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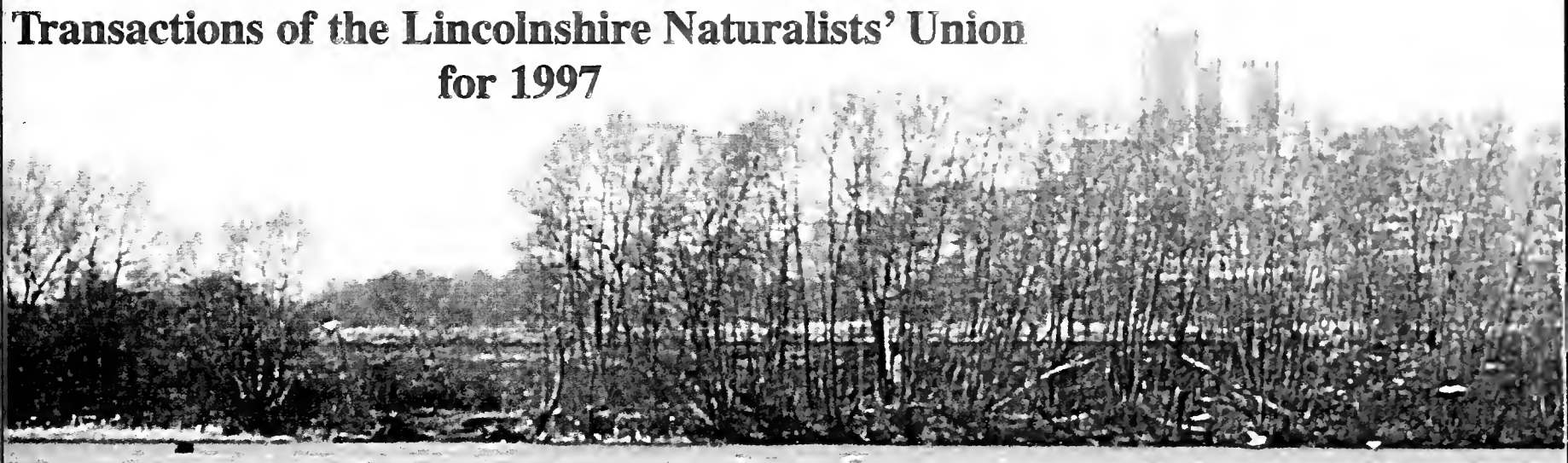

The Lincolnshire Naturalists' Union

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Is the only amateur Natural History Society covering the whole of Lincolnshire.

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Exists for its members to enjoy, study and record the flora, fauna and physical features of Lincolnshire.

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Holds field natural history meetings throughout Lincolnshire during the spring, summer and autumn.

✧

Holds indoor talks, workshops, exhibitions and discussions during the winter.

✧

Welcomes new members and helps them to learn the skills of natural history to make study more enjoyable.

✧

Holds on computer the records of Lincolnshire's wildlife going back over a century.

✧

Supplies wildlife information to the Lincolnshire Trust, English Nature and Local Authorities to help nature conservation.

✧

Publishes its findings annually in The Lincolnshire Naturalist and more often in the LNU Communiqué.

✧

Produces occasional books and pamphlets on Lincolnshire's natural history.

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WILDLIFE IN LINCOLN

Phil Porter

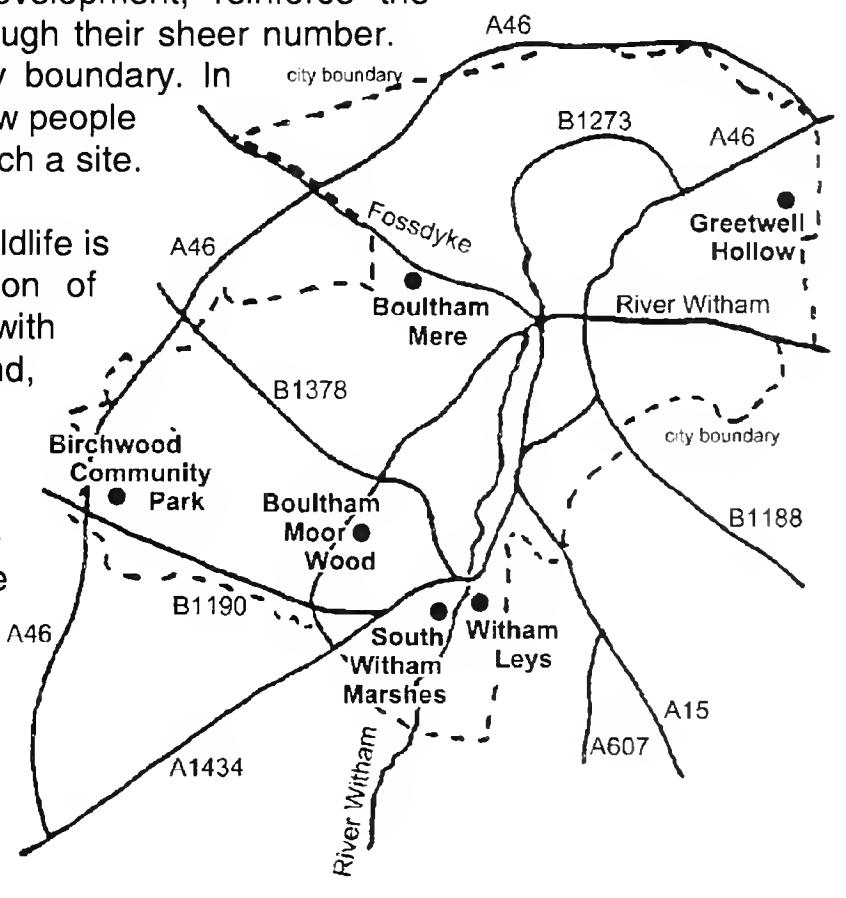
Before I came to Lincoln in November 1993, the only experience I had ever had of the county was a number of visits that I had made to Gibraltar Point from where I had been living in the midlands. Yet these were crucial to my becoming deeply involved in practical conservation. In those days I was only really interested in birds and as good as the Lincolnshire coast may be for migration and so on, a fortnight there, when the birds did not come, sometimes without a car, could be hard going. As a result I decided to volunteer on the reserve for three weeks during the era of Martin Curry and Dave Bromwich. As a result of this splendid experience, I subsequently answered an invitation to a gathering aimed at setting up the Warwickshire Urban Wildlife Group.

Having chaired this body for about three years, I was made redundant from my job in a garden centre and rejoined Dave at Whisby Nature Park for six months as a volunteer. With Dave's help I was able to establish myself with the Lincolnshire Trust in the city from the spring of 1994 ,when the Lincoln Green Project was launched, latterly in partnership with Lincoln City Council and Groundwork Lincolnshire, and this is an account of my impressions of the city's wildlife since then.

Coming from the black country in the conurbation of the West Midlands, it is hard for me to consider Lincoln as much more than a small town and the overwhelmingly rural hinterland reinforces this impression. Back in 1993, I remember noticing with anticipation the approach through birch woods, gravel pits and low-lying farmland, the apparent 'woodland' of the historic core of the city, the Lincoln edge, the commons, and the river valley. It was nevertheless still a shock to learn that the two 10k squares which occupy virtually all of the Lincoln city area have been, and to some extent still are, biologically some of the richest in the county. The Lincolnshire Trust's register of Sites of Nature Conservation Importance, to which I have added a small number, just about balancing those that have been lost to development, reinforce the impression of wildlife diversity through their sheer number. There are over fifty within the city boundary. In downhill Lincoln at any rate, very few people live more than a short walk from such a site.

The richness of the Lincoln area's wildlife is of course due to the juxtaposition of several distinct landscape types, with different climax vegetation and, significantly, different responses to human modification, resulting in the variety of niches seen today, many of which still require to be investigated to a reasonable degree for their wildlife potential. The landscape types could be summarised as follows;

1) the Witham Valley
2) the calcareous scarp slope variously known as Lincoln Edge and Burton Cliff



Sites of Nature Conservation Interest referred to.

3) the fen area of Pyewipe and Skewbridge
4) the Lincoln Heath to the south-west.

The waterways of Lincoln are nowadays embanked against regular flooding and the upstream Witham Valley creates deep inroads into the city providing a green wedge. Except for the former Boston railway, the river valley has been too prone to flooding to attract transport routes away from the city centre and is therefore rural in character to a large extent. Horse-grazing paddocks and allotments line the banks, with the odd ungrazed grassland of great value. The river banks and drainage ditches house some interesting water plants. On the other hand, there are virtually no riverside trees left within the city.

The calcareous clay and limestone scarp slope supports rough grassland, often with dense hawthorn scrub where horse grazing is absent. Steep slopes, spring lines and common grazing rights have all led to gaps in the urban development of this feature. The South Common has interesting herb communities, and the regeneration potential of woody species can be seen at the disused claypits at Burton Road and Cross O'Cliff where dense hawthorn and oak/ash tree cover is very dense. On top of the slope, the odd vacant lot among the industrial and housing estates shows the vestiges of a limestone flora with greater knapweed and field scabious for example.

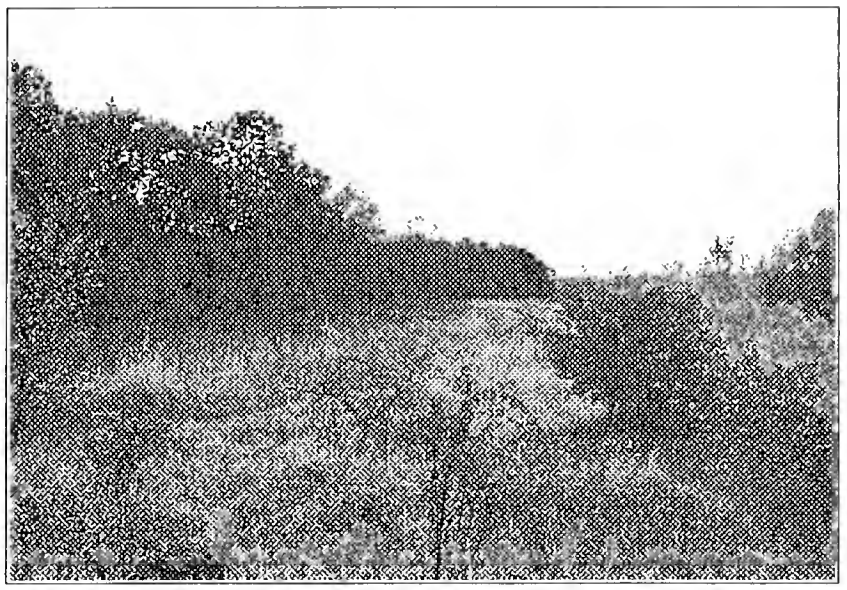
At the foot of the West End scarp slope, the low-lying former fen areas through which the Fossdyke Navigation approaches Lincoln, have been entirely drained. However, the drainage at Pyewipe Fen was only fully completed in the 1960's and the existence of the Boultham Mere reserve has encapsulated much of the fen vegetation. There is currently a large area of arable farming within the fen area, although the majority of this is scheduled for housing development within the next few years. The former Swanpool water body and its associated woodland are to be restored during this development, which will also necessitate new excavations to compensate for the volume of the foundations of the houses. It would probably be advantageous if this water body could be zoned for the sort of water recreation which would be disastrous at Boultham Mere.

Finally the Lincoln Heath, only slightly higher than the fen areas, has been extensively farmed, developed, excavated and planted with conifers so that only the secondary regeneration to be found at the Swanholme Lakes SSSI could really be said to resemble the original habitat. There are a few corners elsewhere in which natural regeneration contains some heathy elements however, such as the Pheasantry, Boultham Moor Wood and areas along the Catchwater Drain. Notably, the maintained screening of Tritton Road has a great deal of gorse which has been absorbed into the amenity framework, the ultimate in maintenance-free landscaping. The extensive birch woods of the former heathland have been reduced to a small fraction by housing developments to the west of Hartsholme, admittedly in an attractive manner where the lower density upper end of the market allows a number of the original specimens to remain.

I will now discuss of some of the best specific sites within the matrix of green spaces within the city. One notable exception will be the Hartsholme and Swanholme complex which is in the hands of the City Council's team of rangers based here at our headquarters and has therefore never been any part of my remit in Lincoln. My working knowledge of it would pay scant compliment to the local nature reserve and SSSI.

Birchwood Community Park

The Birchwood Community Park is part of the former Skellingthorpe airfield and a corner of this once extensive woodland and open space which, although small, is safe from the extensive residential development that has covered the remainder. The City Council



Birchwood Community Park photo Phil Porter

deserve praise for setting up the Community Park and it has much to offer, especially when combined with the neighbouring birch woods of the Hospital Plantation. The whole area is much drier than it used to be prior to development, and rabbits exert a powerful influence on the vegetation of the open areas. Another defining factor is the low fertility of much of the soil area. Topsoil seems to be confined to bunds which punctuate the Community Park in an apparently random pattern and only here is there rank vegetation of rosebay willowherb and tall grasses. This lack of fertility has limited the growth of the extensive plantings of willow and birch that line the pathways. These trees attract redpolls and goldfinches during the autumn and winter. Curiously, they also shelter a small colony of bee orchids and a single twayblade which appear to be growing in little more than rubble

The open grasslands can be divided into disturbed and fairly undisturbed locations. The more undisturbed areas have an interesting flora with grasses either shorn extremely short by rabbits or suppressed by low fertility. Here there can be found common centaury, changing forget-me-not and mouse-ear hawkweed. The disturbed areas have recently been harrowed to prepare for semi-ornamental plantings in the vicinity of the surrounding houses, with species such as *rugosa* roses. This gives rise to an abundance of scentless mayweed, scarlet pimpernel, evening primrose, weld and bugloss.

Despite the drainage history of the Community Park, there are small patches of ground where compression has caused impeded run-off in periods of wet weather and these have patches of rushes. These temporary ponds seem to have a strong attraction for breeding frogs when they appear at the appropriate season, but rarely in my experience has the water remained long enough to allow the amphibians to complete their life cycle.

A fair proportion of the coarser grassy areas are maintained as meadows by the City Council, which has just begun to cut the grass in a similar way to a hay crop, with the cuttings removed. This usually takes place too late in the year to gain the full value of the regime because some of the grass has been laid flat by the elements before the cut and is left behind. Nevertheless it is a step in the right direction. The flora contains ox-eye daisy, musk thistle and red bartsia. Meadow pipits appear to be resident all the year in the largest of these meadows and certainly attempt to breed.

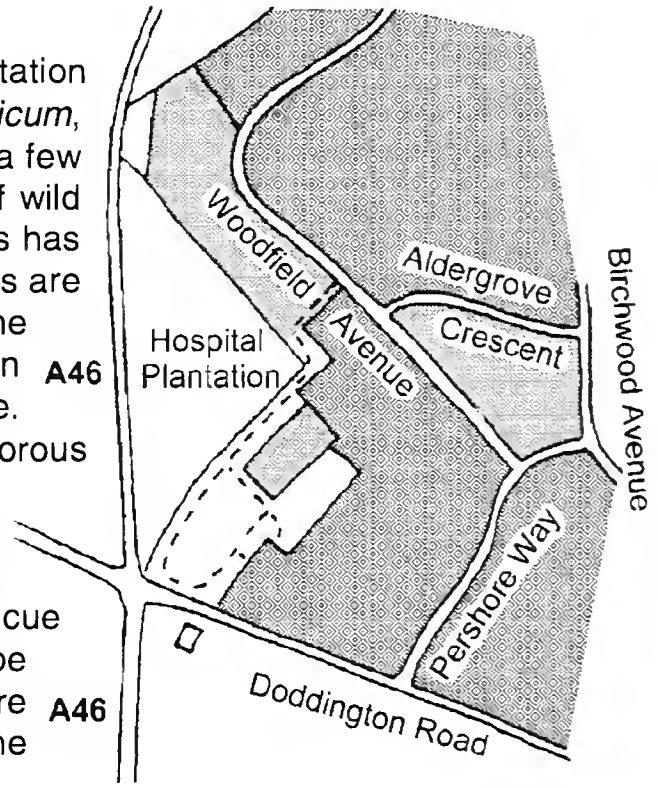
Although the Community Park is a fine provision and safe from housing development, there are other open spaces in Birchwood which merely await their development fate and at least one of these is distressingly good for plants. This lies alongside Woodfield Avenue and appears to consist of heavily compacted clay and sand. In some parts the surface is almost bare and extremely dry and hard. There are some small heaps of sand and gravel. This area contains an incredible density of herbs. Most common is St. John's wort, common vetch and ribwort plantain but there is also a lot of bird's foot, wild carrot, field madder, bugloss, mouse-ear hawkweed and blue fleabane. Less frequently found are bee orchids, sulphur cinquefoil, sand spurrey and corn salad. The only hope for these plants seems to be a soil transfer to the Community Park when the development takes place.

The multitude of flowering plants probably suggests a good invertebrate population in the area. This still remains to be confirmed but I have found the male of the large and distinctive tachinid fly *Alophora hemiptera* (plate 1) which favours hogweed flowers for feeding. The species is parasitic on shieldbugs and the male looks rather like an hemipteran, while the female has a more orthodox dipteran appearance. The picture-wing flies of the Tephritidae which mine plants of various species are also represented. Their patterned wings attract attention as they feed on flower heads. *Orellia falcata* and *Xyphosia miliaria* larvae mine in goatsbeard roots and thistle or burdock flowers respectively. Some *Urophora* species make distinctive stem galls on creeping thistle but I have never seen adults there.

On the ground in areas where the vegetation is short or lacking, green tiger beetles can be found and sand wasps *Ammophila* sp. hunt for butterfly and moth caterpillars. I have swept a few moths at dusk including the cream-bordered green pea, the sandy carpet, the beautiful carpet, the barred red, a conifer specialist, and the small yellow wave, but I have not yet used a moth trap on the site

Hospital Plantation

The adjacent birch woods of the Hospital Plantation have a strongly acid feel with *Rhododendron ponticum*, bell heather and ling, despite the fact that within a few yards of their margins, there is an abundance of wild carrot growing where the concrete of the runways has presumably altered the pH of the soil. The heathers are struggling on the brink of annihilation in fact, as the woodland starts to shade the plants out. They can only be found on the path margins here and there. Much of the floor of the wood is slave to two vigorous colonisers, purple moor-grass and bracken, except where a greater preponderance of oaks makes the shade too dense even for them. Here heath bedstraw is likely to be found among fescue grasses. All of this vegetation is very likely to be kept in check by the local arsonists, and setting fire to this wood is a favourite pass-time during the summer.

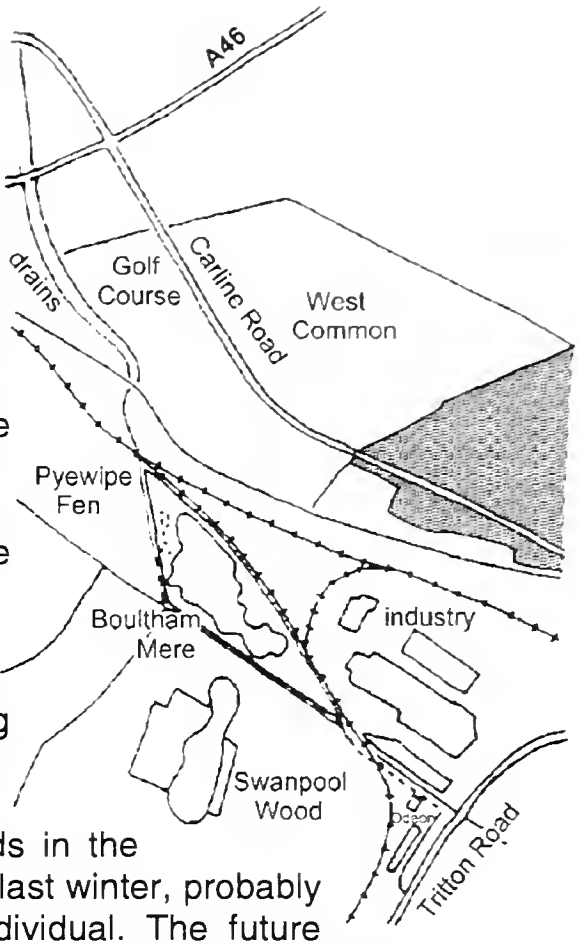


One of the welcome denizens is the slow-worm (plate 2) and I have seen two specimens captured by young children whose freedom had to be carefully negotiated. There is heresay evidence that common lizards can also be found. They are apparently brought in by cats occasionally. A curious occurrence during 1997 was of a coal tit which attempted to nest in a ground level cavity at the foot of a small tree. I don't know whether or not it was successful but it seems unlikely. During the same year, a grasshopper warbler sang for some time on the edge of the wood but again there is no proof of success as this is a very secretive species indeed.

Boultham Mere Nature Reserve (plate 3)

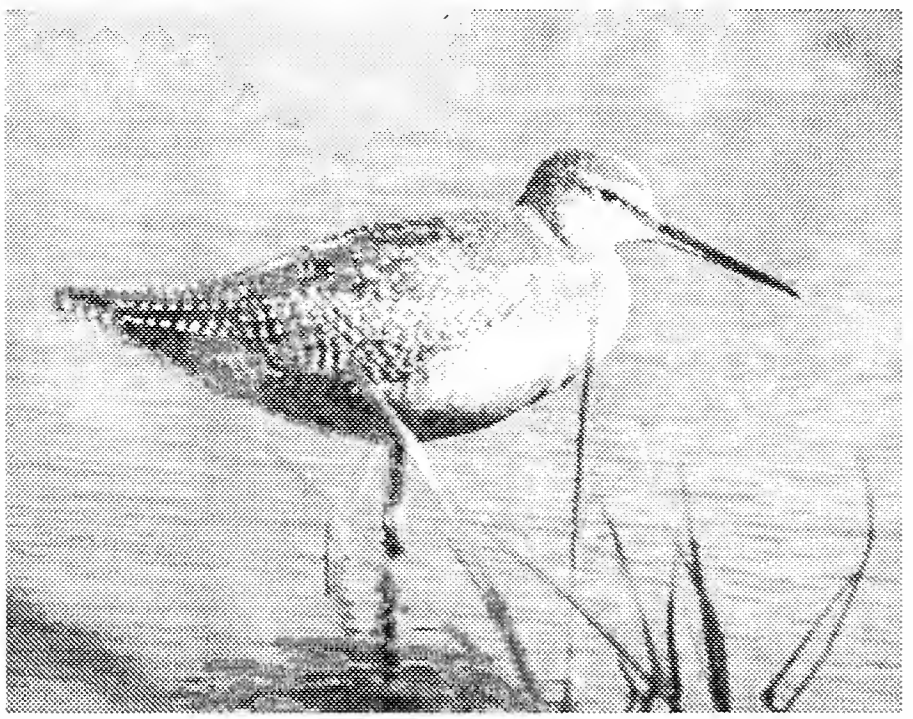
Boultham Mere, the Lincolnshire Trust reserve, has recently been undoubtedly the best recorded site in Lincoln, with the warden Steve Botham making available water bird counts on between 250-300 dates per year, and including a lot of scarce and some rare species. The ballast pit was excavated in the 1850's and therefore constitutes a mature wetland habitat in the lowest part of the Lincoln city area.

Waterbirds comprise a sizeable proportion of those on the extensive list for the reserve and the composition defines the sort of water body that Boultham Mere is. The water is very shallow and freezes within days of a cold snap. As a result, the really specialised birds of the water surface are infrequent because they are generally less mobile and favour deeper water. Grebes are virtually summer visitors in many years and visits by sea ducks are rare. On the other hand, dabbling ducks which enjoy the dense cover can be numerous. Mallard and teal are often to be seen in good numbers, even if they are not particularly obvious when they are feeding, often at night, in the reedbeds.



Until the winter of 1997-8, the previous eighteen years had seen at least one bittern (plate 4) spending some time at the turn of the year, although often interrupted by periods of heavy frost. This made Boultham Mere among the most attractive reedbeds in the county for the bird. Sadly, the sequence was broken last winter, probably due to the death of the most recent wintering individual. The future presence of bitterns may depend on a hard European winter causing an influx of surplus migrants, as the British breeding population is far too small to provide many colonists. At the same time, new five-year funding may be forthcoming to make improvements in the quality of the reedbeds which have received no major management and are in the process of slowly drying out. Specialist advice will be invaluable as to the best way to achieve this.

The fact that the purple heron has twice visited the reserve is another tribute to the habitat. That secretive bird of marshy wilderness, the water rail (plate 5) breeds here, but then again, how the numbers could be accurately assessed is anybody's guess. The species can frequently be seen furtively making its way past the front of the hide, especially in the fading light, and their squealing calls emanate from all parts of the reserve. During the autumn of 1997, its smaller relative the spotted crake took the same route past the hide at about 20:05 for a few days.



Spotted redshank photo Bill Moorcroft

Despite its shallow nature, Boultham Mere only recedes extensively in drought conditions over several years. When this happens, the exposed mud provides a magnet for migrant waders which pass over the area. These are not numerically plentiful, but the range of species is remarkable. During 1996-7, 24 species occurred including red-necked phalarope and spotted redshank and the transient visits of many of these birds simply illustrates the rewards available for intensive coverage.

Boultham Mere is one of the waters where the provision of breeding rafts has encouraged common terns to stay and breed. They do so in the face of competition from black-headed gulls and against the odds, they generally compete successfully for the limited breeding opportunities. This is remarkable as the resident gulls have the chance to set up territories before the migrant terns arrive, but the aggressive persistence of the terns seems to prevail sufficiently for the breeding numbers of the two species to equal out. Interestingly, the terns seem to fish exclusively away from the breeding lake, using the surrounding drainage dykes and the Fossdyke Navigation. I believe that the Whisby colony also declines to fish in the Grebe Lake breeding area.

Kingfishers nest in a specially provided sandy bank which is difficult to reach and provides good security for them. The hide provides plenty of opportunity to see these birds at most times of the year when the water is not frozen.

Among the passerines, reedbed specialists are again prominent and the reed warbler (plate 6) is common, although poor access to the main reedbed makes precise counting difficult. A ringing programme is aimed at finding out the true number. There have been two rarities among the warblers over the years, when Savi's warbler and marsh warbler have been located by song. During the winter of 1996-7, a flock of bearded tits stayed for about eight weeks. Although this was also an isolated occurrence, the second record in fact, all these reedbed birds together suggest that Boultham Mere is of great importance.

Boultham Mere has been the site of a concentrated moth survey, and between us Steve Botham and I have amassed a total of 380 species from numerous trapping sessions. This contains a number of notable species including 26 species of the leaf-mining micro-moths identified by Rex Johnson from the marks they leave as larvae on their food plants

The site is famous for its fresh water plants, such as great water parsnip which is frequent in its favoured areas. Greater bladderwort does not always flower and is difficult to locate in its off-years. Lesser spearwort is quite common, while yellow loosestrife abundant at the moment in recently cleared willow coppice on damp or wet ground. Water violet flourishes in its special place and lesser marshwort, being very difficult to find, may be more common than it appears. Purple willow is quite common in certain areas but lesser water plantain has not been seen for several years now to my knowledge. The lesser reedmace is a major element in the marginal vegetation and seems to dominate the greater species which is confined to a few corners. The form at Boultham Mere is in the shorter range of the species, being about five feet tall, whereas at Whisby Nature Park, the biggest stand is much taller. Reed is quite extensive but the main bed is of very difficult access and really needs some management, although another problem is to find a time when there is not an important species in residence.

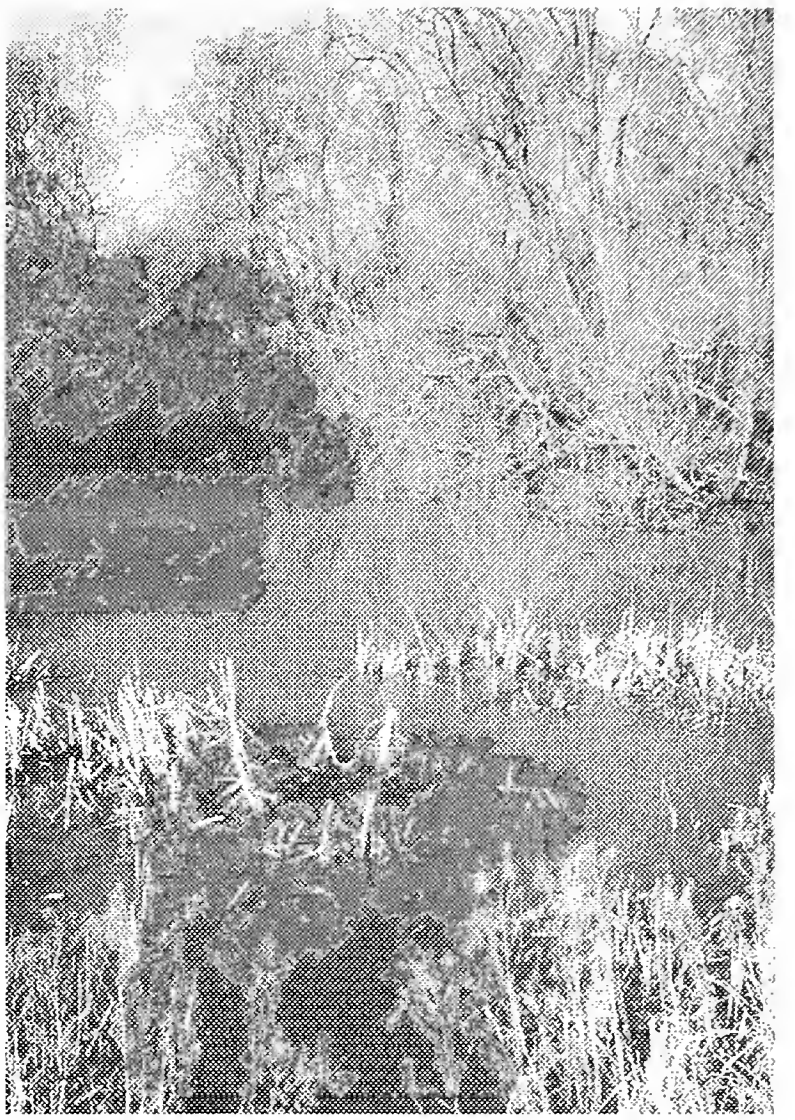
The western shore is the main conservation area and three years ago, broad-leafed helleborine made an appearance and now seems established so there are always novelties to look out for. The drains to the south and west of the reserve are a stronghold for both the red-eyed damselfly and the variable damselfly. The former appears to be spreading in the county. There is usually no great problem in finding the variable damselfly in suitable weather along the southern boundary of the reserve. The distinctive abdominal markings need to be confirmed to distinguish it from the other blue damselflies.

Witham Valley

The Witham Valley south of Lincoln to the city boundary forms a considerable green wedge in towards the Cathedral, gradually becoming more and more urban, but with points

of interest even up to the Brayford Pool.

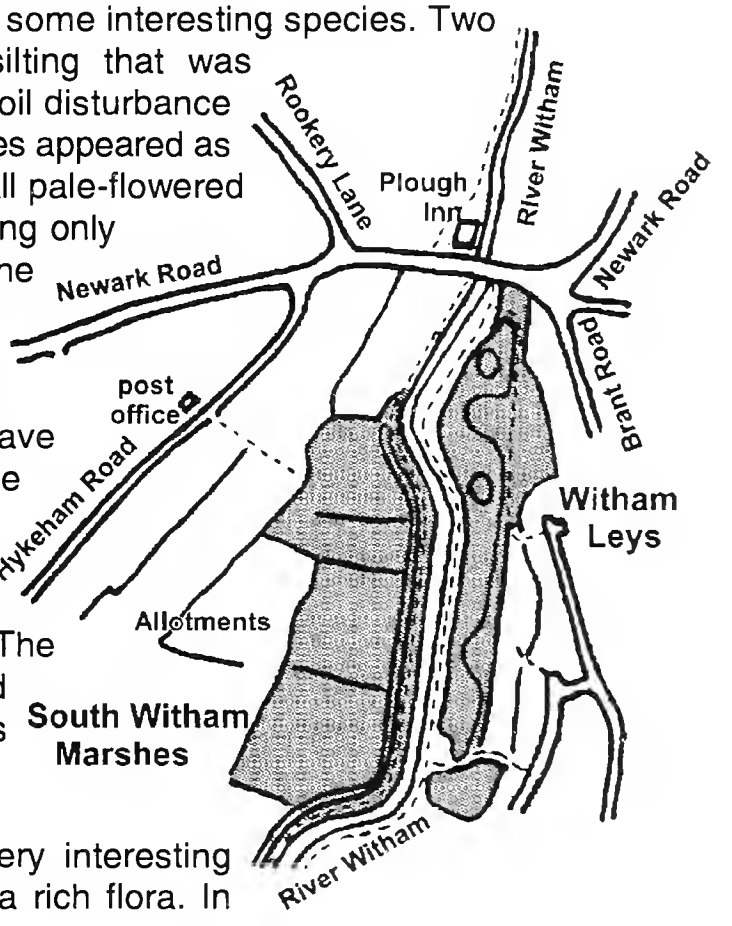
South of Brace Bridge there is much to be grateful for. The fishponds at Witham Leys need to be investigated for invertebrates. Higher plants and animals recently recorded are not exceptional but the one-time ornamental parkland has gradually returned to nature in the present century. There may have been enough continuity of mature trees here to indicate valuable invertebrate populations. The mature trees betray the ornamental origins and Norway maple, horse chestnut and Turkey oak dominate the area. Unusually for urban 'woodland', there are no sycamores but the Norway maples are almost equally prolific in their seeding. Colonies of redcurrant and garden dogwood clothe the ground under the trees. Warblers include garden, sedge and blackcap. There are dense beds of reed sweet-grass and greater reed-mace .



Witham Leys photo Phil Porter

To help cope with the heavy public use, a stone footpath has been built through the site. There are mature hawthorn hedgerows here which provide feeding for winter thrushes, while large alders also attract siskins and kingfishers are sometimes seen here.

Although it lacks outstanding plants, there are some interesting species. Two of these are related to an extensive de-silting that was necessary a few years ago which resulted in soil disturbance and dredging. Subsequently two garden escapes appeared as the site began to clothe itself. A species of small pale-flowered 'love-in-a-mist' remains to be identified, growing only a few centimetres tall. The other invader is the garden carrot which grows in fair abundance at the moment amongst increasingly luxuriant waterside vegetation which must surely smother the plants soon. Some of the roots have served to compensate regular volunteers on the site! Almost as curious are the plants of enchanters nightshade which lined the paths even before the disturbance. These might also have arrived among garden throw-outs. The water-side flowers can be very prolific and include water chickweed and skullcap as less usual species.



On the other side of the river, there are very interesting meadows and drainage ditches which carry a rich flora. In

parts they are extensively reverting to a dense scrubland of roses, willows and birch. The most interesting meadow areas contain devil's bit scabious, sneezewort, tormentil, greater burnet and meadow-rue. This community indicates a slight acidity in the soil reaction. One of the first floral displays of spring is pignut which is very numerous. The amount of this species makes it disappointing that the chimney-sweeper moth which feeds on pignut has not been seen yet. It is not long before the leaves of great burnet show themselves in even greater numbers away from the river whilst the more familiar meadowsweet clothes the wetter section. By the time these come into flower, there is a fine colourful display with vetches, bedstraws, knapweeds and thistles.

Flooded meadows by the Witham photo Phil Porter

The drainage ditches are subject to a five year management cycle of clearing by the Upper Witham Internal Drainage Board and this seems to maintain the water violet, tubular water dropwort, ragged robin, marestail, brown sedge, creeping jenny, marsh woundwort and marsh marigold, however violent the effects appear when the machine has just left the site. The material removed from the drain bottom is deposited on the bank, so that very little is actually lost. The plants are actually easier to monitor during the years just after the delph has been cleared. At this time a population of smooth newts can also be appreciated as the clarity of the water is excellent. The ruddy darter seems to be getting commoner in the county and was present during the summer of 1997. This area could also be rewarding for invertebrate survey should the opportunity present itself.

In other parts of the valley, there are fields which still act as flood plains although the inundations quickly drain away and generally attract little more than a flock of gulls in the meantime. The housing of the Calder Road area is just too close to expect that standing water would be welcome for any length of time. These fields are used for horse grazing at a very high density and have been spoiled for the time being, but the ditches that intersect them still contain many of the plants mentioned above and should there be a change in land use, these grazing fields have huge potential.

As the Witham flows further north past Newark Road towards the centre of Lincoln, the buildings close in somewhat, especially on the east bank, where there is very little access, but the opposite bank still has a lot to offer. Before long the marginal vegetation includes quite a colony of flowering rush (plate 7) and the shallows have a small quantity of arrowhead. This stretch of river is good for banded demoiselle damselflies. The western bank is backed by grazing paddocks as far north as Boultham Park and I have not investigated these so far.

The riverside section of Boultham Park has large crack willows in profusion which provide good foraging for treecreepers and woodpeckers with their deeply fissured rough bark. This area is well known as the haunt of lesser spotted woodpeckers and remains the only place where I have managed to see this shy species in the county. Other notable birds might include siskins although they are even more reliable among the mature alders which surround the park lake in the formal section. However unpromising this concrete basin might seem, it can play host to wildfowl such as shoveler wigeon and even goosander The Canada geese that can be found here taking scraps from the visitors mostly belong to one of the attractively proportioned small races of the species. The conifers in the pinetum nearly always hold goldcrests and coal tits, sometimes in good numbers. The wild riverside area has one notable plant, small balsam which glows in a clearing. There is also a patch of ragged robin in the drainage ditch which runs parallel to the river.

Greetwell Hollow

The old quarry workings at Greetwell Hollow provide the best experience of limestone grassland to be found in the city. The hills and hollows of the oldest workings have grassed over and provide grazing for cattle despite the proximity of the Outer Circle industrial estate. A small stream flows through the site, settling into two marshy areas of different character as it does so. There are extremely dense scrub areas in some of the hollows while the disturbed habitats of the oldest of the modern workings are producing interesting flora as their regeneration proceeds.

Greetwell Hollow is probably best known for the sometimes large numbers of bee orchids there. The populations are changing their location at the moment and the largest numbers have moved from the permanent grassland of the oldest workings to more disturbed sites which is a cause for concern as their future is far less assured there. It might have been predicted that such an opportunistic species would colonise the newly created lime-rich surfaces in the bottom of the newly disused quarry, but why should they have started to disappear from the older grasslands at the same time? Other calcicoles include stemless thistle, purging flax, field scabious, and very rarely, salad burnet. The small stream contains a patch of bog pondweed which is lime-hating. There are four less usual umbellifers; knotted hedge parsley, wild parsnip, rough chervil and fool's parsley.

The bird life of Greetwell Hollow has been reported sometimes on a daily basis by Brian Eke and there have been surprises as a result. Barn owls and little owls thrive in the quarry areas and their pellets would tell much about the small mammal and beetle populations if their roosting places could be found. Thrushes can collect into reasonable flocks for feeding and roosting, especially redwings and fieldfares, while the marshy areas support both species of snipe and in winter, green sandpiper could also turn up. The security

Brambling photo DAR

of the lower marsh with its thick beds of reedmace also tempts water rails. Sometimes a 'spring' of teal can be found, and seed-eaters such as brambling and reed bunting might join the parties of commoner finches in the winter. There is usually a good passage of wheatears as the quarry resembles their breeding habitat, and their congener the meadow pipit breeds here quite commonly. Other interesting visitors include the grey wagtail which often spends the winter on the stream and a black redstart which mistook the quarry face for its native mountain ledges several years ago.

Boultham Moor Wood

Boultham Moor Wood is a feature which thousands of people drive through every day, probably without realising how impressive are some of the trees within its borders. Sadly, they would not suspect how roughly the wood has been treated either. Situated just north of the Sainsbury supermarket on both sides of Tritton Road, the wood now barely betrays its heathy heritage, but there are people who can remember the present caravan retail field adjoining the wood when it was pink with bell heather. Now all that remains in the wood is a pathetic remnant fading away under an increasing tree canopy near to Sainsbury's. This scrap does not seem to have the energy to reproduce itself from cuttings as I did try this a couple of years ago.

Boultham Moor Wood photo Phil Porter

There is a site where re-establishment of bell heather would be appropriate. On the eastern flank of Tritton Road lies a tiny area of gorse and broom where no trees grow and this little heath is being kept open by grass cutting. Even in this tiny area, such grass cutting is a time consuming job, but in the absence of grazing of any kind, very necessary to maintain any of its special character. Although rabbits must be abundant in the nearby railway embankment, there are just too many dog walkers for them to be comfortable and Tritton Road is too busy for them to penetrate to the eastern side of the wood.

It was very rewarding when a plant that characterises the desired habitat, heath bedstraw, appeared during the summer of 1997. It was probably hanging on un-noticed among the coarse grasses that had been building up. Although this small success was welcome the reason for carrying on the management also lies with the interest that can be generated in the idea of maintaining an example of a previous landscape, albeit in extreme miniature, for the benefit of young people in the area. It may help schoolchildren appreciate the dynamics of landscape evolution as it is affected by man's influences.

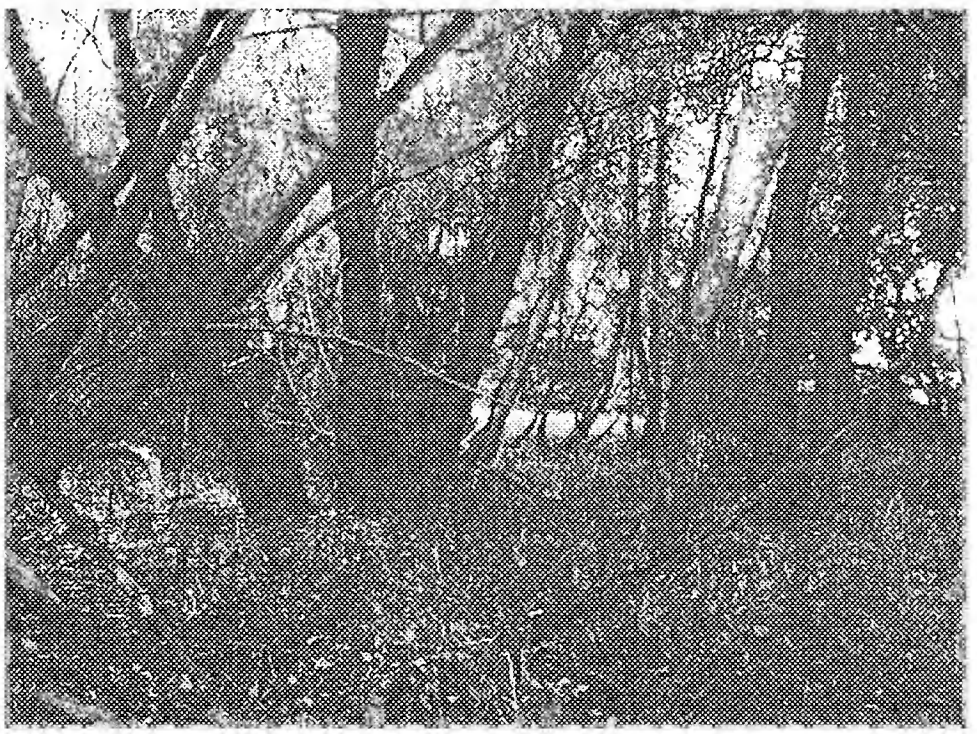
It is a characteristic of urban woods and wasteland that many of the plants are the result of throw-outs from surrounding gardens. These in Boultham Moor Wood are honesty, star of Bethlehem, crocus, tulip and hyacinth, Spanish bluebell and the garden variety of yellow archangel, which finds itself well at home in the shady conditions. There are a few tree

species which indicate that some planting may have taken place, such as beech, spindle (one plant) and bird cherry.

The native trees of the wood are now more numerous than ever before if old maps of the area can be taken as evidence. The birch and pedunculate oak which comprise the majority of the naturally wild regenerating trees have only comparatively recently changed its character from heathland to woodland. There is no sign of the woodland floor indicators of mature woodland, even though some of the oaks are quite old. They presumably grew up as field or hedgerow trees. The gradual decay of the birch trees as the canopy closes over has encouraged great spotted woodpeckers to remain in this busy woodland. The horse's hoof fungus is also prominent.

Pike Drain Marsh

Not far away from Boultham Moor Wood lies a wet woodland of quite different character. Pike Drain Marsh is overgrown and neglected having come into existence when shallow pits were partly filled in with rubbish and then left to colonise after building had cut off the road access for further tipping. There are marshy depressions with much reed sweet-grass framed with clay banks and intermediate levels, but much of the site is so overgrown with mature willows of the 'crack' type, with major limbs and branches broken off with age and lying in a tangle on the ground or propped up at all angles, that the lie of the land is far from evident. There are also several oaks of some age but younger than those in Boultham Moor Wood. A feature almost unique in the city is an area of mature hazel *Corylus avellana* plants. Not surprisingly, they show no sign of ever having been coppiced. The drier parts of the complex have birch, gorse and broom.



Pike Drain Marsh photo Phil Porter

Characteristic birds include jays great spotted woodpecker and willow tit. The Pike Drain runs past this habitat and suffers dreadful abuse along this stretch, although the effect from the variety of appliances and furniture which are regularly dumped is superficial. It contains a variety of common water plants, and at least once I have seen a kingfisher hazard a flight along the drain.

West Common

West Common provides one of the great green wedges that characterise Lincoln. It sweeps down from near the top of the Lincoln Edge towards the fenny area of Pyewipe and in its original form must have held a wide variety of plant life from the calcareous upper slopes to the acid sands of the lower levels. The latter habitat is the one best represented these days. Horse grazing at a considerable density has been more destructive of the variety of grassland plants on the upper slopes. The golf course sweeping down to towards the Fossdyke holds several good species such as tormentil, devil's bit scabious and sneezewort though all these are subject to the management of the

course to determine the extent of their flowering and may only have a brief blooming or a very short stature. The harebells do better being located along the edge of the former racecourse. These acidic areas are less attractive to the horses.

The verges on Carholme Road are one of the many sites where winter gritting is providing habitat for coastal plants, in this case Danish scurvy grass which is a feature during the early summer, thriving in the saline conditions. One of the major features of the upper slopes is the row of mature elms which have survived the ravages of Dutch Elm disease. Presumably this survival indicates a genetic resistance to the fungus.

South Common

At the other end of town, South Common also has horse grazing and a golf course to bear. The pathway on the crown of the escarpment which forms part of the Viking Way also has fine elm trees, accompanied by ash of a similar age. The pronounced spring line a little way down the slope has not been running freely in recent years and the ponds which used to collect in hollows have been mere damp rushy patches. The recent increase in rainfall may remedy this. The larger permanent ponds near the base of the slope have been landscaped and fenced but still serve as a focus for the birds to drink and bathe.

West Cliff

The West Cliff of Lincoln has always been an area of cattle grazing, with hawthorn hedges delineating paddocks. These days only a few horses remain. The former brick pit near the top breaks the slope running down from Burton Road. The whole depression is thickly overgrown with scrub and is one of the most reliable places in Lincoln to see sparrowhawk. The bottom of the pit sometimes collects water but it seems to me that there must be a complicated ground structure here as the depth of water present seems to have no relation to the amount of rainfall. In any event the bed of the pond is usually grassed and often dry. There is a stand of Himalayan balsam in one of the very inaccessible parts.

Away from the pit, ungrazed paddocks are gradually becoming coarser and coarser and scrubbing up with hawthorn and elder. The original hedgerows are full of large specimens of both these species, and in winter there is usually a concentration of Scandinavian and native thrushes which feed on the berries for as log as they last and roost in the security of the scrub. During the summer, the thickets hold blackcaps and garden warblers and the hedgerows lesser whitethroats, with common whitethroats in the bramble patches.

There are a few patches of short turf where rabbits or Allen scythes crop the grass and typical flowers include meadow vetchling, tufted vetch, pignut, lesser knapweed and lady's bedstraw. An interesting plant can be found around the two seasonal ponds, depending on the degree to which they dry out during the summer. When the depressions are left as damp mud by August, the trifid bur-marigold can be found. If the pond retains water to any depth there are none, and if the mud dries out completely, the plants are very small.

Doddington Road Industrial Estate

Some locations seem very unpromising for plants but yield the odd interesting species. One such area is the Doddington Road industrial estate. One field seems relatively undisturbed and there are abundant lesser knapweed and wild carrot among the fairly coarse grasses which are grazed by tethered horses. Liberally scattered throughout this field are clumps of hedge bedstraw which is most unusual in the area. Directly adjacent is a very disturbed plot with sandy soil, heavily colonised by annuals, and on one particularly bare patch there is a colony of annual knawel. No doubt these plants will eventually go under as the vacant lots are taken up.

Boultham Moor

Boultham Moor lays no claim to being anything resembling its original form. The site bearing that name consists of a capped tip, resulting in a considerable gap in the built-up area of Moorland Avenue. The open rough grassland is mowed occasionally by the local authority to prevent a fire hazard following a momentous blaze a few years ago and this is beginning to reveal quite an interesting flora. Musk thistle, common spotted orchid, common St Johns wort, field scabious, toadflax, soapwort and hare's tail clover can all be found in greater or lesser quantities among the increasingly fine grasses.

Industrial Land

As the Witham Valley leaves Lincoln downstream to the east, the land-use is chaotic with industrial estates, railway corridors, rubbish dumps and scrap yards interspersed with derelict land, including former railway land. This area is still to be fully investigated but there are surprises. Viper's bugloss is almost characteristic of some of the derelict niches, often accompanied by wild mignonette. The broad-leafed everlasting pea sprawls over many a pile of broken concrete. A plant requiring further investigation this year appears to be hybrid of creeping cinquefoil and tormentil. Wild clematis can be found in the vicinity of the railway station.

There is anecdotal evidence of the presence of common lizards in this area away from the worst human disturbance, where broken concrete provides hot basking platforms. There may well be an interesting hymenopteran population, given the relative abundance of flowers and bare-ground nesting opportunities in this forgotten hinterland.

Future Study

There is much to investigate in all areas of the city, especially in the invertebrate world. One ambition that I have is to set out moth trapping in a range of sites during the summer of 98 and subsequently. There are gardens which abut green sites of interest which will provide safe sites for automatic traps which can be inspected during the following day. Other invertebrates should also be sampled as the opportunity arises. These are the fields in which new discoveries must surely follow as they have at Boultham Mere, and new information is bound to colour preconceptions about how the green spaces should be managed for the greatest biodiversity. Of course, the cause of many invertebrates is often difficult to pursue in urban sites where the goodwill of communities is often the major factor in directing how the site develops. Our less conspicuous species are not likely to have intrinsic value in this case where the public are concerned. Nevertheless, the species profile will have much information for us to interpret in helping to safeguard the matrix of wildlife resources in the city. I hope that some new results will feature in future issues of 'The Lincolnshire Naturalist'.

Phil Porter, the 104th President of the LNU in 1997/98 is the Lincoln Green Environmental Partnership Officer for the Lincs Trust. He presented this paper as his Presidential Address at Hartsholme Visitor Centre, Lincoln, on 21st March 1998.

BIOLOGICAL DATASETS AND COLLECTIONS IN LINCOLNSHIRE

Roger Key & Dave Bromwich

Now that it seems likely that a county-wide Local Biological Records Centre may be set up for Lincolnshire, eventually to connected to the rest of the country by a National Biodiversity Network, it would seem that the time is ripe to take stock of what information

as already been gathered together on Lincolnshire's wildlife. Our aim is to lay down a marker on the state of biological recording in the county at a single point in time and record the whereabouts of as many significant datasets and collections as we can locate.

We designed and circulated a form amongst all those known to hold information on Lincs biodiversity, including all the LNU recorders, the Trust, museums and statutory bodies with the request for details of data holdings and collections, asking for further details of earlier recording, the state of the data and what provisions had been made for its future safe keeping. The results are summarised below, group by group and we thank all those who contributed information. More detailed meta-data are held by the authors and will be passed to the Records Centre when it is formed. Although an attempt was made to be as comprehensive as possible, no doubt we missed significant datasets, references and collections. If anyone spots information that we have missed, please contact the authors.

Fungi 56,000 species in GB, 2450 known in Lincolnshire.
Recorder: LNU & British Mycological Society. Mr Ken Rowland, 2 Dene Close, Skellingthorpe, LN6 5SU 01522 686900. **Earlier recorders:** WW Fowler 1880s. HCW Hawley 1907. GM Waterhouse 1943-1965. HJ Houghton 1966-1996. **County Flora.** In prep. **Dataset.** All records are computerised using Microsoft Access at the recorder's home and BMS, supported by species cards. 41400 records, 660 sites and 322 recorders.

Lichens 1576 species in GB, 294 in Lincolnshire
Recorder: LNU. Prof. Mark Seaward. University of Bradford. Bradford BD7 1DP. 01274 234232. **Earlier** recorders: see flora. **County Flora.** Seaward 1980. **Dataset.** 12960 records held on loose leaf files as lists and maps, transferred to 10km cards arranged alphabetically by species at home of the recorder. Grid references only for records have been transferred to a customised PC system at University of Bradford and those data are destined for British Lichen Society. **Significant collections & location:**- Personal herbarium collection held by Recorder, content described on Web. Recorder has also assembled LNU collection. Other collections documented in county flora.

Algae 5500 species in GB, unknown number in Lincolnshire.
Recorder: Environment Agency. Dr Bill Brierley, Waterside House, Waterside North, Lincoln LN2 5HA. 01522 513100. **County Flora.** None known. **Dataset.** Post 1989 records generated by EA are fully computerised using the EA's custom system at the above address. All paper records are kept variously at Lincoln and Spalding EA Offices. **Significant collections & location:**- Samples and reference collections maintained at EA Laboratories at Spalding and Lincoln. There is an herbarium of seaweed specimens at Rumbold St. Data on Charophytes are held at the Natural History Museum, London.

Bryophytes 1037 species in GB, 390 Lincolnshire
Recorder: LNU. Prof. Mark Seaward. (see Lichens). **Earlier** recorders: see flora. **County Flora.** Seaward 1983. **Dataset.** 9285 records held on loose leaf register dating back 100 years. Records transferred to 10km cards and maps arranged alphabetically by species at home of the recorder. Grid references only for records have been transferred onto computer to the British Bryological Society. **Significant collections & location:**- Personal herbarium collection held by recorder, content described on the Internet. The recorder has also assembled an LNU collection.

Ferns & Seed Plants 3354 taxa in GB, 1221 in VC53, 1366 in VC54
Recorder: LNU/Botanical Society of British Isles. Mrs Irene Weston, Lindhris, Riseholme Lane, Riseholme, Lincoln. LN2 2LD. 01522 543419. LNU Mr Marson Peet, Meadow's Edge, Rumbold Lane, Wainfleet. **County Flora.** Gibbons, 1975. Gibbons & Weston, 1985.

Dataset. All records up to 1994 are with the Biological Records Centre, Monks Wood, including those collated for the 1960 Atlas, the Scarce Plants project (1987) and the Monitoring Scheme (1994). Those for the Atlas 2000 project are currently with Mrs Weston and will be computerised at the end of the project. The Trust has a large dataset of records, mainly from its reserves, part computerised using Recorder. Data for the south of the county are being computerised by Richard & Kaye Heath, 56 Pennytoft Lane, Pinchbeck. **Significant collections & location:**- A large herbarium in the old museum was damaged by water seepage and is now with the City Council.

Dragonflies 48 species in GB, 25 known in Lincolnshire.
Recorder: LNU/British Dragonfly Society. Mr John Redshaw, 7 Fennell Road, Pinchbeck, Spalding, PE11 3RP 01775 768227. Assisted by D Bromwich, 8 Craven St, Lincoln.. **Earlier recorders**: **County Fauna**. Bee (1917) Chapman & Wilson (1983) Redshaw (1993). Bromwich (1996). **Dataset.** Records on species cards and maps at the recorder's home, supported by annual diaries, BRC cards, lists and letters, duplicated at home of D Bromwich, currently being input to Recorder. **Significant collections:**- none known.

Grasshoppers, Crickets, Cockroaches & Earwigs 46 species in GB, 16 in Lincs.
Recorder: Mr Brian Redman, 31 Garfits, Boston, PE21 7EU. 01205 351406. **Earlier recorders**: none known. **County Fauna**. none known. **Dataset.** Information being collated by recorder. **Significant collections:**- none known.

Bugs & Hoppers bugs - 556 species in GB, 276 known in Lincolnshire. Hoppers - 1150+ species in GB, unknown number in Lincolnshire.
Recorder: Dr Peter Kirby, 21 Grafton Avenue, Netherton, Peterborough, PE3 9PD 01733 265043 keeps records and is prepared to look at specimens. Shield bugs are recorded by (LNU) Annette Binding, 6 Willow Court, Washingborough. Lincoln, LN4 1AS. 01522 793684. **Earlier recorders**: E Woodthorpe, JE Mason, 1880s. A Thornley Roebuck, 1930s. **County Fauna**. Mason (1888), Roebuck (1935), Kirby (1988). **Dataset.** File of notes and lists held by Dr Kirby at his home. Shield bugs are fully computerised on Recorder at the home of Mrs A Binding, with 639 records of 18 species. **Significant collections & location:**- Dr Peter Kirby, Mrs Annette Binding (addresses above). Roger & Rosy Key, (see beetles).JE Mason collection at City Museum Rumbold Street Depot.

Beetles 4100 species in GB, 2044 known in Lincolnshire.
Recorder: LNU Dr Roger Key, 67 Peterborough Road, Crowland, Lincs PE6 0BB 01733 210541, assisted by Annette Binding. **Earlier recorders**: WW Fowler 1880s. A Thornley/W Wallace 1890s-192?0. 1940s-1960s EC Riggall. **County Fauna**. Thornley & Wallace (1908-1914) summary Key 1993. **Dataset.** Records are fully computerised using Recorder package at the recorder's home, fully supported by original paper copies and literature sources. 25,000+ records from 1047 sites, 272 recorders and 249 literature sources. An earlier dataset (referred to by AT/WW & ECR as "the records") has gone missing. Environment Agency, Spalding have large dataset of aquatic species, computerised on custom system. Balfour Browne Club c/o Scottish Agricultural College have large dataset of waterbeetles being added to Recorder. **Significant collections & location:**- WW Fowler & A Thornley. Nottingham Museum. W Wallace - Lincolns CC, Rumbold St depot, Lincoln. EC Riggall - sold to Watkins & Doncaster in 1970s and subsequently broken up. Roger Key, address above. Annette Binding, 6 Willow Court, Washingborough. J Bratton, Countryside Council for Wales, Bangor. D Bilton (water-beetles) Plymouth University. Lincs material also at Doncaster Museum (Waterhouse Collection), Manchester Museum © Johnson), Hope Dept. Museum, Oxford University (MWR Graham).

Butterflies 71 species in GB, 41 known in Lincolnshire.
Recorder: Two organizations record butterflies. LNU: Mr Allan Binding, 6 Willow Court, Washingborough, Lincoln, LN4 1AS. 01522 793684. Butterfly Conservation: Mr Mark Tyszka, 10 Riby Road, Keelby, Grimsby, DN41 8ER. 01469 560678. **Earlier recorders**: see Duddington & Johnson (1983) p255 for 14 county recorders since 1893. **County Fauna**. Mason (1905-1908), Duddington & Johnson (1983), Johnson, (1997). **Datasets.** LNU records fully computerised using Recorder at recorder's home, part supported by paper copies and literature. 46,896 records from 545 sources. Butterfly Conservation 1994-1997 records computerised on the *Levana* database. Paper records with sites, transects & records back to 1970s. **Significant collections:-** JH Duddington at the home of Rex Johnson, 23 Church Street, Messingham, Scunthorpe. Significant collections at the Rumbold St depot, Spalding Gentleman's Society, and Scunthorpe & Louth museums.

Moths 2600 species in GB, 1530 known in Lincolnshire.
Recorder: LNU. Rex Johnson, 23 Church Street, Messingham, Scunthorpe, DN17 3SB 01724 763349 **Earlier recorders**: see Duddington & Johnson (1983) p255 for list of 14 county recorders since 1893. **County Fauna**. Mason (1905-1908), Duddington & Johnson (1983), Johnson, (1997). **Dataset.** LNU records are being progressively computerised using Recorder package at the recorder's home, fully supported by original LNU journals, species cards, diaries etc. Paper records include single species and site cards, most at the recorder's home, others archived at the Stamp End Depot of ?LCC. National Rothamstead Moth scheme has Lincolnshire data from Riseholme and Saltfleetby. Woodruffe-Peacock diaries at Oxford University also have data. Some early data were summarised by Jeffs and was then destroyed. **Significant collections & location:**- JH Duddington at the home of Rex Johnson. REM Pilcher at the Natural History Museum, London. JE Mason at City Museum Stamp End Depot. Reference Collection at Scunthorpe Museum including material from JH Duddington & RS Key. There is also material at Caistor, Louth & Market Rasen museums, at Gibralter Point and Far Ings Field Centres and at the homes of numerous moth recorders throughout the county.

Sawflies 500 species in GB, 75+ known in Lincolnshire.
Recorder: Dr David Sheppard, 10 Stainfield Road, Hanthorpe, Bourne, PE10 0RE 01778 570573. **Earlier recorders**: EAW Peacock, A Thornley, A Roebuck, C Morley, MWR Graham. County Fauna. Thornley (1899), Roebuck (1938). **Dataset.** Records are currently on species cards and maps at the recorder's home, arranged taxonomically and are being added to from the national dataset, supported by lists, letters, reports & publications. **Significant collections & location:**- David Sheppard, address above. Hope Dept. Museum, Oxford University (MWR Graham collection).

Parasitic Hymenoptera Approx 4000 species. Lincolnshire total unknown.
No recorder. Significant collections & location:- Dr S G Compton, Leeds University, has data and collection of *Chalcidoidea* from a number of sites, willed out of the country. The Hope Dept. Museum, Oxford University, may have material from MWR Graham.

Ants/wasps/bees 630 species in GB, 274 known in Lincolnshire.
Recorder: LNU Dr Michael Archer, 17 Elmfield Terrace, Malton Road, York. YO3 0EH. 01904 424773. **Earlier recorders**: JW Carr, CF George, A Thornley, MWR Graham, HP Jones, H Britten. **County Fauna**. Graham (1941). Summary Archer (1997). **Dataset.** Records are on taxonomically ordered species cards at the recorder's home, supported by recorder's lists copies of literature sources etc. Ca 2500 records from 35 recorders and 37 literature sources. Records may soon be input to a computer database, most likely Biobase. **Significant collections & location:**- Dr Michael Archer, address above. Lincs

material also at Manchester, Leeds, Nottingham, and Liverpool Museums.

Flies ca 6000 species in GB, Lincolnshire total unknown
Recorder: LNU Diptera overall. Mr Andrew Godfrey, 90 Bence Lane, Darton, Barnsley, S. Yorks. S75 5DA. LNU Hoverflies & larger Brachycera. Jillian Mears, 6 Leatham Royd, Manchester Road, Marsden, Huddersfield HD7 6HA. **Earlier recorders**: A Thornley, JE Mason JH White. **County Fauna**. White (1947). **Dataset.** Records are being systematically computerised on Recorder at the home of Jillian Mears. Approximately half of available records have been computerised to date. Most original information is in the form of site lists, notebooks and letters at the home of Andy Godfrey. Currently approximately 4900 records from 35 recorders and 10 literature sources. Research into historical records is continuing. The Environment Agency may have data on the Chironomidae. **Significant collections & location:**- Doncaster Museum (P Skidmore). Wallace collection at the Rumbold St. depot. Private collections: Andy Godfrey, part of larger national collection. Jillian Binding, John Flynn (Grimsby), Bill Hoff (Grebby), Martin Drake (Market Deeping), John Bratton (CCW Bangor), Alan Stubbs (Peterborough) have all recorded in Lincs.

Spiders 620+ species in GB, 222 known in Lincolnshire.
Recorder: LNU none. Current collator, Mrs Alexis Spencer, Hollytree Farm, Croft, Skegness. PE24 4SH. 01754 810273. **Earlier recorders**:,G Whatmough, R Kent. **County Fauna**. None known. **Dataset.** Records are on taxonomically ordered species cards at the home of Phil Porter, supported by recorder's lists copies of literature sources etc. 2573 records have been entered onto Recorder and are housed at the home of Roger Key (see beetles). **Significant collections & location:**- That of Mr G Whatmough, currently located with Mr Rex Johnson, 23 Church Street, Messingham, Scunthorpe, DN17 3SB.

Woodlice 36 species in GB, 17 known in Lincolnshire.
Recorder: LNU Neil Pike, c/o Lincolnshire Trust, Banovallum House, Manor House Street, Horncastle. LN9 5HF. 01507 526667. **Earlier recorders**: R Johnson. **County Fauna**. None known. **Dataset.** The British Isopod Study Group visited a number of sites in Lincolnshire in October 1993, but data have not been received back into the county.

Centipedes and Millepedes 146 species in GB, 40 known in Lincolnshire.
Recorder: LNU Neil Pike (see woodlice). **Earlier recorders**: None. **County Fauna**. None known. **Dataset.** The British Myriapod Group visited a number of sites in Lincolnshire in October 1993, but data have not been received back into the county.

Non-marine Molluscs 202 species in GB, 147 known in Lincolnshire.
Recorder: LNU Mr John Redshaw, 7 Fennell Road, Pinchbeck, Spalding, PE11 3RP 01775 768227. Assisted by Mrs Vi Wilkin, Beckside, Hibaldstow, Brigg, DN20 9EQ in the north of the county. **Earlier recorders:** CS Carter & JF Musham variously 1905-1943. **County Fauna**. Carter (1905). **Dataset.** Records on 10km square cards and maps at the recorder's home, supported by diaries from 1970. **Significant collections & location:**- Collections of EJ Redshaw, EC Riggall, CS Carter (part) & JF Beetlestone are held at the recorder's home (address above). These are destined for Leeds City Museum, unless a curated home in Lincolnshire is found. JF Musham & CS Carter (part) collections at Rumbold St. V Wilkin, collection at home. WD Roebuck collection at Leeds Museum.

Fish 56 Freshwater species in GB, 37 known in Lincolnshire.
Recorder: Mr Nick Bromidge, Environment Agency, Guy Gibson Hall, Manby Park, Louth, LN11 8UR 01507 328102. **Earlier recorders**: None. **County Fauna**. 60 species of marine

fish are recorded from the Humber by Rees (1982). **Dataset.** Held on the Environment Agency's PC network database at the Manby Office, backed up by individual field survey data sheets. A total of 1398 records from 316 locations.

Reptiles & Amphibians 12 species in GB, 10 known in Lincolnshire
Recorder: LNU Miss Norah Goom, Old Mill Farm, Birthorpe, Sleaford, 01529 240211. **Earlier recorders**: FL Blaythwayt, R Wood-Powell, M Johnson. **County Fauna**. Johnson (1982). **Dataset.** Records are held as lists from recorders, sorted by recorder and then by year. A significant proportion of records have been computerised using Recorder. Computerised and paper records are held at the recorder's home. A significant dataset held on BRC cards from the mid-1970s at the former museum has yet to be found.

Birds c500 species in GB, ca 360 known in Lincolnshire
Recorder: Lincolnshire Bird Club. Recorder Howard Bunn. Report Editor Anne Goodall, 5 Chambers Farm Cottages, Hoop Lane, Apley, Mkt Rasen. LN8 5JR. **Earlier** recorders: K Atkin, G. Catley, A Bull. **County Fauna**. Smith & Cornwallis (1955) Lorand & Atkin (1989) **Dataset.** c460,000 records since 1950 held on species cards, 10km cards and maps sorted by species and 10km square, kept at A Goodall's home and at home of K Atkin. 1998 records are computerised using Club Recorder at home of J Mighell, 3 Church Walk, Metheringham. Pre 1976 data deposited at the former museum have yet to be found. Other datasets include the BTO common bird census & estuaries counts, Environment Agency bird surveys between 1989-93, Caton Haigh diaries held at the British Library. **Significant collections & location:**- There are old collections of Lincolnshire birds-eggs and skins at the Rumbold Street depot, at the Spalding Gentleman's Society, at Ayscoughfee Hall, Spalding, and at Scunthorpe Museum. The Natural History Museum in London has many important Lincolnshire bird skins from 1800s to date.

Mammals 39 species in GB, 42 known in Lincolnshire
Recorder: **Bats** - Lincolnshire Bat Group/LNU Annette Faulkner, 65 London Road, Spalding, PE11 2TN 01775 766286. **Other mammals.** LNU Miss Norah Goom, Old Mill Farm, Birthorpe, Sleaford, NG34 0EX. 01529 240211. **Earlier recorders**: FL Blaythwayt, R Wood-Powell, M Johnson. **County Fauna**. Johnson (1982), Faulkner (1998)(bat maps). **Dataset. Bats**. Approx 2000 records. Chronological series of roost reports and card index of site records, sorted alphabetically, held at recorder's home. Recorder is currently accessing and transferring English Nature's centrally held records. **Other mammals**. Records are held as lists from recorders, sorted by recorder and then by year. A significant proportion of records have been computerised using Recorder. Computerised and paper records are held at the recorder's home. A significant dataset held on BRC cards from the mid-1970s at the former museum has yet to be found.

Freshwater Invertebrates
Groups covered: Water beetles, water bugs, caddis-flies, alderflies, mayflies, stoneflies, aquatic Crustacea, aquatic molluscs, leeches, flatworms. Recorder: Richard Chadd, Environment Agency, Stepping Stone Walk, Winfrey Avenue, Spalding, PE11 1DA. 01775 762123. **County Fauna.** Water mites: George (1900). ?no others. **Dataset.** Post 1986 records generated by the Environment Agency are fully computerised using the EA's DBase custom system at the above address. All paper records are kept at Spalding EA Offices arranged by site and chronologically. **Significant collections & location:**- Reference collections maintained at Environment Agency laboratory at Spalding.

Marine/Estuarine & Intertidal Invertebrates
Recorder: Drs Brian Barnett & Helgi Gudmundsson, The Environment Agency, Waterside

North, Lincoln. LN1 1TE The Environment Agency regularly surveys Humber and coastal epi- and infauna. **County Fauna.** Hinton-Clifton (1964). **Dataset**. Data held at Environment Agency, Lincoln. **Significant collections & location:**- Reference material at EA, Lincoln. Some data and collections may also be held at the Institute of Estuarine Studies, Hull University, Cottingham Road, Hull. A collection of Lincolnshire marine molluscs from EJ Redshaw is held at the Spalding Gentlemen's Society Museum.

Other, Non-taxonomic Datasets

There are a number of other biological data holdings that are not based on any specific taxonomic groups. The **Lincolnshire Trust** has about 600,000 computerised records of species across all taxa on its Reserves and SNCIs across the county. There are additional Trust Recorder datasets concerning single sites, including at Gibralter Point and Whisby Pits complex. The **English Nature** offices at Grantham and Wakefield hold datasets of information on the county, including information on SSSIs in site files and on species protected under the Schedules of the 1981 Wildlife and Countryside Act, in particular bats, badgers and great crested newts. Their central support teams at Peterborough also hold national datasets on heathlands, grasslands, ancient woodlands and invertebrates and there is a lower plants site register at JNCC, also at Peterborough. The **Biological Records Centre** hold national datasets on a wide variety of groups of organisms. For example, a recent enquiry to BRC about ground beetles in the county revealed over 800 records from 18 sources unknown to the LNU recorder. BRC is part of the **Institute of Terrestrial Ecology**, who hold national data from key sites used in the compilation of the Nature Conservation Review (Ratcliffe, 1977) and will certainly include botanical and invertebrate data on the county. A number of other museums and educational institutions may hold collections or data on the county's biodiversity. Some of these are summarised in Ostler (1993, 1994).

Groups not covered

As far as we can ascertain, there are neither recorders, county datasets, collections or county faunas for: neuropteroid insects, *Stenorrhyncha* (aphids etc), springtails & other apterygotes, plant galls (the British Plant Gall Society is to target Lincolnshire for their annual meeting in 1998), pseudoscorpions, mites, harvestmen, fleas & other external and internal parasitic groups, earthworms and other annelids, unicellular organisms other than algae, micro-crustacea, nematodes, rotifers and tardigrades. There are Lincolnshire records in the national BRC datasets for at least some of these groups.

Summary of datasets

A number of points stand out from the results of the survey. At least 24 individuals and 9 organizations hold biological data on the county and the information is held in a wide variety of locations and formats. 71% of all datasets are either fully or are partly computerised, although some of these are only in summary (10km square) form. Although the majority are on Recorder, two other biological recording packages are being used as well as customised databases, some based on commercial packages. There is obviously much work to be undertaken to combine this data into a working Local records Centre.

Data Security

In the questionnaire survey we asked about provision for future of the datasets. A perhaps not surprising proportion of respondees declined to answer some or all of this part of the survey, and a disturbingly high proportion admitted to having made no provision at all for handing on the data in the event of their death. Only 6 datasets were specifically catered for in instructions for recorders' estates and 2 of these are to be willed out the county. Two recorders declined to allow their data be amalgamated with a wider Lincolnshire dataset or to deposit a copy with the LNU for safe keeping. Most significant collections are willed

to secure institutions, mostly out-of county, a sad reflection of the lack of secure museum accommodation in Lincolnshire, although a number of collections have not so far had such provision made for them. The biological collections held at the Rumbold Street depot of Lincoln City Council are in a poor state with various pest infestations.

All of this is worrying, given the loss of historic data and collections that has already occurred specifically because of lack of provision. Several recorders only have records from when they took over as recorder, despite there having been earlier recorders who must have had card indexes or record books. We would urge all data holders to make sure that at least a copy of their data remains in the county and can be amalgamated and searched as part of a county wide data system across all taxa.

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THE WASPS AND BEES (HYMENOPTERA: ACULEATA) OF GIBRALTAR POINT NATIONAL NATURE RESERVE, LINCOLNSHIRE

Michael E. Archer

Gibraltar Pint National Nature Reserve (plate 9) has been found to be an excellent site for aculeate wasps and bees with 102 recorded species, of which four species are of national importance and a further possible seven species are of regional importance.

Gibraltar Point, with Syke's Farm (VC 54, TF55) is a coastal site of 437 ha, just south of Skegness. The Point consists of sand dunes, salt and freshwater marshes, with juvenile to mature succession stages of dune and saltmarsh present. Flowery grassland and sea-buckthorn scrub are extensive and the west dunes have mature shrubs and trees. Flowers of hawthorn and sycamore provide important food sources and decaying brick walls and dead tree trunks in sunny situations of Syke's Farm provide valuable nesting sites.

Table 1 - The number of species of aculeate Hymenoptera recorded from Gibraltar Point and Watsonian Lincolnshire.

	No. species	
Family	Gibraltar Point	Watsonian Lincolnshire
Solitary Wasps		
Dyrinidae	1	5
Bethylidae	1	2
Chrysididae	7	14
Tiphiidae	0	1
Mutillidae	0	1
Sagygidae	0	2
Pompilidae	6	24
Eumenidae	4	12
Sphecidae	27	69
Total Solitary Wasps	46	130
Solitary Bees		
Colletidae	5	9
Andrenidae	9	32
Halictidae	14	26
Megachilidae	6	12
Anthophoridae	6	20
Total Solitary Bees	40	99
Social Species		
Formicidae	9	17
Vespidae	5	7
Apidae	11	21
Total Social Species	25	45
Total Species	111	274

Between 1989 and 1997, and once during 1965, I made a total of 13 visits to Gibraltar Point, throughout the year as follows: May (3 visits), June (3), July (3), August (3) and September (1). During these visits all aculeate wasp and bee species seen were recorded (Archer sample) and usually collected with a hand net for later identification. I have also had access to records from a RSPB course on 14 Aug. 1983, W.A.Ely during 1986, J.T.Burn on 25 Aug. 1991, R.W.J.Uffen on 10-11 June 1994, P.F.Yeo and C.Watson on 6 Aug. 1994, A.S.Lazenby on 4 Sept. 1994, K.Wilson on 20 May 1996 and S.P.M.Roberts on 22 Aug. 1996. In addition I confirmed or identified specimens collected by D.S.Hill on 16 visits from 1982 until 1996. In the following account biological names are according to Kloet & Hincks (1978).

Species Present

At the family level, the distribution of the species is given in Table 1 for both Gibraltar Point and Lincolnshire. About 40% of the species known from Watsonian Lincolnshire have been recorded from Gibraltar Point. The dominant wasp family is the Sphecidae and the dominant bee family is the Halictidae.

The Archer sample consists of 270 records derived from 73 species of solitary wasps and bees (Table 2). A record represents a specimen differing in one of the following three variables: name, sex and date of visit. The number of records of pompilids, sphecids and halictids are particularly noticeable. From the Archer sample 46 species (63%) were represented by one, two or three records (the unusual species) while the other 27 species (37%) each were represented by four to 14 records (common species)(Table 3). *Philanthus triangulum* is currently expanding its range in England and Wales and was first recorded in Lincolnshire at Gibraltar Point during 1996. Solitary species recorded at Gibraltar Point, but not in the Archer sample are: *Gonatopus sepsoides, Bethylus fuscicornis, Priocnemis perturbator, Crabro cribrarius, Ectemnius sexcinctus, Nysson dimidiatus, Hylaeus hyalinata, Andrena fulva, A. saundersella, Lasioglossum smeathmanellum, Sphecodes puncticeps, Nomada ruficornis and Anthophora furcata.*

Table 2 The number of records and species of solitary aculeate wasps and bees recorded at Gibraltar Point in the Archer sample.

Family	No. species	No. records
Chrysididae	7	17
Pompilidae	5	34
Eumenidae	4	14
Sphecidae	24	84
Colletidae	4	9
Andrenidae	7	28
Halictidae	12	64
Megachilidae	6	13
Anthophoridae	4	7
Total	73	270

Table 3 - The number of records for each species of solitary wasp and bee recorded in the Archer sample.

No. of records per species	Species	No. species
1	*Omalus auratus, Chrysis rutiliventris, C. cyanea, Ancistrocerus scoticus, Trypoxylon figulus, Crabro peltarius, Pemphredon inornatus, P lethifer, Passaloecus gracilis, Philanthus triangulum, Colletes halophilus, C. succinctus, Andrena synadepha, Megachile centuncularis, M. versicolor, Nomada goodeniana, Anthophora plumipes.*	17
2	*Hedychridium ardens, Chrysis impressa, Arachnospila anceps, Trypoxylon attenuatum, Crossocerus annulipes, C. tarsatus, Passaloecus corniger, Mellinus arvensis, Lasioglossum calceatum, Sphecodes fasciatus, Megachile circumcincta, M. willughbiella, Epeolus variegatus.*	13
3	*Chrysis angustula, Evagetes crassicornis, Ancistrocerus gazella, Tachysphex pompiliformis, Trypoxylon clavicerum, Crossocerus elongatulus, C. megacephalus, C. podagricus, Hylaeus communis, Andrena nigroaenea, A. subopaca, Lasioglossum minutissimum, L. nitidiusculum, Sphecodes crassus, Osmia caerulescens, Nomada marshamella.*	16
4	*Ancistrocerus oviventris, Colletes fodiens, Andrena chrysosceles, A. haemorrhoa, Lasioglossum morio, Osmia leaiana.*	6
5	*Crossocerus wesmaeli, Ectemnius cavifrons, Gorytes quadrifasciatus, Lasioglossum leucopum, L. villosulum.*	5
6	*Pompilus cinereus, Ancistrocerus parietum, Crossocerus quadrimaculatus, Ectemnius continuus, Ammophila sabulosa, Andrena barbilabris, Sphecodes monilicornis.*	7
7	*Chrysis ignita, Oxybelus uniglumis, Andrena scotica.*	3
8	*Sphecodes gibbus.*	1
9	*Anoplius infuscatus, Halictus rubicundus.*	2
13	*Pemphredon lugubris.*	1
14	*Episyron rufipes, Halictus tumulorum.*	2

The west dunes are particularly rich in species. The seaward edge of the west dunes has subterranean nesting areas for *Anoplius infuscatus, Halictus rubicundus and H. tumulorum. A. infuscatus* can be seen hunting for its spider prey by moving rapidly over the surface of the ground. The burrow entrances of the halictids are very noticeable, particularly during 1990, when enormous numbers emerged. The cleptoparasite, *Sphecodes gibbus*, of *H. rubicundus*, also is often observed trailing its host. *Pemphredon lugubris* is found nesting in the dead wood at Syke's Farm and on its mating flights among the leaves of the sycamore. *Episyron rufipes* is often numerous, flying over and resting on

the surface of bare sand in sunny situations. *E. rufipes* subterranean nests are in aggregations, making them conspicuous. The females may be observed entering and leaving their burrows and the males searching for the females.

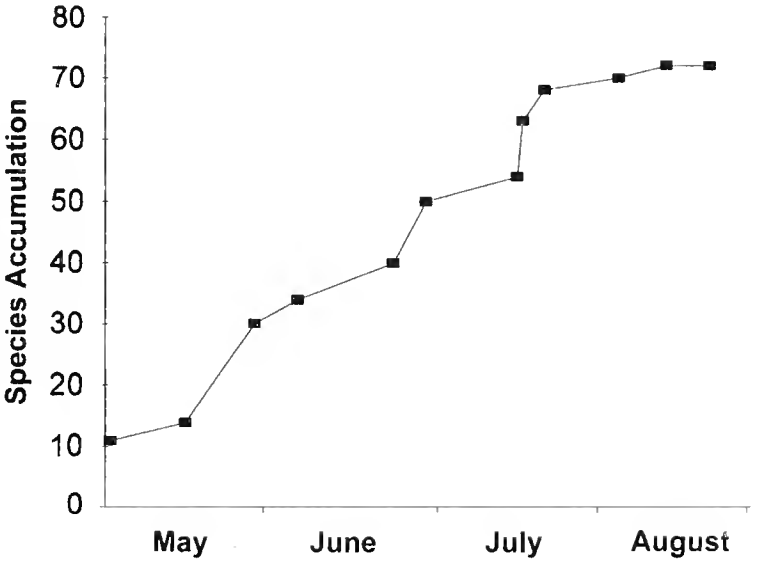
The social wasps recorded are: *Dolichovespula media, D. sylvestris, Vespula rufa, V. germanica and V. vulgaris*. *D. media* is a recent addition to the British list, having been first recorded in East Sussex during 1980. It was first recorded in Lincolnshire during 1993, and at Gibraltar Point during 1996. The social bees recorded are: *Bombus lucorum, B. terrestris, B. lapidarius, B. jonellus, B. pratorum, B. hortorum, B. pascuorum, B. muscorum, Psithyrus bohemicus, P. vestalis and Apis mellifera*. The specimen of *B. jonellus*, which was recorded on a RSPB course during August 1983 has not been confirmed, so some doubt must relate to its correct identification. The ant species recorded are: *Myrmica lobicornis, M. rubra, M. ruginodis, M. sabuleti, M. scabrinodis, Leptothorax acervorum, Lasius alienus, L. flauvus and L. niger*. The authority for several of these species is derived from Barrett (1970).

Table 4 The number of species of solitary wasps and bees recorded per month and new species seen per month at Gibraltar Point in the Archer sample.

	May	June	July	Aug	Sept
Solitary wasps					
No. species	13	23	30	22	0
No. new species	13	12	12	3	0
Solitary bees					
No. species	16	18	18	12	1
No. new species	16	9	6	1	1

Seasonal Progression of the Solitary Species

From the Archer sample for the number of solitary wasp species, July was the most productive month. For new species May, June and July were more-or-less equally productive (Table 4). For the number of species of solitary bees May, June and July were about equally productive with May being the most productive month for new species.



The figure shows the accumulation of solitary species of the Archer sample throughout the season when adults are active. It can be considered in three parts. Part 1 during early and mid-May, when the accumulation is relatively constant, may be called the spring aspect. Part 2 from late May, when there is a relatively rapid increase in the number of species, followed by a slower increase until the middle of July. Part 2 may be called the early summer aspect. Part 3 from the middle of July, when there is another relatively rapid increase in the number of species, followed by a slower increase during August. Part 3 may be called the late summer aspect.

The spring aspect consists of spring species and species with two generations a year, including spring and summer populations (Archer, 1966). The spring species are solitary bees consisting of the genus *Andrena*, with their cleptoparasites of the genus *Nomada*, and *Anthophora plumipes*. These spring species disappear by mid-June. The two generation species are solitary bees consisting of the genera *Halictus* and *Lasioglossum*, with their cleptoparasites of the genus *Sphecodes*.

The early summer aspect consists of the summer species and further two generation species. The summer species are the chrysid, pompilid, eumenid and sphecid solitary

wasps, and solitary bees of the genera *Osmia* and *Megachile*. The two generation species, of the genera *Lasioglossum* and *Sphecodes*, such as *L. villosulum* and *S. monilicornis*, might have been missed during the spring aspect.

The late summer aspect consists of further summer and two generation species. The summer species consists of species that emerge in late summer, e.g. *Mellinus arvensis, Philanthus triangulum, Colletes* spp. with cleptoparasites *Epeolus* spp., and *Hylaeus* spp., and of species that probably emerged in early summer but were missed. Such missed species could be *Chrysis rutiliventris, Ancistrocerus scoticus, Trypoxylon figulus, Pemphredon inornata* and *Megachile versicolor*, which were only recorded on one visit.

Quality Assessment of the Solitary Species

Four species are nationally scarce species (Falk, 1991). *Ectemnius sexcinctus* and *Sphecodes crassus* are near the northern edge of their ranges in Lincolnshire. *Nysson dimidiatus* extends north to Northumberland. *Colletes halophilus* is mainly a coastal species of southern and eastern England, extending eastwards from Hampshire and northwards to Spurn Point in east Yorkshire. *Philanthus triangulum* was considered a RDB3 species (Falk, 1991) but it is now a widespread species in England and Wales (Roberts, 1997), although at present a rarity in Lincolnshire. The following species may also be considered Lincolnshire rarities: *Chrysis rutiliventris, Dolichovespula media, Andrena synadelpha, Sphecodes puncticeps, Bombus jonellus* and *B. muscorum*. Gibraltar Point is the only known site in Lincolnshire for *C. rutiliventris, A. synadelpha* and *B. jonellus*. The Lincolnshire rarities are widely distributed in Britain except for *A. synadepha*, which is on to northern edge of its range in Lincolnshire.

Table 5 The national quality scores of the species of solitary wasps and bees recorded from Gibraltar Point.

Status	Status Value (A)	No. species (B)	Quality Score (AxB)
Universal	1	54	54
Widespread	2	25	5 0
Restricted	4	1	4
Scarce	8	4	32
Total		84	140

Species can be given a national status (Archer, 1997) and hence a status value. By adding the status value of each species a quality score of 140 is obtained for Gibraltar Point (Table 5). Dividing the quality score by the number of species gives a species quality score of 1.7.

Quality and species quality scores also have been calculated for my twelve visits from May until August (Table 6). Table 6 also shows the overall quality and species quality scores for the Archer sample. The overall species quality score is slightly higher for all records (1.7) compared with the Archer sample (1.5), mainly due to two high quality species, *Ectemnius sexcinctus* and *Nysson dimidiatus*, not present in the Archer sample. Each of these two high quality species are represented by a single record. The species quality scores for each visit are similar to the overall value, except for the May scores. The number of species recorded on each visit can vary greatly from eleven to 26 species, a variation of 236%.

Table 6 The national daily quality scores of the solitary wasps and bees recorded from Gibraltar Point in the Archer sample.

Date	No. species	Quality Score	Species Quality Score
1 5 94	11	14	1.3
15 5 92	11	13	1.2
28 5 90	22	25	1.1
5 6 96	17	30	1.8
23 6 95	16	27	1.7
29 6 93	24	32	1.3
16 7 92	21	31	1.5
17 7 96	26	38	1.5
21 7 92	25	46	1.8
4 8 89	13	22	1.7
13 8 95	17	26	1.5
21 8 91	15	19	1.3
Overall	72	111	1.5

Cleptoparasitic Load

The cleptoparasitic load (CL) is the percentage of aculeate species that are cleptoparasites (or parasitoids) on other host aculeates. A more-or-less complete list of species at a site should be made before the CL is calculated to avoid bias towards either the host or the cleptoparasitic species. Since the species list for Gibraltar Point can be judged to be more-or-less complete CLs for the species of solitary wasps and bees can be calculated (Table 7). The cleptoparasitic loads for the species of solitary wasps and bees are similar being about one fifth of the species.

Table 7 The relative frequency of the cleptoparasitic species among the solitary wasps and bees recorded at Gibraltar Point.

	No. hosts (H)	No. clepto--parasites (C)	Cleptoparasitic Load
CL=100*C/(H+C)			
Solitary wasps	35	9	20.5
Solitary bees	31	9	22.5

Aerial Nester Frequency

The aerial nester frequency (AF) is the percentage of aculeate host species that have aerial nest sites. Aerial nests are often in old beetle burrows in dead wood or the central cavities of stems such as bramble. Subterranean nesters nest in the ground, usually in burrows dug by themselves, but sometimes in crevices or other pre-formed burrows. Some crevice nesters, e.g. *Megachile centuncularis*, sometimes nest in crevices in the ground, but since usually they choose aerial sites, they are regarded as aerial nesters. A fairly complete list of species should be made before the AF is calculated to avoid bias towards aerial or subterranean nesters. The AF for solitary wasps, at about a half of the species, is higher than the AF for solitary bees, at about a quarter of the species (Table 8).

Table 8 The nesting habits of the host species of solitary wasps and bees recorded from Gibraltar Point.

	No. aerial nesters (A)	No. subterranean nesters (S)	Aerial Nester Frequency AF=100*A/(A+S)
Solitary wasps	17	18	48.6
Solitary bees	8	23	25.8

Discussion - Quality Assessment. Within Lincolnshire it is possible to compare Gibraltar Point only with Risby Warren, for which a comparative study has been made (Archer, 1993). At Risby Warren 63 species of solitary wasps and bees were found, with a species quality score of 1.8. The species quality scores for the two sites are very similar and may indicate the scores that might be expected from other good Lincolnshire sites.

A further comparison is possible with Spurn Point (Archer, unpublished) where 77 species of solitary wasps and bees have been found, with a species quality score of 2.6. The higher score for Spurn Point is due to the presence of two very rare species, of which one is now extinct. If these two very rare species are removed, the species quality score becomes 1.8, which is similar to the Lincolnshire scores.

Quality scores are likely to be greatly influenced by recording effort, but species quality scores should largely.correct for variation in recording effort (Ball, 1992; Foster, 1996). Although my recording effort was more-or-less equal for each visit, the range of daily quality scores (354%) is greater than the species quality scores (164%). The greater range of quality scores is a consequence of the variation in the number of species found on each visit. Thus species quality scores can correct, like variation in recording effort, for the variation in the number of species recorded.

Can a species quality score from a one or two visits to a site be a relatively good prediction of the overall species quality score for the site? To attempt to answer this question it is necessary to know the range of species quality scores for sites in Britain. For solitary

wasps and bees, species quality scores have been found to vary from 1.6 to 5.5 (Archer & Burn 1995, Archer 1996), although lower values down to 1.0 are possible. As such, with the possible exception of the May visits, one or two visits to Gibraltar Point would have been sufficient to give a good estimate of the species quality score.

Discussion - Cleptoparasitic Load. Wcislo (1987) showed that the amount of parasitic behaviour among the aculeate Hymenoptera correlated with geographical latitude, being higher in the temperate, compared with the tropical regions. As such, CLs for sites in Britain should have similar values. The CL for the solitary wasps (20.5) is similar to the British CL (19.7), while the CL for the solitary bees (22.5) is a little lower than the British CL (26.0). The missing solitary bee cleptoparasites would be species of the genus *Coelioxys*, whose hosts are species of the genus *Megachile*.

Discussion - Aerial Nester Frequency. The AF for the solitary wasps (48.6) is very similar to the British AF (46.2), while the AF for the solitary bees (25.8) is a higher than the British AF (17.9). For the solitary bees the higher AF value is probably a reflection of the lack of species of the genus *Andrena*, which are available from the species pool for Lincolnshire (Table 1).

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WOODLAND ORIGIN AS A FACTOR IN THE DISTRIBUTION OF NATIVE TREES AND SHRUBS IN CENTRAL LINCOLNSHIRE

George F. Peterken

Ancient woods tend to be richer than secondary woods for many groups of plants and animals, and they also tend to harbour a disproportionately large number of rare and local woodland species. One of the earliest demonstrations of this important feature was in central Lincolnshire. Using lists of flowering plants and ferns compiled for 89 ancient

woods and 273 secondary woods, Meg Game and myself (Peterken and Game, 1984) showed that: the number of species in ancient woods increased with area; that ancient woods were indeed generally richer than secondary woods; that, nevertheless, there was overlap, such that the richest secondary woods of a given size were richer than the poorest ancient woods; and that there were many species which were found only or mainly in ancient woods (i.e., they were "ancient woodland indicators").

When we surveyed the woods in 1972-1981, we also recorded the presence of native trees and shrubs, as well as the older introductions, but the records collected were not analysed at the time. At an early stage I suggested that spindle *Euonymus europeaus,* sessile oak *Quercus petraea,* wild service tree *Sorbus torminalis* and small-leaved lime *Tilia cordata* were confined to ancient woods and old mixed hedges; that hazel *Corylus avellana* and Midland hawthorn *Crataegus laevigata* were slow colonisers but commonly planted; and that aspen *Populus tremula* was a slow colonist in part of the study area (Peterken, 1974).

This paper compares the diversity of native trees and shrubs in ancient and secondary woods, and identifies those species which have a strong association with ancient woods. Throughout, the term "secondary wood" refers to woods originating after 1600. Some of the ancient (i.e., pre-1600) woods may also be secondary, but most are probably primary (i.e., relicts of the original natural forests).

Survey and analysis

We visited all ancient and most secondary woods in central Lincolnshire some of them several times. Plant lists were compiled on traverses which crossed each wood and included an examination of at least part of the margins. Several surveyors participated, but the majority of records came from Irene Weston, Peter Weston, Meg Game and myself. It is unlikely that lists were complete, but spot tests in a sample of sites suggested that 80-90% of all species were found, and that there were no significant bias in recording.

The number of species in individual woods

Fig.1 (overleaf) shows the relationship between the number of native tree and shrub species and the wood area for all 89 ancient woods and 268 secondary woods. Five secondary woods were omitted because the recorders happened to omit records of trees and shrubs. These linear relationships with log area and the degree of variation around them is typical of species-area relationships. The figure also demonstrates that ancient woods tend to be larger than secondary woods.

Larger ancient woods were generally richer than smaller woods, but there was considerable variation: some small woods, eg Goslings Corner and Gatecliff, were conspicuously rich, but two ancient woods of 80-90 ha contained fewer species than several woods of less than 10 ha. There was a general tendency for larger secondary woods to be richer than smaller ones, but the scatter about the species-area relationship was very much greater than for ancient woods. Secondary woods were generally poorer in native tree and shrub species than ancient woods, but there was considerable overlap. Larger ancient woods were clearly richer than the larger secondary woods, whereas the smallest ancient woods are only slightly richer than the secondary woods of the same size. We also asked whether the secondary woods were becoming richer as the years passed by comparing the number of species found in woods originating at different periods. From the information available, we were able to map all woods at three dates, 1820 (First Ordnance Survey 1" maps), 1887 (First Ordnance Survey 6" maps) and 1946 (Air Ministry air photographs). The regressions are very similar, and in statistical terms they were not significantly different. Thus, woods originating before 1820 are not richer that woods originating later, which implies that secondary woods are not getting richer as the centuries

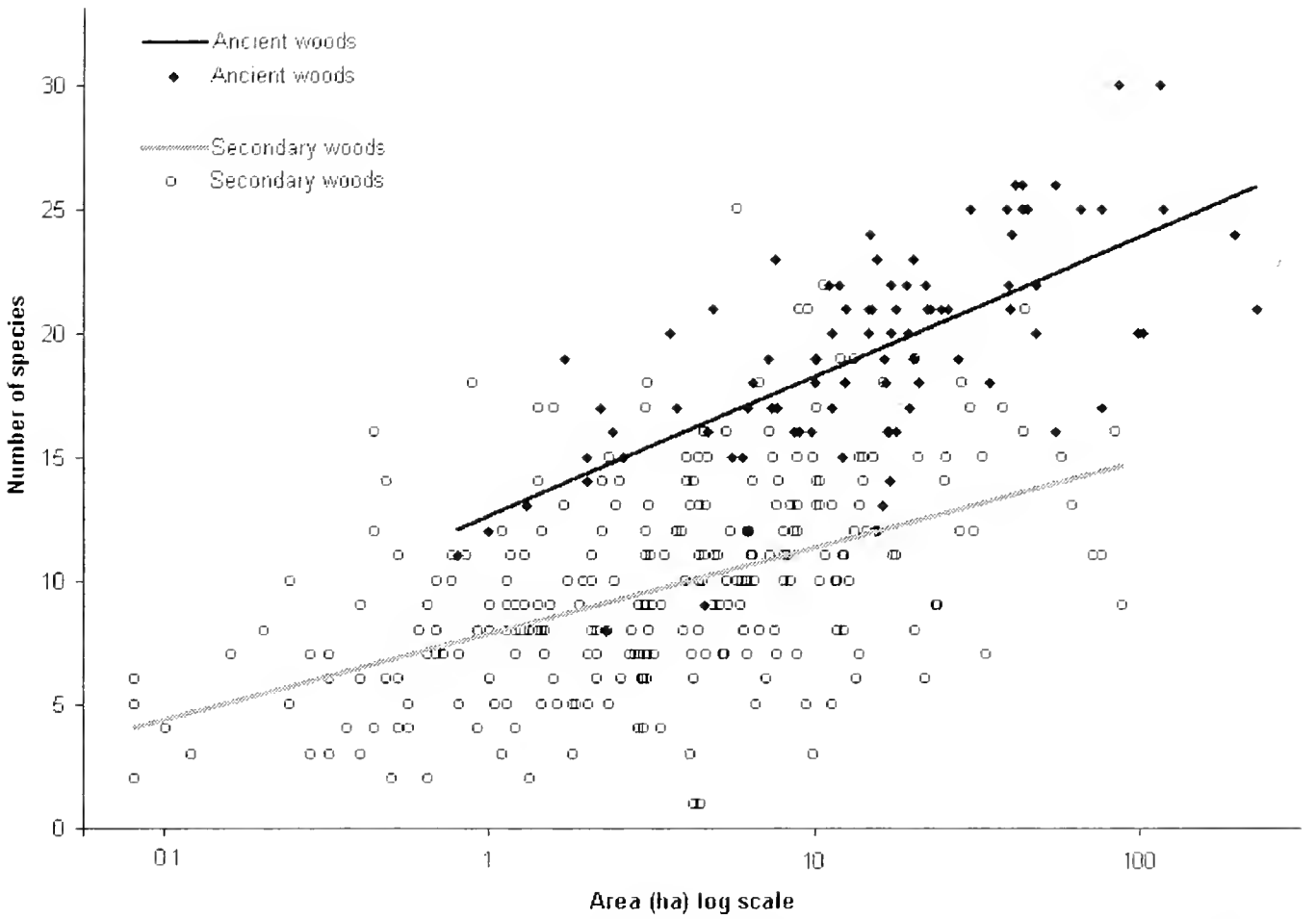


Fig 1. Relationships between wood area and the number of native tree and shrub species in ancient and secondary woods in 1972-1981. Regressions:

Ancient woods: S = 5.65 log (ha) +12.58 (n=89, r^2=0.45, p = <0.001)
All secondary woods: S = 3.48 log (ha) +7.90 (n=268. r^2=0.23, p = <0.001)
Secondary originating before 1820: 5 = 3.24 tog (ha) +8.03 (n=96. r^2=0.22, p = <0.001)
Secondary originating 1820-1887: S = 3.67 log (ha) +9.03 (n=27, rU-oil., p = 0.09)
Secondary originating 1887-1946: S = 3.09 log (ha) +8.87 (n=26, r^2=0.11, p = 0.11)
Secondary originating 1946-1971: S = 3.36 log (ha) +7.97 (n=8, r^2=0.11, p = 042)
ANCOVAR. A:S F slope = -208.61, F intercept = -198.91 Both highly significant, as F 0.05, 1356 =3.84. Thus, ancient is significantly different from secondary at p = <0.001
SI 820-1887: Si 946-71 (i.e. comparing the most extreme periods of origin). Slopes not significantly different F intercept = -3.36, F 0.05,1115 = 3.93, not sig at 5%.

pass. We found exactly the same surprising result when we analysed the ground vegetation (Peterken and Game 1984).

The distribution of individual species

We examined the distribution of individual species between ancient and secondary woods by calculating for each species the proportion of locations which were ancient woods. Thus, we recorded pedunculate oak *Quercus robur* in 265 woods, of which 87 were ancient and 178 were secondary, i.e. 33% of the locations were ancient woods. Any species which was found only in ancient woods would score 100%, and any which were confined to secondary woods would score 0%. Any species which was randomly distributed in relation to sites would register 25%, and any distributed randomly through the wooded area would register 48%, i.e. the proportion of the surveyed woodland area which was ancient.

The table summarises the distribution between ancient and secondary woods of all species of native and introduced trees and shrubs which were found in at least 10 woods arranged according to the strength of their association with ancient woods. Virtually all species were found in both ancient and secondary woods, but several had strong affinities to one of the other. At one extreme two species were not recorded in any ancient wood. At the other, three fairly widespread species were very strongly biassed to ancient woods.

The full range can be divided into three groups.

Ancient woodland species
The 16 species showing an affinity with ancient woods (50% or more of all localities in ancient woods) were all native species. They included several characteristic coppice constituents as well as small trees and shrubs. Most were associated with heavy, poorly-drained soils, the exceptions being alder buckthorn *Frangula alnus* (light, acid soils) and osier *Salix viminalis* (wet soils, streamsides, pond margins), both of which were rare.

These are presumably original native species which have (i) survived within ancient woods, (ii) rarely or never been planted in secondary woods, but (iii) have colonised naturally only to a limited extent. Although some, such as hazel *Corylus avellana*, are frequent in secondary woods, none have colonised rapidly enough to occupy secondary woods as thoroughly as they occupy ancient woods.

Secondary woodland species
At the other end of the scale, 11 species showed an affinity with secondary woods (24% or fewer locations in ancient woods). They comprise a heterogeneous collection of:

- planted introductions (horse chestnut *Aesculus hippocastanum,* beech *Fagus sylvatica,* Scots pine *Pinus sylvestris,* yew *Taxus baccata*)
- heathland species (Scots pine, *Pinus sylvestris,* broom *Cytisus scoparius,* gorse *Ulex europeaus*)
- streamside species (white willow *Salix alba,* crack willow *Salix fragilis*)
- native species of fertile soils (elder *Sambucus nigra,* wych elm *Ulmus glabra, English elm Ulmus procera*)

The association of planted species with secondary woods is readily explained by the origin of many secondary woods as plantations. The streamside species were biassed to secondary woods, partly because ancient woods are generally distant from streams. Otherwise, the native species which have colonised secondary woods comprised (i) those responding to high residual fertility in formerly cultivated soils, and (ii) those colonising secondary woods on heathland, where there are few ancient woods. The one species which was found in most ancient woods, elder, *Sambucus nigra*, was commonly associated with disturbed ground: it is possible that its frequency in ancient woods has been increased by the habit of using neglected woods as rubbish dumps.

Species equally distributed between ancient and recent woods
Eighteen species had no significant affinity with ancient or secondary woods (25-49% of locations in ancient woods). They comprised:

- commonly planted native trees (ash *Fraxinus excelsior,* pedunculate oak *Quercus robur*)
- fast-colonising native trees and shrubs (silver birch *Betula pendula,* downy birch *Betula pubescens,* hawthorn *Crataegus monogyna, ash Fraxinus excelsior,* privet *Ligustrum vulgare,* sloe *Prunus spinosa,* pedunculate oak, *Quercus robur,* gooseberry *Ribes uva-crispa,* field rose *Rosa arvensis,* dog rose *Rosa canina,* grey willow *Salix cinerea,* rowan *Sorbus aucuparia*)
- streamside species (alder *Alnus glutinosa,* ash *Fraxinus excelsior*)
- naturalised introductions (sycamore *Acer pseudoplatanus,* cherry laurel *Prunus laurocerasus,* rhododendron *Rhododendron ponticum*)
- ambivalent species. holly *Ilex aquifolium* is normally regarded as native throughout Britain, but was regarded as an introduction by Gibbons (1975). Lime *Tilia x europaea vulgaris* is both a natural and an artificial hybrid (Pigott, 1991), and it is possible that some of the limes in ancient woods were natural hybrids.

Species	Ancient wood locations (ex 89)	Secondary wood locations (ex 273)	Proportion of locations in ancient woods (%)	
Sorbus torminalis	31	5	86	
Tilia cordata	63	11	85	coppice
Euonymus europeaus	34	7	83	
Quercus petraea	13	5	72	coppice
Populus tremula	55	23	71	
Cornus sanguinea	65	30	68	
Frangula alnus	12	7	63	
Viburnum opulus	61	40	60	
Prunus avium	16	12	57	
Corylus avellana	86	70	55	coppice
Salix caprea	53	46	54	
Ribes sylvestre	33	29	53	
Acer campestre	81	77	51	coppice
Malus sylvestris	60	58	51	
Salix viminalis	5	5	50	
Crataegus laevigata	65	66	50	coppice (rarely)
Rosa arvensis	67	72	48	
Betula pubescens	74	87	46	
Rhododendron ponticum	14	17	45	introduction
Betula pendula	64	91	41	
Salix cinerea	67	102	40	
Ligustrum vulgare	54	83	39	
Prunus spinosa	83	141	37	
Ilex aquifolium	27	46	37	doubtfully native*
Tilia vulgaris	15	27	36	coppice ?introduction
Sorbus aucuparia	32	58	36	
Quercus robur	87	178	33	coppice
Prunus laurocerasus	3	7	30	introduction
Fraxinus excelsior	86	208	29	coppice
Rosa canina	75	187	29	
Crataegus monogyna	86	233	27	coppice (rarely)
Acer pseudoplatanus	52	142	27	introduction
Alnus glutinosa	17	47	27	coppice
Ribes uva-crispa	12	35	26	
Sambucus nigra	71	220	24	
Ulmus glabra	36	114	24	coppice
Ulmus procera	18	77	19	coppice; introduction
Fagus sylvatica	19	84	19	introduction
Ulex europeaus	10	52	16	
Aesculus hippocastanum	4	27	13	introduction
Cytisus scoparius	2	15	12	
Salix alba	1	9	10	
Salix fragilis	2	35	5	
Taxus baccata	0	12	0	introduction
Pinus sylvestris	0	14	0	introduction*

*Gibbons, 1975

Plate 1 Fly *Alophora hemiptera* (page140), parasitic on shield bugs which it resembles, found at Birchwood Community Park. photo Roger Key

Plate 2 Slow worm *Anguis fragilis* (page 140) required some rescuing at Hospital Plantation. photo Geof Trinder

Plate 3 Reed cutting at Boutham Mere - (page 140) photo Phil Porter

Plate 4 Bittern (page 141). 1997 was the first for 18 years that one failed to turn up at Boultham Mere at sometime in the year photo Bill Moorcroft

Plate 5 Water rail - not often seen, but a regular breeder at Boultham Mere (page 141). photo Bill Moorcroft

Plate 6 Ringing is under way at Boultham to ascertain how many reed warblers are breeding there (page 142). photo Bill Moorcroft

Plate 7 Flowering rush *Butomus umbellatus* gets right into the heart of Lincoln along the Witham Valley (page 144). photo Geof Trinder

Plate 8 Small-flowered buttercup *Ranunculus parviflorus* (page 183), a scarce and declining plant in Lincolnshire. photo Rene Weston

Plate 9 Bee and wasp habitat at Gibraltar Point (page 157). Viper's bugloss and ragwort on the spoil of an old rabbit burow. photo Kevin Wilson

Plate 10 Sand wasp, *Ammophila sabulosa* a frequent species at Gibraltar Point (page 157). photo Roger Key

Plate 11 Hardy Gang Wood. Ancient woods have more species of trees and shrubs than secondary ones (page 162).

photo Roger Key

Plate 12 Flowers of spindle *Euonymus europaeus*, strongly associated with ancient woodland in central Lincs (page 176).

photo Roger Key

Plate 13 Pale bee orchid *Ophrys apifera* var. *chlorantha* (page 185) at Grantham, with normal flower inset.

main photo M. Pool
inset G. Trinder

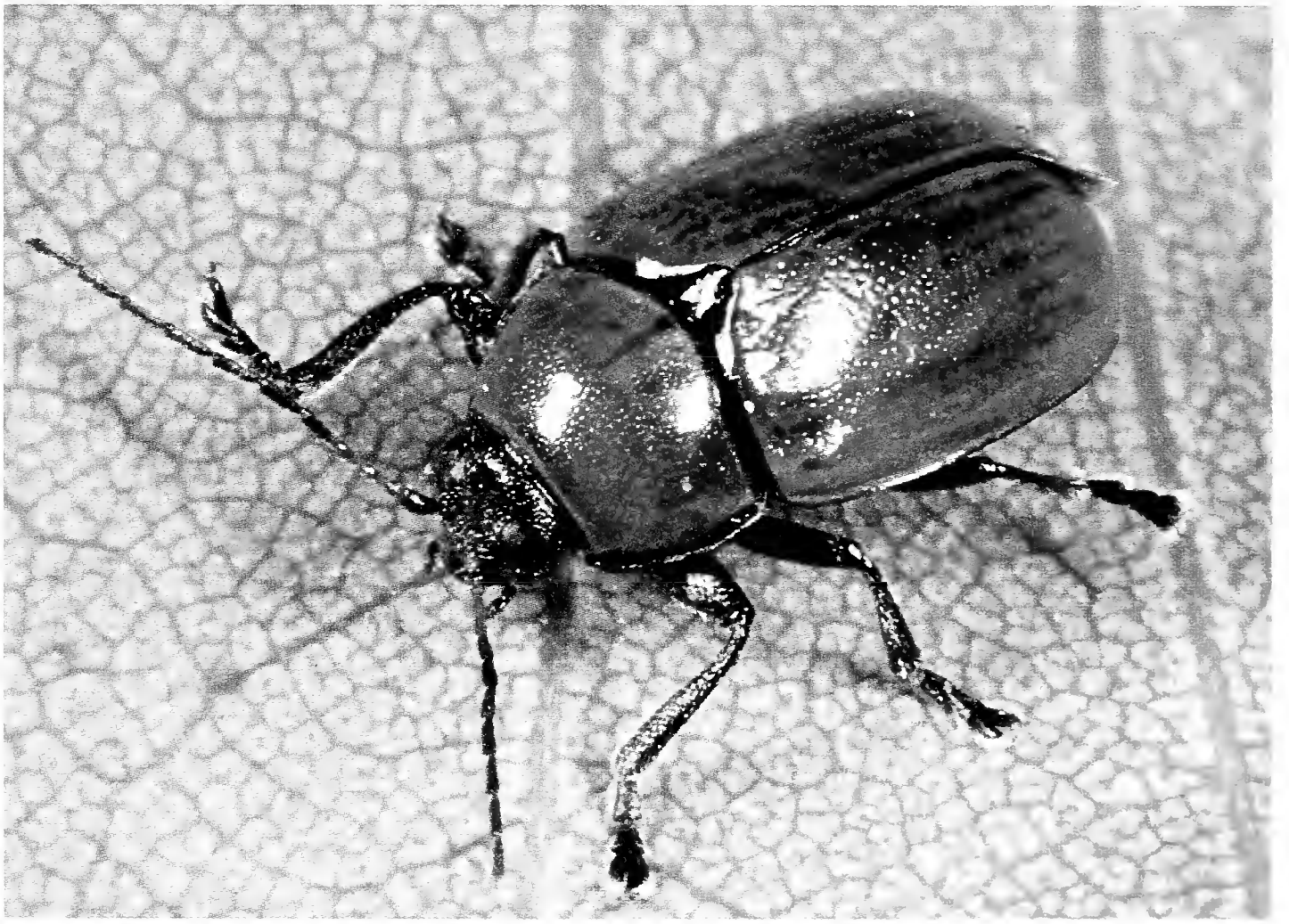


Plate 14 The leaf beetle *Cryptocephalus coryli* at Kirkby Moor. A study in under way of this, one of our rarest beetles (page 192).

photo Roger Key

Plate15 Irish Yellow Slug *Limax maculatus*, was new to Lincs in 1997 (page 195). photo D G Rands

Plate 16 LNU members sorting bugs at Gibraltar Point (editorial) photo Jane Ostler
left to right - Annette Faulkner, Annette Binding, Roger Key, Allan Binding, Phil Porter

Most species are common and widespread constituents of ancient woods which have been able to colonise secondary woodland. Many are well-recognised pioneers, such as the birches and the rosaceous shrubs. Some have been assisted by planting, especially pedunculate oak *Quercus robur*. Others may also have benefited from their presence in streamside scrub, especially *alder Alnus glutinosa*. The naturalised introductions have rarely been planted in ancient woods, but have naturally colonised both ancient and secondary woods, notably sycamore *Acer pseudoplatanus*.

Reviewing the broad pattern brought out by this analysis, it is worth noting that the comparisons between species in particular genera conform to the general pattern of colonising ability in lowland Britain as a whole. Thus the two birch *Betula* species colonise equally. The colonising ability of hawthorn *Crataegus monogyna* is greater than (>) Midland hawthorn *C.laevigata, rowan Sorbus aucuparia* > wild service tree *S. torminalis,* pedunculate oak *Quercus robur* > sessile oak *Q.petraea,* dog rose *Rosa canina* > field rose *R.arvensis,* sallow *Salix caprea* < other *Salix* spp. Only the *Ulmus* species surprise, but perhaps wych elm *U. glabra* was planted as much as English elm *U. procera*.

The role of hedges

Until recently, central Lincolnshire was pervaded by a network of hedges. Most have been removed from most parishes within the study area, but enough remained in the 1970s to study their general character. Most were quickset hedges, planted at Inclosure, into which the commonest colonists were dog rose *Rosa canina,* sloe *Prunus spinosa,* elder *Sambucus nigra* and ash *Fraxinus excelsior*. A few were wood-relict hedges (Pollard 1973), i.e., the margins of cleared ancient woods preserved on field margins. Some were unmistakably identified as such from historical records, whereas others were identified from (i) their intimate mixture of tree and shrub species, (ii) absence of obviously planted shrubs, (iii) sinuous line and (iv) presence of well-developed bank. In addition to these certain or presumed wood-relict hedges, there were a few mixed hedges on ruler-straight alignments, which may have been planted using trees and shrubs from local woodland.

Trees and shrubs in hedges, like those beside streams, could have generated seed for colonising new woods. The wood-relict hedges could have been sources for slow-colonising species. Many secondary woods formed on ground next to hedges, and eventually incorporated the hedge are part of the wood: in such instances one could say that species in the hedge were colonised by the secondary woodland.

The hedgerow network must have facilitated the colonisation of secondary woods by species that were planted in hedges, both by actual colonisation across the short distance from the nearest hedges, and by passive incorporation of pre-existing hedges. The species which would have benefited most were hawthorn *Crataegus monogyna,* pedunculate oak *Quercus robur,* ash *Fraxinus excelsior* and perhaps wych elm *Ulmus procera.* Hedges may also have helped those species which readily colonise hedges, notably *Sambucus nigra* elder and the rosaceous shrubs, by providing 'stepping stones' between woods.

Ancient woodland indicators

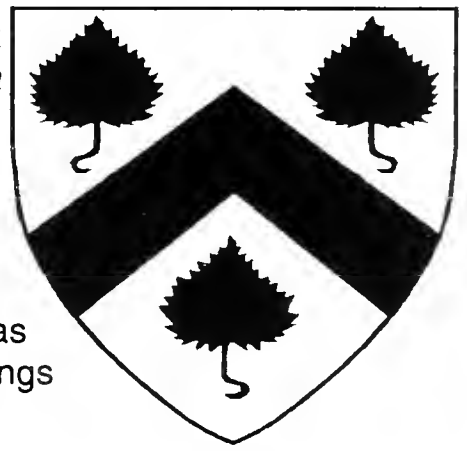
The distribution of individual species was examined in more detail to determine the significance of habitat continuity in their distribution. Any tree and shrub species with a limited colonising ability, and thus a strong requirement for habitat continuity, would have all or most of the following distributional characteristics:

- Most woodland locations are in ancient woods.
- In hedges, strongly associated with wood-relict and other mixed hedges. May also be associated with old boundaries generally, notably parish boundaries, sinuous field boundaries and the hedges of old village closes.

- Populations in secondary woods concentrated in secondary woods originating next to ancient woods, wood-relict hedges and other old boundaries. May also be associated with secondary woods next to streams, which can also function as old boundaries for trees and shrubs.
- Individuals in secondary woods lacking contact with ancient woods, wood-relict hedges, etc., were planted.

The species at the head of the list in Table 1 are strongly associated with ancient woods. Wild service tree *Sorbus torminalis* has the reputation of an ancient woodland indicator almost throughout its British range (Pigott, 1974; Lloyd, 1977; Rackham, 1980). In central Lincolnshire it was very strongly associated with ancient woods and wood-relict hedges (Peterken, 1983). Of the 5 secondary woods in which it was found, 2 were next to ancient woods and 1 was by a parish boundary. At another site, the three individuals were the same size and in a straight line, so were judged to have been planted. There was very little evidence of colonisation within woods. Indeed, wild service tree *Sorbus torminalis S.torminalis* was strongly associated with ancient wood margins, to which presumably it had been almost confined by selective management within the coppices.

The other species with a reputation as a slow colonist throughout its British range is small leaved lime *Tilia cordata* (Pigott, 1969; Rackham, 1980). In central Lincolnshire the 11 secondary locations included 6 next to ancient woods, 1 on a parish boundary and three presumed planted sites in parkland belts at Scriveslby and Baumber. The one possible instance of long-distance colonisation was to Brickyard Plantation, near Minting Park. This species was found in a few wood-relict and other mixed hedges. Seedlings are rarely found in the woods, and then only close to parent trees. In central Lincolnshire it appears to be capable of only slow and short-distance colonisation, even within individual woods.



Small-leaved lime on the brass in St Cornelius church, Linwood. Lime, which is still just about surviving in Lynwode Wood, has become a symbol of the ancient woods of central Lincolnshire.

The third species with a very strong bias to ancient woods in central Lincolnshire, spindle *Euonymus europeaus* (plate 12) has only a weak affinity with ancient woods in East Anglia (Rackham, 1980), but was strongly associated with wood-relict hedges in Huntingdonshire (Pollard, 1973). In central Lincolnshire, the pattern was reinforced by fact that the 7 secondary sites included 2 in secondary woods next to ancient woods and 4 in woods by parish boundaries. It was found in several wood-relict and other mixed hedges, even though there had been attempts to remove it to mitigate bean aphid infestations.

Sessile oak *Quercus petraea* was present in 13 ancient woods, mainly as coppice, which confirms Gibbons' (1975) note that it occurs in old acid woods and a few hedges. Apparently it has not been planted in secondary woods. The 5 secondary locations include 2 woods against parish boundaries, one of which was a wood-relict hedge. It appears to colonise occasionally on the sandy soils around Market Rasen. Throughout East Anglia this species has a strong affinity with ancient woods and has rarely been planted (Rackham, 1980).

Aspen *Populus tremula* is frequent in ancient woods, mainly as post-disturbance growth from clonal rootstocks. Gibbons (1975) notes it in 'old woods' and sometimes beside railway lines. The 23 secondary woodland sites include 6 adjacent to ancient woods and 12 sites touching a parish boundary, a stream, or both. Locations outside ancient woods

were concentrated in the sandy soils of the districts around Market Rasen and Woodhall Spa. Evidently aspen has is only a limited ability to colonise, particularly to isolated secondary woods in the clay zones. It may have declined while coppices were neglected: today it is flourishing after felling in Goslings Corner and at Moor Farm.

Dogwood *Cornus sanguinea* was frequent in wood-relict and other mixed hedges. Ten of its 30 secondary woodland locations were adjacent to ancient woods or wood-relict hedges. Of the remaining 20, 9 were by parish boundaries, 8 were by streams, 11 were by other old boundaries, leaving only 3 locations which must have been colonised from a distance. Many secondary woods on the limestone heath had been colonised, but none on the Wolds. In Hunts. it was strongly associated with wood-relict hedges (Pollard, 1973).

The remaining species have little or no association with ancient woods, but a few may be slow colonists. Pollard (1973) found that field maple *Acer campestre,* hazel, Midland hawthorn *Corylus avellana, Crataegus* laevigata and guelder rose *Viburnum opulus* were associated with wood-relict hedges. In central Lincolnshire a similar distribution was found: these species were frequent in wood-relict and other mixed hedges, and were weakly associated with ancient woods. Two other infrequent species, alder buckthorn *Frangula alnus* and bird cherry *Prunus avium*, also had a moderate association with ancient woods in central Lincolnshire, but were rare in hedges.

One native shrub species, barberry *Berberis vulgaris*, was not recorded from any wood, but was found in two hedges, both of which were mixed. This is a fragment of a wider pattern, for in other counties it is confined to hedges, or nearly so, e.g. Warwickshire (Cadbury et al, 1971). It seems likely that this is a slow-colonising species which has been able to survive in ancient hedges.

Discussion

This analysis confirms the pattern already reported for ground vegetation: ancient woods are richer than secondary woods originating after 1600. The difference is not great and there is much overlap. In the case of native trees and shrubs, ancient woods of 1 ha have about 4-5 more species than secondary woods of the same area, and the differences increases to 7 more species in 10 ha woods and 9 more species in 100 ha woods.

The differences arise because many species are significantly biassed to ancient woods, and only a few are biassed to secondary woods. Whereas all species were presumably part of the original forests, a substantial proportion have been slow to colonise new woods even though they have had up to 400 years in which to do so. Every species has, nevertheless, found its way into secondary woodland, but in many instances the populations of slow colonists have probably survived on-site as part of ancient hedges, i.e. they have survived rather than colonised. Where the slow colonists have undoubtedly colonised, they have generally reached only those secondary woods close to ancient woods. Significantly, small leaved lime has been one of the slowest to colonise: the "Lincolnshire limewoods" are all ancient woods, but not all ancient woods are limewoods.

It would be reassuring to be able to confirm from historical records that the trees and shrubs of ancient semi-natural woods have remained largely unchanged for centuries. Unfortunately, although medieval and later records to particular woods abundantly confirm that woods were coppiced, direct references to particular species are extremely rare. Usually, one learns that 'timber trees' - presumably oaks - were present with underwood (unspecified). The Kirkstead Psalter map of 1150 records a maple bush at the corner of Shire Wood (Webb, 1944), where, incidentally, a field maple *Acer campestre* still grows, but that is a lone shaft of light in the darkness. Pollen samples from the fens, however,

confirm the long presence of *Tilia* and other species (Valentine and Dalrymple, 1975).

It would also have been reassuring to find that the older secondary woods had become richer than the recently-originated secondary woods. This would have indicated that over the decades and centuries new woods originating on farmland might eventually be colonised by all the available species, and that they might finally become as rich as the ancient woods. In fact, the reverse proved to be true: the secondary woods seem to acquire most of their species at the outset, then get no richer, even after 200-300 years, i.e., this aspect of ecological development appears to proceed at a snail's pace. Remembering that we found exactly the same failure of ground flora to develop over time, we are forced to conclude that secondary woods will never become as rich in plant species as ancient woods, even if they survive in the landscape for hundreds of years.

The slow colonists of central Lincolnshire are also slow colonists in other parts of eastern and Midland England: although there were differences in emphasis, the findings of Pollard (1973) and Rackham (1980) indicate that there is a group of species which require continuity of forest cover in ancient woods and hedges for widespread survival. Whilst they must be relicts of the original forest cover, their distribution and abundance within ancient woods has probably been altered by centuries of management. The strong association of wild service tree *Sorbus torminalis* with ancient wood margins may have been generated by weeding out an unwanted species from coppices.

A substantial fraction of the native trees and shrubs of central Lincolnshire have been able to colonise secondary woods. Their routes have been:

- planting, particularly of oak. Woodruffe-Peacock (1918) gives an example of an 18th century mixed plantation at Cadney.
- colonisation by well-distributed seeds, notably birch and rosaceous shrubs. Again, Woodruffe-Peacock (1918) gives the example of five species distributed by birds, Midland hawthorn *Crataegus laevigata,* plum *Prunus domestica,* purging buckthorn *Rhamnus catharticus,* elder *Sambucus nigra,* and guelder rose *Viburnum opulus.*
- incorporation, by the inclusion of hedges and streamsides in or by secondary woods.

This study reinforces the conservation message from other studies, that to maintain the biodiversity of forest species within a predominantly agricultural landscape, we must keep the woods, trees and shrubs we have now, especially the ancient woods and hedges. This requirement has been incorporated in the 1985 Broadleaves Policy and subsequent advice from the Forestry Authority to the extent that it is now hardly necessary to select the best examples of ancient woods for special measures (Game and Peterken, 1984). The greatest needs now are outside woodlands. All the remaining hedges should be retained, particularly the wood-relict hedges, yet hedges are still being destroyed or neglected. The small streams have largely been engineered into straight ditches lacking trees and shrubs, and there is a great need to restore them as links in a network of habitats.

Acknowledgements

Irene Weston not only helped with the field survey, including searching many inhospitable secondary woods, but has also been generous with her advice and information about the distribution of plants in Lincolnshire. Meg Game, Paul Harding and Peter Weston also shared the surveying. Joanna Francis encouraged me to look again at these old records and helped with the analysis.

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RECORDING FRESHWATER ALGAE IN LINCOLNSHIRE.

Bill Brierley

The freshwater algae are a diverse group, once thought to be a single class and considered to be simple or lowly plants lacking the diversity of structures and reproductive systems found in higher plants such as mosses, ferns, and flowering plants. Some of the algae show characteristics of animals and are included still in both the animal and plant kingdoms. The colours exhibited by the freshwater algae are diverse and can be green, brown and red and any shade between these. They range from 1-2 micrometres to over 20 centimetres as in the stoneworts *Charophyta*. The largest alga, a seaweed can reach 60 metres in length. However most freshwater algae are microscopic and they require identification using a light microscope. Some of the smaller forms require the use of an electron microscope to examine and identify the cells.

At present the Environment Agency holds records of freshwater algae from a limited number of sites in the County. As far as I am aware other records for Lincolnshire are limited and I am trying to find out from various sources of any historical collections or records. If any readers know of such collections or records or have any of their own observations/records then I would be very grateful to receive them. Within the recording scheme we will be collecting information and records on the freshwater algae, excluding the charophytes which are being collected separately.

Algae are found in many habitats, not just freshwaters, ranging from soils, walls, to tree bark and algae will be found where there is moisture and light. The greatest variety is however found in freshwaters. They range from single celled forms which may be found in the open water of rivers, ponds, lakes or even bird baths to colonial or filamentous forms, such as "blanket weed" which can clog streams and rivers in the summer or cause

massive "water blooms" such as the high levels of blue-green algae (or cyanobacteria) which have caught the attention of the media and public in recent years. Algae can therefore have significant financial implications.

There are currently thought to be in excess of 4000 species of freshwater algae in the UK and a checklist of these species is being coordinated by Dr Brian Whitton of Durham University for the Institute of Hydrology. However I would envisage that this number will increase as recording and interest in this exciting and often beautiful group gets underway - for example it is not uncommon to find upwards of 200 species in one lake !

LOSS OF AN IMPORTANT LINCOLNSHIRE INSECT COLLECTION

Roger Key

I have at last "tracked down" Carey Riggall's collection from the 1940s-1960s to which I have referred in earlier beetle reports (eg Key, 1993). Kent coleopterist Norman Heal recently told me that, years ago, he found some of Riggall's specimens, in very poor condition, on sale at Watkins & Doncaster natural history dealers at Hawkhurst. It seems that the storeboxes that held Riggall's collection were probably sold empty but that a few of the more interesting specimens were sold individually to visiting entomologists. One can only imagine what happened to the bulk of the collection. This is a very sad end for a life's work and it is a lesson for us all to provide for the future of important collections.

KEY, R.S. 1993. Beetle recording in Lincolnshire and South Humberside - VC 53 & 54 - a history and current progress. *Transactions of the Lincs Naturalists' Union.* **23.** 113-120

LINCOLNSHIRE NATURAL HISTORY IN 1997

1997 started with a continuation of the three-year long drought, with a continuing quite dry and very mild winter and very early spring. The drought finally broke in May and June, which were unusually cold and wet, June being among the coolest and wettest on record, with obvious repercussions on wildlife. The remainder of the summer was warm, sometimes hot, and was followed by a fairly typical autumn. Early winter was very mild, but with a few sharp frosts in December. Overall, the year was unusually warm, mainly a result of the mildness of the two winters and, according to the weathermen, 1997 was the third warmest year since records began over 300 years ago.

Record Acknowledgements

As always the county recorders have acknowledged a debt of gratitude to all who have taken the time and effort, very considerable in some cases, to submit records. There are so many who send in records of different groups of animals and plants that Individual recorders are now acknowledged together: G Askew, A&A&J Binding, HE Beaumont, E Blood, SP Botham, P Bowler, K Bradshaw, JH Bratton, M Broadbridge, D Bromwich, D Brown, A Burgess. JT Burn, G Catley, R Chadd (Environment Agency), G Clayton, P Cook, A Credland, B Cunnington, L Davey, J Davison, ME Dawson, CM Drake, N Drinkall, W G Earnshaw, G Ellershaw, S Ely, AM Emmet, BC Eversham, D Fairchild, A&C Faulkner, AJ Gardiner, OL Gilbert, P Graves, A Godfrey, N Goom, S Green, Z Harris, C Harrison, D Harrison, KK Harrison, P Haywood, R&K Heath, B Hedley, DG Hemingway, M Hill, P Hodge, WG Hoff, J Jaines, RG Jefferson, ANA Johnson, M Johnson, R&WJ Johnson, M Joy, RS&RJD&WG Key, L King, P King, P Kirby, J Kneeshaw, V Knight, J Lamin, F Lammiman, R Lidstone-Scott, DA Lott, A McGovern, A McGowan, G McMichael, S Meek, C Newlands, J Ostler, A Parker, RJ Parsons, WM Peet, J Petyt, MD&I Pool, P Porter, C Potts, J Rance, J Redshaw, J&C Rees, C Rieser, K D&W Robertson, K Rowland, A Russell, B. Sampson, K Seaton, J Shackles, DA Sheppard, E Simms, K Skelton, B Skinner, C Smith, DH Smith, T Smith, J Starling, K Stephenson, J&J Stobart, G Taylor, J Taylor, BM Troake, N Turnbull, M Tyszka, RWJ Uffen,J Walker B Watkinson I Weston, V Wilkin, KMS Wilson, G Wright.

FUNGI - Ken Rowland

Altogether I have received or collected over a twelve hundred records from more than 50 sites, including 13 LNU Field Meetings. So far I have not been able to check out all the new County records but they will amount to about six or eight.

This year's Fungus Foray was at Austacre Wood on October 26th, the one meeting that I dare not miss. What a day! It is the first time we have had a good look at this wood and 110 species were recorded - one of the best Annual Forays I have attended. There were previously only 6 species recorded for this wood. There was one new county record *Omphalina sphagnicola* and one *Coprinus ephemeroides,* for which we only have one other record in 1908 and which is only about 3-4 mm across was found on horse dung.

Coprinus ephemeroides on horse dung photo Ken Rowland

At Sotby Meadow and Wood in May 25 species were recorded, and the June meeting at Scotton Common and Scotton Beck Fields yielded 37 species (which is pretty good for June). Only 19 species were recorded at Swinstead Valley and Drift in July and in September at Greetwell Hollow 31 species were found, including the fairly rare green-coloured *Hygrocybe psittacina*. In October Annette Faulkner sent records of 15 species for Kirkby Moor and 10 from Moor Farm.

In September Irene Weston sent a specimen of soft rush *Juncus effusus* from beside the road from Bigby to Brigg, with the smut *Uromyces junci* for which we only have one other county record from Snipe Dales, More interesting however, was that on this smut there was the parasitic fungus *Eudarluca carisis* which is a new county record.

Another interesting point this year quite a lot of earth stars *Geastrum* spp. have appeared in various parts of the county. Whilst they are not particularly rare they are unusual, I was called by Mr Jarvis from Doddington Hall to look at literally hundreds of *Geastrum striatum* under a hawthorn hedge in the Hall grounds. Reports also came in from Gibraltar Point, Scunthorpe, Hartsholme and Mablethorpe of various earth stars as well as what I suspect is the rare stinkhorn *Phallus hadriani* from Mablethorpe but this awaits confirmation.

Geastrum striatum - Doddington Hall photo Ken Rowland

A find at Hartsholme Country Park was of a specimen of *Daldinia concentrica* on birch which appeared to be disappearing into powder. As a rare moth larva feeds on this fungus the specimen was passed to Rex Johnson but a beetle emerged which Roger Key identified as the cramp ball weevil *Platyrhinus resinosus*. Also from Swanholme Nature reserve was *Daldinia vernicosa* on burnt gorse and *Neottiella vivida* a small bright orange red cup fungus amongst moss and lichens, both of which are new county records.

MOSSES, LIVERWORTS AND LICHENS - Mark R.D. Seaward

The considerable lichenological work undertaken in 1996 as part of the British Lichen Society's churchyard survey was maintained in 1997: in all, a further 41 churches were investigated (37 by the author). Mainly as a consequence of this, 11 county, 8 vice-county (5 for N.Lincs. and 3 for S.Lincs.), 125 divisional and many grid square records have been added to our registers. Mainly due to the invaluable work of Mr Frank Lammiman, numerous bryophyte records were also added to our registers, including *Zygodon baumgartneri,* a new county moss record, and *Fossombronia foveolata*, a liverwort not seen in the county for more than 60 years.

Mosses

These have been contributed by F.R.Lammiman (FRL), C.Rieser (CR) and T.Smith (TS).

Barbula cylindrica(Taylor)Schimp. + 3 (TS)
B.trifaria(Hedw.)Mitt. 7 (CR)
Bryum rubens Mitt. 18 (TS)
Orthotrichum affine Brid. 5 (FRL)
O.diaphanum Brid. 5 (FRL)
Plagiothecium undulatum(Hedw.)Br.Eur. 5 (FRL)
Pottia truncata(Hedw.)Fuernr. 3 (TS)
Rhynchostegium murale(Hedw.)Br.Eur. 9 (CR)
Zygodon baumgartneri Malta 10 **NCR** (FRL & CR)

Liverworts

Chiloscyphus polyanthos(L.)Dum. 6 (CR & FRL)
Fossombronia foveolata Lindb. 5 (FRL & CR) - known only in the county from collections made by G.H.Allison from Kirkby-on-Bain in the 1930s.
Riccia fluitans L. 7 (FRL)

Lichens

The following records have been contributed by the author unless otherwise stated; OG = O.L.Gilbert (1997) and DHS = D.H.Smith (1996).

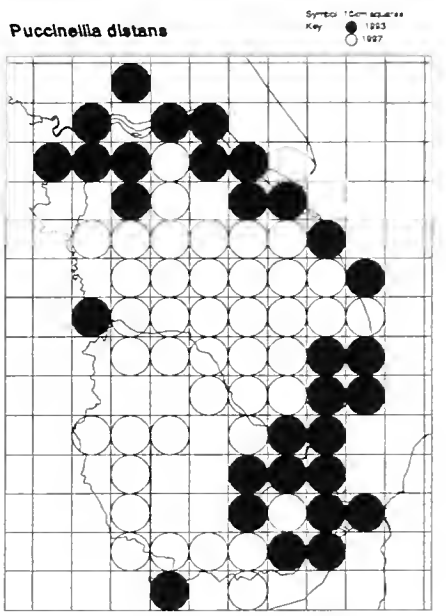
Acarospora rufescens (Ach.)Krempelh. 1, 4, 5, 8, 11
A.smaragdula (Wahlenb.)Massal. 1
Arthonia lapidicola (Taylor)Branth & Rostrup 1 DS, 5 DS
Aspicilia contorta (Hoffm.)Krempelh. 1 DS, 3
Buellia aethalea (Ach.)Th.Fr. 1, 3, 5, 8
B.griseovirens (Turner & Borrer ex Sm.)Almb. 3
B.occelata (Flot.)Korber 10 **NCR** OG, 18 **VCR** OG
Caloplaca aurantia (Pers.)Steiner 4, 8
C.crenularia (With.)Laundon 7 OG
C.isidiigera Vezda 2, 11, 17 OG
C.ruderum (Malbr.)Laundon 18 OG
Candelariella aurella forma *smaragdula* Szat. 17 **NCR** OG
C.reflexa (Nyl.)Lettau 3
Catillaria chalybeia (Borrer)Massal. 7 OG, 17 OG, 18 OG
Cladonia crispata var. *cetrariiformis* 3
C.fimbriata (L.)Fr. 18 OG
C.furcata (Huds.)Schrader 3
C.pyxidata (L.)Hoffm. 3
C.ramulosa (With.)Laundon 3 **VCR**
C.scabriuscula (Delise)Nyl. 3
C.subulata (L.)Weber ex Wigg. 3 **VCR**
Clauzadea immersa (Hoffm.)Hafellner&Bellem. 5 **NCR** OG
C.monticola (Ach.)Hafellner & Bellem. 7
Collema auriforme (With.)Coppins & Laundon 5, 6
C.crispum (Huds.)Weber ex Wigg. 10 OG
C.tenax var. *ceranoides* (Borrer)Degel. 7 **VCR**
Cyphelium inquinans (Sm.)Trevisan 11
Dimerella pineti (Ach.)Vezda 8 DS
Evernia prunastri (L.)Ach. 12 DS
Haematomma ochroleucum (Necker)Laundon 1
H.ochroleucum var.*porphyrium* (Pers.)Laundon 4, 5, 18
Hypogymnia tubulosa (Schaerer)Havaas 3, 12
Lecania cyrtella (Ach.)Th.Fr. 4
L.hutchinsiae (Nyl.)A.L.Sm. 17 **NCR** OG
L.turicensis (Hepp)Mull.Arg. 5 DS
Lecanora chlarotera Nyl. 12
L.conferta (Duby ex Fr.)Grognot 5

Hook. 1
L.expallens Ach. 1
L.intricata (Ach.)Ach. 8
L.orosthea (Ach.)Ach. 8, 11, 18
L.pannonica Szat. 4, 8 **VCR**
L.rupicola (L.)Zahlbr. 7 **NCR** OG
L.sulphurea (Hoffm.)Ach. 18 OG
Lecidella carpathica Korber 17 **VCR** OG, 18 OG
Lempholemma chalazanum (Ach.)B.de Lesd.10 **NCR** OG
Lepraria lesdainii (Hue)R.Harris 17 **NCR** OG
Leproloma vouauxii (Hue)Laundon 1 DS
Leproplaca chrysodeta (Vainio ex Rasanen)Laundon 7 OG, 18
Micarea prasina Fr. 3
Mycoblastus sterilis Coppins & P.James 8 **VCR** DS

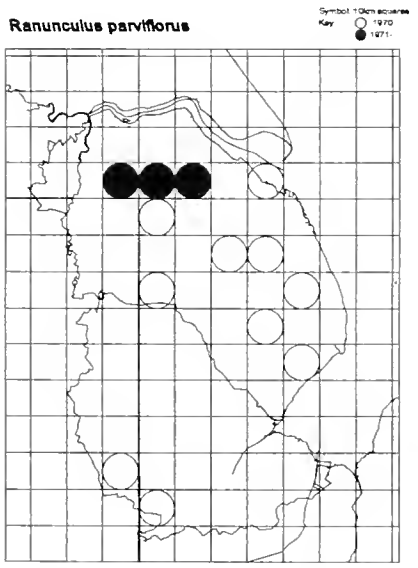
Ochrolechia androgyna (Hoffm.)Arnold 3
O.parella (L.)Massal. 1, 8, 10 OG
Opegrapha saxatilis auct. 7 OG
Parmelia mougeotii Schaerer ex D.Dietr. 6, 7 OG, 10 OG, 17 OG
P.subrudecta Nyl. 3
P.sulcata Taylor 1
P.verruculifera Nyl. 7
Peltigera lactucifolia (With.)Laundon 7
Pertusaria pertusa (Weigel)Tuck. 4
Phlyctis argena (Sprengel)Flot. 4
Placynthiella icmalea (Ach.)Coppins & P.James 7
Platismatia glauca (L.)Culb. & C.Culb. 3
Porpidia macrocarpa (DC.)Hertel & Schwab 1
P.soredizodes (Lamy ex Nyl.)Laundon 1, 4, 5, 7, 8
Protoparmelia badia (Hoffm.)Hafellner 7
Psilolechia leprosa Coppins & Purvis 6
Ramalina farinacea (L.)Ach. 3, 4
Rhizocarpon geographicum (L.)DC. 1 **NCR**
R.obscuratum (Ach.)Massal. 7, 18 OG
Rinodina teichophila (Nyl.)Arnold 5 DS
Scoliciosporum chlorococcum (Graewe ex Stenhammar) Vezda 4, 12
Thelidium decipiens (Nyl.)Krempelh. 10 **NCR** OG
T.incavatum Mudd 17 **VCR** OG, 18 OG
Trapelia involuta (Taylor)Hertel 1, 3, 7 OG
T.placodioides Coppins & P.James 10 OG
Trapeliopsis flexuosa (Fr.)Coppins & P.James 7
T.granulosa (Hoffm.)Lumbsch. 18
Usnea subfloridana Stirton 3
Verrucaria caerulea DC. 18 **NCR** OG
V.macrostoma Dufour ex DC. 1, 3, 4, 7
Vezdaea leprosa (P.James)Vezda 10 **NCR** OG
Xanthoria elegans (Link.)Th.Fr. 17 OG

BOTANICAL NOTES - Irene Weston

Reflexed meadow-grass *Puccinellia distans* (Jacq) Parl. Further to the paper on this species in last year's issue the following data refer to the distribution in Lincolnshire as a whole. Early records show the original coastal distribution of the species. Very few records were received between 1960 and 1993 but LNU botanists concentrated on recording the species in 1997 en route to recording sessions elsewhere. The grass is very easily identified from its reflexed lower inflorescence branches and also by the distinctive greyish green glaucous type foliage which gives the sward its unmistakable appearance on the verge and populations could easily be spotted after a while from the car. Its rapid spread on inland roadside habitats is to be appreciated.



The most common associated halophyte is *Atriplex prostrata* but in one or two sites *Atriplex littoralis* and *Spergularia marina* and *S.rubra* were found. There are still a few squares where the "two salties" have still to be found and 1998 will no doubt bring add further records.

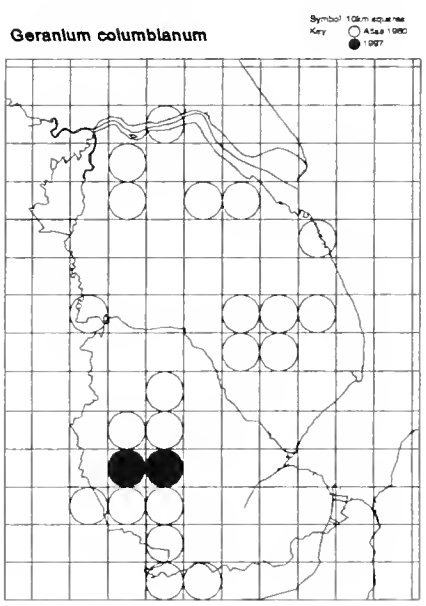


Small-flowered buttercup *Ranunculus parviflorus* L. (plate 8). In 1997 the annual *Ranunculus parviflorus* was recorded in three separate 10 km. squares in north Lincolnshire. The first and most extensive record was in Irby Dales (TA10) by Mark Tyszka on 20th May. Several hundred plants were found in one locality on a sloping chalk bank and more in the adjacent grassland. In June three more flourishing populations were found in the Dale. On May 21 Neil Sanderson recorded it from Manton Warren South (SE90) during a survey of the Coversands heathlands. He records a few plants in a disturbed area, possibly from introduced soil within parched acid grassland in heavily rabbit-grazed heath. I also found it with Vi Wilkin in a chalk quarry at Grasby (TA00) on 1st September on a bare area becoming colonised with fern grass *Catapodium rigidum* mouse eared hawkweed *Pilosella officinarum* and eyebright *Euphrasia sp.*

Our first record was from Wainfleet in 1829 by Oldfield and these are the first since 1962 when G.S.Phillips found it at CleethorpesTA30. As in other areas of Eastern England the species has declined dramatically. The 1994 Scarce Plants Survey indicated fifteen pre-1970 records and the 1997) record from SE90 is from a new square.

As its name suggests *R. parviflorus* has a very small flower and its identification in the field quite unmistakable. The plants can vary in size from tiny plants with single flowers in dense populations, to much branched trailing plants-with many flowers. It is a thermophilic dry open-ground plant which grows in a variety of habitats with low competition and disturbance (Fitzgerald, 1994). It is native and occasional (i.e. not always present but with a seed bank) on chalky banks and elsewhere is a casual (Gibbons, 1975). It is a Mediterranean/Lusitanian species extending into southern Britain and Ireland. The prolific numbers of plants at Irby Dales have presumably cropped up under these conditions from a long dormant seed bank as this area has been previously well worked. There is therefore a possibility that other sites might have been missed.

Long-stalked crane's-bill *Geranium columbinum* L. This annual crane's-bill was recorded in 1997 from two 10 km squares in South Lincolnshire by M.D. & I Pool. It was lovely to see it in abundance in a limestone quarry in SK 93 with the two fluellens *Kicksia spuria* and *K. elatine* and Venus' looking-glass *Legousia hybrida,* also in profusion.




Long-stalked crane's-bill *Geranium columbianum*
photo I Weston

This delightful geranium, often recorded in error, is a very delicate plant with flowers of pale rose, with un-notched petals (cf dove's foot crane's-bill *G. dissectum* with notched petals), which often hang their heads. The flower is cup or bell-shaped, unlike the open flowers of the other species. Described by Gibbons (1975) as native, uncommon and mainly on the chalk, the distribution in 1980 totalled 21 squares but there are only two verified records from 1980 to 1987. This appears to indicate a decline but may well result from under-recording although it parallels a decline in other annuals. Older records indicate the areas where the species might again be found in future.

Wild radish, runch, white charlock *Raphanus raphanistrum* L. ssp *raphanistrum.* This species, once a very common annual arable weed but now severely controlled by selective herbicides, is currently most often seen in fringe habitats - roadsides, field edges, waste ground, rubbish dumps, canal sides and docks, rather than in cornfields. An exception this year was in the addition to the Trust reserve at Scotton Beck Fields SK79. In an unsprayed cereal crop a large population of the radish (white petals with purplish veins) was seen together with other annuals; storksbill, field pansy, corn spurrey

Spergularia arvensis, fiddleneck *Amsinckia micrantha* and the loose silky-bent *Apera spica-venti*, a grass rare in the county with a stronghold in the Isle of Axholme.

Arable weeds were one of the highlights at the field meeting on the calcareous soils of the Swayfield Valley TF02. Species amongst the pea and cereal crops included knotted hedge-parsley, *Torilis nodosa*, narrow -fruited cornsalad, *Valerianella locusta*, round and sharp-leaved fluellens, *Kicksia spuria* and *K. elatine*, dwarf spurge *Euphorbia exigua*, Venus looking-glass, *Legousia hybrida* and *Papaver dubium subsp. lecoqii*. Known as Babington's poppy, this subspecies of the long-headed poppy was not mapped separately for the 1960 Atlas, but jointly with *Papaver dubium* ssp *dubium*. For Atlas 2000 they are to be mapped separately. It is frequent on the chalk in E England and is easily recognised by its yellow sap. In Gibbons (1975) it is regarded as native or introduced, occasional on chalk and possibly overlooked. Dr Turnbull has also recorded the blue scarlet pimpernel *Anagallis arvensis* subsp *foemina* (which is much scarcer than the scarlet pimpernel *A. arvensis* ssp *arvensis,* which occasionally has both scarlet and blue flowers) at Swayfield.

Corncockle *Agrostemma githago* L. Mrs M. Hill reported a thriving colony of this Red Data Book species from Old Wood, Skellingthorpe in July. Approximately 100 plants over 3 x 2 yards - near a newly restored gateway fence at the extreme edge of the wood. This is presumed to have come from dormant seed disturbed by the work and a relic from former populations in cereals. It was also been seen at Aubourne by Mr Green in a field sown with a wild flower mix, and from Navenby churchyard also sown with a variety of wild flowers including orpine which was last recorded as a native at Navenby in 1941. These introduced plants which are formerly native to the county need to be particularly well recorded so that if they spread the origin will have been noted. A recorders dilemma !! Documentation of new plantings would be most welcome for the county records.

Green-winged orchid *Orchis morio* L., A particularly well documented example is that in the autumn of 1990, Mr K. Stephenson who farms in TF17, reseeded an old meadow site by broadcasting a seed mix from local sources which included common-spotted and green-winged orchids and in 1992 added more green-winged orchid seed. In 1997, 100 spikes of the *Orchis morio* were counted. Mr Stephenson is extending his meadow and small woodland reclamation projects under the Countryside Stewardship scheme.

Bee orchid *Ophrys apifera* Huds.
Few varieties of bee orchid are seen in Lincolnshire. Mr E. Simms regularly records the wasp orchid *Ophrys apifera* var *trollii* in SK 91 and in 1997 Mr M.D.Pool found two plants of *Ophrys apifera var flavescens* (plate 13) in Grantham SK93 in a sward with the type.

Broad - leaved helleborine *Epipactis helleborine* (L.) Crantz.
The population of this species recorded by D Thomas in the 1960's in the cemetery at Spalding TF22 continues to flourish under a line of beeches. This is an unusual site for the species in Lincolnshire, particularly in view of its continued existence.

Fenland Banks Orchids. These have been monitored by Kaye Heath in 1996 and 1997: Vernatt's Drain (2 separate localities) TF22 3900 spikes of *Dactylorhiza fuchsii* 460+ *D. praetimissa* and *27 Listera ovata* in 1996 but rabbit damage reduced this in 1997, although 78 spikes of *Ophrys apifera* were found. South Bank of the River Welland at Fosdyke TF33 - 1334 spikes of *Anacamptis pyramidalis* in 1996, 3600 in 1997. The flowers were very large and dark coloured. Hobhole Outfall TF33 - 300+ spikes of *Ophrys apifera* in 1996. South Holland Main Drain TF 41 -10,000+ plants of *Dactylorhiza fuchsii* with *D. praetimissa* and hybrids in 1997. *D. incarnata* was recorded here in 1996. Tydd Gote TF41 - 120 spikes of autumn ladies-tresses *Spiranthes spiralis* in 1996, the most since

the work on the river bank, prior to which numbers up to 1000 had been seen. In 1997 96 spikes were found. East bank of the River Nene TF42 - 448 plants of *Anacamtis pyramidalis* in 1996.

Other records in 1997

Bur Forget-me-not *Lappula squarrosa (Rets.) Dumort.*, a new county record from VC 53 at Bourne by T. Stubley. Hungarian Brome. *Bromus inermis (Leyss.) Holub, 2nd county record from* VC 54 at Revesby by I Weston and confirmed by R. Payne.

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GIBBONS, E.J. 1975. *The Flora of Lincolnshire*. Lincolnshire Naturalists' Union. Lincoln.
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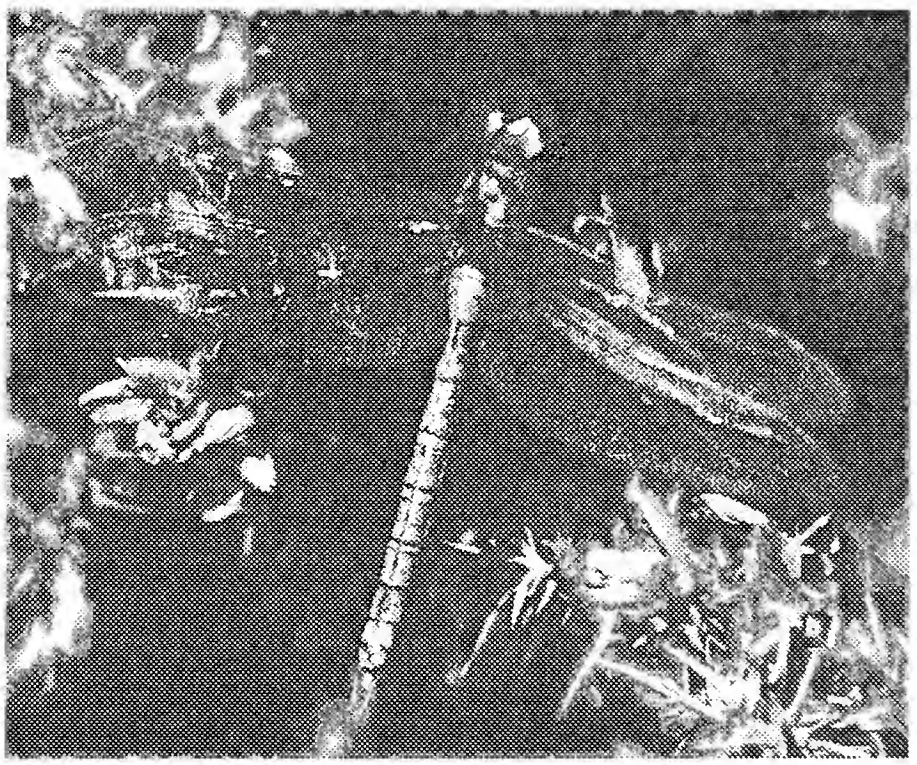
DRAGONFLIES AND DAMSELFLIES - John Redshaw

The highlight of 1997 was the totally unexpected discovery by John Davison of a Norfolk hawker *Aeshna isosceles* at Messingham Sand Quarry nature reserve, SE908032, on 29th August. Initial disbelief of this unlikely record, the first for Lincs was dispelled after seeing a voucher photograph showing all the diagnostic features of the adult male.



Lincolnshire's first ever Norfolk hawker *Aeshna isosceles* photo John Davison

The Norfolk hawker is a very sedentary species which is confined to a few ditch systems in Norfolk and Suffolk and is not known to migrate out from these strongholds. Also the end of August is quite late for this species to be on the wing in an apparently fresh state. It seems possible, therefore, that the Messingham specimen may have been an immigrant from the continent, although it is not known to be a migratory species there either. Its appearance at Messingham, in a totally atypical habitat, well north of its restricted UK range, and a month later than the end of its normal flight period remains a mystery.

The red-eyed damselfly *Erythromma najas* continues to extend its range in the county, and additional site records have been received from Messingham Sand Quarry, Kirkby on Bain pits, TF238609, and Killingholme pits, TA164196.

SHIELDBUGS - Annette Binding

A record of *Podops inuncta* by Brian Eversham at Rauceby Warren Reserve on 9th June 1996 has only recently been sent in. Peter Kirby recorded the species there in 1982 and the last record for this species was at Ancaster Valley Reserve in September 1986.

Neottiglossa pusilla, which was recorded last year at Rauceby Warren Reserve for the first time in the county since 1973, turned up there again in June and also at two new sites. At the end of April, I found a single adult in damp grass at the edge of an old meadow by the Carr Dyke at Washingborough and Roger Key found five adults in September at Kirkby Moor in leaf litter which was also contained a single dead specimen of *Rhacognathes punctatus.* The only previous records for this species in Lincolnshire were all at Scotton Common Reserve, recorded by Peter Kirby in June and July of 1988.

Picromerus bidens, a predatory bug which prefers damp places and of which there are very few county records, turned up in good numbers at the LNU meeting at Witham Marshes in September. At least seven adults were seen hunting over the nettles and thistles. There were three records of the pretty little *Elasmostethus tristriatus* which feeds on garden junipers and cypresses. Jackie Starling caught one at Woodhall Spa in early April which was probably just emerging from hibernation. One was also found in a garden at Crowle on 8th June by Mr Bill Key. Finally, *Eysacorus fabricii,* which was found in enormous numbers in 1996, was back to normal population sizes in 1997.

BUTTERFLIES - Allan Binding

With changes in the weather, it is important to monitor fluctuations in butterflies and look out for more southerly species like brown argus becoming more widespread. While entering records of this species onto the computer I noticed that they seemed to be recolonising old sites and not just moving northwards. Maps of older records and ones since 1990 showed that most new records were from the same areas as before. At 1km^2 resolution, although records on old and new maps did not perfectly match, new records were very close to original sites. I have not had records from all its old sites but this does not mean it is not there. Brown argus are recolonising the sandy and limestone areas where its food plants rockrose, cranesbill and storksbill, grow. Did this butterfly return to Lincs, or has it been overlooked in the last decade but was present in very small numbers?

It was not a good year for migrants, with very few painted lady compared to last year and the red admiral, although well distributed, was down in numbers. The warm autumn weather enabled small tortoiseshell to continue into November and peacocks were seen at Whisby Nature Park and Washingborough into December.

MOTHS - Rex Johnson

Moth reports for the last two years have started with exciting news of migrant species which have enlarged the species list for the year by invading Lincolnshire from Africa, southern Europe and Scandinavia. In 1997, however, most of the tourists stayed away, and a much more usual number of migrants were seen. Most recorders spotted silver y and diamond-backed moths, but numbers were nothing like those of 1996. A very few dark sword grass, great brocade and pearly underwing were seen, and four convolvulus hawk-moths recorded. Two further species deserve special mention- an adult bedstraw hawk-moth turned up at Grebby on 27/7/97 for Bill Hoff and a phone call from Ken Skelton on 16/8/97 alerted me that there were bedstraw hawk larvae on willow-herb around the Scotton Common reserve car park. On the morning of 17/8/97 I counted eleven larvae, some of which were a dingy green in colour and obviously fully fed, ready to go down into the ground to pupate. Clearly migrants in July had visited Scotton as well as Grebby.

The second worthy visitor was the oblique striped *Phibalapteryx virgata,* a moth not recorded in Lincolnshire since the turn of the century. It turned up at Gibraltar Point on 6th

August to Kevin Wilson & G Taylor, having presumably come from the E Anglian Breck where it is found locally.

Macro-moths. Nearly forty people sent in records of macro moths in 1997 but it seemed to be a moderate year, with many recorders noting that numbers of each species coming to light were down by as much as 30 percent. Coupled with the scarcity of migrants, I expected the overall total number of species recorded to be well down, but this was not the case. 465 species were recorded, exactly the same as in 1996. It is strange how the annual tally remains consistent - 425, 441, 475 species in 1993, 94 & 95.

One new species for Lincolnshire, the barred carpet *Perizoma taeniata* Steph. (Nationally Scarce category A), came to my MV light in numbers in Wickenby Wood on 10th August. During the same week several came to Mrs Dawson's light at Dalby. It is a local species which inhabits damp woodland, and the larvae are reported in Skinner (1984), to feed on "a species of moss growing in damp places" and in captivity on the "withered leaves of chickweed and other low plants".

Several rarities which had not been recorded for years turned up. The best of these was the butterbur, which came to Mrs Dawson's light at Dalby (verified by Gerry Haggett). This was last seen in 1987 at South Thoresby by Richard Pilcher. Bill Hoff found the fern at light at Grebby in his garden. The light orange underwing was spotted by John Lamming at Callan's Lane Wood and he found the rush wainscot at Baston Fen. Wendy and I found small chocolate-tip larvae at Laughton and the wood tiger was found at Risby by J Petyt.

Another rare moth in Lincolnshire, the frosted green, was seen by several recorders and it obviously had a very good year. If confirmed, the most unusual re-appearance was what appears to be a very dark coloured buttoned snout *Hypena rostralis*, not seen in Lincolnshire since 1904. A specimen was found dead in November in buildings at Glentham where Colin Smith works. This record is something of a puzzle at the time of writing! This is a nationally scarce species, listed on the UK Biodiversity Action Plan.

Micro-moths. Since the publication of the county fauna (Johnson, 1997) we have added further species which are included below. While a number of other species have been found in the last two years for the first time since Mason's list in the early years of the century and there are further new vice county records, there is insufficient room for this kind of detail here, but I can be contacted for this information and up-to-date reports will be sent to recorders. A selection of records of the new species are given below.

Etainia sphendamni	Rippingale, VC53, 11/7/1996, JL
Stigmella centifoliella	Math & Elsea Woods, VC53, 20/10/1996, RJ
Stigmella regiella	Willingham Forest, VC54, 30/10/1997, R & WJ
Bucculatrix frangulella	Manby & West Woods, VC54, 19/10/1997, R & WJ
Calybites phasianipennella	Willingham Forest, VC54, 13/8/1997, CS
Parornix fagivora	Willingham Forest, VC54, 30/10/1997, R & WJ
Coleophora albidella	Robert's Field, VC53, 19/7/1997, AG
Paltodora cytisella	Linwood Warren, VC54, 8/7/1997, CS
Teleiodes notatella	College Wood, VC54, 15/7/1997, R & WJ
Scrobipalpa acuminatella	Bourne, VC53, 31/5/1997, AG
Caryocolum kroesmanniella	Wickenby Wood, VC54, 13/8/1996, R & WJ
Stathmopoda pedella	Willingham Forest, VC54, 26/7/1996, CS
Batrachedra pinicolella	Bourne Wood, VC53, 11/7/1997, AG
Mompha conturbatella	Willingham Forest, VC54, larvae spring 1997, CS
Phalonidea minimana	Wilsford Heath, VC54, 16/7/1994, KS. Boultham Mere, VC53, 1/5/1997, PP
Phalonidea curvistrigana	Willingham Forest, VC54, 7/7/1997, CS
Aphelia unitana	Boultham Mere, VC53, 1996, PP & SB
Epiphyas postvittana	Lincoln, VC54, 7/8/1997, SB
Epagoge grotiana	Bourne Wood, VC53, 11/7/1997, AG. Linwood Warren, VC54, 15/8/1996, CS
Eana incanana	Scotton Common, VC54, 4/8/1996, RJ. Vernatt's Reserve & Spalding, VC53, Jun./July 1997, AF

Acleris hyemana	Glentham, VC54, 10/9/1996, CS
Acleris lorquiniana	Gosberton, VC53, 1996, MJ
Apotomis sororculana	Crowle Moors, VC54, 1/7/1997, HEB
Ancyclis unguicella	Laughton Forest, VC54, 8/7/1997, R & WJ
Eucosma conterminana	Bourne South Fen, VC53, 16/9/1996, JL
Pammene albuginana	Market Rasen, VC54, 20/7/1996, CS

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FLIES - Andy Godfrey & Jill Mears (née Binding)

Flies other than hoverflies - Andy Godfrey

Nettleton Wood and associated heathland were surveyed during May and found to be of high entomological value. A number of interesting species were recorded including *Platypalpus excisus* (Empididae), *Meonura neglecta* and *M. triangularis* (Carniidae), *Acartophthalmus bicolor* (Acartophthalmidae), *Lyciella laeta*, *Aulogastromyia anisodactyla* (both Lauxaniidae), *Suillia dumicola* and *Aecothea praecox* (both Heleomyzidae), *Colobaea distincta* (Sciomyzidae) and *Eustalomyia vittipes* (Anthomyiidae). Material taken from a birch rothole in Nettleton Wood produced the dolichopodid *Systenus mallochi* which was only described as new to science in 1997 (MacGowan 1997). It is only known from a handful of sites in Scotland and in the Brecks; the only additional records of the new species have been from Nettleton Wood and from a wood in South Yorkshire (MacGowan pers.comm.). *Platypalpus excisus* was also found at Kirkby Moor in October.

Throughout the year I continued to collect Diptera from a tree rothole at Hagnaby, Spilsby and this material along with the material from 1995 and 1996 was identified through the winter. Several Red Data Book and nationally Notable species have been recorded. The Red Data Book species are *Limonia ctenophora*, *L. uniseriata* (Limoniidae), *Systenus bipartitus* (Dolichopodidae), *Pocota personata* (Syrphidae) and *Madiza pachymera* (Milichiidae). The nationally Notable species recorded were *Exechiopsis crucigera* (Mycetophilidae), *Drapetis arcuata* (Tachydromidae), *Systenus leucurus S. scholtzii*, *Achalcus melanotrichus* (Dolichopodidae), *Fiebrigella brevibucca* (Chloropidae) and *Phaonia pratensis* (Muscidae). Several other rarely recorded rothole flies such as the moth fly *Trichinomyia urbica,* which has wood-boring larvae, were also found.

Flies collected by Bill Hoff using a Malaise trap from Welton Wood near Scremby in 1988 were identified. Amongst the more interesting material were *Hercostomus nigrilamellatus*, *H. parvilamellatus*, *Thrypticus tarsalis* (all Dolichopodidae), *Lonchoptera nitidifrons* (Lonchopteridae), *Brachyopa scutellaris* (Syrphidae) and *Pegomya seitenstettensis* (Anthomyiidae). These records combined with earlier ones identified by Bill and Peter Skidmore show the wood to have an exceptional Diptera fauna. At the invitation of Bill Hoff I also sampled a tufaceous spring at the front of Grebby Hall. Several Diptera larvae were taken of which the most interesting are moth fly larvae belonging to either *Pericoma trifasciata* or *P. calcilega*. Both these larvae are peculiar because they coat themselves with lime which is derived from the highly saturated calcareous waters in which they live. Both are rarely recorded - Withers (1989) only gives one British locality for *P. calcilega*) but I have found larvae of both species in springs and seepages throughout Britain.

Hoverflies Jill Mears (nee Binding)

The record of the year must be *Pocota personata*, a large bumble-bee mimic, found in the rot hole at Hagnaby by Andy Godfrey (above). It breeds in rotholes high above the ground

and the adult has a very short flight period and is rarely observed.

At the LNU meeting held at Sotby Wood in May were several specimens of *Cheilosia fraterna*. This is a very local species associated with damp meadows. The adults are often found on buttercup flowers whilst the larvae breed in the stems of marsh thistle. Amongst flies collected by Bill Hoff in 1988 and identified by Andy Godfrey was *Brachyopa scutellaris*. Although widespread it is still far from common, usually associated with sap runs on deciduous trees but I have found this species in a sap run on yew. Burton Pits has continued to produce some excellent wetland species and this year *Parhelophilus frutetorum* and *Anasimyia transfuga* were found. Both of these are scarce and are associated with emergent vegetation at the edges of ponds and ditches.

Finally whilst sorting through a number of hoverflies found in the tide line debris at Gibraltar Point I discovered a single specimen of *Scaeva silentica*. This is the first Lincolnshire record of this species but it is also the species I most expected to find in Lincolnshire. It is a partial migrant and on that basis Gibraltar Point was one of the most logical sites for it to occur. It is known to be associated with pines and although records for the country are widespread it is still a scarce species.

Please send specimens for identification to my new address; 6 Leatham Royd, Manchester Road, Marsden, Huddersfield HD7 6HA.

Rot-hole at Hagnaby in which Andy Godfrey found several scarce beetles and flies. photo A Godfrey

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BEETLES - Roger Key

Inevitably, a few records from earlier years turn up too late to be included in each year's report: Annette Binding found *Ceutorhynchus trimaculatus* (NB), a beautifully marked black, white and orange weevil which feeds on musk thistle, at Rauceby Warren on 20th June 1996 and 10th June 1997. It has only been found once before, at Great Limber in 1937 (Baker 1938). *Hypera meles* (NA), another small weevil which feeds on clovers that Alan Lazenby had found at Guy's Head on 1st August 1994, was confirmed by Dr Mike Morris of Dorset as this rare species. It is new to Lincs.

Andy Godfrey found several interesting species in 1996. The small blue flea beetle *Psylliodes dulcamara* turned up on 13th March beside Hackthorn Beck. It feeds on bittersweet and is new to Lincs. He also found the small rove beetle *Carpelimus zealandicus*, an introduced species, beside a pond at Spridlington - only the second Lincs record, the first being at Crowle in 1981, and the tiny pill beetle *Limnichus pygmaeus* (NA) beside one of the Ancholme head streams at Saxby. This rare species has otherwise only been found beside the River Freshney in 1910 and in 1979 from Alkborough Flats.

I didn't complete identification of beetles from Andy's rot-hole at Hagnaby (see Flies, above) in time for the 1996 report but there were some very significant dead wood species:

I mentioned last year *Prionocyphon serricorne* and *Aderus populneus* as new to Lincs. (note - I also mentioned *Trachodes hispidus* in error for *Acalles misellus).* Also new were *Abraeus granulum* (NA) (on 8 separate occasions) *Harpalaraea pygmaea, Haploglossa gentilis, Aleochara kamilla & Orthoperus atomus.* Another good record *was Symbiotes latus* (NB) - the only other record is from Nocton in 1883 by Cannon Fowler (Fowler, 1889). Therefore there are 6 extra species new to the county in 1996, bringing total to 75, an extraordinary total. There were a further 22 new species to the county in 1997.

Andy also found some good species in 1997.At Nettleham was *Lamprinodes saginatus* (NA) new to Lincs and *Euplectus nanus* (RI), of which there are two old records but it is very difficult to identify and has been split since they were recorded. This is the first confirmed record. He also found *Trachyphloeus bifoveolatus,* the 5th Lincs Record (which also turned up on the Moor Farm meeting in October) and *Phloeopthorus rhododactylus* on broom on 15th May - 13 days after I had found it new to Lincs from Rauceby Warren!

Alan Lazenby also found other species of note in 1997. On 23rd June he found *Salpingus castaneus* in the Ancaster Valley reserve. This small, weevil-like reddish beetle lives on pine and this is only the 5th county record and the first since 1909. On the same day Alan visited Rauceby Warren and found *Stenocarus umbrinus* (NB), a small dark weevil that feeds in poppy seed heads and *Longitarsus curtus* (NA), a tiny yellow flea beetle that feeds on viper's bugloss. It is the 10th county record for *S. umbrinus*, but the first since 1910, while *L. curtus* was only added to the county list in 1992 from Manton Common. Allan's other most significant record was of the fruit bark beetle, *Scolytus mali,* a species that is sometimes a pest of apple trees, but only our fourth record.

An extremely significant addition to our knowledge of the county's beetle fauna came from a survey of Lawn Wood & Tortoiseshell Wood reserves carried out for the Trust by Derek Lott from Leicestershire. This produced a very rich community of dead-wood beetles with 8 species of beetle new to the county. These were *Euplectus karsteni, Dorcatoma serra* (NA), *Dienerella seperanda* and *Cis festivus* (NB) from Tortoiseshell Wood and *Phloeopora teres, Cis vestitus, Abdera quadrifasciata* (NA) and *Ptenidium leaevigatum* from Lawn Wood. Other species with very few records (with nº of old records):-from Tortoiseshell Wood: *Ptinella errabunda* (1), *Xylodromus depressus* (4), *Atheta castanoptera* (2), *Atheta sodalis* (1), *Cryptophagus ruficornis* (NB)(1),*Orchesia minor* (NB)(1- last seen 1855), *Aderus oculatus* (NB)(2), *Magdalis ruficornis* (1), *Acalles misellus* (2), *Scolytus rugulosus* (2), *Ocalea picata* (2) and from Lawn Wood: *Ptinella errabunda* (1), *Leptusa ruficollis* (2), *Triphyllus bicolor* (4), *Lissodema quadripustulata* (NB)(2), *Orchesia minor* (NB)(1), *Acalles misellus* (2), *Conopalpus testaceus* (NB)(5).

The year started well with the small, teardrop shaped brown rove beetle *Myllaena kraatzi* (NB) new to the county from Boultham Park by Phil Porter on 15th January. Another early record of interest was *Lesteva punctata*, which John Bratton found beside a spring on Ferriby Cliff on 29th March. The only other record is one from Winteringham Haven in 1981.

On the first LNU field meeting the "cobweb" beetle *Megatoma undata* (new to Lincs) turned up in a decaying willow beside the Grantham Canal. At the same meeting I was surprised to find the small blue and orange rove beetle *Dianous coerulescens* in moss on a leaking lock gate. It is normally found in moss in waterfalls in north and west Britain and is easy to find, for example, in Wales or the North Yorks Moors. I was surprised to find it here, as it has only once before been found in Lincolnshire, at Benniworth Haven in 1921. I was unable to attend many other LNU meetings, but the meeting with the British Entomological Society at Kirkby Moor and Moor Farm on 4th October turned up 2 new species. My wife Rosy found *Caenocara bovistae* R3 (formerly a very widespread species but only a couple

of British records in the last 25 years) at Moor Farm, squashed in a puffball, and the attractive blue jewel beetle *Trachys troglodytes* was found on devils bit scabious at Kirby Moor by Phil Porter. Another local heathland beetle was the tiny rove beetle *Ousipalia caesula* from Moor Farm, only the 2nd record, the first being by Andy Godfrey at Risby Warren just 3 years ago. Another county second was *Pocadius lanuginosus* which lives in mature puff ball spores. The only other record is one I found at Haxey Turbary in 1981.

Two other new species from Kirkby Moor were found on 22nd September. The smut beetle *Olibrus pygmaeus* (NB) and tiny *Corticaria umbilicata,* found by Peter Hodge from Sussex on a survey for one of our real rarities *Cryptocephalus coryli* (R1) (plate 14). It is listed on the UK Biodiversity Action Plan (BAP) and on 20th June I and my colleagues from English Nature found four, as many as had been found in the county in the last 50 years.

Lincolnshire's other BAP-listed beetle species the crucifix ground beetle *Panagaeus crux-major* (R1) also turned up for the first time since 1991. 5 individuals were found by Dave Hemingway at Saltfleetby on 21 August. This is an unusual time of year as it is thought to be a spring/autumn species.

Kevin Wilson found another beetle new to Lincs at Gibraltar Point on 15th November, the small brown rove beetle *Omalium riparium* from the strandline. Another similar member of the genus, *Omalium septentrionis* turned up new to the county at the Austacre Wood fungus foray on 26th October.

I found an excellent fauna of water beetles in the ditches on Crowland High Washes on 20th September. There were some of the rare species that make Cross Drain so special, including *Hydrochus carinatus* (R3), found only in the Cross Drain by John Bratton in 1993 and in Burton Gravel Pits by Dave Bilton in 1984, although there is a controversial record from Irby-on-Humber which was doubted by the great water beetler Frank Balfour-Browne (Balfour-Browne, 1938 & 1958). Other scarce species were *Haliplius mucronatus* (NA), with 8 scattered records across the county, *Graptodytes granularis,* (NB) *& Hydraena testacea* (NB). Together with a collection of other scarcities found by John Bratton in July 1992, which also included *Berosus affinis, Limnebius papposus, Bagous limosus* (all NB) & *Hydrochus elongatulus* (R3), this makes this area of ditches one of the richer areas for fenland water beetles in the county. Another very interesting water-beetle find was of *Helophorus longitarsis* (RDB3) in a pond on Surflleet Bank, surveyed by Richard Chadd of the Environment Agency. New to the county, this is probably a genuinely rare species but only identifiable by examination of the male genitalia and possibly under-recorded.

In an area of set-aside farmland at Crowland I found the small brown flea beetle *Psylliodes picina* on hedge mustard on 1st July. It is the first time the species has been found in Lincolnshire since 1910 and only the 4th record. Another interesting record from waste ground at Crowland on 20th September was the pollen beetle *Brachypterolus linariae* from toadflax. It has only been found once before in Lincolnshire, from Crowle in 1981.

In my article on beetle conservation in Lincolnshire in 1995 (Key, 1996), I speculated whether our largest longhorn, the very conspicuous *Saperda carcharias* (NA) had become extinct as it had not been seen in the county since 1963. John Redshaw found one of these spectacular beetles in his house in Pinchbeck on 22nd August and it would be nice to find out where it was breeding, which would have been in poplar or willow timber.

Annette Binding added two species of weevil to the list, one in her garden on 8th August. *Otiorhynchus porcatus* is a bizarre species related to the vine weevil, *Otiorhynchus sulcatus,* but smaller, with ridges and tubercles. It is an introduced species in Britain

(Morris, 1997), usually in gardens where it often feeds on primulas and saxifrages at night and is probably moved around the country in garden plants. The other new species is *Gronops inaequalis* (RK), a handsome greyish weevil that feeds on oraches and is a newcomer to Britain from E Europe. Annette found it at Gibraltar Point on 16th August. Its spread through Europe is well noted and it first turned up in Kent in 1982 (Clemons, 1983). There are still very few parts of Britain where it has been found.

Annette also found the small brown dead-wood beetle *Eucinetus meridionalis* at Scotgrove Wood on 7th April. This is another introduced species (Gardner, 1969) otherwise known only from specimens found by Alan Lazenby at Blankney Fen in 1993. One species with, surprisingly only one record is the flour beetle *Tribolium castaneum*, usually a pest species. Annette found one in a hotel in Washingborough on 13th August. Another introduced species was found at Wilsford by Alexander Norman (Norman, 1997) who's father found a large longhorn of the genus *Monochamus*, apparently imported with a garage door. Although described as *M. sartor,* the specimen was identified with the Collins Gem guide, which does not include any other species of *Monochamus* that are regularly imported.

Lastly, in November I received an output of all records of ground beetles *Carabidae* from the Biological Records Centre. This produced an astonishing 883 records of which I was unaware and let me know of another 13 recorders who I did not know had been working beetles in the county. There were four species not represented in the LNU records: *Amara praetermissa* (NB) found by John Bratton at Kirkby Moor in 1988, *Harpalus puncticeps* found by Peter Kirby at Spalding in 1974 and 1978, and *Harpalus schaubergerianus* (NB) and *Harpalus azureus* (NB) found near Wilsford by Brian Davis in 1974..

Statuses quoted are as in Hyman & Parsons (1992&1994) and abbreviated: N - Nationally Scarce (categories A & B), R1 - Red Data Book 1 (Endangered), R3 - Red Data Book 3 (Rare). RI - Red Data Book Indeterminate RK - Red Data Book Insufficiently Known.

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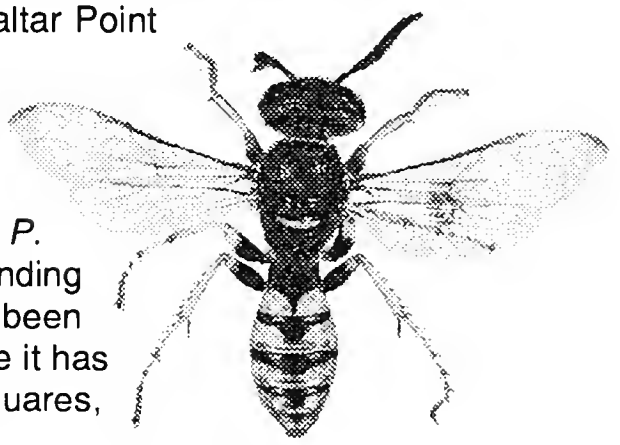
BEES AND WASPS - Michael E. Archer

Four new species have been added in 1997 (although only one was actually recorded in 1997) to the list of the aculeate Hymenoptera (bees, wasps & ants) for Lincolnshire, which now stands at 273 species. In 1993 I showed that 250 species had been recorded

(Archer, 1993), so that during the last four years I have been able to add 23 species to the list. Besides my own records I have received records from three others, John Burn, Andrew Godfrey and Raymond Uffen, to whom I am most grateful. Status categories quoted are as in Falk (1991).

The new species in 1997 were as follows: Two species of dryinid wasps (a very primitive family, very similar to the Parasitica), *Aphelopus serratus* Richards and *Anteon fulviventre* (Haliday), were found at Welton Wood on 12 July 1988 by John Burn. I found the ruby-tailed wasp, *Chrysis rutiliventris* Abeille de Perrin at Gibraltar Point on 21 July 1997, the hosts of which could be the mason wasps, *Ancistrocerus scoticus* (Curtis) and *A. oviventris* (Wesmael), both of which are found at Gibraltar Point. Fourth, the cleptoparasitic bee, *Nomada lathburiana* (Kirby), from Tattershall Old Sand Quarry and Gravel Pits during May 1995 by Andrew Godfrey. The host of *N. lathburiana* is the solitary mining bee, *Andrena cineraria* (Linn.), which has been recorded once in Lincolnshire at Sausthorpe by Marcus W. Graham during the 1930s-1940s.

Other important records by Andrew Godfrey were the ruby-tailed wasp, *Hedychridium cupreum* (Dalhbom)(Nb), and the spring mining solitary bee, *Andrena tibialis* (Kirby)(Na), both found at Tattershall Old Sand Quarry and Gravel Pits. I found the cleptoparasitic solitary bees, *Sphecodes crassus* Thomson (Nb), at Gibraltar Point, and *Nomada fulvicornis* Fab. (RDB3) at Kirby Moor. In addition I found the solitary wasp or bee-wolf, *Philanthus triangulum* (Fab.) at Gibraltar Point and Rauceby Warren. *P. triangulum* was found for the first time in Lincolnshire during 1996 at Gibraltar Point and is included in Falk (1991) as Red Data Book 2 but has recently considerably expanded its range in Britain. The 1997 records of *P. triangulum* indicate that the species is similarly extending its range in Lincolnshire. *P. triangulum* has been recorded twice in Yorkshire during 1997 and, since it has now recently been found in more than 100 10km squares, it can now be considered a widespread species (Archer, 1997).



Bee wolf *Philanthus triangulum*
photo ME Archer

During 1997 I discovered, with the assistance of Adrian Norris, that specimens that Harry Britten recorded at Grantham during 1940s were deposited at Leeds museum. Eight species are represented in this small collection, but none were new to Lincolnshire.

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MOLLUSCS - John Redshaw

Due to the efforts of Chris du Feu and his 6th form studies group at Queen Elizabeth High School, Gainsborough, several new slug species have been added to the county's fauna in recent years. The group, known as the QEHS Slug Safari Group, and working under the guidance of Mr. du Feu, has produced some remarkable results including the addition of

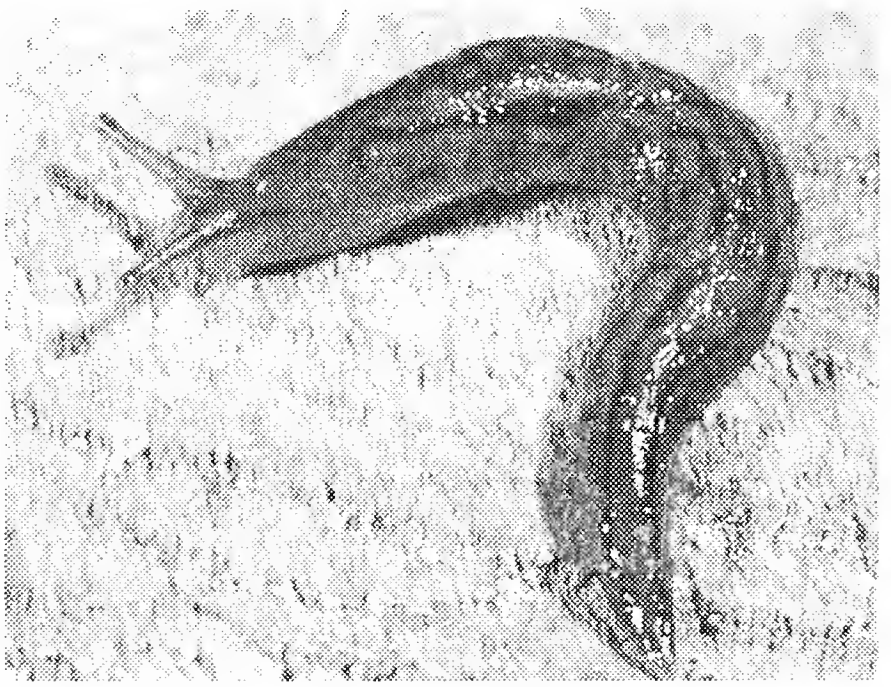
41 new 10 km square records around Gainsborough and at Riseholme and Spalding. To get one new molluscan county record about every ten years is an achievement; the Slug Safari however has produced four new species in the same number of years.

In March 1994 a garden slug, *Arion distinctus*, was found in Gainsborough (SK814913). This species is a segregate of *Arion hortensis* and was formerly known as *Arion hortensis* form A (Kerney & Cameron, 1979), with a limited distribution throughout Britain. It has subsequently proved to be more widespread following the publication of an 'Aidgap' key (Cameron et al. 1983) and has been found elsewhere in the county by the SSG or Mr. du Feu at Sturton by Stow, Saxilby, Riseholme and Spalding.

In May 1994 the worm slug *Boettgerilla pallens* was found in Gainsborough (SK88). This slug is only 3 cm long when extended, is slim and very pale to the extent of being translucent and appears worm-like. It is widespread in eastern Europe and was probably introduced to Britain with greenhouse plants. It is found sparingly in scattered locations in England. This record appears to be the first for the eastern counties, (Kerney, 1976).

In 1997 the Irish yellow slug *Limax maculatus* (plate 15) (formerly *L. pseudoflavus* and *L. grossui* (Kerney & Cameron, 1979)(Cameron, 1983) was found in April and July at Sturton by Stow (SK 891807). This find was totally unexpected. It is, as its common name suggests, widely distributed in Ireland, but it has previously only been recorded in north-west England and north Wales. It is large, being some 10 cm long when extended, and is yellow with brown markings. It is nocturnal, rarely being active until well after dark.

Most recently, a Spanish slug, *Limax valentianus* was found on waste grassland in Gainsborough (SK8191) in December 1997. It originates from the Iberian peninsula and has been spread by man into many parts of the world. It is between 5 and 7 cm long with a yellowy-grey or yellowy-violet body and a slightly darker head, and has been recorded mainly from greenhouses and very rarely in open habitats, (Kerney & Cameron, 1979).



Spanish slug, *Limax valentianus* *photo Derek Rands*

A slug formerly thought to be rare in the county, with only two 10 km square records is Caruan's slug, *Deroceras caruanae*. It now appears to be more widespread, and has been found around Gainsborough, and at Riseholme and Spalding.

The dedication of Chris du Feu and his group has proved to be invaluable in extending our knowledge of the county's slug fauna. His advice is that if we want to extend our knowledge further it is essential that slugs are searched for after dark. I am grateful to Derek Rands for supplying photographs from his superb library of slides.

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BIRDS - Anne Goodall

The birding year got off to an only too predictable start when the *Tove Knutsen*, discharging at the Humber mouth well-head on Friday 3rd Jan, suffered an engine room fire. Some 50 tons of oil went into the Humber and reached the south shore. Most came ashore at Cleethorpes though signs of oiling were later found down the coast as far as Ingoldmels, covering the whole of the south Humber mouth wader feeding areas with a thin film of oil on each tide. For the next week feeding waders were examined daily for traces of oil, organised by Ian Shepherd. This showed that the proportion of oiled birds increased to 6 Jan, when of a sample of 3000 waders examined a third showed some oiling, with small birds such as sanderling and ringed plover worst affected.

A week after the incident only 12% of waders showed some oil and two weeks later there was little trace. As in previous incidents very few corpses were found, even though the severely oiled would certainly have died. A beached birds' survey was carried out over the weekend of 11-12th Jan, and this showed as expected that oiled seabirds, including red-throated divers, gulls and auks, came ashore between Donna Nook and Mablethorpe. Greatest casualties were recorded among fulmar, with 36 corpses picked up, and also among guillemots. Over the same period oiled red-throated divers were recorded at Covenham Reservoir on 8th Jan (later died), Barton Pits on 12th and Toft Newton Reservoir and the Witham Mouth on the 18th. It is also significant that Gibraltar Point had an all-time record of 440 red-throated divers present on 7th, presumably escapees from the Humber mouth, with high numbers remaining there for most of the month.

Also at Gibraltar Point was the large and unexpected influx of shorelark over the 96/97 winter; the maximum of 71 birds just before Christmas has only been exceeded in two previous winters, both in the early 1970s. With good numbers also at Donna Nook and in Norfolk, the chance was taken to initiate a colour-ringing study, organised by Robin Cosgrove. By late spring 14 birds had been colour-ringed at Gib. - 30% of all the shorelarks ringed in Britain to date. The last birds left Gib. on 10th May - the latest ever - with sightings of marked birds at Filey and Redcar on their way north in May.

The related woodlark was the subject of a national breeding survey in 1997, organised in Lincolnshire by Graham Catley. At the last full census in 1994 there were 10 pairs in the county, with another 2-3 singing males. An increase was expected, but in the event all expectations were exceeded by the findings of 30-33 pairs plus another 4 singing males; pairs were found in areas not previously suspected of holding woodlarks, and densities at the regular sites were much higher than in previous years. It is hoped to organise a follow-up survey in 1998, and all records of this species anywhere in the county will be welcome.

Other breeding species had mixed fortunes. Among raptors there were at least 5 pairs of summering/breeding buzzards: one each in the north-west, south-west and central Lincs, and at least two in the wolds. It is of interest that this colonisation appears to be from the east – the continent – not the west, since there is still a considerable gap between us and the Welsh population. Maximum numbers of birds were recorded in the county in March (records from 20 sites) and October (12 sites).

For cormorants on the other hand the situation at our only current breeding situation looks bleak. After the first recorded successful attempt in 1992, when 17 pairs bred, numbers at the Deeping St James colony increased steadily to 1995, with coloured-marked birds

from Denmark, Wales and Essex all sighted there. However, an attempt at illegal control in 1995 was reported by local birders, as a result of which the owner has declared the area 'off limits'. The current situation is therefore not known but is probably not good. A survey of inland cormorants in 1997 showed that numbers of summering birds continue to increase in the county; at least three sites had cormorants present all year, and a total of 10 sites had summering birds in June. Another inland breeding attempt can therefore be expected at any time, with Kirkby Pits probably the most likely site.

The annual heronries census recorded 284 nests at 17 colonies – well down on last year, and the lowest county total since 1978. Part of this is explained by disturbance at the Deeping colony, where numbers have declined from 105 in 1992, when cormorants started to nest, to 95 in 1995, when they were badly disturbed, to 74 in 1997, suggesting that disturbance continues. However the full story is more worrying, since all nine colonies with more than 10 nests declined between 1996 and 1997, on average by just over 20%. Last winter was not severe enough to affect heron survival, suggesting an impact via the food chain. As a top predator, this species must be closely monitored.

Surveys were also organised by Keith Atkin on two urban species in 1997, to provide population estimates for the forthcoming Atlas of Lincolnshire Birds (in preparation). Firstly searches of sample areas showed that of tetrads suitable for collared doves but not holding them by 1990, about 60% have now been colonised, and secondly a census of swifts in Louth between May and July totalled 560 displaying birds, with a maximum of 1200 overhead. This equates to 280-300 pairs for one small country town which, with similar results from intensive ringing studies carried out by Steve Keightley on one housing estate in the Boston area must cast doubt on the most recent population estimates of 8000 pairs for the whole of Great Britain! (Gibbons et al., 1993).

The summer also brought an arrival of crossbills on the coast, peaking at 110 at Gibraltar Point on 27th May. The birds moved quickly inland and were present in most coniferous plantations in the county by June, with a steady trickle of records through to the year end; it will be interesting to see whether 1998 brings news of confirmed breeding. In general, autumn 1997 proved rather quiet with none of the impressive falls of the last few years. However siskins arrived in good numbers and sizeable wintering flocks have been reported from most areas. The first shorelarks returned to Gibraltar Point on 28th Oct, and two colour-ringed birds (males, ringed consecutively in winter 96/97) arrived on 4th Nov. Any sightings of colour-ringed birds, anywhere in the county, with exact locality and total number in the flock, would be very welcome.

At the year end the national Non-Estuarine Waterfowl Survey, previously carried out nationally in 1985-86 and for Lincolnshire most recently in 1989-90 also, was repeated. The results of this survey are of interest since they show the impact of the current Environment Agency beach recharge scheme on feeding waders. Thus, while totals over the stretch were slightly reduced (down from a mean of 112 to 98 for sanderling, the main species) the distribution was very different. One hundred of the 119 waders recorded were concentrated in the most northerly section counted, Trusthorpe-Sandilands, which has not yet had large volumes of sterile sand sprayed over the inter-tidal feeding areas. Only four sanderling were recorded between Sandilands and Skegness, whereas in 1989-90 up to 15 were recorded in each 2km length.

Reference

GIBBONS, D.W., REID, J.B., & CHAPMAN, R.A. 1993. *The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991.* T & A D Poyser. London

MAMMALS, REPTILES & AMPHIBIANS - Norah Goom

Distribution of mammals in Lincolnshire still reflects the distribution of observers as much as the occurrence of the species and there are still many gaps. Some 10km. squares still appear to have neither hedgehogs nor rabbits, though this is unlikely to be a true picture. It is not surprising therefore that small mammals in the county are under-recorded. Of two species of national concern, the harvest mouse *Micromys minutus* did not figure at all in the records received for 1997 and the water vole *Arvicola terrestris* appeared only once. Loss of habitat will have contributed to a decline in harvest mouse populations.

Of the larger mammals, mink *Mustela vison* are seen often at Thurlby Fen by Kay Heath, a fact which has disturbing implications for other wild life in the neighbourhood. It is possible that badgers are under-recorded because this species is subject to malicious abuse as well as to death on the road. All such records are treated as confidential. 11 live sightings were reported during the year and 14 dead bodies.

Unusually several cetaceans were reported. Five harbour porpoises *Phocoena phocoena* were seen off Gibraltar Point in the year and two were washed up dead. A common dolphin *Deiphinus delphis* and a white-beaked dolphin *Lagenorhynchus albirostris* were found dead in February, as was a juvenile sperm whale *Physeter catodon* at Skegness in December. A minke whale *Balaenoptera acutorostrata* was reported at South Ferriby in November.

Records of reptiles continue to be few. Maurice Johnson seems to be the only person to see adders *Vipera berus* - at Kirkby Moor and near Barlings Park Wood, but grass snake *Natrix nafrix* and common lizard *Lacerta vivipara* have both been reported from 4 different sites. Slow-worm *Anguis fragilis* has appeared only once in the records. The common frog *Rana temporaria* thrives in at least 18 sites. The common toad *Bufo bufo* is recorded from only seven sites but is likely to be under-recorded, to judge from the "toads crossing" notices displayed beside some roads in the spring. Only 3 records of newts were received, all of smooth newt *Triturus vulgaris*.

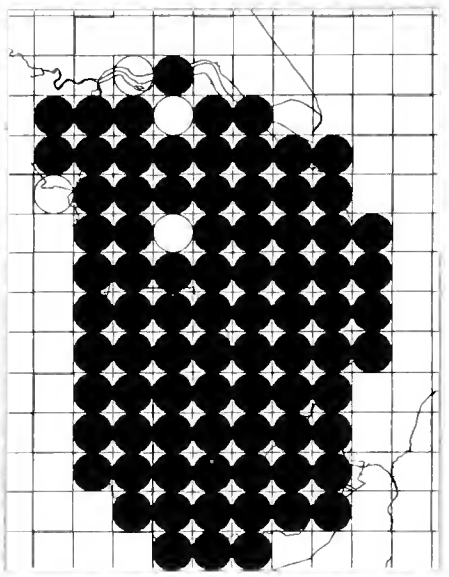
BATS - Annette Faulkner

The *Bats on the Map* project continues to produce interesting results, including two unconfirmed sightings of Natterer's bats *Myotis nattereri* in the fens (we have a confirmed record from Crowland for 1994). Included here are preliminary maps for all the Lincolnshire species. “All Bats” includes records not identified to species.

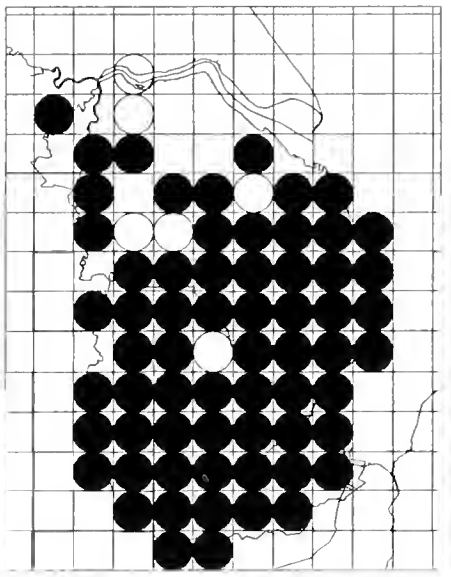
Bat rescue work forms a large part of summer activities. 1997 was not a good year, especially for pipistrelles *Pipistrellus pipistrellus.* The bad weather in the second half of June, when the majority or the babies are born, meant that a number of nursery colonies were abandoned as the females were unable to feed and had look after their own survival above that of their offspring - their normal strategy being to sit out the bad spell by becoming torpid to conserve energy until the weather improves. The Bat Group was inundated with calls from concerned people who had found baby bats away from the roost. The warm early spring meant that some babies were born exceptionally early. Just before the weather broke we were passed an abandoned young pipistrelle already 4-5 weeks old, meaning he had been born in the 3rd-4th week of May. This colony, in Spalding, partially recovered in July, with juveniles still in the roost until mid September. Because we have so little information on other species' roosts we have no idea how other colonies fared.

This year we stayed on after a number of LNU field meetings to record bats: At

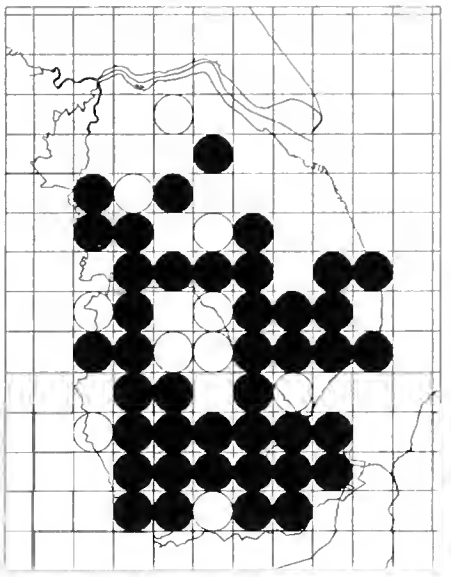
All Bats



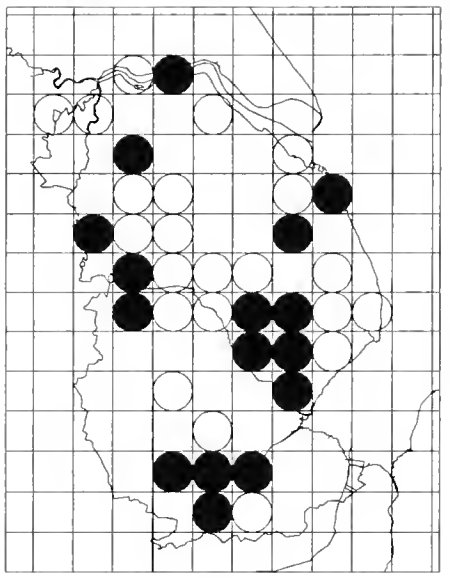
Pipistrelle



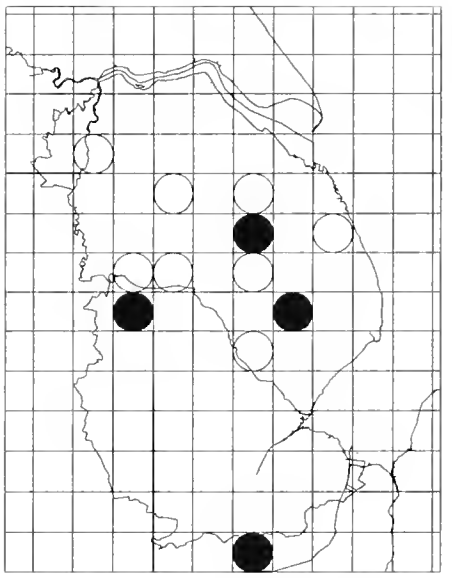
Brown long-eared



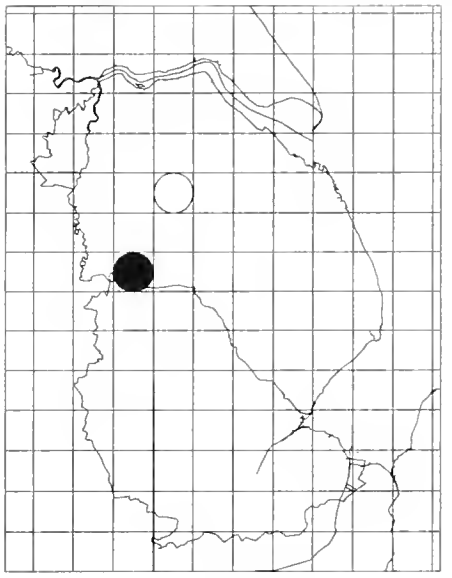
Noctule



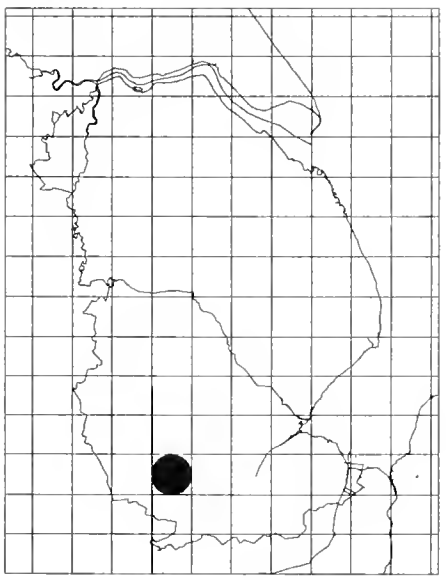
Natterar's



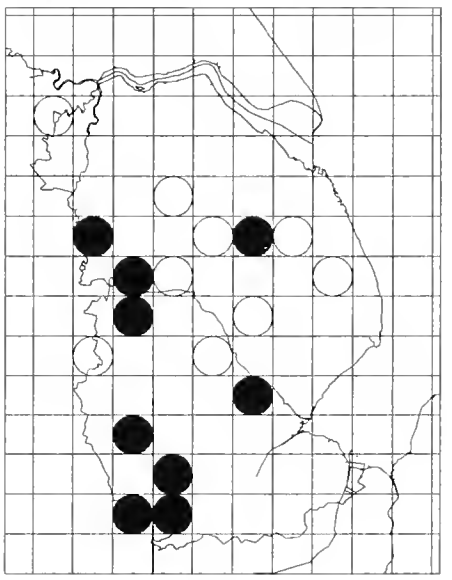
Barbastelle



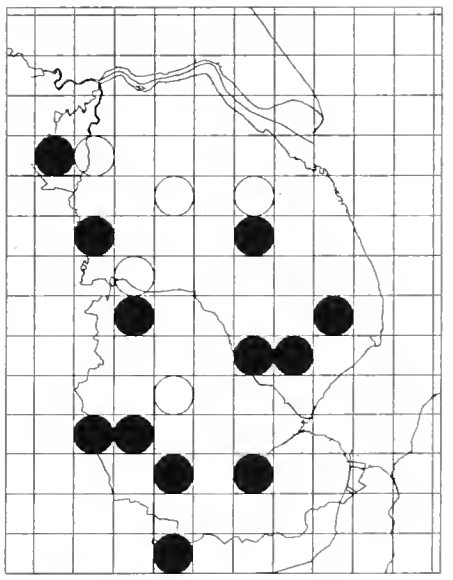
Leisler's



Whiskered/Brandt's



Daubenton's



Woolsthorpe/Grantham Canal a few pipistrelles were feeding along the northern part of the River Devon and along the canal and two Daubenton's bats *Myotis daubentonii* were feeding under the canal road bridge, where their social, cricket-like calls were clearly audible and amplified by the bridge.

The green lane by Sotby Meadows was a well-used feeding area, both by pipistrelles and

another species, thought to be whiskered/Brandt's *Myotis mystacinus/brandtii*. We found that these bats were using the road as a highway to fly into the green lane and traced them back to a corner of Sotby Wood where we suspected they had a tree roost. Sotby Wood itself had very few bats: pipistrelle and possibly brown long-eared *Plecotus auritus*. The eastern marshy area at Greetwell Hollow turned out to be an important feeding area, with a swarm of bats creating a continuous chatter on the detectors and we located others at the other marsh on the western side of the bank. At Moor Farm there were mainly pipistrelles, although an unfamiliar signal on the bat detector suggested another species. Three pipistrelles took advantage of the moth trap light to have an impromptu feast and performed some spectacular aerobatics over and round the people sitting round the trap. By late October insects were getting harder to find and the bats kept much more on the move, creating shorter signals on the bat detector, but there were still a few bats about at Austacre Wood, mostly pipistrelles.

TRANSACTIONS OF THE LINCOLNSHIRE NATURALISTS' UNION

Officers of the Union in 1997

President	Mr Philip Porter	**President Elect**	Mr Graeme Clayton
General Secretary	Ms Sara Bright	**Treasurer**	Mrs Mark Crick
Auditor	Mr John Levine	**Membership Secretary**	Mr Allan Binding
Publicity Secretary	Mr Roger Goy	**Programme Secretary**	Mr Neil Pike
Sales secretary	Mrs Annette Binding	**Records Secretary**	Mr Rex Johnson
Publications Editor	Dr Roger Key	**External Representitives**	Mrs Jane Ostler Mr Ken Rowland
Executive Committee	Mr Mark Crick, Mrs Annette Faulkner, Mr Graham Weaver. Mr Ken Rowland		

Section Recorders

Geology	Mr David Robinson	**Higher plants**	Mrs Irene Weston & Mr Marson Peet
Bryophytes/Lichens	Prof. Mark Seaward		
Fungi	Mr Ken Rowland	**Birds**	Mr Jim Rance
Mammals	Miss Norah Goom	**Bats**	Mrs Annette Faulkner
Molluscs	Mrs Vi Wilkin (N), Mr John Redshaw (S)	**Spiders**	Mr Roy Kent
		Isopods	Mr Rex Johnson
Dragonflies	Mr John Redshaw	**Moths**	Moths Mr Rex Johnson
Butterflies	Mr Allan Binding	**Beetles**	Dr Roger Key
Flies	Mr Andrew Godfrey & Miss Jillian Binding		

Field Meetings in 1997

April 26th; River Devon and Grantham Canal. SKS3. Misty and rather damp, the weather was appalling during the early morning but as is usual for the spring meetings, the membership rallied and the attendance was encouraging. The River Devon, as it flows through Woolsthorpe by Belvoir, has been allowed to run in its natural channel, flanked by mature trees, so that it provides a welcome respite in a sea of arable with blackcaps and treecreepers on the large willows. Members who reported a large patch of riverside butterbur got into trouble with Rene Weston for not noticing whether the plants were male or female! A riverside grassland with a scattering of very ancient trees held great burnet and greater celandine was numerous around the farm. In the afternoon, the disused Grantham Canal had marginal plants including greater tussock sedge which has been present at the site for a very long time, with derelict locks providing feeding for a pair of grey wagtails and anchorage for the small black spleenwort and maidenhair spleenwort

ferns. The associated railway track was thickly overgrown with blackthorn and hawthorn scrub, popular with bullfinches feeding on the flower buds.

May 25th; Sotby Meadow and Wood. TF27/I 7. Sotby Meadow provided many people with their first view of the curious fern, moonwort, with a limited distribution elsewhere at Saltfleetby and with old records for Woodhall Spa and Risby Warren. The meadows were not the sheet of colour that they would become later in the year but there were large numbers of adder's tongue fern and twayblade orchids, marsh marigolds, pepper saxifrage and water avens by the stream. It was unfortunate that Forest Enterprise had chosen the preceding winter to clear the ditches at Sotby Wood, but the effect on recording was not as drastic as it might have been. The verge outside the wood had marsh valerian, purple moor grass and lesser whitethroat singing in the hedge. The dark conifer plantations which comprise the majority of the wood contained climbing corydalis here and there, but there was no sign of the lady's mantle which was known to have been there.

June 14th; Cliff House Waddingham SK99 and Scotton Common. SK89. There was a certain amount of disquiet among those who knew this splendid unimproved pasture well about the future of some of its special plants. The burnt tip orchid was not seen, although this was not thought to be necessarily a bad sign, because of its fractious habit of not flowering every year but purple milk-vetch, abundant last year, seemed confined to a single hummock, and only one clustered bellflower was seen. It was being grazed by two horses and there were conspicuous patches of thistles and nettles. Nevertheless, there was a good list of species with thyme, rockrose, early sedge and dropwort. The Scotton Common reserve is being extended and the recording concentrated on the newer area of Scotton Beck Field which had benefited from the comparatively wet weather which had encouraged more vegetation growth but rabbit grazing is still the major factor. The seasonally dry areas had creeping willow, bell heather and common centaury and a fox moth was found. The beckside had marsh violet, sneezewort and ivy-leafed crowfoot. The return route through the heath revealed heath spotted orchid (or possibly a hybrid) in a exclosure area and also a fine area of marsh gentian.

13th July. Eager Farm Protected Roadside Verge & Swayfield Valley SK92. An ultimately fine day preceded by the sort of downpour that may have put people off. Various calcareous grassland flowers were seen, including a number of pyramidal orchids on the verge and the spectacular hedge bedstraw, which is more common in the south of the county. There are interesting arable weeds in the fields adjacent to the verge and knotted hedge parsley was new to a number of members. The afternoon visit to Swayfield Valley was gruelling as an 'alternative' route towards the SSSI took the party alongside a rape field with a seven foot high crop. The SSSI itself was grazed very short and was not very productive. Scarce annuals in the field margins are dealt with in the botanical report and clustered bellflower headed a varied list of downland flowers in Swayfield Drift. The day flying four-spotted moth was found, one of less than ten records although it has been found before in the area.

9th August. Tetney Blow Wells & Tetney Haven. TA3O. A very hot day at a time when the attendances are low owing to holidays and the party was fairly small. The meadow at the reserve had been cut for hay but there were some common plants in the regrowth. Around the pools and hedgerows, there was a super-abundance of hoverflies, especially *Episyrphus balteatus,* and *Scaeva pyrastri* and a selection of common butterflies. The blow wells themselves had unbranched burr-reed and water violet, in addition to a cool retreat from the sunshine! There was no such escape at Tetney Haven and a very warm stiff breeze added to the sunshine. Although salt marsh can be very rich in birds, the sultry weather depressed their activity. We were very glad to see a buzzard sail over our heads

moving inland. The saltmarsh had sea wormwood, sea aster, sea purslane and sea lavender and a single plant of spiny restharrow on the bank of the canal.

14th September. South Witham Marshes SK96 & Greetwell Hollow. SK97 TFO7. Two urban fringe sites on the outskirts of Lincoln with plenty of wildlife potential. During the morning the riverside 'marshes' (damp meadows) yielded a selection of good plants including devil's bit scabious, sneezewort and great burnet, with tubular water dropwort, water violet and narrow-leafed water plantain in the small drainage ditch. The old limestone workings at Greetwell Hollow had wild parsnip which is much rarer in this part of the county than on the southern limestone. The spent cocoons of burnet moths were very prominent on the grass stems indicating that '97 had been a good year for this species. A single brown argus and a kingfisher were caught on video by Dave Bromwich.

4th October. Moor Farm & Kirkby Moor. TF26. This was a joint meeting with the British Entomological Society, although only three members of that society attended. A number of scarce insects turned up at both sites which are included in the relevant reports, and green nightshade was unusual at Moor Farm. Singing woodlarks were good to see. It was a cool evening for moth trapping after tea at Woodhall Spa, and relatively few species turned up although a number of bats were detected.

26th October. Austacre Wood. TF17. The Fungus Foray was one of the more successful of recent years with about 150 species recorded. See the fungus report.

Indoor meetings of the LNU in 1997

18th Jan Sat	Christine Godfrey Memorial Lecture. The inedible the unpronounceable, and barely visible.	David Sheppard
15th Feb Sat	a.m. Recorder's Meeting p.m. display of natural history exhibits by recorders	LNU Recorders
22nd Mar Sat	The Dragonflies of in Lincolnshire. AGM & Presidential Address	Dave Bromwich
16th Nov Sat	Bug sorting at Gibraltar Point (plate 16)	Roger Key
6th Dec Sat	Christmas Miscellany	
	Video highlights of 1997	Dave Bromwich
	Festive Quiz	Jim Rance

OBITUARIES

It is with sadness that we learnt of the recent deaths of Tom Baker, George Posnett and George Whatmough.

George Whatmough was spider recorder for the LNU for many years and lived at Lincoln. His records and collections are now held by the LNU.

† GEORGE POSNETT 1910-1998 - memories by Roger Goy

George Posnett died early in 1998, aged 88. He joined the LNU many years ago and used to say that, at that time, it was made up of clergy and doctors and it was years before anyone spoke to him. I first met George thirty-eight years ago when he ran his junior naturalists' club and went around Hartsholme Country Park when there was no Birchwood Estate and the old Skellingthorpe Airfield still existed - a lovely wildlife area in those days.

George was a founder member of the Lincolnshire Trust when it was formed from the LNU in 1948. At the time, I used to go around all the Women's Institutes with him and worked his projector while he gave talks, including some scary ones about Lincolnshire ghosts.

He had some splendid stories. A favourite one was about when the LNU went to Tumby Woods and Miss Gibbons was mesmerised by looking into a wood-ant's nest and fell into it and had to go and change her clothes. Another time he was staying in an old railway carriage with friends at Gibraltar Point (before it was a reserve and when he had to fetch water from Skegness) and they caught some fish and made a batter out of lard. As they couldn't eat it all, they put the leftovers on the tin roof. In the end they didn't get to sleep until 4 am after having indigestion and then were woken up at 5 am by lots of gulls on the roof eating the leftovers. Also one night, one of his pals woke up to see a pair of eyes staring at him - shining the torch George saw a rat on his pal's chest. Another friend with a shot-gun told him to hold still and fired at such close range that the rat was blasted to pieces but didn't touch the friend it was on.

My favourite of his stories - on one of the LNU meetings one of the attendees was Miss Gibbons' brother, who George had met up with on their way back to the meeting place. The gentleman said "I've seen the biggest caterpillar ever and it had shaving brushes on its back" (obviously a vapourer caterpillar) but he had put it in his pocket and lost it. Back at tea at the village hall, George was sitting next to him when the caterpillar climbed up out of his pocket, up his jacket and up onto the top of his head. It then fell into his salad as he was about to pick up a fork full. George saved him from severe irritation by stopping him.

We once went on an evening and dawn chorus at Wilsford Heath Quarry and George played a tape of a nightingale song which started one off that sang all night, after which it was Sleaford for breakfast.

Fond memories of George - Rest in Peace.

† FREDERICK THOMAS BAKER OBE MA (Nottm) Hon MA (Hull) FSA FMA FRES ALA

obituary by David Robinson and Mark Seaward

With the death of Tom Baker in January at the age of 86, we lost our longest serving officer (1930-1966). He was born in Lincoln at Elm House, appropriately now part of the Museum of Lincolnshire Life, in the establishment of which he played a key role. His father was an architect, a background which influenced his life-long interest in architecture. He was educated at St John's Preparatory and the Municipal Technical School. Originally it had been his intention to teach natural sciences. However, he started as the first junior appointment at the City & County Museum at ten shillings a week. He became interested in every aspect of the work and continued his studies at University College, Nottingham by extra-mural visits under Professor H H Swinnerton (LNU President 1936-37). He also took the Museums' Diploma and became a Fellow of the Museums Association. In 1946 he was elected a Fellow of the Society of Antiquaries and for a time served on its Council.

During World War II he was seconded to the Midland Agricultural College where he carried out research on pests, working on wood mice, potato root eelworm, wireworm, mangold fly, leatherjacket, carrot fly and earwigs, in recognition of which he was made a Fellow of the Royal Entomological Society. After the war he qualified as a librarian and in 1948 he was appointed Deputy Director of the Lincoln City Libraries, Museum and Art Gallery.

Tom was a teenager when he joined the LNU and at the age of nineteen became Assistant Hon. Sec. (1930-32), succeeding as Hon. Sec., a position he held for the next twenty-seven years (1933-1960). He also took over the editorship of *Transactions* in 1934, continuing to 1966, his attention to detail and design, always in his trademark green ink,

ensuring a consistently high quality of publication. Tom's contribution to natural history and nature conservation can hardly be exaggerated, building up the LNU after its lean wartime years, and initiating and editing the series of Lincolnshire Natural History brochures - *The Geology of Lincolnshire* (1949) and *The Birds of Lincolnshire* (1955). He was made an Honorary Life Member of the LNU in 1965, and the title of Patron of the Union was conferred on him when the Union celebrated its centenary in 1993.

As Hon. Sec. of the LNU he was responsible for forming the Lincolnshire sub-committee of the National Nature Reserves Investigation Committee, whose report in 1945 led to the nature conservation provisions of the 1949 National Parks Act and creation of the Nature Conservancy. The sub-committee continued as part of the LNU, with Ted Smith as its secretary, from which the Lincolnshire Trust evolved in 1948, in which Tom played a guiding role. He became their first Hon. Treasurer, serving until 1959 and his vision and wisdom were vital factors in its foundation and development. He remained a Council member until 1989, a remarkable record of forty-one years.

From 1950 to 1954 he researched prehistoric Lincolnshire, for which he was awarded an MA by Nottingham University for his thesis *The Prehistoric Settlement of Lincolnshire*. His interests in archaeology, local history and natural history gave him a broad understanding of man's place in the environment and his effects upon it. This was clearly revealed in his masterly Presidential Address to the Union in 1962 - *The Rise to Dominance of Man in Lincolnshire: an ecological study.*

In Lincoln he rose to be Director of the City Libraries, Museum and Art Gallery (1961), the post he held until retirement in 1974. His book *Roman Lincoln* had been published in 1937, and *Historic Lincoln* appeared in 1983. He helped J B Whitwell with *Roman Lincolnshire* in 1970, the same year he fully revised and edited Arthur Mee's *Lincolnshire*. His administrative skills led him to found the Lincoln Archaeological Research Committee in 1945, being its first secretary and supervising excavations, and later becoming Vice-Chairman of the Lincoln Archaeological Trust and the Trust for Lincolnshire Archaeology. He was a founder member, Chairman and later President of Lincoln Civic Trust, Chairman and later Vice-President of the Society for Lincolnshire History and Archaeology, and Chairman of the Lincolnshire Historic Buildings Joint Committee. A founder member of the Tennyson Society he supervised the establishment of the Tennyson Research Centre in Lincoln in 1964, in recognition of which in 1983 he was awarded an Honorary MA by Hull University. What gave him even greater pleasure was the award in 1972 of the OBE for services to archaeology and history in Lincoln, the city he loved and served.

As a long-time member of Lincoln Rotary Club he, created an unbeaten record of sixty after-dinner speeches and in 1994 he was presented with an engraved glass bowl. His last public appearance was less then two weeks before his death when he attended the annual Tom Baker lecture which the Club had instituted.

Through all the threads of an active life, Tom was a practising Christian, becoming a deacon in the Baptist Church at eighteen, where he preached and held a variety of offices until he retired as superintendent deacon in 1970. His deep faith was unshaken by the early death at the age of 47 of his son Professor Peter Baker FRS of King's College London, and of his wife Doris just two months later.

Tom Baker's influence in natural history, nature conservation, archaeology and local history, and his contribution to the life of the City of Lincoln and of the county were far reaching. He was one of the kindest, wisest and most modest of men, and will be sorely missed by all those who had the privilege of knowing him.

Contributing to "The Lincolnshire Naturalist"

We are constantly on the lookout for full length articles or short notes, even a few lines, on any aspect of Lincolnshire's 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 a 3½" computer disk with accompanying paper copy, in just about any word processor format (although don't let this put you off sending in an article) and in the format described here. Adding an ASCII text file in addition to the word-processed file will ensure that it can be incorporated directly. Most word processors can also output in ASCII. Drawings, black & white photographs, colour transparencies or negatives (please include a print) can be included. Colour illustration may be rendered to black & 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) or 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 capitalization (eg Brandt's bat). References to journals and books should please be as below. Pease note and use the capitalization and italic convention.
WOODRUFFE-PEACOCK, Rev E.A., 1900. The Lincolnshire Naturalist's 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 Dr Roger Key, 67 Peterborough Road, Crowland, Lincs, PE6 0BB, tel 01723 210541, to whom texts should be sent.

Editorial **Roger Key**

The success of the new format in attracting articles for "The Lincolnshire Naturalist " continues and I have had to hold over two short papers until next year; a healthy situation for a local journal with a small print-run, but frustrating for the authors for whom it is always satisfying to see the fruits of their labours as soon as possible. Again I would appeal for more short notes of particularly important observations, more drawings and photos to liven up the text, as well as longer papers and reports. By asking for more, I run the risk of compounding the difficulty in fitting everything into the space, but that is my problem!

The activities of the LNU continue to grow and diversify. I was particularly pleased to see the large turnout for the bug-sorting day at Gibraltar Point (plate 16). Everyone enjoyed themselves tremendously, sorting huge numbers of unidentified insects left over from two projects, one by MAFF to examine the value of new farm woodlands, the other to assess the possible impact of the abortive proposed M11 extension through Lincolnshire in the 1980s. The sorted specimens can now be distributed to the recorders for identification and will no doubt, add considerably to our knowledge of our county's more inconspicuous denizens. The event proved so popular, as well as educational and useful, that we may repeat it.

Erratum - In the article on dragonflies in the last issue, the key to the maps was missing. White circles represented pre1970 records, bisected circles represented records from 1971-1992 and black circles records from 1992-1996. **Dave Bromwhich**.

THE LINCOLNSHIRE NATURALIST

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Transactions of the Lincolnshire Naturalists' Union

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cover photograph
Boutham Mere in winter
photo by Phil Porter