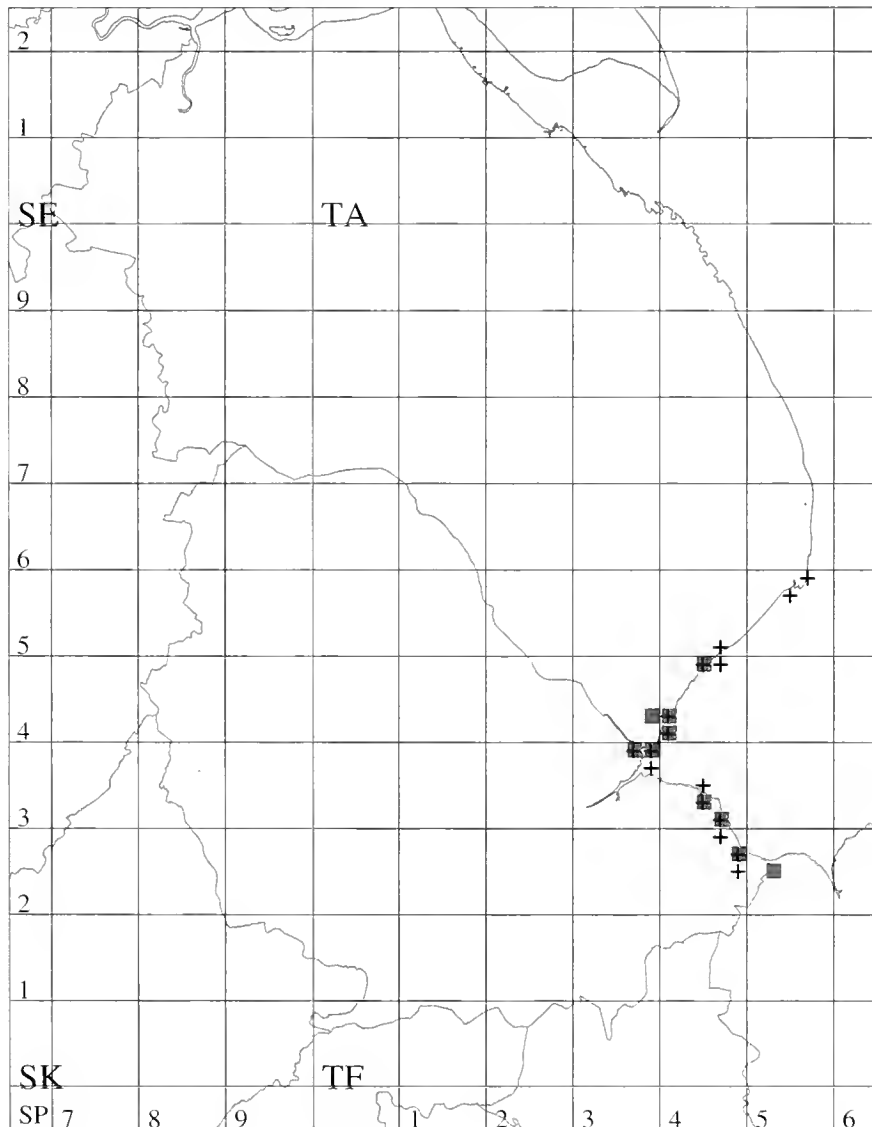
2005 has been a very good year for orchids. *Orchis apifera* has shown up in many extra localities including garden lawns at Riseholme and South Carlton (IW), a lawn on Alford Industrial Estate (Colin Hutchinson), at Kirkby Gravel Pits (K. Robertson), Mareham Lane, Sleaford, (AB) and Scunthorpe Steelworks, (VW, PK and T. Cook).

Anacamptis pyramidalis. 53 spikes were recorded on July 22 at Riseholme by Ian Birch. This was completely new to the Riseholme Estate and found in a young ash plantation on what was formerly arable land, on the alkaline cliff. The

Sarcocornia perennis (Perennial Glasswort)

Tetrad Records

■ Records before 1990 + Records for 1990 onwards



species is normally found on the coastal dunes and on inland alkaline soils. The appearance at Riseholme poses an interesting question. Is it native here but not recorded previously due to the arable nature of the farmland or has it been brought in with the planted ash?

Three new orchid books were published in 2004 and 2005 with superb colour photographs. 2004 Lang, D. *Britain's Orchids* Wild Guides Ltd, 2005 Foley, M. & Clarke, S. *Orchids of the British Isles* Griffin Press.2005.

Harrap, A. & S. *Orchids of Britain and Ireland - A Field and Site Guide*. A and C

Black. These are mentioned as they all highlight the recent changes in nomenclature in the Orchidaceae based on molecular – i.e. DNA analysis. To quote a few changes!: *Orchis morio*, green winged orchid = *Anacamptis morio*, *Orchis ustulata*, burnt-tip orchid = *Neotinia ustulata*, *Listera ovata* twayblade = *Neottia ovata*, *Aceras anthropophorum* man orchid = *Orchis anthropophorum*, *Coeloglossum viride* frog orchid = *Dactylorhiza viridis*.

Coastal species

Neil Harris, P. Kirby and B. Wilkinson have worked extensively on *Sarcocornia perennis*. NH has 10 localities and the map above shows the increase in the number of records. Again, a dilemma. Is this environmental change and spread of the species or does it reflect a greater concentration of search? *Ruppia maritima* has been recorded in four new localities (PK). Three in TF55 and one in TF45, all drains adjacent to the sea bank. *Cochlearia danica* and *Spergularia marina* continue to spread along inland roads (PK & IW).

Other significant records – a very large number of records were made in 2005 in both vice counties and a few of the more interesting are listed below:

Alisma lanceolatum. Marton, SK88. Brian Hedley. A rare species in the county, verified by T. Rich. The much commoner *A. plantago-aquatica* is shown growing beside the rarity in Brian Hedley's fine photograph (Plate 16).

Rumex maritimus. Marton, SK88. (BH).

Hyoscyamus niger. Newton on Trent, SK87. (BH). A very large number of plants on a landslip.

Convallaria majalis. Tattershall Thorpe Carr, TF25. K. Robertson

Zostera (noltei), species to be confirmed. Horseshoe Point. TA30. G. Weaver. Very few records in the county and the last seen in this area at Tetney in 1956.

Ranunculus arvensis. Grainthorpe, arable. TF39. Christine Adlard. Now an extremely rare cornfield weed in Lincolnshire.

Luzula sylvatica. Hatton Wood, TF17 and Legsby Wood TF18. David Harrison.

Melampyrum pratense. Hardygang Wood, TF07. (DH).

Gnaphalium sylvaticum. Willingham Woods, TF18. (DH).

Ranunculus parviflorus. Tallington Lakes Leisure Park, TF10. Neil Harris.

Juncus compressus. Pinchbeck Fen Slupe, TF12. (NH). *Genista tinctorum*.

Twyford Forest, SK92. (NH). *Gagea lutea* Careby Wood, TF01. Brian Laney and Mark Jannick.

Silene noctiflora. Swallow, TA10. N. Hickling. A very large population.

Petroselinum segetum. Saltfleetby, TF48 and TF49. P. Kirby.

Petroselinum segetum. Theddlethorpe, TF48. Tim Smith,

Petroselinum segetum. Grainthorpe, TA30. W. Meek,

Papaver hybridum. South Rauceby, TF04. M.D. Pool.

Catabrosa aquatica. Tetford, Hillside Farm, TF37. (Jeremy Fraser).

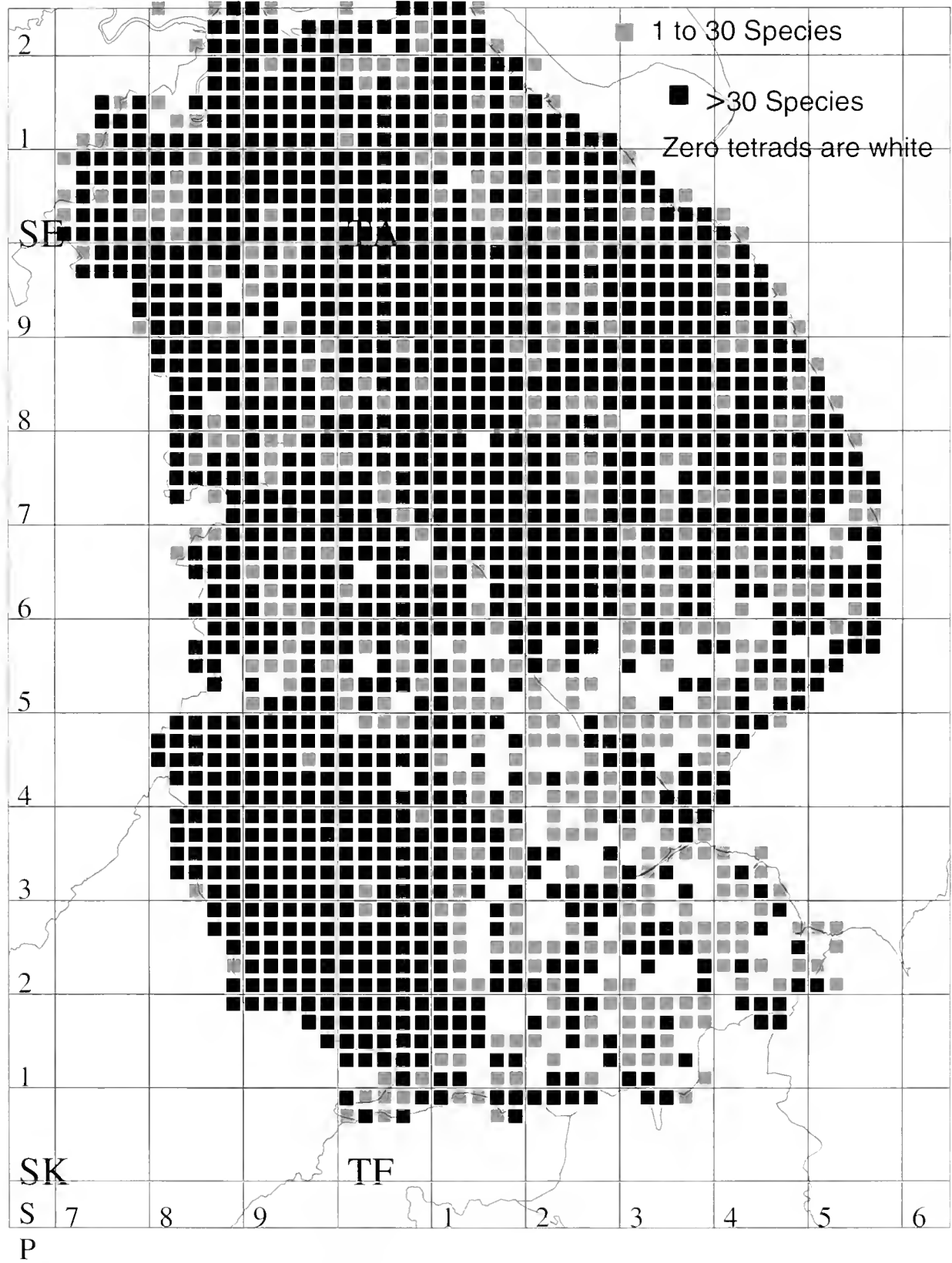
Recording - Tetrad surveys

The map below shows the under-recorded tetrads in Lincs. i.e. those with no records at all and those with records of less than 30 species.

The uneven coverage is primarily due to the past system of recording based on

the hectad (10 km. square). The richer habitats in a hectad would be visited first and once recorded a species might not be listed again though present at other sites. Some tetrads perceived as unlikely to add species to the hectad master list would not be worked at all. Another contributory factor is the vast extent of the County. Lincolnshire has land in 91 hectads and 1923 tetrads (2km. squares).

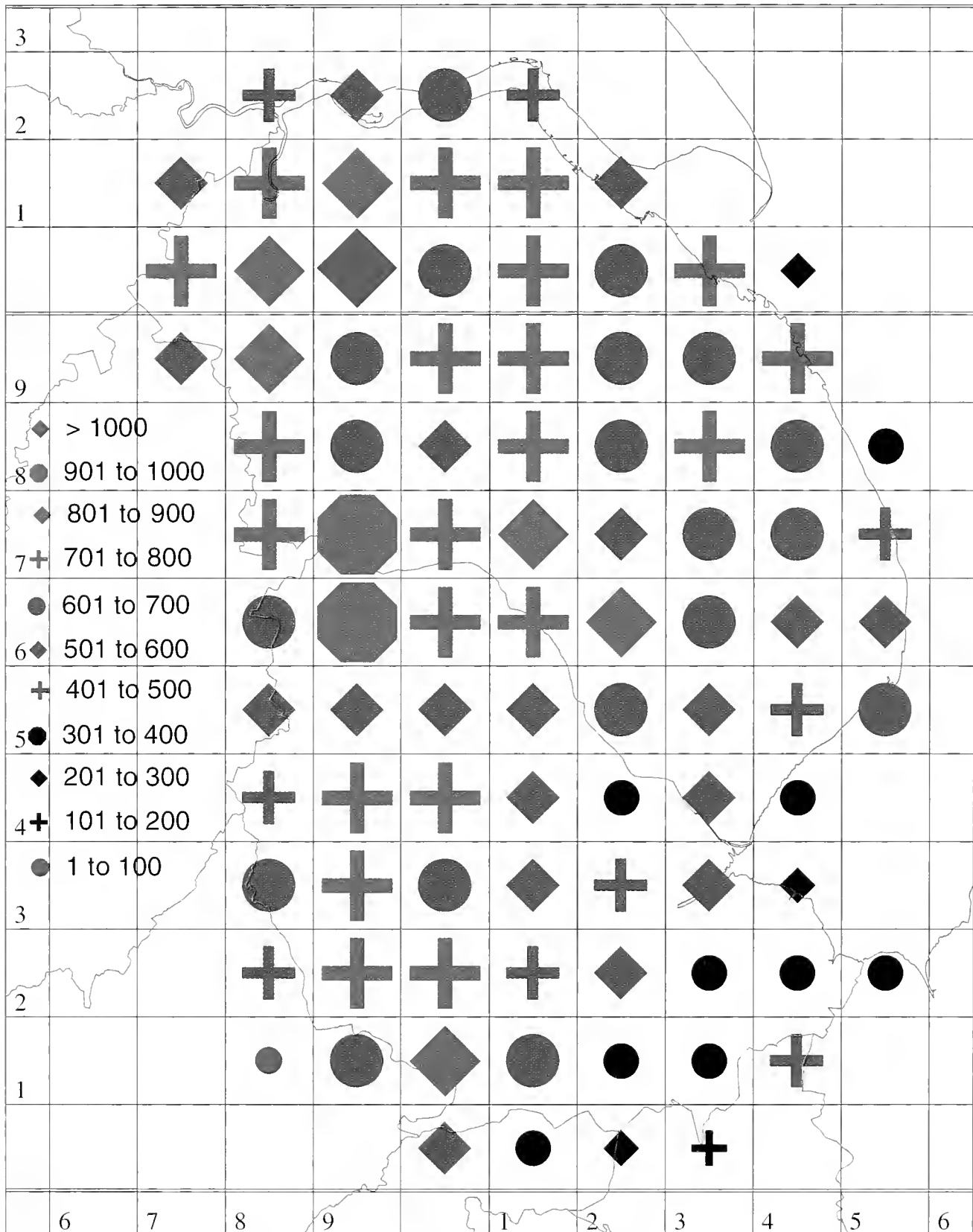
Tetrads with zero, 1 to 30 and more than 30 species



Tetrad mapping not only delineates species distribution more precisely but also detects change far earlier and now the gaps are being filled. Recent surveys by the recording team and volunteers of LNU have shown that it is not difficult to find 100 plus species in a tetrad even those with very limited access. Anyone wishing

to work a tetrad please contact PK in North Lincs. (VC54) or M Pool in South Lincs. (VC53) for an update.

Numbers of species per hectad (10km square)



Hectad and number of species recorded per hectad

Hectad	Species	Hectad	Species	Hectad	Species	Hectad	Species	Hectad	Species
SE90	1023	TA01	763	TF55	647	SK95	571	TA12	444
		SK94	759	TF25	645	TF15	566	TF23	432
		SK92	758	TF28	640	TF56	563	SE82	430
SK97	950	TF02	754	TF11	635	SK85	560	TF41	402
SK96	927	SK93	750	TA20	634	TF05	559		
		TF04	745	SK91	630	SE92	556	TF10	398
		TA10	744	TA02	623	TF34	550	TF21	394
SK89	882	TF18	725	TF37	619	SE71	549	TF42	382
TF26	876	SK87	720	TF03	618	TF13	540	TF58	347
SE91	841	TF38	719	SK83	615	TF00	538	TF32	346
TF01	839	TF16	717	SK98	611	TA21	532	TF24	328
SE80	833	TF49	717	SK99	610	TF14	512	TF44	325
TF17	804	SK88	713	TF29	609	TF35	510	TF31	315
		TA11	705	TF36	608	SK79	509	TF52	308
		SE70	702	SK86	602	TF33	507	TA40	299
TF19	792							TF43	235
TF09	786					SK84	491	TF20	223
TF06	781	TA00	699	TF46	595	TF45	480		
TA30	779	TF47	686	TF08	588	TF12	470	TF30	175
SE81	775	TF39	675	TF27	581	TF57	469		
TF07	765	TF48	648	TF22	580	SK82	454	SK81	92

A Prickly Situation

Roses and brambles have always been difficult to determine due to hybridisation and introgression and need expert identification. In 2005 MDP sent away specimens of roses from Bracebrough Wood in S.W. Lincs., TF01. All but one were collected in a short length of hedgerow and sent to Mr. R. Maskew, the BSBI Rose referee. The results show that we have *R. rubiginosa*, *R. arvensis*, *R. canina* Group Dumales, *R. canina* Group Lutetianae, *R. tomentosa*, *R. tomentosa* (female) x *R. canina* (male), and *R. arvensis* var. *gallicoides*, i.e. seven different types. The situation with brambles is the same but the experts are always willing to give an answer. Fresh fruiting material is required which includes a portion of stem with fully developed hips and a short length (c. 20cms) of mature leading stem with leaves and characteristic prickles as well as some notes on the size and type of bush. A national survey is now taking place recording hybrid species. Again we should collect material for diagnosis. *Carex* (sedge) hybrids and *Salix* (willow) hybrids often need the referee's verification.

Thank you to all recorders from 2005.

ERRATA

The Moths article in Transactions Volume 26, Part 2 should have been credited to Colin Smith.

TRANSACTIONS OF THE LINCOLNSHIRE NATURALISTS' UNION Officers of the Union in 2005

President	Richard Chadd	President elect	Christine Rieser
General Secretary	John Margetts	Treasurer	Ian MacAlpine-Leny
Auditor	John Levine	Membership Secretary	via LWT
Publicity Secretary	Vacant	Programmes Secretary	Phil Porter
Sales Secretary	Colin Smith	Records Secretary	Roger Key

Executive Committee Chris Manning, Colin Smith, Mark Crick.

External representatives Roger Key (National Federation of Biological Recorders), Ken Rowland (Community Council & Swanholme Advisory Group).

Section Recorders

Ants, wasps & bees	Dr Michael Archer	Geology	Mr David Robinson
Bats	Mrs Annette Faulkner	Higher plants	Mrs Irene Weston & Mr Paul Kirby
Beetles	Dr Roger Key	Isopods & myriapods	Mr Neil Pike
Bryophytes/lichens	Prof. Mark Seaward	Macro moths	Mr Colin Smith
Butterflies	Mr Allan Binding	Mammals and herptiles	Mr Colin Faulkner
Dragonflies	Mr Richard Chadd	Micro moths	Mr John Lamin & Mr Colin Smith
Fish	Mr Nick Bromidge & Mr Ian MacAlpine Leny	Molluscs	Mr John Redshaw
Flies	Mr Andrew Godfrey & Mrs Jillian Mears	Plant Galls	Mr Graeme Clayton
Freshwater invertebrates	Richard Chadd & Ms Alice Hiley	Sawflies	Dr David Shepphard
Fungi	Mr Ken Rowland	Spiders	Mrs Annette Binding
Grasshoppers, etc.	Mr Brian Redman	Shield bugs	Mrs Annette Binding

SECRETARY'S REPORT John Margetts

The LNU is continuing to prosper and a number of on-going projects are at or nearing completion. Last year I reported that we were negotiating for a permanent home for our collections. Professor Seaward identified a potential home on the Riseholme campus of the University of Lincoln. Negotiations are now complete and we now have a formal agreement with the University of Lincoln for the use of a room at Riseholme. Our collections and library have been moved in. We now need to sort through the collections and produce an inventory so that the collections can be of real use. Thanks are due to Professor Seaward and Richard Chadd and the other members involved for securing this for us. The Biological Record Centre has progressed over the year. Its name has been changed to the Environmental Records Centre to reflect the intention to record geological data and, in future, other data relating to the natural environment. Congratulations are due to our development officer, Margaret Cole on her marriage. She is now Margaret Haggerty. We have achieved ongoing funding for our Botany project. Over 550,000 botanical records have now been transferred to our computer database. Two LNU members have new books in the final stages of publication (and perhaps on sale by the time you get to read this). Colin Smith has produced an updated Moths of Lincolnshire and Chris Manning has produced a book on deer. Both books will have an initial print-run of 200 copies.

MEETINGS 2005

Saturday January 22nd Illustrated Talk. Slug awareness workshop by Chris du Feu, Saturday February 19th Annual Recorders Meeting, Saturday March 26th Annual General Meeting and Presidential Address by Chris Manning 'The Humber Estuary, Formation, Function and Wildlife', 24th April 675th field meeting Whisby Nature Park, 8th May 676th field meeting The Pingle, Conningsby, 29th May 677th field meeting Tetford Hill, 10th July 678th field meeting Kenwick Park Golf Course, Louth, 10th July 679th field meeting Southrey Wood, 21st August 680th field meeting Moor Closes, 11th September 681st field meeting Linwood Warren 16th October 682nd field meeting Skellingthorpe Old Wood, Sunday 20th November The Revd Francis Linley Blathwayt: contribution of a former LNU President by Dr Trevor Kerry

Contributing to *The Lincolnshire Naturalist*

We are constantly on the lookout for full length articles or short notes, even a few lines which can be useful space fillers, on any aspect of our natural history, current or historic. Consider a note in *The Lincolnshire Naturalist* for any new or significant observations.

Articles should be typed. It would help the editor tremendously if they could either be e-mailed or sent on CD or floppy disk with accompanying paper copy, in Word© or Word Perfect© format. Files of over 0.5 megabytes should be sent on a CD. Drawings, colour or black & white photographs, colour transparencies or negatives (please include a print) can be included. If you submit your own photographs, take them or scan them at a resolution of at least 200 dots per inch and at a size equal to or larger than the size they will be printed at (approximately 11.5x7.5cm). Colour illustration may be rendered to black and white. Please give a caption. Illustrations will be returned and edited text resubmitted to the author for approval and proof-reading before publication.

Convention adopted for names - Latin names should be *italicised*, **not** (bracketed) nor underlined and should follow the English name (where applicable) with no separating comma. English names should start with lower case letters unless incorporating other names warranting capitalisation (eg Brandt's bat).

References to journals and books should please be as below. Please note and use the capitalization and italic convention.

WOODRUFFE-PEACOCK, Rev E.A., 1900. The Lincolnshire Naturalists at Freiston. *The Naturalist*, **25**: 141-144.

DUDDINGTON, J. & JOHNSON, R. 1983. *The Butterflies and Larger Moths of Lincolnshire and South Humberside*. Lincolnshire Naturalists' Union. Lincoln. 299pp.

The final copy date is **31st March** of the year in which the Transactions are to be issued. Please contact the editors directly if there is difficulty in meeting this deadline. If in any doubt as to whether your observation merits a note or an article, or you have any other queries please do get in touch with the editor c/o Lincolnshire Naturalists' Union, Lincolnshire Wildlife Trust, Banovallum House, Horncastle, LN9 5HF to whom texts should be sent. A guidance note is available and is sent out to recorders. Otherwise, please attempt to imitate the format in this issue of the Lincolnshire Naturalist.

Editorial

Nick Tribe

Once again, the editors of Transactions would like to thank all the contributors for their excellent articles and photographs. We hope that this edition maintains the high standard that you have come to expect. This year we have included an article on Rev. F L Blathwayt and while the article is not the strict natural history subject that this journal normally carries, we thought that given its strong Lincolnshire focus, and the fact that its subject was an important Lincolnshire naturalist, we thought it worthy of inclusion.

Last year we raised the question of a change of format. Clearly, mid-volume was not the time to carry out such an exercise but the question of how Transactions should be published and importantly, how much the LNU is prepared to pay for a re-designed publication remains.

Please keep the articles coming, we hope that you enjoy this edition.

THE LINCOLNSHIRE NATURALIST

including
Transactions of the Lincolnshire Naturalists' Union
for 2005

Volume 26, Part 3, 2006



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