The Lincolnshire Naturalist

Volume 28 Part 4

Transactions of the Lincolnshire Naturalists' Union

for 2014, published 2015

The Lincolnshire Naturalists' Union

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

◊

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

◊

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.

◊

Supplies wildlife information to the Lincolnshire Environmental Records Centre

◊

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

◊

Produces occasional books and pamphlets on Lincolnshire's natural history

Joining the Lincolnshire Naturalists' Union

If you would like to join us in studying Lincolnshire's Natural History

Please send your name, address and subscription (cheque or postal order) to:-
The Lincolnshire Naturalists' Union, c/o Lincolnshire Wildlife Trust,
Banovallum House, Manor House St, Horncastle, LN9 5HF

Ordinary Membership	£15
Family & group membership is	£18
Student/senior citizen/junior membership is	£10
Life membership	£200
Joint life membership	£250

http://www.lnu.org

ISSN 1756-1884

Printed by Lincoln Print & Copy Centre, Stonefield Park Ind. Est.
9 Clifton St, Lincoln LN5 8LQ
Edited by Phil Porter

Front Cover; White-legged Damselfly *Platycnemis pennipes* Nick Tribe

ASPECTS OF DRAGONFLY AND DAMSELFLY RECORDING IN LINCOLNSHIRE

Nick Tribe

LNU Presidential Address delivered 7th March 2015

This address covers the following aspects of Odonata recording and behaviour:

1. The history of Lincolnshire dragonfly and damselfly recording;
2. The changes in Lincolnshire's species;
3. The 2014 Dragonfly Atlas – phenology and population trends;
4. Odonata migration;
5. Factors that are driving change in Odonata populations;
6. Future trends;

1. The history of Lincolnshire dragonfly and damselfly recording;

We are lucky that in 1917 Herbert Bee contributed an article to Transactions on the species of Odonata in Lincolnshire. He provided detailed recent records for 16 species with enough detail to indicate probable breeding. There is another species listed, the White-faced Darter *Leucorrhinia dubia*, which usually breeds in acid peaty pools, which is probably best described as 'Status Unknown', as there was an absence of recent detail in Bee's record. Eight breeding species were dragonflies and eight were damselflies. In common with a lot of historic records, Herbert Bee's Scarce Chaser *Libellula fulva* records have to be treated with some caution as they are outside the current known range but they are included among the 16 residents.

Dave Bromwich updated the LNU on the status of Odonata in Lincolnshire in his Presidential Address delivered in March 1997. Dave reported 20 breeding species comprising 12 dragonflies and 8 damselflies. The gains in breeding species since 1917 were all dragonflies, namely Migrant Hawker *Aeshna mixta*, Black-tailed Skimmer *Orthetrum cancellatum*, Black Darter *Sympetrum danae* and Emperor *Anax imperator*. Three species were now known to be extinct; both the White-faced Darter, and Scarce Chaser, whatever the latter's status in 1917, were long gone and the Scarce Emerald Damselfly *Lestes dryas* was last recorded in the 1960s. One vagrant, the Yellow-winged Darter *Sympetrum flaveolum*, had been recorded since 1917 and a Red-veined Darter *Sympetrum fonscolombii* had been reported in 1996 but no details were available.

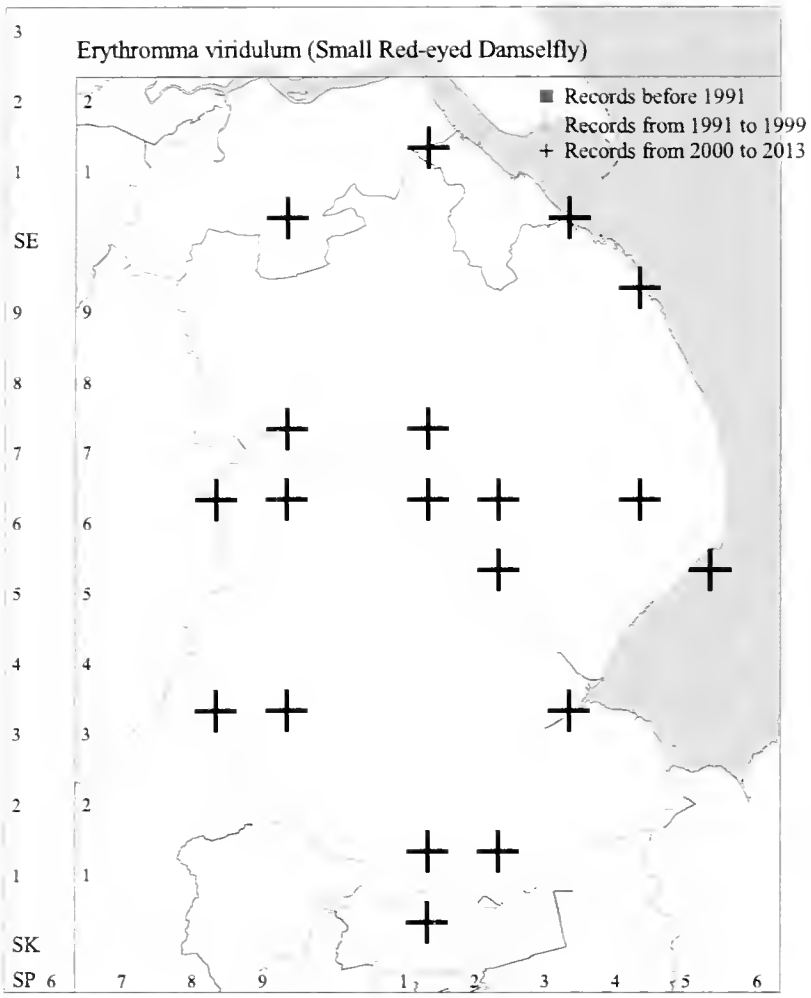
In 2014, ninety-seven years after Herbert Bee's original account of the Odonata of Lincolnshire, the county supported 23 breeding species. In the eighteen years since Dave Bromwich's talk, Small Red-eyed Damselfly *Erythromma viridulum*, White-legged Damselfly *Platycnemis pennipes* and Red-veined Darter had taken the count up to 13 breeding dragonfly species and 10 breeding damselfly species. Three vagrant species have occurred since Dave's 1997 address, namely Norfolk Hawker *Aeshna isoceles*, Lesser Emperor *Anax parthenope* and further Yellow-winged Darters *Sympetrum flaveolum*. In researching this article I have found two records of Downy Emerald *Cordulia aenea* in Transactions from near Lincoln in 1949 but I need to consider these records further. Fortunately the list of extinctions hasn't grown.

2. Changes in Lincolnshire's species;

This account discusses the significant changes in Lincolnshire resident species since Dave Bromwich's address; it does not cover most of the widespread species and the noteworthy Odonata sites that were mentioned, as there is not a lot that is new to report and readers are referred to that address if they wish to know more.

This address is based overwhelmingly on records of adults, not larvae, but this is not too much of an omission as larval records would tell the same story.

Key to map symbols. The maps divide the records up to 2013 into three time periods mirroring those used in the 2014 Dragonfly Atlas (Cham *et al*, 2014). The red squares show records before 1990 and the blue circles show records from 1990 to 1999 inclusive, while the black crosses are for records from 2000 to 2013.



Small Red-eyed Damselfly *Erythromma viridulum* (Map 1). See Pg.236.

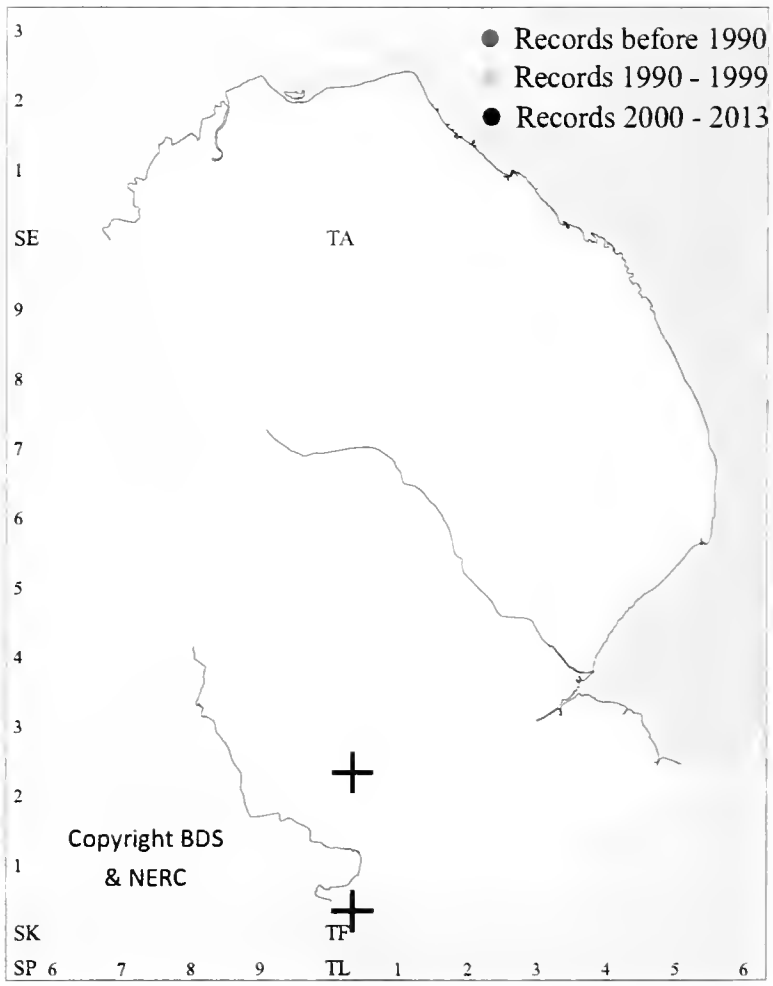
Small Red-eyed Damselfly was first seen in the UK in 1999 in Essex and reached Lincolnshire in 2006. Its range spread appeared to slow from 2007 and it currently occurs as far north as North Yorkshire. It had been expected to colonise the UK as it had expanded across much of northern continental Europe since the 1980s.

It breeds in open, still water with complex submerged vegetation and the males appear to need floating aquatics or surface algae on which to perch and from which to seek mates . It will tolerate brackish water and until the tidal surge of December 5th/6th December 2013, Gibraltar Point's Mill Pond was the best place to see hundreds of individuals of this species. It's one to keep a look out for as there are surely more occupied sites awaiting discovery.

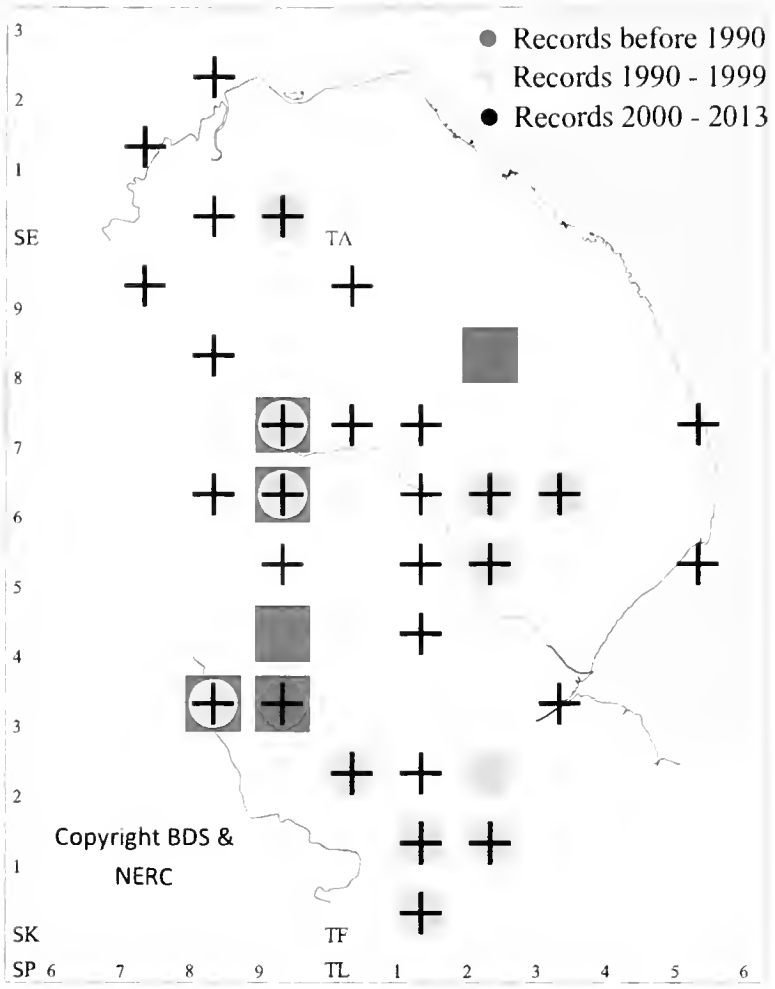
White legged Damselfly *Platycnemis pennipes* (Map 2). See front cover.

Another colonist since 2000 and the species with the most restricted range in the county is the White-legged Damselfly. First reported in 2007, this species occupies just one site, the River Welland where it emerges from under the A1 and runs through Stamford Meadows. It does not seem to occur downstream of Stamford. A species of sunny, muddy-bottomed rivers with slow to moderate flow, it appears to need tall surrounding terrestrial vegetation in which to forage and perch and this may explain why it does not occur below Stamford where the banks are heavily grazed. It has been expanding its range in England and Wales.

Note the outlier 10km square. That record is of a single male White-legged Damselfly found at Bourne Wood Pool in July 2010 and confirmed from a photograph by Stuart Ball of JNCC. This record is of relevance when this address later refers to small isolated ponds.



Erythromma najas (Red-eyed Damselfly)



Red-eyed Damselfly *Erythromma najas* (Map 3).
See Pg. 236.
This is a more complex map reflecting the long history of this species being recorded in Lincolnshire. A 10km square with a red square, a blue circle and a black cross demonstrates lengthy occupancy by that species. A red square may reflect an extinction or a lack of recent recorder effort.

Like the Small Red-eyed Damselfly, the much larger Red-eyed Damselfly prefers open, still or slow-flowing waters with plenty of floating aquatics or algae on which to perch.

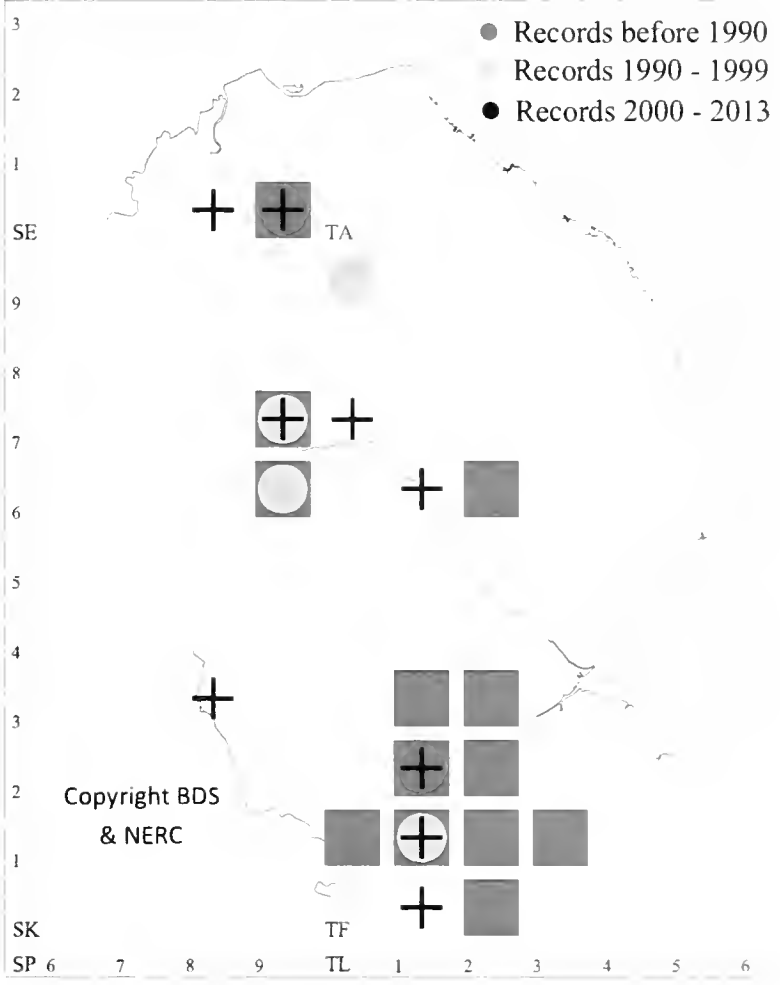
As can be seen from the map, this species appears to be infilling areas in Lincolnshire, a pattern mirroring the national situation.

Unlike the Small Red-eyed Damselfly, this species is not a new colonist. In researching this address it became apparent that Lincolnshire's oldest Odonata record was for this species. James Stephens published a series of books on British entomology in the early 19th century and in the sixth volume, published in 1835, Red-eyed Damselfly was noted as 'found in Lincolnshire in June', its only known British location at the time and the county's oldest record by some margin.

Variable Damselfly *Coenagrion pulchellum* (Map 4).
See Pg. 235.
Of the blue damselflies, the Variable Damselfly has the most restricted range within the county, as Azure Damselfly *Coenagrion puella*, Common Blue Damselfly *Enallagma cyathigerum*, Red-eyed Damselfly and Small Red-eyed Damselfly are more widely encountered. Nationally, it is thought that its distribution, from Dumfriesshire to Somerset and over to East Anglia, tends to reflect remnant fenland landscapes (Cham *et al*, 2014).

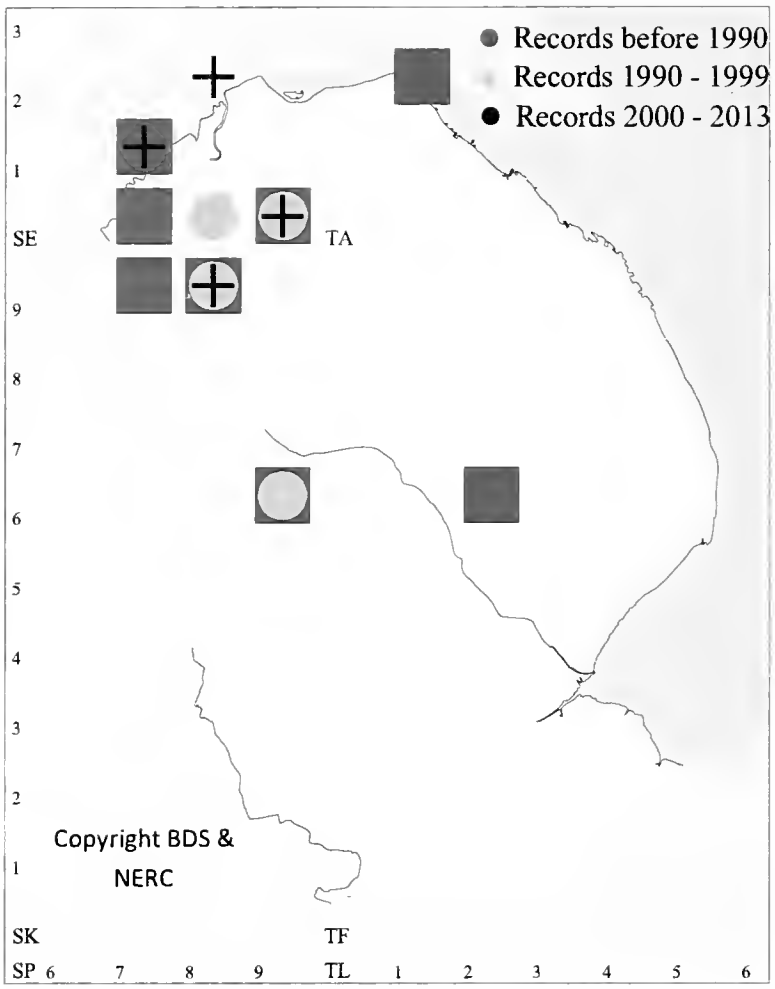
It is a species that breeds in fens and well vegetated slow-flowing waters. The species appears to prefer mature habitats with an absence of, or low intensity, management, eg, dredging and weed cutting. In Lincolnshire it is found at many widely scattered locations. There appears to be a dearth of records from the Lindsey Outmarsh. Does this represent an absence of suitable habitat as many of the drains are heavily managed?

Coenagrion pulchellum (Variable Damselfly)



The national trend is thought to be of range contraction but new occupancy of five 10km squares has occurred since 2000 in Lincolnshire. The number of non-updated pre-1990 10km squares from around the Fens, indicate lack of recent recorder effort in those squares and it will be a task for the forthcoming years to re-find Variable Damselfly in some of the historically occupied squares. In 2014, Phil Lee showed it could be done by relocating a population alongside the River Idle in SK79 on the Nottinghamshire/Lincolnshire border (record not shown on Map 4).

Aeshna juncea (Common Hawker)



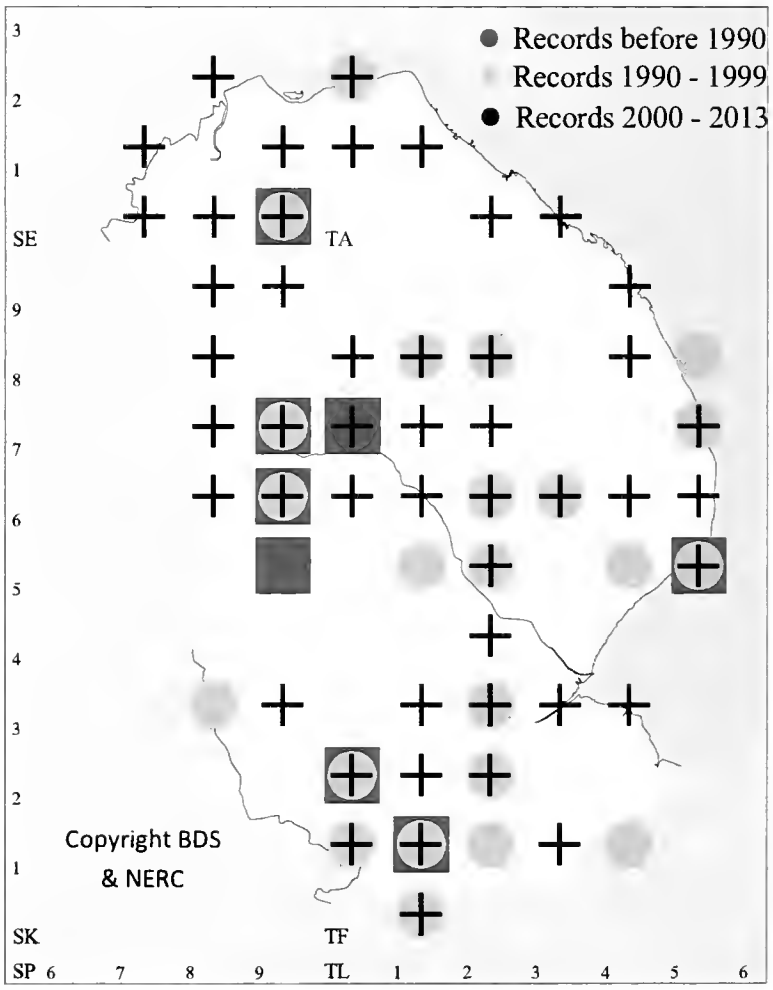
Common Hawker *Aeshna juncea* (Map 5). See Pg. 238.
As a breeder in acidic bog pools, almost all records of Common Hawker since 1990 are from the Humberhead Levels. Dave Bromwich reported that the species was 'hanging on in small areas of south-west Lincoln and the Woodhall Spa heaths'. Sadly these populations are no more. A combination of drought, impacts associated with development and inappropriate management probably accounted for the mid-Lincolnshire colonies. Bob Merritt identified this species at Swanholme in 1986 but low water levels, changing water chemistry and shading from trees all may have contributed to the loss of this particular population.

Questions remain over some of the records for this species, particularly in the 1980s and 1990s, due to its similarity to the closely related Migrant Hawker *Aeshna mixta* which was spreading its range at the time. This issue is not confined to Lincolnshire however. The spread of Migrant Hawker and other large dragonflies may exert competitive pressures on this species in the larval stage, but abiotic factors such as climate change may also be putting pressure on populations.

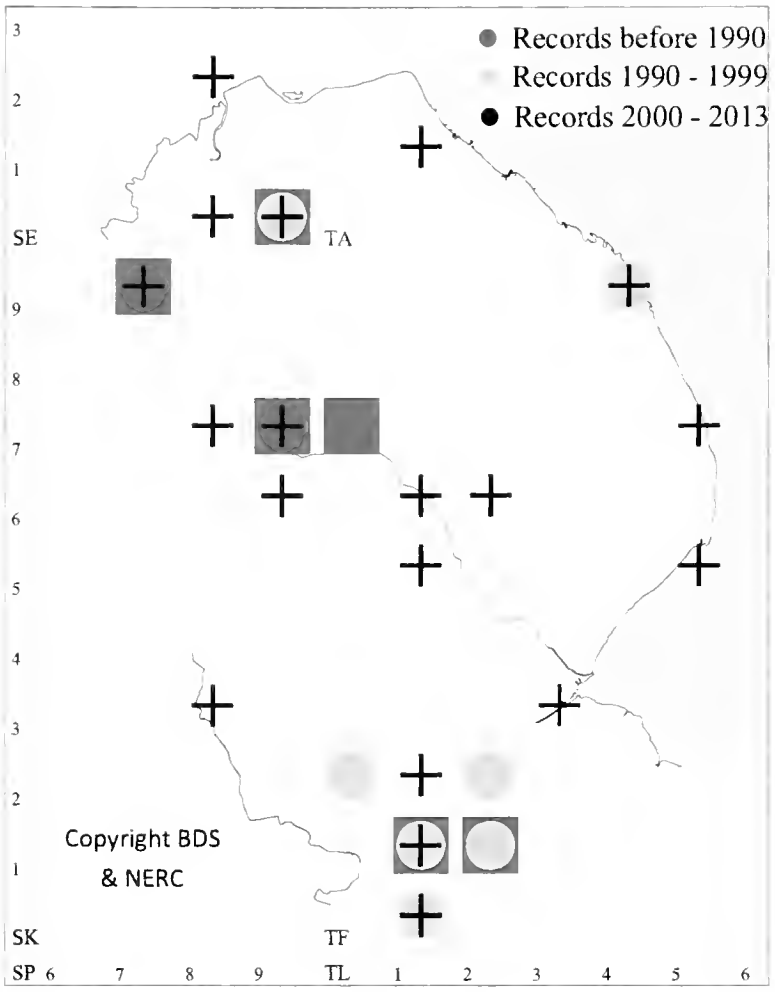
Orthetrum cancellatum (Black-tailed Skimmer)

Black-tailed Skimmer *Orthetrum cancellatum* (Map 6). See Pg. 237.
Black-tailed Skimmer breeds in wide range of still and slow flowing water and seems to prefer waterbodies with bare margins. Males frequently settle on the bare margins and actively defend territories against competitors while awaiting females.

This species has been exhibiting steady expansion northwards and has appeared in Scotland since 2000. The first record that I have found is from Transactions in 1950 (Kirk, 1950) but it was not until 1985 that the species was recorded again and it has been recorded pretty much annually since. The map illustrates nicely how the species has spread across the county.



Brachytron pratense (Hairy Dragonfly)



Hairy Dragonfly *Brachytron pratense* (Map 7). See Pg. 237.

For a long time Hairy Dragonfly was considered a county rarity but I now consider it likely to be found at any medium-sized or lengthy waterbody with strong emergent growth. Patience brings rewards as the males of this species are active patrollers of the reedy margins as they seek females, usually only offering brief views. Emergent and bankside vegetation is important for larvae so this species needs structurally complex wetlands that are not too heavily managed. I think that the lack of suitable habitat is the main restricting factor for this species.

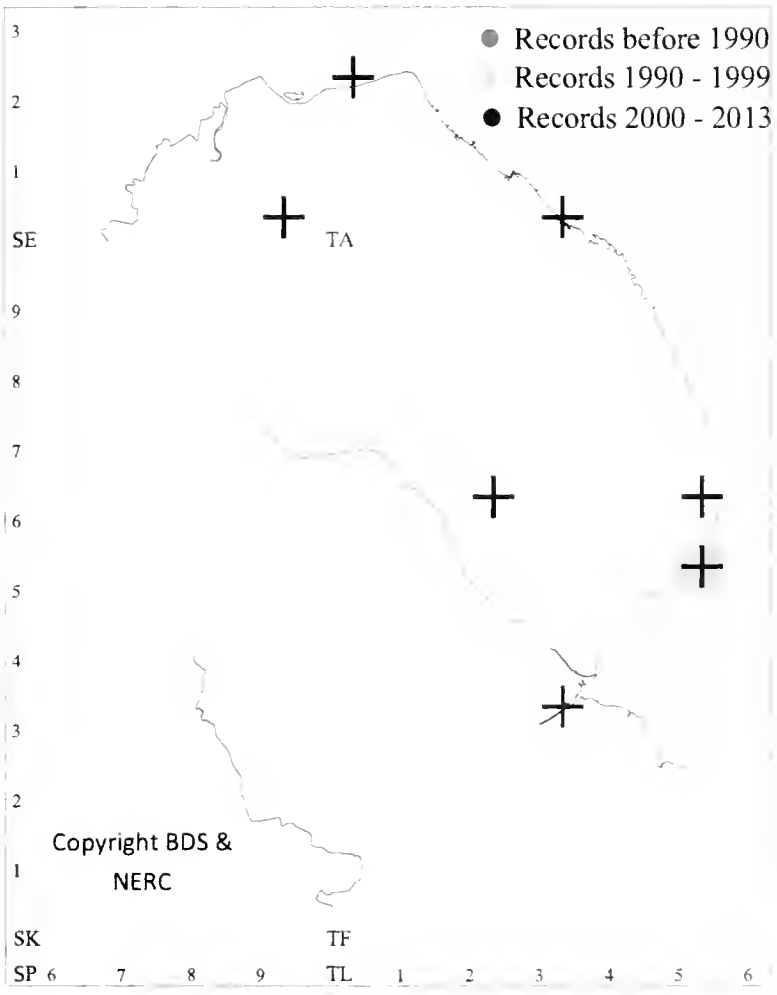
It is recorded very locally as far north as the west coast of Scotland but Lincolnshire is the largest, northerly population of this species. It is now seen regularly at the coastal reserves. It is worth noting that the first species list for Saltfleetby-Theddlethorpe NNR from 1980 to 1981 by Tim Clifford contained 8 species. The same site now supports up to 15 regularly seen species, including Hairy Dragonfly, with another three or four vagrants to the site. Similarly, in 1985 intensive recording by Eric Blood in TF55 Gibraltar Point returned records of nine species. In 2013 TF55 returned records of twenty species. This illustrates how species diversity of many sites has increased over the last few decades.

Red-veined Darter *Sympetrum fonscolombii* (Map 8) See Pg. 235.

Red-veined Darter is a known long-distance migrant. It is a regular breeding species around the Mediterranean but northern European populations are a mix of breeders and migrants from further south. Records from Britain increased in the 1990s and it is seen annually now.

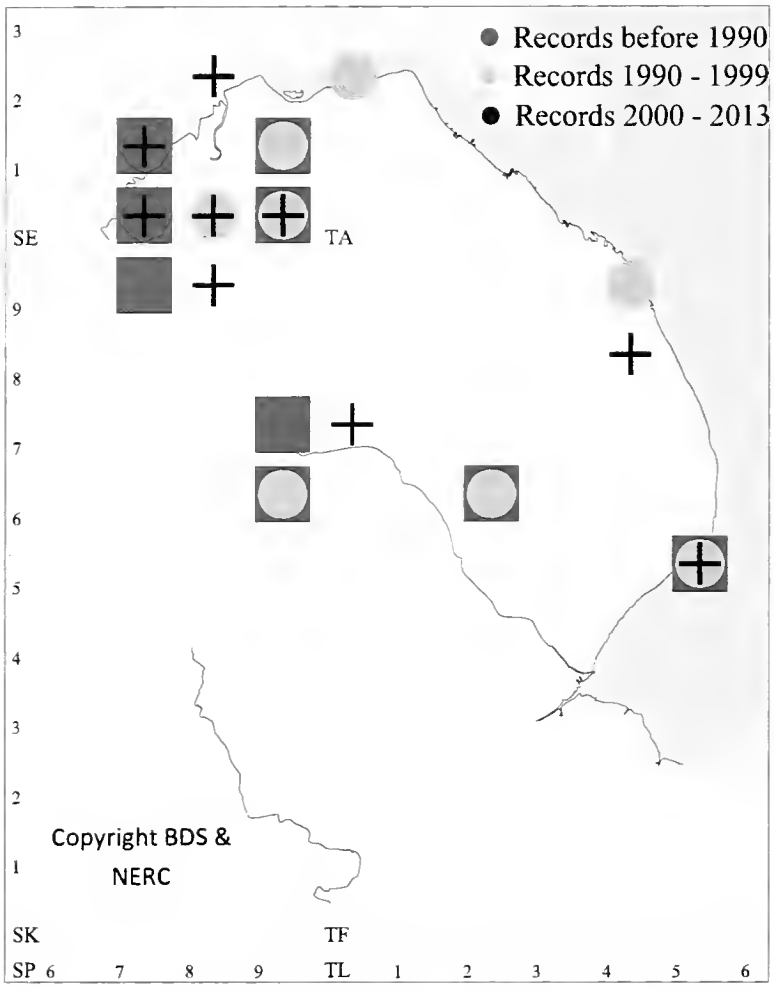
Red-veined Darter was known to be an erratic vagrant from continental Europe by early dragonfly watchers but the species was not recorded in Lincolnshire until 1998. It does not appear to have been recorded again in Lincolnshire until 2005 and since then it has been seen in five years up to 2013.

Sympetrum fonscolombii (Red-veined Darter)



It prefers shallow waterbodies that warm up quickly and have sparse vegetation. Most of our records are coastal and the waterbodies of Gibraltar Point and Frampton Marsh are the most reliable sites for seeing this species. The waterbodies at Frampton Marsh would appear to be very suitable for this species. Breeding may well have occurred as Lincolnshire sites have produced multiple sightings in concurrent years. It is thought that this species can complete its life cycle between spring egg-laying and late-summer emergence in southern England, but most breeding follows the obligate univoltine life cycle (one generation per year), that is typical of the darters.

Sympetrum danae (Black Darter)



Black Darter *Sympetrum danae* (Map 9). See Pg. 238. As with Lincolnshire's other peatland specialist the Common Hawker, the Black Darter was known from mid-Lincolnshire sites, namely south-west Lincoln and the Kirkby Moor area. It has not been recorded from its historic mid-Lincolnshire sites since 1990 and is now confined as a breeding species to the peatland sites of the Humberhead Levels where is can be seen in the hundreds in July and August. As with Common Hawker this species has been lost from Swanholme since the 1980s and probably for the same reasons.

It is still found in many southern English counties that support peatland habitats but it is mainly a species of the north and west of Britain and Ireland. It is known to be a strongly dispersive species and the Lincolnshire map shows a history of migrants being recorded, principally at coastal sites.

3. The 2014 Dragonfly Atlas – phenology and population trends;

The influential Dragonflies of Great Britain and Northern Ireland (Hammond, 1977) was the first modern dragonfly guide. It did not advertise itself as an atlas, although the dot maps were a very useful guide to species' distributions at the time.

The Atlas of the Dragonflies of Britain and Ireland (Merritt *et al*, 1996) was based on 110,000 records up to and including 1990. This explains the date divisions used in the 2014 Atlas maps and the maps used in this address. It provided a significant step up in accuracy from Hammond's maps and has formed a numerically robust basis for the analysis of change in the latest Atlas.

The Atlas of Dragonflies in Britain and Ireland (Cham *et al*, 2014) is based on records from a recording drive between 2008 and 2012 with a few records of rare species added from 2013. The database used contained just under 1.1 million records. England and Wales returned records from 96% of their 10km squares and Scotland managed a very creditworthy 87% return rate.

Dragonfly recording applies a concept of Vice-County Diversity Threshold (VCDT) which is total number of species that you would expect to be find given the latitude of the county – a useful encouragement when recording for an Atlas. Lincolnshire's VCDT is 11 species. In 2012 at the start of the last Atlas recording year, of the ninety-six 10km squares in Lincolnshire, 50 10km squares supported more than the VCDT in species recorded since 2000, a fact that reflects very well on the efforts of the county's Odonata recorders.

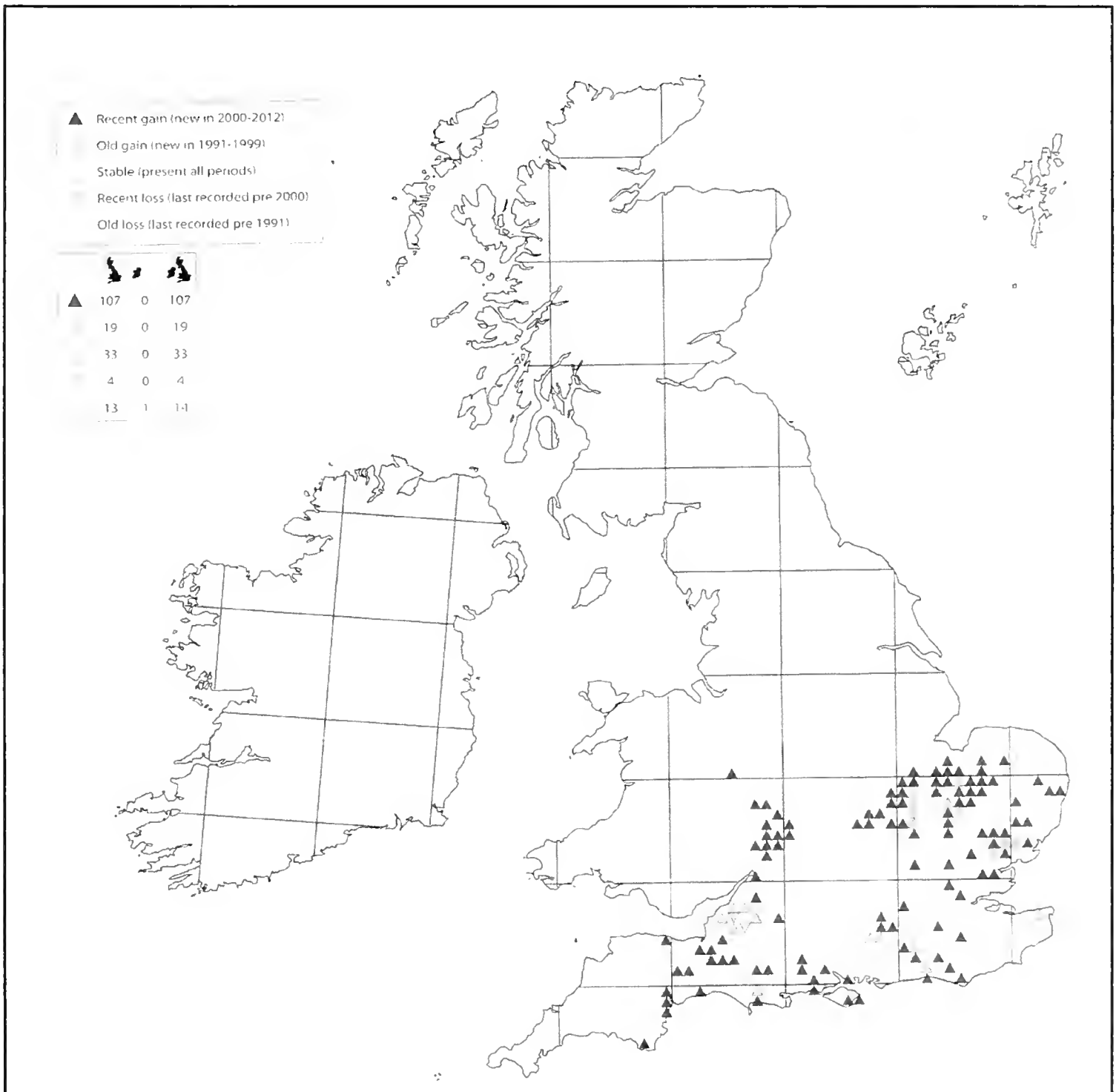
So what does the new Atlas tell us about the national picture?

The 1990 Atlas baseline data has allowed detailed mapping of changes in distribution that are presented in a style that reflects modern atlas standards. Care is needed as the presence of adults does not prove that successful breeding has occurred – a fact strengthened by a recent article (Nelson, 2014) that demonstrated the lack of a clear relationship between where adult Odonata, late-stage larvae and exuviae occur at the site level.

One of the improvements in recording has been the spatial and temporal accuracy of records. Six figure grid references are the now the norm and most records are available with an exact date. This has allowed an accurate investigation of the flight period of most species for the first time.

Of the 1.1 million records, for reasons outlined below, approximately a third are suitable for generating UK-wide population trends. Again, this is a first for dragonfly recording.

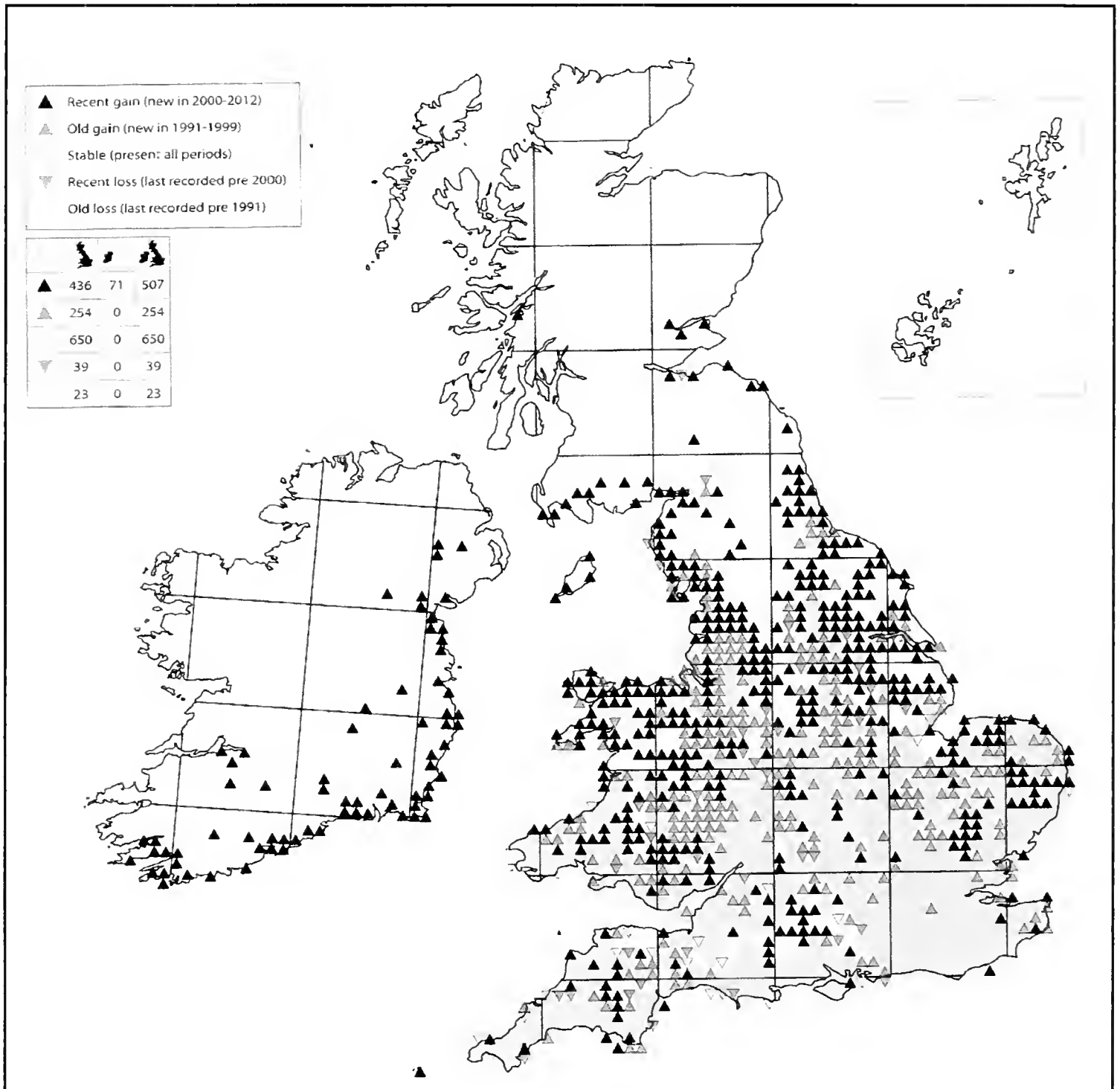
In the 1996 Atlas the Scarce Chaser was confined to six discrete southern areas from Wiltshire east to Kent and Norfolk. Since then the species has spread, for example, from the Great Ouse in Cambridgeshire to Northamptonshire and west Norfolk (Map 10). The species prefers neutral or slightly base-rich slow-flowing rivers with mature vegetation.



Map 10. Distribution pre-1991, 1991-1990, 2000-2012 Scarce Chaser *Libellula fulva*. From Cham *et al* 2014.

There are some old records of Herbert Bee's from near Lincoln in June 1917 which do not appear on this map and are of questionable status although he does separately list the obvious confusion species present at the time, namely Broad-bodied Chaser *Libellula depressa*, so he was obviously aware of the differences between the species. Incidentally, the south Yorkshire records are from near Askern with 17 records between 1888 and 1970 (NBN).T his species was recorded at Ingleborough (Norfolk) in 2009 about 5km from Lincolnshire, Castor Hanglands (Cambridgeshire) in 2011, about 7km from Lincolnshire's southern border. Is it a candidate for the next species to be recorded in Lincolnshire? One for the southern recorders to look for.

One of everybody's favourite species, the Emperor *Anax imperator* is Britain's joint largest dragonfly and can't be missed as the bright blue males patrol conspicuously over waterbodies. The national picture



Map 11. Distribution pre-1991, 1991-1990, 2000-2012 Emperor *Anax imperator*. From Cham *et al* 2014.

shows the spread of this species which has not only reached Scotland in 2003 but also the east coast of Ireland in 2000 (Map 11). There is some evidence that the hard winter of 2010 checked populations in northern areas (Cham *et al*, 2014). Even in Lincolnshire, the map shows that the species has spread. Its habitat needs are probably met reasonably frequently in Lincolnshire. It prefers still and slow-flowing waters with plentiful submerged vegetation with open surface water.

3a. Phenology;

As mentioned above, latter-day recorders regularly record the date of sightings. Spreadsheets and data-bases allow for, and indeed encourage, such precision and make data handling a lot easier. This has made the study of the phenology of Odonata more straightforward, or at least the study of the phenology of the adult flight period. It must be noted that just over 5% of records nationally relate to larvae, exuviae or recent emergents.

With the impact of climate change, it may be hypothesised that flight times would move forward in the year as adult activity is dependent on air temperature. The start of the flight period for many British species have advanced by 2 days per decade between 1960 and 2004 (Hassall *et al*, 2007).

The analysis conducted in the new Atlas is UK-wide which means that it covers emergence periods that span several weeks across the length of the UK. It also makes no allowance for early and late springs. The table for Black-tailed Skimmer (below) does appear to show an earlier peak in activity for post-1990 records (Table 1). Other species where an earlier peak in records is apparent include Large Red Damselfly *Pyrrhosoma nymphula*, Hairy Dragonfly, Red-veined Darter and Azure and Variable Damselflies. Note that the first two species listed are spring-emergent species. Spring-emergent species are primarily

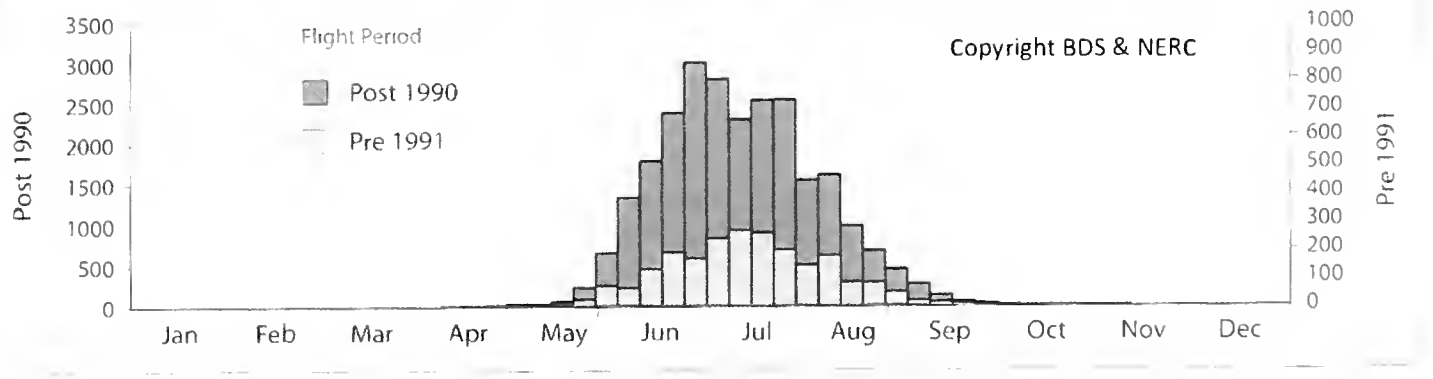


Table 1. Number of records flight period Black-tailed Skimmer *Orthetrum cancellatum* Pre-1991 and post 1990, from Cham *et al* (2014)

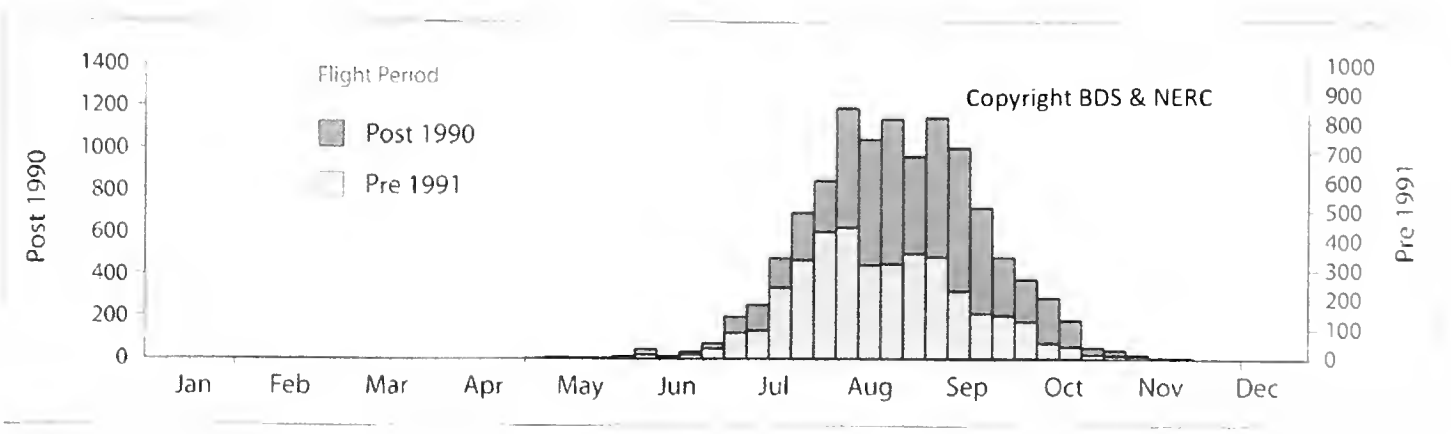


Table 2. Number of records flight period Black Darter *Sympetrum danae* Pre-1991 and post 1990, from Cham *et al* (2014)

responding to water temperature to dictate emergence; is milder winter weather causing waterbodies to warm earlier as a mechanism for driving this change?

However the same analysis for Black Darter (above) shows no such earlier activity, in fact peak numbers have regressed by several weeks (Table 2). A causal factor has been postulated in that better weather, including higher temperatures, is known to extend adult life-spans so more individuals may fly for longer.

Studies also indicate changes in voltinsim, ie, the number of generations per year. Red-eyed Damselfly was considered to have a two year life cycle in Britain. Changes in emergence patterns in Germany indicate that this species has adopted a mix of one year (univoltine) and two-year (semi-voltine) life cycles. British breeding species such as Blue-tailed *Ischnura elegans* and Common Blue Damselflies are multi-voltine around the Mediterranean, i.e. up to three generations per year (Corbet and Brooks, 2008). What changes may we expect to see?

3b. Population modelling;

One of the most forward-looking aspects of the latest Atlas is the first attempt to model population trends at a national scale.

Odonata are one of our better recorded insect groups, probably second best recorded after lepidoptera. The need to monitor BAP-listed species (Southern Damselfly *Coenagrion mercuriale* and Norfolk Hawker) and the opportunity to monitor population trends at a time of unparalleled change in species' distributions drove this investigation.

There are problems with the data. Most Odonata records are casual records from unstructured surveys. They reflect the recorder's interest in particular sites and species and can lead to many false negatives, ie, a lack of records of species that are present but are of little interest to the recorder. Species' detectability also has an influence in what gets recorded. 40% of the species lists in the national data-base comprise a single record. There is also a question as to whether it is really worth trying to count Odonata in a meaningful way at many sites – numbers of the Common Blue Damselfly at Whisby Nature Park can only be very broadly estimated for example. Recording effort also varies spatially and temporally, further reducing the ability to detect statistically significant trends.

In order to extract usable data, for post-1980 records, records were aggregated to one km squares for visits where three or more species had been recorded, i.e., the recorder had made an effort to record all the species present. To be selected, the one kilometre squares needed visits in at least 3 years since 1980. 360,000 records from the 1.1 million available were therefore used for the analysis.

Modern statistical technique was applied to the data and trends for 39 of the 46 breeding species in Britain and Ireland were generated.

Caution must be exercised about trends for such a wide environmental zone and the rigorous selection criteria for data means that there is a strong bias in southern 10km squares. With these qualifications, 28 of the 39 species for which trends could be calculated show a significant trend. 15 species show a positive trend, 13 show a negative trend.

Table 3 (page 215) shows the ten species showing the strongest positive and negative trends in percentage change in distribution and abundance since 2000, i.e., the probability of recording a species in a typical visit reflecting the number of occupied sites and abundance at those sites.

The largest gainer is a new colonist, the Small Red-eyed Damselfly. Other species for which we have noted significant change in Lincolnshire and appear in the national positive trend column are Red-eyed Damselfly, Hairy Dragonfly, White-legged Damselfly and Black-tailed Skimmer.

Table 3. Percentage change in distribution and abundance since 2002 assuming linear change 1980-2012 (Cham *et al*, 2014)

Positive trend	**Decadal Trend %**	**Negative trend**	**Decadal Trend %**
Small Red-eyed Damselfly *Erythromma viridulum*	369.5	Scarce Blue-tailed Damselfly *Ischneura pumilio*	-50.0
Scarce Chaser *Libellula fulva*	159.8	Irish Damselfly *Coenagrion lunulatum*	-48.6
Red-eyed Damselfly *Erythromma najas*	59.7	White-faced Darter *Leucorrhinia dubia*	-38.1
Hairy Dragonfly *Brachytron pratense*	48.5	Black Darter *Sympetrum danae*	-28.1
Scarce Emerald Damselfly *Lestes dryas*	33.8	Common Hawker *Aeshna juncea*	-22.9
Beautiful Demoiselle *Calopteryx virgo*	32.4	Emerald Damselfly *Lestes sponsa*	-21.0
Downy Emerald *Cordulea aenea*	26.3	Northern Damselfly *Coenagrion hastulatum*	-13.2
White-legged Damselfly *Platycnemis pennipes*	25.8	Blue-tailed Damselfly *Ischneura elegans*	-11.6
Black-tailed Skimmer *Orthetrum cancellatum*	21.9	Golden-ringed Dragonfly *Cordulegaster boltonii*	-10.8
Migrant Hawker *Aeshna mixta*	21.4	Azure Hawker *Aeshna caerulea*	-10.6

A warning has to be given for those in the negative trend column due to the southern bias of the data. Overall, there is no clear pattern for declining species nationally but Lincolnshire's two declining species, Black Darter and Common Hawker are both in this group. There are seven species in the negative trend group that are associated with northern and western regions in Britain and Ireland. Future repetitions of this analysis may be very revealing.

The value of site lists in this analysis, i.e., a complete list of what is seen even if some species are recorded as 'present' rather than numerically, must be emphasised. Three site visits in a year spread across the main flight period will produce enough data for robust analysis. Bird population modelling is using the same approach and popular online recording sites such as Birdtrack and Living Record give the user the option to note whether a site list has been produced.

4. Odonata migration;

Another fascinating piece of research examining species range change was conducted by Rachel Hickling et al (2006). Their analysis looked at 16 species groups and looked at changes in latitudinal

and altitudinal occurrence in the UK based on data up to 2000.

For each species group, data for two periods between 1960 and 2000 were selected to reflect 25 years of change, where possible. The analysis excluded known migrants, introduced species and poorly recorded species or those of limited distribution. The northern limit of species' ranges was examined in this study; colonisations are easier to detect than extinctions as populations can persist in areas for a long time if climate change is influencing a species but other aspects of a species' niche remain favourable.

The figure in Table 4 for latitudinal change reflects the mean latitude of the 10 most northerly occupied 10km squares. The figure quoted is the difference in mean latitude between the two time periods, in the case of Odonata, the time periods were 1960-1902 and 1985-1995.

The latitudinal and altitudinal changes observed for Odonata was the largest for any group studied at 104km (64 miles) and 61.9 m respectively. Overall 15 groups showed range expansions latitudinally and 14 groups altitudinally. It is interesting that many groups have expanded further than birds and butterflies and the reasons for this are no doubt complex. The fact that all the groups examined bar one have expanded in range points to the fact that there is a large common factor driving the changes.

The only group to show a decline was amphibians and reptiles with the caveat that only three species were suitable for the analysis. Many reptiles and amphibians are habitat specialists and most have poor powers of dispersal in the modern countryside.

Table 4. Mean latitudinal shift, altitudinal shift, number of species used in the analysis and time periods used for each taxonomic group. Data for 8 of the 16 used in the analysis presented (Hickling et al, 2006)

Taxonomic Group	Latitudinal Change (km)	Altitudinal Change (m)	No. of Species in Analysis	Time Periods for the Analysis
Birds	29	-2.1	22	1968-72 to 1983-91
Butterflies	29	11.1	29	1970-82 to 1990-2000
Fish	47	32.7	15	1965-75 to 1990-2000
Ground Beetles	55	12.7	59	1965-75 to 1990-2000
Aquatic Bugs	64	19.2	14	1970-80 to 1990-2000
Spiders	84	24.3	85	1965-75 to 1990-2000
Odonata	104	61.9	20	1960-70 to 1985-95
Herptiles	-83	-33.0	3	1960-70 to 1985-95

In the Collins New Naturalist volume *Dragonflies* (Corbet and Brooks, 2008) a fascinating study of Odonata dispersal was reported. In Germany, Jochen Lempert surveyed a small rural pond with a limited range of breeding Odonata and marked as many of the flying Odonata as possible. Germany supports

eighty-one species of Odonata and no fewer than a third of the that number of species visited the pond over the course of the year. Most visits were short; Odonata can assess a pond's breeding potential through ultra-violet wavelengths and they are thought to be able to assess vegetation presence, absence and structure as well as detect some aspects of water chemistry by sight. At times, new animals arrived every few minutes and at least 1600 darters (*Sympetrum* sp.) were observed. As Corbet and Brooks comment, we must envisage a 'countryside overlain by a blanket of dispersing dragonflies several metres above the ground', in suitable weather at least. Migration/disperal explains the White-legged Damselfly in the unlikely habitat of Bourne Woods. It also explains Messingham Sand Quarry's Norfolk Hawker in 1997. What else would be observed if a small waterbody was watched systematically for a whole flight season?

5. Factors that are driving change in Odonata populations;

Are the changes a result of improved recording?

Increased recorder numbers, better identification guides, better binoculars, better data capture and data sharing have undoubtedly led to improved recording. However it is clear from the very large number of new species arriving in the county and new site records, even at well-watched sites, that there is more than improved recording effort at play.

Water quality has undoubtedly improved in recent decades and has been identified as a significant factor in some species' spread. It is probably most rapidly effective at the catchment-scale by allowing species to spread along watercourses and many species have shown a lot of range infilling which may relate in part to water quality improvements. This is also probably linked to more favourable management of certain water courses. However improved water quality again does not explain the speed and number of new species arrivals at well-watched sites within Lincolnshire.

Habitat creation in Lincolnshire has largely been seen in disused sand and gravel pits where water quality is usually high. Disused gravel pits are now among the most productive sites for Odonata in Lincolnshire. Re-wetting other sites can be complex, although the Willow Tree Fen reserve demonstrates what can be done; this new site supported sixteen species on one weekend in June 2014. It can be inferred from the fact that Odonata are extending their range altitudinally (Table 4), that habitat creation is not the major explanation for species' spread; most wetland creation is taking place at low altitudes.

The only factor that is broad enough in scale and quick enough in pace to explain most of the changes that we are witnessing is climate change.

For most species, temperature is the largest single factor controlling its large-scale distribution. Meteorological Office data shows that Lincolnshire has experienced up to a 1°C rise since 1960 and this trend is due to accelerate due to global warming. The same data source shows that Lincolnshire is getting drier in the summer and this is probably part of the expected trend to more seasonally concentrated rainfall patterns, ie, heavier winter rain and drier summers. For endothermic species like Odonata, air and water temperatures are critical and with their obvious powers of dispersal, they have quickly exploited the climatically suitable space now available to them. Increasing summer drought will cause local extinctions, a phenomenon that has been seen before in Lincolnshire in 1976.

6. Future trends;

Sea level rise for the 20th century is estimated to have been 17cm on the Lincolnshire coast and the government's predictions for future planning purposes is for a little under 1m of sea level rise by 2105.This will have some significant implications for coastal and riverine habitats from salt water intrusion, changing coastal processes and increasing difficulty in draining land. Coastal habitats will

change and one possible scenario is for the amount of coastal habitat to increase to make flood management easier. The creation of freshwater to brackish transitional habitats could create valuable new habitat for aquatic species. Riverside washlands may also make a return – this may do a lot for the conservation of other wetland species such as amphibians.

Sand and gravel extraction will also continue as will wet grassland and fenland habitat creation. If there is one priority for wetland habitat creation in Lincolnshire it would be to create more small ponds and ditches, where space and water budgets allow. These can be kept fish-free and managed rotationally if numerous enough, which will benefit early successional species. But any wetland creation is welcome as wetlands cover 3% of our surface area and support 10% of our species (RSPB *et al*, 2013). The same report highlighted that about 60% of the freshwater invertebrates monitored exhibited a decline over the recorded period. For freshwater plants, the decline was over 50%.

At a time of unprecedented species change in Lincolnshire, which other species may we expect to see arrive? Scarce Chaser has already been mentioned. Willow Emerald Damselfly *Chalcolestes viridis* is expanding very rapidly and is now in Norfolk and Hertfordshire. Southern Emerald Damselfly *Lestes barbarus* has made it a far as coastal east Norfolk. Dainty Damselfly *Coenagrion scitulum* is still confined to Kent and Southern Migrant Hawker *Aeshna affinis* hasn't been seen outside Essex. Keeled Skimmer *Orthetrum coerulescens* is found in North Norfolk. Lesser Emperor was observed at Whisby in 2006, 2007 and 2014.

Acknowledgements
I owe a tremendous debt to previous dragonfly recorders in Lincolnshire namely John Redshaw and Ian Capitt and my fellow current Odondata recorder, Richard Chadd. Thanks are also due to Adrian Bicker (mc2 software - Living Record), Charlie Barnes (Lincolnshire Environmental Records Centre) and Claire Install and Steve Prentice (British Dragonfly Society) for technical assistance. Credit is due to the photographers who provided photos for the address. My biggest thanks are to the recorders as it is their efforts that make it all possible.

References

BEE, H.C., Lincolnshire Dragonflies, *Trons. LNU*, 1917 93-95
BROMWICH, D. The Dragonflies and Damselflies of Lincolnshire, *Trons. LNU*, 1998 69-82
CHAM, S. et al, *Atlos of Drogonflies in Britain ond Irelond*, 2014, BRC and NERC CEH
CORBET, P. and Brooks, S. *Drogonflies* 2008 Collins
HAMMOND, C.O., *The Drogonflies of Greot Britoin ond Irelond* 1977, revised 1983 (Merritt, R.), second impression 1985, Harley Books
HASSALL, C., Thompson, D. J., French, G. C. & Harvey, I. F. 2007. Historical changes in the phenology of British Odonata are related to climate. *Globol Chonge Biology*, 13, 933-941.
HICKLING, R. et al, The distributions of a wide range of taxonomic groups are expanding polewards, *Global Chonge Biology* 2006 12, 450-455
KIRK, F.L., Entomology *Trons. LNU* 1950 p205
MERRITT, R., Moore, N. W. and Eversham, B.C., *Atlas of the Dragonflies of Britoin ond Irelond*, 1996 HMSO ITE Publication No. 9
NELSON, M. Surveying Odonata: are current monitoring methods up to the task? *Journol of the British Drogonfly Society* Vol. 30 No. 1 April 2014 17-31
STEPHENS, J.F., *Illustrotions of British Entomology or o Synopsis of Indigenous Insects; Mondibuloto* Vol. 6, 1835 Baldwin and Cradock
The Stote of Noture in the UK ond its Overseos Territories, 2013 RSPB *et ol*

PRESIDENTIAL PROFILE
NICK TRIBE
PRESIDENT 2014-2015

Nick Tribe's interest in nature conservation started in his early twenties. Work as a volunteer in Warwickshire led to a career change into conservation after an MSc in Environmental Science and Ecology from Lancaster University in 1995. Nick worked as a nature reserve warden for 5 years (1996 to 2001) for the Lincolnshire Wildlife Trust, English Nature and the RSPB when he started to work for English Nature (now Natural England). He has a broad interest in wildlife recording and has shared the post of Odonata Recorder for Lincolnshire since 2011. He has was editor of Transactions from 2004 to 2011 and has chaired the LNU Executive from 2014.

CHECKLIST OF LINCOLNSHIRE LICHENS AND LICHENICOLOUS FUNGI

M. R. D. Seaward

DEPARTMENT OF ARCHAEOLOGICAL, GEOGRAPHICAL & ENVIRONMENTAL SCIENCES, UNIVERSITY OF BRADFORD, BRADFORD BD7 1DP

Introduction

Although only 11 years have elapsed since the publication of the previous lichen checklist for Lincolnshire (Seaward 2004), 22 county, 25 vice-county, and innumerable divisional and 10 x 10 km grid square records have been added to our registers, as well as numerous changes to lichen nomenclature; furthermore, distributional data based on the 10 x 10 km grid records (as well as earlier natural history divisions) are provided in published form for the first time. In consequence, the Lincolnshire lichen flora can be summarized as follows: 345 taxa (333 species, 3 subspecies, 5 varieties & 4 forms) have been recorded from Lincolnshire, of which 4 are presumed extinct and 4 are probably extinct; in addition, 18 lichenicolous fungi and other taxa traditionally treated as lichens by lichenologists that have been recorded from the county are listed. Synonyms are provided for names of taxa that differ from those listed in previous checklists, and 8 species are listed as being erroneously recorded from the county or doubtful in the absence of supporting herbarium material.

Significant positive and negative changes in the county's lichen flora, as referred to in annual reports in these *Transactions*, continue as a consequence of human activity: for example, although more diverse and interesting epiphytic assemblages are often to be witnessed, in many cases the silver and gold lichens clothing twigs and branches of deciduous trees have a low diversity consisting of just a few *Physcia* and *Xanthoria* species as a result of hypertrophication (excessive nitrogen, mainly derived from agricultural and animal husbandry practices). A further example of human impacts in recent years can be

gauged from the detailed on-going study of the county's 685 churchyards, 92.6% of which have now been lichenologically investigated. Since the 2004 checklist, 297 churchyards have been surveyed for the first time and many have been resurveyed, the latter unfortunately revealing in many cases the decline in their saxicolous lichen assemblages due not only to the lack of public respect afforded to them over the centuries, but also to poor or ill-advised management in recent years.

With such a large county to cover, there is plenty of scope for lichenological studies and it is clear from the paucity of records for many overlooked or difficult to determine lichens (particularly in the field), such as *Caloplaca*, *Lecania*, *Lecanora* and *Verrucaria* species, that a more detailed flora containing ecological, biogeographical, historical and bibliographical information is unlikely to be realized in the near future.

The nomenclature in the following checklist is mainly according to Smith *et al.* (2009) and Hawksworth (2003), and the distributional data are based on (a) the number of present and past (pre-1960) 10 x 10 km grid square records (maximum 90), followed by (b) the natural history divisions (1-18) devised by Jukes-Brown and Woodruffe-Peacock (1895), reproduced in Seaward (1980, fig.2), with 19th century records given in rounded brackets.

Lichens

Acarospora anomala H.Magn. (1/0) 3 [1]
A. fuscata (Schrad.) Th.Fr. (79/0) 1-18
A. rufescens (Ach.) Kremp. (71/0) 1-18
A. smaragdula (Wahlenb.) A.Massal. (17/0) 1,3,4,8,10-12,14,15
A. umbilicata Bagl. (2/0) 8,16
A. veronensis A.Massal. (3/0) 6,7,11
Acrocordia salweyi (Leight. ex Nyl.) A.L.Sm. (1/0) 7
Agonimia gelatinosa (Ach.) Brand & Diederich (1/0) 3
A. tristicula (Nyl.) Zahlbr. (28/0) 1-6,8,10,12-17
Amandinea punctata (Hoffm.) Coppins & Scheid. (75/0) 1-18
Anaptychia ciliaris (L.) Körb. ex A.Massal. (2/2) 11,(13),(14),15
Anisomeridium biforme (Borrer) R.C.Harris (1/0) 11
A. polypori (Ellis & Evenh.) M.E.Barr (1/0) 15
Arthonia lapidicola (Taylor) Branth & Rostr. (6/0) 1,5,11,17,18
A. radiata (Pers.) Ach. (24/0) 3-15
A. spadicea Leight. (2/0) 8,15
Aspicilia caesiocinerea (Nyl. ex Malbr.) Arnold (1/0) 17
A. calcarea (L.) Körb. (75/0) 1-18
A. contorta (Hoffm.) Kremp. (61/0) 1-8,10-18
subsp. *hoffmanniana* S.Ekman & Fröberg (3/0) 7,14,15
A. radiosa (Hoffm.) Poelt & Leuckert (16/1) 2,3,7,11,13-17
Bacidia arceutina (Ach.) Arnold (1/0) 8
Baeomyces rufus (Huds.) Rebent. (2/0) 2,15
Belonia nidarosinensis (Kindt) P.M.Jørg. & Vězda (29/0) 1-4,6-18
Bilimbia sabuletorum (Schreb.) Arnold (67/0) 1-18
Bryolepraria lesdainii (Hue) Canals et al. (16/0) 2,6-8,10,11,14,15,17
Bryoria fuscescens (Gyelnik) Brodo & D.Hawksw. (1/0) 7 [2]
Buellia aethalea (Ach.) Th.Fr. (68/0) 1-18
B. griseovirens (Turner & Borrer ex Sm.) Almb. (8/0) 2,3,6,7,11,15,18
B. occelata (Flot.) Körb. (4/0) 6,10,15,18
Calicium glaucellum Ach. (1/0) 7
C. viride Pers. (10/0) 7,8,10,14,15
Caloplaca arcis (Poelt & Vězda) Arup (1/0) 3
C. aurantia (Pers.) Hellb. (67/0) 1-18
C. cerina (Ehrh. ex Hedw.) Th.Fr. (1/0) 11 [3]

C. chlorina (Flot.) H.Olivier (56/0) 1-18
C. chrysodeta (Vain. ex Räsänen) Dombr. (37/0) 2,3,5-18
C. citrina (Hoffm.) Th.Fr. s.lat. (87/0) 1-18 [4]
C. crenularia (With.) J.R.Laundon (6/0) 2,3,6,7,12
C. crenulatella (Nyl.) H.Olivier (12/0) 1-3,6-8,10,11,13
C. dalmatica (A.Massal.) H.Olivier (1/0) 12
C. decipiens (Arnold) Blomb. & Forssell (73/0) 1-18
C. flavescens (Huds.) J.R.Laundon (84/0) 1-18
C. flavocitrina (Nyl.) H.Olivier (62/0) 1-18
C. flavovirescens (Wulfen) Dalla Torre & Sarnth. (31/0) 1-4,6-16,18
C. holocarpa (Hoffm.) A.E.Wade (84/0) 1-18
C. lactea (A.Massal.) Zahlbr. (3/0) 2,11,15
C. limonia Nimis & Poelt (1/0) 15
C. oasis (A.Massal.) Szatala (1/0) 3
C. obscurella (Lahm ex Körb.) Th.Fr. (2/0) 8,11
C. ruderum (Malbr.) J.R.Laundon (37/0) 5,6,8,10-18
C. saxicola (Hoffm.) Nordin (78/0) 1-18
C. teicholyta (Ach.) J.Steiner (79/0) 1-18
C. ulcerosa Coppins & P.James (2/0) 17
C. variabilis (Pers.) Müll.Arg. (9/0) 8,12,14,15,17
Candelariella aurella (Hoffm.) Zahlbr. (85/0) 1-18
forma *smaragdula* Szatala (2/0) 6,17
C. medians (Nyl.) A.L.Sm. (81/0) 1-18
C. reflexa (Nyl.) Lettau (23/0) 1-8,10,11,13-16
C. vitellina (Hoffm.) Müll.Arg. (86/0) 1-18
forma *flavovirella* (Nyl.) A.Henderson (3/0) 4,11,16
C. xanthostigma (Ach.) Lettau (4/0) 8,15
Catillaria chalybeia (Borrer) A.Massal. (29/0) 1-4,7,10,11,13-18
C. lenticularis (Ach.) Th.Fr. (18/0) 1,9-15,17,18
Cetraria aculeata (Schreb.) Fr. (8/0) 1,2,5,7,9,10,13
C. islandica (L.) Ach. (2/0) 7,10
Chaenotheca chlorella (Ach.) Müll.Arg. (1/0) 15
C. ferruginea (Turner ex Ach.) Mig. (16/0) 2,3,7,8,10,11,13-16
C. trichialis (Ach.) Th.Fr. (1/0) 8
Chrysothrix candelaris (L.) J.R.Laundon (6/0) 7,8,15,16
Cladonia arbuscula (Wallr.) Flot. (7/1) 1-3,5,7,(9),10
C. cariosa (Ach.) Spreng. (2/0) 2
C. cervicornis (Ach.) Flot. (2/0) 2
C. chlorophaea (Flörke ex Sommerf.) Spreng. s.lat. (38/0) 1-3,5-11,13-16,18 [5]
C. ciliata var. *tenuis* (Flörke) Ahti (7/0) 2,7,9,10,11
C. coccifera (L.) Willd. (1/0) 13 [6]
C. coniocraea (Flörke) Spreng. (48/0) 1-16
C. crispata var. *cetrariiformis* (Delise ex Duby) Vain. (3/0) 3,7,13
C. digitata (L.) Hoffm. (5/0) 2,6,7
C. diversa Asperges (8/0) 1,2,7,10,13
C. fimbriata (L.) Fr. (52/0) 1-18
C. floerkeana (Fr.) Flörke (7/0) 1,2,5,7,10,13
C. foliacea (Huds.) Willd. (4/0) 2,10,13
C. furcata (Huds.) Schrad. (19/1) 1-3,5,7,9-11,13,15,16
subsp. *subrangiformis* (Sandst.) Abbayes (2/0) 15-16
C. glauca Flörke (3/0) 5,7,13
C. gracilis (L.) Willd. (4/1) 2,5,7,10,(11),(15) [7]
C. humilis (With.) J.R.Laundon (12/0) 1,2,6,7,9,13-16
C. incrassata Flörke (1/0) 1
C. macilenta Hoffm. (17/1) 1-3,5,7,8,10-12,13 [8]

C. ochrochlora Flörke (7/0) 3,7,8,12,13,15
C. pocillum (Ach.) Grognot (9/0) 1,2,9,11,15,18
C. polydactyla (Flörke) Spreng. (8/0) 2,3,7,10,13,15,16
C. portentosa (Dufour) Coem. (10/0) 1,2,5,7,10,11,13
C. pyxidata (L.) Hoffm. (7/0) 2,3,5,(7),9,(10),(11),(13),14-16 [9]
C. ramulosa (With.) J.R.Laundon (8/0) 2,3,5,7,13-15
C. rangiformis Hoffm. (14/0) 1-3,5,9-11,14-16
C. scabriuscula (Delise) Nyl. (7/0) 1-3,10,13
C. squamosa Hoffm. (11/1) 1-3,5,7,10,13-15
var. *subsquamosa* (Nyl. ex Leight.) Vain. (1/0) 7
C. subulata (L.) F.H.Wigg. (8/0) 1-3,13,14,16
C. sulphurina (Michx.) Fr. (1/0) 13
C. symphycarpia (Flörke) Fr. (1/0) 2
C. uncialis subsp. *biuncialis* (Hoffm.) M.Choisy (5/0) 2,5,7,10
Clauzadea immersa (Hoffm.) Hafellner & Bellem. (1/0) 5
C. metzleri (Körb.) Clauzade & Cl.Roux ex D.Hawksw. (2/0) 2,16
C. monticola (Ach.) Hafellner & Bellem. (21/0) 3,5-8,10,11,13-16
Cliostomum griffithii (Sm.) Coppins (39/0) 1-3,5,7-18
Collema auriforme (With.) Coppins & J.R.Laundon (28/0) 1,3,5-8,10,11,13-16
C. bachmanianum (Fink) Degel. (1/0) 15
C. crispum (Huds.) F.H.Wigg. (22/2) 2,3,5-7,10,11,13-16
C. cristatum (L.) F.H.Wigg. (0/6) (2),(15) [10]
C. fuscovirens (With.) J.R.Laundon (9/0) 2,3,6,9,10,12,15
C. limosum (Ach.) Ach. (0/1) (15) [10]
C. tenax (Sw.) Ach. (15/0) 2,3,6,8-11,13-16
var. *ceranoides* (Borrer) Degel. (25/0) 1-3,6-8,10,12-16
Cyphelium inquinans (Sm.) Trevis. (10/0) 8,10,11,13-16
Dimerella pineti (Ach.) Vězda (5/0) 3,8,11,16
Diploicia canescens (Dicks.) A.Massal. (82/0) 1-18
Diploschistes muscorum (Scop.) R.Sant. (2/0) 13,15
D. scruposus (Schreb.) Norman (11/2) 7-11,14,15
Diplotomma alboatrum (Hoffm.) Flot. (72/0) 1-18
Dirina massiliensis forma *sorediata* (Müll.Arg.) Tehler (54/0) 2-18
Enterographa crassa (DC.) Fée (1/0) 15
Evernia prunastri (L.) Ach. (59/0) 1-17
Fellhaneropsis vezdae (Coppins & P.James) Sérus. & Coppins (1/0) 10
Flavoparmelia caperata (L.) Hale (18/1) 2,3,6-8,10,11,13-15
F. soredians (Nyl.) Hale (15/0) 1-4,7,8,10,11,15,17
Fuscidea lightfootii (Sm.) Coppins & P.James (2/0) 4,13
Graphis scripta (L.) Ach. (0/1) (15) [11,12]
Gyalecta jenensis (Batsch) Zahlbr. (1/0) 14
Haematomma ochroleucum (Neck.) J.R.Laundon (56/0) 1-16
var. *porphyrium* (Pers.) J.R.Laundon (55/0) 1-16,18
Hyperphyscia adglutinata (Flörke) H.Mayrhofer & Poelt (10/0) 2,6-8,10,11,13-15
Hypocenomyce scalaris (Ach. ex Lilj.) M.Choisy (38/0) 1-4,6-8,10,11,13-18
Hypogymnia physodes (L.) Nyl. (48/0) 1-11,13-16,18
H. tubulosa (Schaer.) Hav. (27/0) 1-4,7-17
Hypotrachyna afrorevoluta (Krog & Swinscow) Krog & Swinscow (5/0) 3,5,8,10
H. revoluta (Flörke) Hale s.lat. (13/0) 1,2,5-8,10,13-16 [13]
Lecanactis abietina (Ach.) Körb. (3/0) 7,15
Lecania cyrtella (Ach.) Th.Fr. (7/0) 1,3,4,8,10,11
L. erysibe (Ach.) Mudd (85/0) 1-18
L. hutchinsiae (Nyl.) A.L.Sm. (1/0) 17

L. inundata (Hepp ex Körb.) M.Mayrhofer (6/0) 3,13,15,16
L. naegelii (Hepp) Diederich & Van den Boom (1/0) 10
L. rabenhorstii (Hepp) Arnold (1/0) 11
L. turicensis (Hepp) Müll.Arg. (12/0) 2,5,10-12,14-17
Lecanora albescens (Hoffm.) Branth & Rostr. (84/0) 1-18
L. antiqua J.R.Laundon (70/0) 1-18
L. campestris (Schaer.) Hue (86/0) 1-18
subsp. *dolomitica* O.L.Gilbert (1/0) 14
L. carpinea (L.) Vain. (20/0) 2-5,7,8,11,13-15
L. chlarotera Nyl. (58/1) 1-18
L. confusa Almb. (1/0) 4
L. conizaeoides Nyl. ex Cromb. (89/0) 1-18
L. crenulata Hook. (83/0) 1-18
L. dispersa (Pers.) Sommerf. (88/0) 1-18
L. epanora (Ach.) Ach. (1/0) 7
L. expallens Ach. (85/0) 1-18
L. horiza (Ach.) Linds. (1/0) 11
L. intricata (Ach.) Ach. (20/0) 1,3-6,8-11,13-15
L. muralis (Schreb.) Rabenh. (86/0) 1-18
L. orosthea (Ach.) Ach. (65/0) 1-18
L. pannonica Szatala (39/0) 2-11,13-18
L. persimilis (Th.Fr.) Nyl. (8/0) 1-3,5,6,10,11,13,14
L. polytropa (Hoffm.) Rabenh. (80/0) 1-18
L. pruinosa Chaub. (1/0) 18
L. pulicaris (Pers.) Ach. (3/0) 7,13,14
L. rupicola (L.) Zahlbr. (3/0) 7,10,11
L. saligna (Schrad.) Zahlbr. (14/0) 1-6,11,13,15,18
L. sambuci (Pers.) Nyl. (1/0) 5
L. semipallida H.Magn. (2/0) 2,3
L. soralifera (Suza) Räsänen (74/0) 1-18
L. stenotropa Nyl. (4/0) 2,8,14
L. sublivescens (Nyl. ex Crombie) A.L.Sm. (1/0) 16
L. sulphurea (Hoffm.) Ach. (38/0) 1,3,4,6-15,17,18
L. symmicta (Ach.) Ach. (7/0) 1-3,11,13
L. umbrina (Ach.) A.Massal. (9/0) 2,3,5,7,8,13,15
L. varia (Hoffm.) Ach. (6/0) 4,7,10,15,16
L. zosterae (Ach.) Nyl. (1/0) 11
Lecidea fuscoatra (L.) Ach. s.lat. (53/0) 1-14,16,17 [14]
L. hypopta Ach. (1/0) 7
Lecidella carpathica Körb. (3/0) 10,17,18
L. elaeochroma (Ach.) M.Choisy (51/1) 1-18
L. scabra (Taylor) Hertel & Leuckert (81/0) 1-18
L. stigmatea (Ach.) Hertel & Leuckert (85/0) 1-18
Lempholemma chalazanum (Ach.) de Lesd. (1/0) 10
Lepraria incana (L.) Ach. s.lat. (85/0) 1-18 [15]
L. lobificans Nyl. (40/0) 2-11,13-18
L. vouauxii (Hue) R.C.Harris (71/0) 1-18
Leptogium biatorinum (Nyl.) Leight. (1/0) 3
L. schraderi (Ach.) Nyl. (5/0) 8,9,11,16
L. tenuissimum (Dicks.) Körb. (1/0) 3
L. turgidum (Ach.) Cromb. (2/0) 2,3
Lichina confinis (Müller) C.Agardh (1/0) 9
Lobaria pulmonaria (L.) Hoffm. *Loc.non cit.* in Lees (1892) [11]
Melanelixia fuliginosa (Fr. ex Duby) O.Blanco et al. (48/0) 1-17
M. glabratula (Lamy) Sandler & Arup (47/0) 1-11,13-16,18
M. subaurifera (Nyl.) O.Blanco et al. (60/0) 1-18

Melanohalea elegantula (Zahlbr.) O.Blanco et al. (1/0) 14
M. exasperata (De Not.) O.Blanco et al. *Loc.non cit.* in Lees (1892) [11]
M. exasperatula (Nyl.) O.Blanco et al. (2/0) 15,17
Micarea denigrata (Fr.) Hedl. (11/0) 1-3,5,7,13,18
M. erratica (Körb.) Hertel, Rambold & Pietschm. (5/0) 10,11,13
M. lignaria (Ach.) Hedl. (15/0) 1,2,4,6-8,10,11,14-16
M. melaena (Nyl.) Hedl. (1/0) 7
M. misella (Nyl.) Hedl. (2/0) 1,5
M. nitschkeana (J.Lahm ex Rabenh.) Harm. (3/0) 2,9
M. prasina Fr. (11/0) 1-3,5,7,13,15,17
Mycoblastus fucatus (Stirt.) Zahlbr. (17/0) 3,4,6-10,13-16
Ochrolechia androgyna (Hoffm.) Arnold (7/0) 3,7,8,10,15
O. parella (L.) A.Massal. (12/0) 1,2,4,8,10-12,15
O. subviridis (Høeg) Erichsen (1/0) 7
O. turneri (Sm.) Hasselrot (8/0) 7,8,11,14-16
Opegrapha atra Pers. (4/0) 8,10,11,18
O. calcarea Turner ex Sm. (40/0) 2-18
O. demutata Nyl. (1/0) 11 [1]
O. gyrocarpa Flot. (1/0) 18
O. niveoatra (Borrer) J.R.Laundon (3/0) 15,17,18
O. ochrocheila Nyl. (1/0) 15
O. varia Pers. (1/0) 10
O. vermicellifera (Kunze) J.R.Laundon (1/0) 8
O. vulgata (Ach.) Ach. (3/0) 8,10,11
Parmelia saxatilis (L.) Ach. (43/1) 1-16
P. sulcata Taylor (77/0) 1-18
Parmelina tiliacea (Hoffm.) Hale (2/0) 8,10
Parmeliopsis ambigua (Wulfen) Nyl. (7/0) 3,5,7,8,15,16
Parmotrema perlatum (Eschw.) M.Choisy (14/0) 1-3,5-8,10,11,14,15 [17]
Peltigera canina (L.) Willd. (3/0) 9,13
P. didactyla (With.) J.R.Laundon (17/0) 2,3,5,10,11,13,15,16
P. hymenina (Ach.) Delise ex Duby (11/3) 2,3,7,9,(10),11,13-15
P. membranacea (Ach.) Nyl. (18/5) 1-3,5,7,9,(10),11-14,(15),16
P. neckeri Hepp ex Müll.Arg. (2/1) 9-11
P. praetextata (Flörke ex Sommerf.) Zopf (1/1) (9),12
P. rufescens (Weiss) Humb. (22/0) 1,2,5-7,9-11,13,14,16
Pertusaria albescens (Huds.) M.Choisy & Werner (9/0) 3,4,7,8,15,16
var. *corallina* (Zahlbr.) J.R.Laundon (12/0) 3,7,8,10,11,15,16
P. amara (Ach.) Nyl. (25/1) (2),3,6-11,13-18
P. coccodes (Ach.) Nyl. (7/0) 7,8,10,15
P. pertusa (Weigel) Tuck. (10/0) 3,4,7,8,10,15,16
Petractis clausa (Hoffm.) Kremp. (4/0) 3,8,10,11
Phaeophyscia nigricans (Flörke) Moberg (70/0) 1-18
P. orbicularis (Neck.) Moberg (85/0) 1-18
Phlyctis argena (Spreng.) Flot. (42/0) 1-5,7-18
Physcia adscendens (Fr.) H.Olivier (87/0) 1-18
P. aipolia (Ehrh. ex Humb.) Fürnr. (3/0) 2,6,13 [17]
P. caesia (Hoffm.) Fürnr. (87/0) 1-18
P. dubia (Hoffm.) Lettau (55/0) 1-18
P. stellaris (L.) Nyl. (5/0) 2,3,8 [14]
P. tenella (Scop.) DC. (82/0) 1-18
Physconia distorta (With.) J.R.Laundon (3/0) 11,15
P. enteroxantha (Nyl.) Poelt (10/0) 8,10,11,14,15,18
P. grisea (Lam.) Poelt (84/0) 1-18
P. perisidiosa (Erichsen) Moberg (4/0) 10,11,13
Placynthiella dasaea (Stirt.) Tønsberg (1/0) 5

P. icmalea (Ach.) Coppins & P.James (49/0) 1-16,18
P. uliginosa (Schrad.) Coppins & P.James (12/0) 1,2,5-7,10,11,16
Placynthium nigrum (Huds.) Gray (56/0) 1-18
Platismatia glauca (L.) W.L.Culb. & C.F.Culb. (11/0) 2-4,7,8,10,11,15,16
Pleurosticta acetabulum (Neck.) Elix & Lumbsch (1/0) 11
Polyblastia dermatodes A.Massal. (3/0) 3,10,11
Polysporina simplex (Davies) Vězda (6/0) 10,11,14,15,17
Porpidia crustulata (Ach.) Hertel & Knoph (20/0) 2-11,14,15
P. macrocarpa (DC.) Hertel & A.J.Schwab (6/0) 1,5,7,16
P. soredizodes (Lamy ex Nyl.) J.R.Laundon (73/0) 1-18
P. tuberculosa (Sm.) Hertel & Knoph (82/0) 1-18
Protoblastenia rupestris (Scop.) J.Steiner (57/0) 1-3,5-18
Protoparmelia badia (Hoffm.) Hafellner (10/0) 1-3,7,8,10,14,15
Pseudevernia furfuracea (L.) Zopf (3/0) 4,7,11
var. *ceratea* (Ach.) D.Hawksw. (5/0) 4,8,10,13,16
Psilolechia leprosa Coppins & Purvis (58/0) 1-11,13-18
P. lucida (Ach.) M.Choisy (84/0) 1-18
Punctelia jeckeri (Roum.) Kalb (21/0) 2,3,5,7-11,13-17
P. subrudecta (Nyl.) Krog s.lat. (40/0) 2-18 [18]
Pyrenocollema halodytes (Nyl.) R.C.Harris (1/0) 3
Pyrrhospora quernea (Dicks.) Körb. (5/0) 7,9-11
Ramalina calicaris (L.) Fr. (0/1) (7) [11]
R. canariensis J.Steiner (8/0) 3,8,9,11,12,15,18
R. capitata (Ach.) Nyl. (5/0) 7,10,11,13
R. farinacea (L.) Ach. (56/0) 1-18
R. fastigiata (Pers.) Ach. (16/1) 2,3,5,(6),7,8,10-14
R. fraxinea (L.) Ach. (3/2) 7,9,10,(13),(15)
R. lacera (With.) J.R.Laundon (5/0) 8,10,11,13,15
R. pollinaria (Westr.) Ach. (5/0) (1),10,11
R. siliquosa (Huds.) A.L.Sm. (1/0) 11
R. subfarinacea (Nyl. ex Cromb.) Nyl. (2/0) 10
Rhizocarpon geographicum (L.) DC. (3/0) 1,10
R. reductum Th.Fr. (47/0) 1-18
Rinodina calcarea (Arnold) Arnold (6/0) 10,12,14,15,17,18
R. oleae Bagl. (84/0) 1-18
R. pityrea Ropin & H.Mayrhofer (1/0) 3
R. teichophila (Nyl.) Arnold (58/0) 1-18
Sarcogyne regularis Körb. (63/0) 1-18
Sarcopyrenia gibba var. *geisleri* (Beckh.) Vav.-Ros. & Hladun (10/0) 6,9,10,12-15,17
Schismatomma decolorans (Turner & Borrer ex Sm.) Clauzade & Vězda (7/0) 3,10,11,15,16,18
Scoliciosporum chlorococcum (Graewe ex Stenh.) Vězda (40/0) 1-13,15,16,18
S. umbrinum (Ach.) Arnold (72/0) 1-18
Solenopsora candicans (Dicks.) J.Steiner (5/0) 10,11,14-17
Solorina saccata (L.) Ach. (0/1) (2) [11]
Staurothele hymenogonia (Nyl.) Th.Fr. (2/0) 3,10
Steinia geophana (Nyl.) Stein (1/0) 8
Stereocaulon nanodes Tuck. (1/0) 12
S. pileatum Ach. (2/0) 10,13
S. vesuvianum Pers. (2/0) 10,16
Tephromela atra (Huds.) Hafellner ex Kalb (73/0) 1-18
Thelidium decipiens (Nyl.) Kremp. (1/0) 10
T. incavatum Mudd (4/0) 7,11,17,18
T. papulare (Fr.) Arnold (1/0) 17
T. zwackhii (Hepp) A.Massal. (4/0) 3,8,10,11
Thelocarpon laureri (Flot.) Nyl. (1/0) 2
Toninia aromatica (Sm.) A.Massal. (68/0) 1-18

Trapelia coarctata (Sm.) M.Choisy (39/0) 1-18
T. glebulosa (Sm.) J.R.Laundon (29/0) 1-11,13,15,18
T. obtegens (Th.Fr.) Hertel (8/0) 2-6,10,14
T. placodioides Coppins & P.James (51/0) 1-18
Trapeliopsis flexuosa (Fr.) Coppins & P.James (7/0) 1,2,7,10,15
T. granulosa (Hoffm.) Lumbsch (52/0) 1-16,18
Tuckermanopsis chlorophylla (Willd.) Hale (9/0) 2-4,7,8,10,15
Usnea cornuta Körb. (1/0) 16
U. hirta (L.) F.H.Wigg. Loc.non cit. in Lees (1892) [11,16]
U. subfloridana Stirt. (18/0) 3-5,7,8,10,11,13-16
Verrucaria aethiobola Wahlenb. (1/0) -- 16
V. baldensis A.Massal. (69/0) 1-8,10-18
V. caerulea DC. (1/0) 18
V. ditmarsica Erichsen (1/0) 3
V. dolosa Hepp (2/0) 8,11
V. fuscella (Turner) Winch (75/0) 1-18
V. hochstetteri Fr. (71/0) 1-18
V. macrostoma Dufour ex DC. (51/0) 1-18
forma *furfuracea* de Lesd. (79/0) 1-18
V. muralis Ach. (86/0) 1-18
V. murina Leight. (4/0) 3,8,11
V. nigrescens Pers. (88/0) 1-18
forma *tectorum* (A.Massal.) Coppins & Aptroot (1/0) 15
V. simplex P.M.McCarthy (1/0) 15
V. viridula (Schrad.) Ach. (75/0) 1-18
Vezdaea leprosa (P.James) Vězda (1/0) 10
Xanthoparmelia mougeotii (Schaer. ex D.Dietr.) Hale (39/0) 2-4,6-8,10-18
X. verruculifera (Nyl.) O.Blanco et al. (26/0) 3,4,7-16
Xanthoria calcicola Oxner (78/0) 1-18
X. candelaria (L.) Th.Fr. s.lat. (84/0) 1-18 [19]
X. elegans (Link) Th.Fr. (13/0) 3,7,9,12-17
X. parietina (L.) Th.Fr. (88/0) 1-18
X. polycarpa (Hoffm.) Th.Fr. ex Rieber (76/0) 1-18
X. ucrainica S.Kondr. (18/0) 1-4,7,8,10,11,13,15,16

Notes:

[1] First British record
[2] Last seen 1962 – probably extinct
[3] Last seen 1970 – probably extinct
[4] s.str. confirmed from (33/0) 2-5,7,10,11,13-16
[5] Including *C. merochlorophaea* Asah. from (1/0) 10
[6] Only one s.str. record confirmed; all older records referable to *C. diversa*
[7] 19th century records probably *C. furcata*
[8] Including *C. bacillaris* Genth recorded from (7/0) 1,2,5,7,10
[9] Some older records referable to other species
[10] Probably extinct
[11] Extinct
[12] Loc. non cit. in Lees (1892)
[13] s.str. confirmed from (4/0) 1,5,10,14
[14] Most, if not all, records referable to *L. grisella* Flörke
[15] Numerous records referable to other species
[16] Some records referable to other species
[17] Also loc. non cit. in Lees (1892)
[18] s.str. confirmed for (33/0) 2-5,7-15; some earlier records referable to P. jeckeri
[19] s.str. confirmed from (1/0) 4

Synonyms:

Aspicilia subcircinata (Nyl.) Coppins = *A. radiasa*
Bacidia naegelii (Hepp) Zahlbr. = *Lecania naegelii*
B. sabuletarum (Schreb.) Lettau = *Bilimbia sabuletarum*
B. vezdae Coppins & P.James = *Fellhaneropsis vezdae*
Buellia punctata (Hoffm.) A.Massal. = *Amandinea punctata*
Cetraria chlaraphylla (Willd.) Vain. = *Tuckermanapsis chloraphylla*
Cladania subrangiformis Sandst. = *C. furcata* subsp. *subrangifarmis*
Caelacaulan aculeatum (Schreb.) Link = *Cetraria aculeata*
Lecanora canferta (Duby ex Fr.) Grognot = *L. antiqua*
L. flatawiana sensu auct. = *L. semipallida*
L. hagenii (Ach.) Ach. = *L. umbrina*
Lepraria lesdainii (Hue) R.C.Harris = *Bryalepraria lesdainii*
Lepralama vauauxii (Hue) J.R.Laundon = *Lepraria vauauxii*
Mycoblastus sterilis Coppins & P.James = *M. fucatus*
Myxobilimbia sabuletarum (Schreb.) Hafellner = *Bilimbia sabuletarum*
Neafuscelia verruculifera = *Xanthaparmelia verruculifera*
Parmelia acetabulum (Necker) Duby = *Pleurasticta acetabulum*
P. caperata (L.) Ach. = *Flavaparmelia caperata*
P. elegantula (Zahlbr.) Szatala = *Melanahales elegantula*
P. exasperata De Not. = *Melanohalea exasperata*
P. exasperatula Nyl. = Melanohalea *exasperatula*
P. glabratula (Lamy) Nyl. = *Melanelixia glabratula*
P. glabratula subsp. *fuliginasa* (Fr. ex Duby) J.R.Laundon = *Melanelixia fuliginosa*
P. maugeatii Schaer. ex D.Dietr. = *Xanthaparmelia maugeatii*
P. perlata (Huds.) Ach. = *Parmatrema perlatum*
P. revaluta Flörke = *Hypotrachyna revaluta*
P. saredians Nyl. = *Flavoparmelia saredians*
P. subaurifera Nyl. = *Melanelixia subaurifera*
P. subrudecta Nyl. = *Punctelia subrudecta*
P. tiliacea (Hoffm.) Ach. = *Parmelina tiliacea*
P. ulaphylla (Ach.) F.Wilson = *Punctelia ulaphylla*
P. verruculifera Nyl. = *Xanthaparmelia verruculifera*
Parmatrema chinense (Osbeck) Hale & Ahti = *P. perlatum*
Peltigera lactucifalia (With.) J.R.Laundon = *P. hymenina*
Palyblastia gelatinasa (Ach.) Th.Fr. = *Aganimia gelatinosa*
Rinodina gennarii Bagl. = *R. aleae*
Thelidium micracarpum (Davies ex Leight.) A.L.Sm. = *T. zwackhii*
Verrucaria glaucina auct. = *V. fuscella*

Other lichen taxa erroneously recorded from the county or doubtful in the absence of supporting herbarium material:

Cladania rangiferina (L.) F.H.Wigg. Several old records are erroneous, all referable to other species
Callema fasciculare (L.) F.H.Wigg. Doubtful in the absence of supporting herbarium material
Diptomamma hedenii (H.Magn.) P.Clerc & Cl.Roux Several records, doubtful in the absence of supporting herbarium material
Leparia membranacea (Dicks.) Vain. Several records, doubtful in the absence of supporting herbarium material
Physcia leptalea (Ach.) DC. Loc. non cit. in Lees (1892) doubtful in the absence of supporting herbarium material
Usnea ceratina Ach. Single early record (1841) as *U. plicata* – doubtful in the absence of supporting herbarium material; also loc. non cit. in Lees (1892)
U. cf. filipendula Stirt. (syn. *U. dasopoga* sensu auct. brit.) Single early record (1898) as *U. barbata* – doubtful in the absence of supporting herbarium material; also loc. non cit. in Lees (1892)

Xanthoria aureola (Ach.) Erichsen Several records – all questionable

Lichenicolous fungi and other taxa traditionally treated by lichenologists:

Arthonia apotheciorum (A.Massal.) Almq.
Arthonia punctiformis Ach.
Arthopyrenia punctiformis A.Massal.
Athelia archnoidea (Berk) Jülich
Cyphelium sessile (Pers.) Trevis.
Cyrtidula hippocastani (DC.) R.C.Harris
Intralichen christiansenii (D.Hawksw.) D.Hawksw. & M.S.Cole
Lichenoconium lecanorae (Jaap) D.Hawksw.
Muellerella lichenicola (Sommerf.) D.Hawksw,
Opegrapha parasitica (A.Massal.) H.Olivier
Polycoccum pulvinatum (Eitner) R.Sant.
Roselliniella cladoniae (Anzi) Matzer & Hafellner
Rhymbocarpus cruciatus (Sherwood et al.) Etayo & Diederich
Skyttea buelliae Sherwood, D.Hawksw. & Coppins
Vouauxiella lichenicola (Linds.) Petr. & Syd.
V. verrucosa (Vouaux) Petr. & Syd.
Weddellomyces epicallopisma (Wedd.) D.Hawksw.
Xanthoriicola physciae (Kalchbr.) D.Hawksw.

References

HAWKSWORTH, D.L. (2003) The lichenicolous fungi of Great Britain and Ireland: an overview and annotated checklist. *Lichenologist* 35: 191 -232.
JUKES-BROWN, A.J. & WOODRUFFE-PEACOCK, E.A. (1895) Sketch map of the soils and natural history divisions of Lincolnshire. *Naturalist* 20: 289-301.
LEES, F.A. (1892) Botany and outline flora of Lincolnshire. In: *History, Gozetteer ond Directory of the County of Lincolnshire* (W. White, ed.): 37-63. , W. White, Sheffield.
SEAWARD, M.R.D. (1980) *Lichen Floro of Lincolnshire*. Lincolnshire Naturalists' Union, Lincoln.
SEAWARD, M.R.D. (2004) A checklist of Lincolnshire lichens. *Tronsoctions of the Lincolnshire Noturolists' Union* 26: 26-30 & 39-40.
SMITH, C.W., APTROOT, A., COPPINS, B.J., FLETCHER, A., GILBERT, O.L., JAMES, P.W. & WOLSELEY, P.A., eds (2009) *The Lichens of Greot Britain ond Irelond*. British Lichen Society, London.

WELTON-LE-WOLD , LINCOLNSHIRE – BACK TO BASICS

Allan Straw

The deposits worked in the Welton quarry (TF280882) until 1973 have been described and discussed for some 40 years, mainly because of two important features; the discovery of artefacts and mammalian fossils beneath ancient tills, and the direct overlay of a much younger till on one of these. The most recent references to the site are by Green (2011) and Gamble (2014), (but see also Straw 2015). These authors relied on a report for English Heritage (Aram *et al*, 2004) which included an interpretation of the environmental circumstances surrounding the deposits at variance with previous ones. Some of the statements in these publications are not strictly accurate nor square with the situation on the ground. This paper outlines the sedimentary succession, reiterates the older views, and discusses the problem of age.

The quarry location and schematic section of the deposits are figured in Gamble (2014). West of the road, two thick units of glacial till (Welton and Calcethorpe Tills – Straw, 1969, 2005) overlie two of sands and gravels (Alabaster and Straw, 1976). East of the road, a third, younger till (Marsh Till) overlies weathered Welton Till and Upper Gravel (Straw, 2015).

By 1973, at the end of quarrying, a combined 13m of Tills were exposed west of the road, mostly

lodgement tills emplaced by ice flowing toward the south. Beneath, the Upper Gravel was some 7-8m thick, consisting of flint gravel disposed mainly in discontinuous, inter-bedded planar units, poorly sorted, some massive, some with traces of bedding. The massive beds result from mass-movement processes, the others from seasonal floods as bar-core sediments. All the fossils and artefacts, found in the north-east corner of the western pit, were lodged in this deposit occurring generally within a narrow, 2m vertical zone some 4-6m below the base of the overlying till. In secondary context they had been 'rafted' within several units, even though probably from a single source.

There is no sedimentary evidence in the Upper Gravel for the former existence of a relatively fast-flowing stream that could have transported the fossils and artefacts, and certainly none that indicates a cool temperate climatic environment, as claimed by Aram *et al* (2004, Section 4). Alabaster and Straw did not refer to the sediments as 'a water-lain deposit originating in a fluvial system', but as 'successive sheets of rock waste transported by mass movement processes over a generally aggrading land surface'. They were laid down under a severe arctic nival climate (Straw, 2005) under which no elephant could have lived.

Beneath a weak, undulating unconformity the Lower Gravel, clearly layered and well-sorted into cross-bedded seams and lenses, was certainly water-laid, but the content and character indicate mechanical weathering and transport by braided streams under a sub-arctic nival climate (Straw, 2005). Near its surface, two ice-wedge casts were observed with probably more destroyed by extraction. Much of the sand consisted of well-rounded quartz grains and limonite ooliths derived from an upstream outcrop of Lower Cretaceous rocks, in too great quantities for the stream to remove. The intermittent layers of silt are likely to be flood-plain sediments in the Lower Gravel, but wind-blown in the Upper (Straw, 1976)

The sedimentary succession is therefore quite straightforward. On a wide Chalk-based valley floor some 600m across, stream-borne sands and gravels, under Sub-Arctic conditions, began to aggrade following exposure of Roach and Carstone rocks in the headward areas , eventually covered by the Upper Gravel introduced by debris flows bringing masses of small flints from higher slopes within the catchment, with spring floods re-sorting materials across the valley floor and silts being moved in drier summers. Active-layer processes and gelifluction point to the presence by this time of permafrost. These Gravels were then overspread by the ice-sheet which emplaced the Welton and Calcethorpe Tills. So, the deposits together testify to a single phase of deteriorating climate that culminated in glaciation, and the Gravels, in their extent, thickness and continuous aggradation could realistically, by comparison with gravel bodies elsewhere, have accumulated within a period of no more than 20,000 years.

The suggestion of Aram *et al* (2004, Sections 4 and 6) that the fossils were very nearly contemporaneous with the sediments (Upper Gravel) is misleading. Most of them were abraded, and the 'fresh' appearance of the elephant teeth was more a consequence of protection by skull bone during transport. As most of the flints in the deposit are less than 7cm across it was argued, assuming a river, that the fossils were too large to be carried far. However, small clast size need only be a reflection of what material was available (Straw, 2005). In any case the fossils and artefacts were moved by debris flows.

An important part of the 2003-2004 research was to obtain samples for analysis by the Optically Stimulated Luminescence (OSL) technique, which attempts to determine the length of time a target mineral (usually quartz) was last exposed to light. Difficulties were met in collecting samples (Aram et al, 2004) and during processing. From ten samples only three age estimates were obtained:

96,000 +/- 10,000 at base of the Welton Till
166,000 +/- 22,000 from sand in the base of the Marsh Till
365,000 +/- 28,000 deep in the Lower Gravel

Noting that the estimate for the Marsh Till is twice that for the Welton Till although it is much younger,

the reliability of the Gravel sample can be questioned. Green (2011) referred the 365,000BP date to the Lower Gravel, and considered glaciation had occurred in Marine Oxygen Isotope Stage (MOIS) 6 (180,000 to 130,000BP). Gamble (2014) applied the same date to the Upper Gravel, and both seem to have assumed that the Gravels accumulated over a very long period of time, after 400,000BP until the onset of glaciation. The OSL age estimates at Welton are highly provisional and inconsistent. To use them indiscriminately without adequate qualification, is unwise and serves only to make the straightforward situation at Welton unhelpfully complex, and raises implications that cannot be sustained.

Recent research in the former Trent catchment provides a different story (Bridgland *et al*, 2014). Organic deposits at Southrey, Tattershall Thorpe and near Newark belong definitely to a MOIS 7 interglacial, and in Lincolnshire these deposits rest directly on Wragby Till. In the Bain valley, the Wragby Till is contemporary with the Calcethorpe Till (Straw, 1966) which extends east to Welton where it is closely related to the Welton Till. There are firm grounds therefore for ascribing all these Tills to a glaciation at c. 270,000BP within MOIS 8 (300,000 to 245,000BP) and, as the Gravels immediately preceded glaciation, they can be regarded as early MOIS 8 (290,000-270,000BP)(Straw 2015).

Welton therefore is special on numerous counts apart from the presence of fossils and artefacts. The Gravels are the sole occurrence in the Wolds of a valley-floor deposit sourced entirely within a single catchment, and they testify to a single period of increasingly cold climate culminating in permafrost and glaciation. A long erosion interval (over 200,000 years) was followed by incursion of ice from the east when Marsh Till was placed on the eroded surface of the Welton Till. Such superimposition occurs elsewhere in eastern England only at Dimlington, in Holderness.

References

ALABASTER, C. and STRAW, A., 1976. The Pleistocene context of faunal remains and artefacts discovered at Welton-le-Wold, Lincolnshire. *Proceedings of the Yorkshire Geologicol Society*: **41**: 75-93.

ARAM,J., HAMBLY,J., and RACKHAM, J., 2004. *Towords on understonding of the Ice Age ot Welton-.le-Wold, Lincolnshire*. Project Report for English Heritage, March, 2004. 103pp.

BRIDGLAND, D.R., HOWARD, A.J., WHITE, M.J., and WHITE, T.S. (eds.) 2014. *Quoternory of the Trent*. Oxbow Books, Oxford. 434pp.

GAMBLE, H., 2014. Where elephants once roamed! *Tronsoctions of the Lincolnshire Noturalists' Union (for 2013)*: **28**: 161-167.

GREEN, C., 2011. *The origins of Louth*. Lindes Press. Louth. 177pp.

STRAW, A., 1966. The development of the middle and lower Bain valley, east Lincolnshire. *Tronsoctions of the Institute of British Geogrophers*: **40**: 145-154.

STRAW, A., 1969. Pleistocene events in Lincolnshire: a survey and revised nomenclature. *Transoctions of the Lincolnshire Noturolists' Union*: **XVII**: 85-98.

STRAW, A., 1976. Sediments, fossils and geomorphology: a Lincolnshire situation. In *Geoorchoeology, Eorth Science ond the post*. Eds. D.A. Davidson and M.L.Shackley: Duckworth. London. 317-326.

STRAW, A., 2005. *Glociol ond pre-glociol deposits ot Welton-le-Wold, Lincolnshire*. Studio Publishing Services, Ltd. Exeter. 39pp.

STRAW, A., 2015 The Quaternary Sediments at Welton-le-Wold, Lincolnshire. *The Mercion Geologist:**18:** 227-215.*

THE LEAFHOPPER *Doratura impudica* (Homoptera: Cicadellidae) IN LINCOLNSHIRE.

Dr David Sheppard

In 2013, I was asked by Dr Alan Stewart (Sussex University), Auchenorrhyncha Recording Scheme Organiser, to look for possible habitats for the UKBAP priority leafhopper, *Doratura impudica*, along the Lincolnshire coast. It was known to be associated with *Elymus farctus* Sand Couch grass on the seaward side of newly colonising sand dunes and was known from sites in Kent (1), Essex.(3) and Norfolk (4). Several likely sites were found between Gibraltar Point and Donna Nook but too late in the year to find the leafhopper.

On 24th July 2014, I met Dr Stewart at Gibraltar Point and, with almost the first sweep of his net, he was

successful in finding several specimens on the outer dunes north of the shorebird sanctuary area. We then searched at Seacroft Marsh where we found further specimens. On the following day we searched on the outer dunes at Saltfleetby-Theddlethorpe and on newly formed dunes near Saltfleet Haven but were unable to find it at either site. I returned to Gibraltar Point on 30th July when, accompanied by Richard Doan, the shorebird warden, I was able to enter part of the bird sanctuary where another specimen was found.

It would appear that the outer dunes south of Skegness may support a major national colony of this rare species.

My thanks to Paul Kirby for describing the habitat of Sand Couch grass and for providing distribution maps to guide the preliminary search; to Richard Doan for accompanied access to the shorebird sanctuary area and to Alan Stewart for showing me how it's done.

A SHORT REVIEW OF SPIDERS IN LINCOLNSHIRE

Annette Binding

Lincolnshire covers two main Vice Counties, VC53 South Lincs and VC54 North Lincs plus a small section of Vice County 63 South West Yorkshire which covers Crowle Waste (Moor), which is in Lincolnshire. The two main vice counties are roughly the same size but VC54 is more populated. VC 54 includes all the warrens around Scunthorpe as well as the Lincolnshire Limewoods and most of the coast. All these sites are well visited, although not always well recorded for spiders. VC53 is more sparsely populated and includes the South Kesteven Woodlands and the fenland districts south of Boston and Spalding. VC53 is much less visited than VC54.

Spider recording in Lincolnshire has been more or less continuous from the 1950's to the present day. I took over as County Recorder in 1998. Lincolnshire is the second largest county in England and it is impossible to cover it alone but I have been fortunate to have been supported by some very enthusiastic people who over the years have sent me records and brought me specimens. They have found many species of note, something which would not have been possible without them. Since the rise of the digital camera I also now regularly receive photographs of spiders via email and I identify as many as possible. I try to encourage people to take an interest in spiders and I am assisted in this by Imogen Wilde, BAS Regional Co-ordinator and Mentor – East Midlands Region. She has taken on the role of organising meetings, newsletters and internet contacts.

Despite all the work that has been put in, there are still some parts of the county with very few records as a quick look at the county map in the East Midlands Spider Group Newsletter reveals. Much of the under recorded area is in the south of the county where there are a group of 10km squares which stand out for having virtually no records. The lack of records in this part of the county is the same even for butterflies, a group which have been heavily recorded across the county over the past 25 years with annual records for Lincolnshire exceeding 15,000. Some years ago we visited this under recorded part of the county to look for butterflies and other invertebrates certain that we could find some species to fill the gap but were only able to find a handful of species. This part of the county is intensively farmed and we found very few places to stop and look for invertebrates of any kind. On our visit we were concentrating on butterflies so another visit dedicated to spiders should turn up something.

In a recent email from the British Arachnological Society it was suggested that it might prove interesting to research the records to show those species with no post-1980 records. I have now done that for my VC's and the results are as follows.

Species and year of last known record

V.C. 53 South Lincolnshire

Agelena labyrinthica 1965
Bathyphantes approximatus 1960
Bathyphantes nigrinus 1965
Bathyphantes parvulus 1960
Bolyphantes alticeps 1961
Centromerita bicolor 1966
Centromerita concinna 1970
Centromerus dilutus 1973
Centromerus sylvaticus 1973
Ceratinella brevipes 1973
Ceratinella scabrosa 1953
Cnephalocotes obscurus 1954
Dicymbium tibiale 1974
Diplocephalus picinus 1960
Dysdera erythrina 1960
Ero cambridgei 1967
Gonatium rubellum 1965
Gongylidiellum vivum 1971
Haplodrassus signifer 1960
Labulla thoracica 1960
Lepthyphantes ericaeus 1960
Lepthyphantes tenebricola 1960
Leptorhoptrum robustum 1960
Lophomma punctatum 1960
Macrargus rufus 1960
Megalepthyphantes nebulosus 1969
Meioneta innotabilis 1960
Meioneta saxatilis sens. str. 1954
Meioneta saxatilis/mossica sens. lat. 1960
Microlinyphia impigra 1973
Microneta viaria 1966
Moebelia penicillata 1960
Monocephalus fuscipes 1960
Ozyptila trux 1966
Peponocranium ludicrum 1970
Pholcomma gibbum 1966
Pirata latitans 1966
Pirata piscatorius 1970
Porrhomma microphthalmum 1960
Robertus lividus 1971
Robertus neglectus 1970
Saaristoa abnormis 1960
Silometopus reussi 1963
Tapinopa longidens 1960
Tegenaria atrica 1960
Theridion familiare Notable B 1899
Tiso vagans 1964
Walckenaeria cucullata 1960
Walckenaeria cuspidata 1964

V.C. 54 North Lincolnshire

Agalenatea redii 1965
Agyneta subtilis 1976
Araeoncus humilis 1975
Araneus marmoreus var. *pyramidatus* 1976
Baryphyma trifrons 1960
Bolyphantes alticeps 1969
Bolyphantes luteolus 1968
Centromerita concinna 1971
Centromerus arcanus 1970
Centromerus dilutus 1969
Centromerus prudens 1976
Ceratinella scabrosa 1960
Cryphoeca silvicola 1969
Dicymbium nigrum/brevisetosum sens. lat. 1951
Erigone arctica 1979
Hahnia nava 1969
Halorates reprobus 1977
Haplodrassus silvestris Notable B 1898
Hygrolycosa rubrofasciata Notable A 1970
Marpissa muscosa Notable B 1900
Meioneta innotabilis 1969
Meioneta saxatilis sens. str. 1972
Meioneta saxatilis/mossica sens. lat. 1972
Micrargus subaequalis 1976
Microctenonyx subitaneus 1960
Micrommata virescens 1900
Moebelia penicillata 1969
Oonops domesticus 1974
Pardosa hortensis 1899
Pelecopsis mengei 1969
Pelecopsis nemoralis 1909
Philodromus emarginatus Notable B 1937
Pocadicnemis pumila/juncea sens. lat. 1966
Porrhomma convexum 1977
Prinerigone vagans 1909
Robertus neglectus 1960
Scotina gracilipes 1963
Tapinocyba praecox 1963
Tegenaria parietina 1963
Thyreosthenius parasiticus 1969
Trichopterna thorelli 1911
Typhochrestus digitatus 1960
Walckenaeria dysderoides 1971
Xysticus luctuosus Notable B 1908

V.C. 53 South Lincolnshire
Walckenaeria nudipalpis 1970
Xysticus erraticus 1957
Zygiella atrica 1960

345 species of spider have been recorded in Lincolnshire as a whole, 335 species in VC54 and 248 in VC53, plus 6 species in VC63. Of the 335 species in VC54, 44 have no post-1980 records and there are 52 species with no post-1980 records in VC53. Among the species with no post-1980 records, there are a few which have not been seen for over 100 years and it is possible that they are now extinct in the county. The lists include 1 Notable species in VC53 and 5 Notable species in VC54. Lincolnshire has only one species on the Species of Principle Importance (SoPI) list, *Philodromus fallax* Nb, which has been recorded from three sites on the coast between 1899 and 1984.

Researching these figures has shown that that despite Lincolnshire being rather under recorded, there are more species with post-1980 records than without and it is possible that some of the species on the list will be rediscovered in future years.

DAUBENTON'S BAT IN THE FENS

Annette Faulkner

As many members will be aware the Lincolnshire Fens are woefully under-recorded, both the southern fens around the Wash, and even more so the fens in the Isle of Axholme. This is slowly changing, and I have been to a number of events in the last few years looking at cataloguing species indigenous to the fens. However, not all fen specialists are found exclusively there and many have a much more wide-spread distribution. One such is the Daubenton's Bat *Myotis daubentonii*.

This bat mainly forages over water, where it hunts for aquatic insects, catching them in its mouth or scooping them up with its feet or tail as it flies low over the surface of the water. It is the one bat species about which there is no concern, as it is widespread and found in most places where there is suitable habitat, though classed as uncommon nationally (Natural England's classification). But where are the roosts? And are they really as widespread in the Fens as we think? To date we had little solid information, only assumptions.

Unlike pipistrelle species *Pipistrellus spp.*, Whiskered/Brandt's *Myotis mystacinus/brandtii*, and Brown Long-eared Bats *Plecotus auritus,* Daubenton's Bats do not roost in houses or other domestic buildings, and with the exception of Tattershall church and a historic record of a pumping station in the Isle of Axholme, are not known from buildings of any description. Consequently we had few roost records across the county, numbering less than ten at the start of the project I am about to describe. What roosts we did know of included a redundant culvert, the storm water drains under Doddington Park in Lincoln (discovered in 2014), trees, and bridges, plus some historic or anecdotal records in similar structures.

Daubenton's Bats are considered to emerge at around forty minutes after sunset. Utilising the many bridges across fenland drains, would it be possible to time their arrival and from that track them back to where the roost was likely to be? And could we then locate the roost? In 2013 we had tried something similar at the confluence of drains at Pode Hole, near Spalding, with some degree of success, in that we suspected the roost was in the immediate area – but where exactly was it?

In 2014 we gathered together three teams of Bat Group volunteers to work under a leader, and

surveyed the Hobhole Drain north of Boston, the South Holland Main Drain, south of Spalding, on both of which we already had some information, and started from scratch on the Isle of Axholme, first checking if the pumping station roost was still in use, plus a little bit of work also on the River Ancholme at its northern end. This was a completely new technique which had never been tried before, as all the work on Daubenton's bats so far has been carried out in the Yorkshire Dales! Surveys were carried out mostly in July, with a few going on into August, but by then many parts of the drains were becoming clogged with algae, meaning the bats were dispersing elsewhere.

The results were impressive, producing two potential roosts in bridges, with a third in a tunnel on the Hobhole Drain, and two on the South Holland Main Drain. They also updated information on a known roost in a culvert there, first recorded in 1987 and in continual occupation since. The results for the Isle of Axholme were much less clear-cut. The arrangement of bridges there is not so regular as on a lot of the drains, and we established that the roost at the pumping station was no longer in use. Indeed by the end of the surveying season we still didn't know whether there were any Daubenton's Bats there! The River Ancholme was more productive, but a paucity of bridges and access was a problem there too.

With the exception of the tunnel all the potential roosts were in modern concrete bridges, and the intention in 2015 is to continue with this work to see if it is possible to confirm the presence of the suspected roosts, and also investigate other watercourses, time and personnel allowing, including following up on early records on the Louth canal. The full report on the project so far is available from myself via info@lincsbatgroup.co.uk.

Elenchus tenuicornis (Kirby, 1815) (Strepsiptera: Elenchidae): AN ORDER OF INSECTS NEW TO LINCOLNSHIRE.

Dr. David Sheppard

During the on-going survey of the insects in Snipe Dales (TF32-68-), a male specimen of a stylopid, *Elenchus tenuicornis* (Kirby, 1815) was taken in a malaise trap during May 2014. At about the same time, a male specimen was taken in a malaise trap at Epworth Turbary (SE75-04-). More male specimens were taken in a malaise trap at Snipe Dales in July and August 2014, and at Epworth Turbary in June 2014. A leafhopper *Criomorphus albomarginatus* (Homoptera: Delphacidae) host with an adult female stylopid was taken at Sotby Meadows (TF20-77-) on 29th June 2014 and another at Deeping Lakes (TF18-08-) on 29th July 2014. The nymphal host of the latter was not identifiable but resembled a species of *Javesella* Fennah, 1963. Although these are the first records of *E.tenuicornis* in Lincolnshire, it is clearly not a rare animal.

Stylopids develop within the bodies of a host insect. The first instar nymphs burst out of the body of the host, probably through the thin intersegmental membranes. The nymphs are free-living triungulinids, which cling to vegetation until they can attach themselves to the body of a potential host. Each nymph burrows into the body of a host, in the case of *E.tenuicornis* into the body of a leafhopper nymph, probably through an intersegmental membrane when this is still soft after shedding of the exoskeleton. Development continues within the body of the host, eventually distorting the abdominal segments and causing malformations of the reproductive organs. The female stylopid matures within the skin of its last larval instar with only the cephalothorax protruding between the abdominal segment of the host. When adult, the female is about 2mm long and occupies almost all of the host's abdomen. The head-end of the male puparium similarly protrudes between the abdominal segments of the host's body and from which the winged adult emerges. The males are free-living with only a hind pair of wings which are characteristically twisted but flatten out to a petal shape. These males live for only a short time, mating

Variable Damselfly

Nick Tribe

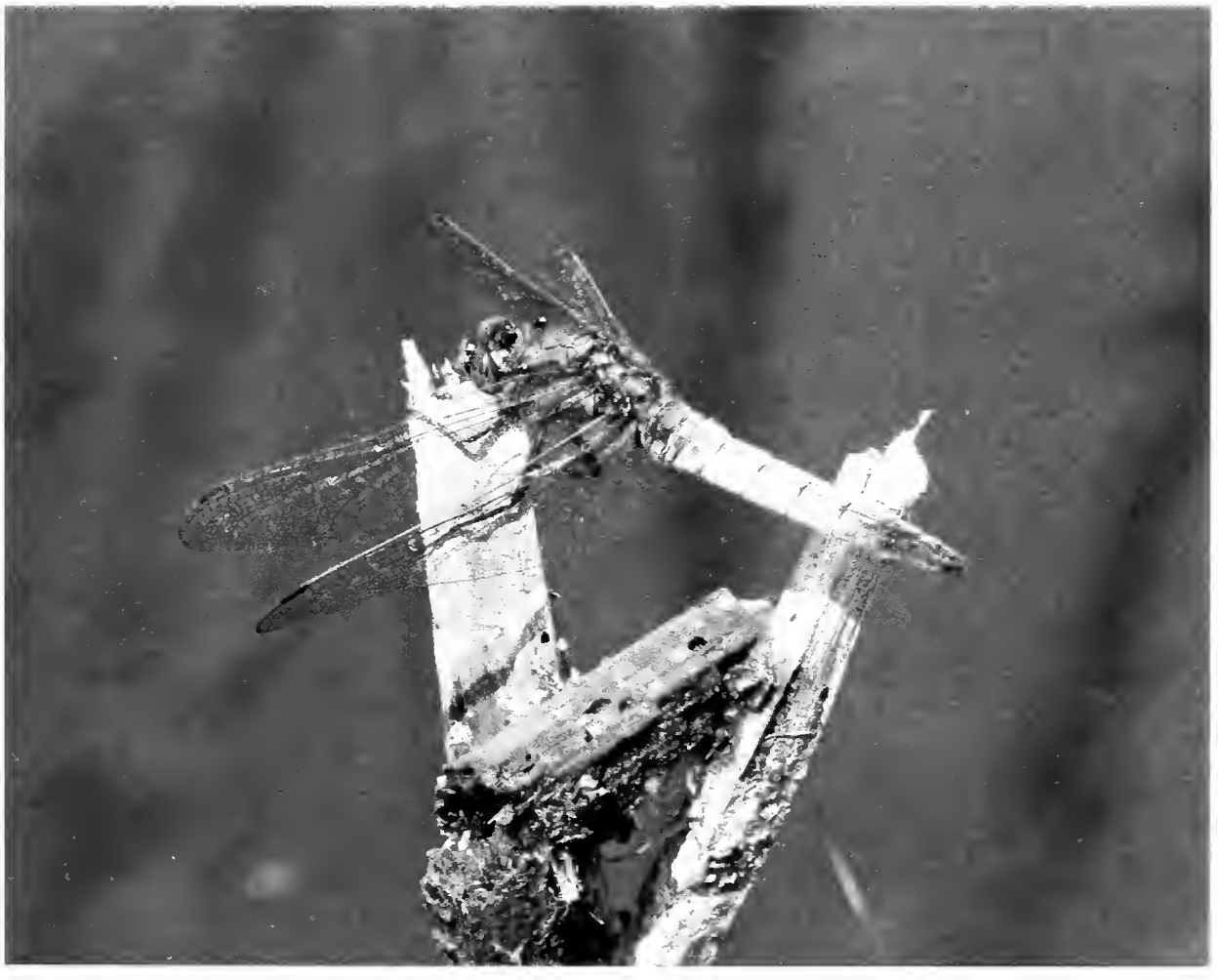
Red-veined Darter

Nick Tribe

Red-eyed Damselfly Nick Tribe

Small Red-eyed Damselfly Pam Taylor/BDS

Hairy Dragonfly Val Perrin



Black-tailed Skimmer Nick Tribe

Common Hawker Dave Kitching

Black Darter Nick Tribe

with the females which never leave their host's body. The host leafhopper nymphs never mature to an adult, dying shortly after the male *E. tenuicornis* emerges or the triungulinid nymphs emerge and disperse.

The absence of earlier records for Lincolnshire is probably because only the male is free-living, is short-lived and is very small, about 1.5mm long. The leafhopper hosts have been little-studied in Lincolnshire and are only visibly parasitized during the brief period when the female cephalothorax or male puparium of *E. tenuicornis* protrude between their abdominal segments. The taxonomy of the order has only recently been revised and keys to the British fauna have been difficult to locate. Older classifications of the Strepsiptera considered each species to be host-specific. More recent revisions, such as that of Kathirithamby (1989) have reduced the number of accepted species, recognising that some stylopids can develop in a range of host species. *Elenchus tenuicornis* is recorded as a parasite of some 42 species in 23 genera of leafhoppers (Kathirithamby, 1989). The British list of Strepsiptera has been reduced from 18 species (Kloet & Hincks, 1945) to 15 species (Pope, 1977) to 10 species (Fauna Europaea checklist, accessed 2014). The Lincolnshire specimens were identified using Kinzelbach (1969).

Although I claim this as the first record of a Stylopid in Lincolnshire, both Alan Philips and John Flynn tell me that they have both found stylopised specimens of solitary bees (*Andrena* spp.) in Lincolnshire in the past. However as neither could provide me precise details of these captures and no other records are held in the GLNP database, I have taken the liberty of claiming the glory. Should these specimens be found, they will most probably prove to be *Stylops melittae* Kirby, 1802, which would also be a new record for Lincolnshire.

My thanks go to Alan Philips and John Flynn for providing information on their captures of stylopised bees.

References.

FAUNA EUROPAEA CHECKLIST OF STREPSIPTERA OF BRITAIN AND NORTHERN IRELAND. www.nhm.ac.uk/research-curation/scientific-resources/biodiversity/uk-biodiversity. Accessed 10/6/2014.

KATHIRITHAMBY, J., 1989. Review of the Order Strepsiptera. *Systematic Entomology* 14:41-92.

KINZELBACH, R.K., 1969. *Familie: Stylapidae, Fächerflügler (=Ordnung: Strepsiptera)*. In: Freude, H., Harde, K.W. & Lohse, G.A. (Eds) *Die Köfer Mitteleurapas*. Bd. 8: 139-159.

KLOET, G.S. & HINCKS, W.D., 1945. *A Check List of British Insects*. Kloet & Hincks, Stockport.

POPE, R.D., 1977. A Check List of British Insects. Part 3: Coleoptera and Strepsiptera. *Handbaaks far the Identificotian af British Insects Vol XI, Part 3*. Royal Entomological Society of London, London.

OBITUARY

Frank Lammiman 1915-2014

Christine Rieser

Frank Raymond Lammiman was born in Lincolnshire on April 8th 1915 and lived in Ludborough from the age of 3 until he died on Jan 24th 2014. His father had been an agricultural worker and Frank left school at 14 to start work in farming, all aspects of which he enjoyed. Later, after the arrival of his family, he went to work with Fisons where his work included helicopter spraying. After 20 years, Fisons pulled out of the local branch and Frank was made redundant. He then worked for 10 years as manager of Vergettes Granary. He retired in 1980.

With this background he naturally acquired a wide knowledge of soils and habitats for wildlife. He was very observant and had an excellent memory for wild flower species and could remember for many years where an uncommon species had been seen. He kept a ledger of plant records from 1968 -1986 and

collected data for Miss Joan Gibbons for her County Flora. Much of this work was done in the company of Ken Wilson of Covenham, and his records were given to Rene Weston and Paul Kirby. He also had a good general knowledge of other forms of wildlife and for many years was a member of the Lincolnshire Naturalists Union and also the Grimsby branch of the Lincolnshire Wildlife Trust. In 1991-92 he was the elected President of the LNU and gave a fascinating Presidential Address entitled "Seventy Years in a Lincolnshire Parish "(LNU Trans.XX11 No.1 1992) about changes that had occurred in the countryside during his life.

After his retirement he became interested in Bryophytes (Mosses and Liverworts) and taught himself to use the microscope for identifying species. He joined the British Bryological Society and attended some bryological field courses. He began recording species of moss and liverworts in Lincolnshire and kept records on Mapmate Recording Computer Programme for passing on to the National Bryophyte Recorder. This was important work as no regular surveys of Bryophytes in Lincolnshire had been made since the 1930s. Since then the atmosphere in much of the country had become very polluted and many species of bryophyte especially epiphytic species had become extinct in all but those areas subject to clean air from the Atlantic. With the improvement in air quality after the Clean air Act (1953) bryophyte species were recorded as they began to spread back from the west.

I met Frank while attending the BBS field meetings as a fellow member of the Society. Meetings were often held in Scotland or other sites where the atmosphere is usually more damp and less polluted than in Lincolnshire and there were good opportunities for studying a range of bryophyte species. In 1997 I came to Lincolnshire to work with him on the bryophyte flora here. He was always a pleasure to work with and taught me a lot about wildlife generally.

With his wife May he had had a large family, 5 children (2 of whom predeceased him), 15 grandchildren and, at the time of his death, 25 great grandchildren.

EXTRACT FROM
"ON A SUBMARINE FOREST, ON THE EAST COAST OF ENGLAND".

Joseph Correa de Serra, LL. D. F. R. S. and A. S.

Read February 28th 1799.

This fascinating excerpt came to light when Dave Bromwich happened across it at Lincolnshire Wildlife Truston the open access internet site JSTOR. Much more in hope than expectation, Paul Learoyd contacted Dr. Mark Spencer at the Natural History Museum to see if the sheet mentioned in the account might still exist. Dr. Spencer is well-known to the Union for his enthusiastic work in ensuring the future care of the Lincolnshire Herbarium. Amazingly, despite his warnings of likely disappointment, he found the specimen sheet referred to in this account and a picture of it is reproduced below. Dr. Spencer showed the specimen at his talk in Lincoln University's Great Minds lecture series on November 27th 2014.*

This excerpt, presented to the Royal Society in 1799, describes the 'sunken forest' off the Lincolnshire coast as it appeared to the author and Sir Joseph Banks in 1796 and also the discovery of the recognizable holly and other tree leaves in the clay deposits found there. The full text goes on to muse on the provenance of ancient buried plant deposits around the world in locations where the species could not have survived, either by altitude or latitude under conditions at that time. This was, of course, all without knowledge of the tectonic forces that explained the anomalies in much later years. The title, entered into your favourite search engine, will lead you to the full text. In my defense, I will mention that the text has been reproduced as it was written in the style of the time! (Editor)

In geology, more perhaps than in any other branch of natural history, there exists a necessity of strictly separating the facts observed from the ideas which, in order to explain them, may occur to the mind of the observer. In the present state of this science, every well ascertained fact increases our still narrow stock of real knowledge; when, on the contrary, the reasonings we are enabled to make, are at best but ingenious guesses, which too often bias and mislead the judgement. I shall therefore endeavour, in this Paper, to give, first, a mere description of the object, unmixed with any systematical ideas, and shall afterwards offer such conjectures on its cause as seem, to me to be fairly grounded on observation.

It was a common report in Lincolnshire, that a large extent of islets of moor, situated along its coast, and visible only in the lowest ebbs of the year, was chiefly composed of decayed trees. These islets are marked in Mitchell's chart of that coast, by the name of day huts; and the village of Huttoft, opposite to which they principally lie, seems to have derived its name from them. In the month of September, 1796, I went to Sutton, on the coast of Lincolnshire, in company with the Right Hon. President of this Society, in order to examine their extent and nature. The 19th of the month, being the first day after the equinoctial full moon, when the lowest ebbs were to be expected, we went in a boat, at half past twelve at noon, and soon after set foot on one of the largest islets then appearing. Its exposed surface was about thirty yards long, and twenty-five wide, when the tide was at the lowest. A great number of similar islets were visible around us, chiefly to the eastward and southward; and the fishermen, whose authority of this point is very competent, say, that similar moors are to be found along the whole coast, from Skegness to Grimsby, particularly off Addlethorpe and Mabelthorpe. The channels dividing the islets were, at the time we saw them, wide, and of various depths; the islets themselves ranging generally from east to west in their larges dimension.

We visited them again in the ebbs of the 20th and 21st; and, though it generally did not ebb so far as expected, we could notwithstanding ascertain, that they consisted almost entirely of roots, trunks, branches, and leaves of trees and shrubs, intermixed with some leaves of aquatic plants. The remains of some of these trees were still standing on their roots; while the trunks of the greater part lay scattered on the ground, in every possible direction. The bark of the trees and roots appeared generally as fresh as when they were growing; in that of the birches particularly, of which a great quantity was found, even the thin silvery membranes of the outer skin were discernible. The timber of all kinds, on the contrary, was decomposed and soft, in the greatest part of the trees; in some however, it was firm, especially in the knots. The people of the country have often found among them very sound pieces of timber, fit to be employed for several economical purposes.

The sorts of wood which are still distinguishable are birch, fir, and oak. Other woods evidently exist in these islets, of some of which we found the leaves in the soil; but our present knowledge of the comparative anatomy of timbers, is not so far advanced as to afford us the means of pronouncing with confidence respecting their species. In general, the trunks, branches, and roots of the decayed trees, were considerably flattened; which is a phenomenon observed in the Surtarbrand or fossil wood of Iceland, and which Scheuchzer remarked also in the fossil wood found in the neighbourhood of the lake of Thun, in Switzerland.

The soil to which the trees are affixed, and in which they grew, is a soft greasy clay; but, for many inches above its surface, the soil is entirely composed of rotten leaves, scarcely distinguishable to the eye, many of which may be separated, by putting the soil in water, and dextrously and patiently using a spatula, or a blunt knife. By this method, I obtained some perfect leaves of Ilex Aquifolium, which are now in the Herbarium of the Right Hon. Sir Joseph Banks; (see picture) and some other leaves which, though less

perfect, seem to belong to some species of willow. In this stratum of rotten leaves, we could also distinguish several roots of Arundo Phragmites.

The provenance label on the reverse side reads;
In a bog, under the level of low-water mark, in the sea, at Sutton in Lincolnshire, Sept. 1796.

These islets, according to the most accurate information, extend at least twelve miles in length, and about a mile in breadth, opposite to Sutton shore. The water without them, towards the sea, generally deepens suddenly so as to form a steep bank. The channels between the several islets, when the islets are dry, in the lowest ebb of the year, are from four to twelve feet deep; their bottoms are clay or sand, and their direction is generally from east to west.

A well dug at Sutton, by Joshua Searby, shows that a moor of the same nature is found under ground, in that part of the country, at the depth of sixteen feet; consequently, very nearly on the same level with that which constitutes the islets. The disposition of the strata was found to be as follows:

- Clay, 16 feet.
- Moor, similar to that of the islets, from 3 to 4 feet.
- Soft moor, like the scowerings of a ditch bottom, mixed with shells and silt, 20 feet.
- Marly clay, 1 foot.
- Chalk rock, from 1 to 2 feet.
- Clay, 31 yards.
- Gravel and water; the water has a chalybeate taste.

In order to ascertain the course of this subterraneous stratum of decayed vegetables, Sir Joseph Banks directed a boring to be made, in the fields belonging to the Royal Society, in the parish of Mablethorpe. Moor, of a similar nature to that of Searby's well, and of the islets, was found, very nearly on the same level, about four feet thick, and under it a soft clay.

The whole appearance of the rotten vegetables we observed, perfectly resembles, according to the remark of Sir Joseph Banks, the moor which, in Blankeney Fen, and in other parts of the East fen in Lincolnshire, is thrown up in the making of banks; barks, like those of the birch tree, being there also abundantly found. This moor extends all over the Lincolnshire fens, and has been traced as far as Peterborough, more than sixty miles to the south of Sutton. On the north side, the moory islets, according to the fishermen, extend as far as Grimsby, situated on the south side of the mouth of the Humber; and it is a remarkable circumstance, that in the large tracts of low lands which lie on the south banks of that river, a little above its mouth, there is a subterranean stratum of decayed trees and shrubs, exactly like those we observed at Sutton; particularly at Axholme isle, a tract of ten miles in length, by five in breadth; and at Hatfield chase, which comprehends one hundred and eighty thousand acres. Dugdale * had long ago made this observation, in the first of these places; and De la Pryme ** in the second. The roots are there likewise standing in the places where they grew; the trunks lie prostrate. The woods are of the same species as at Sutton. Roots of aquatic plants and reeds are likewise mixed with them; and they are covered by a stratum of some yards of soil, the thickness of which, though not ascertained with exactness by the above-mentioned observers, we may easily conceive to correspond

with that which covers the stratum of decayed wood at Sutton, by the circumstance of the roots being (according to Mr Richardson's observations ***) only visible when the water is low, where a channel was cut, which left them uncovered.

* History of Embanking and Draining. Chap. XXVII
** Philos. Trans. Vol XXII p.980
*** Philos. Trans. Vol XIX p.528

Little doubt can be entertained of the moory islets of Sutton being a part of this extensive subterraneous stratum, which by some inroad of the sea, has been there stripped of its covering of soil. The identity of the levels; that of the species of trees; the roots of these affixed, in both, to the soil where they grew; and, above all. The flattened shape of the trunks, branches, and roots, found in the islets, (which can only accounted for by the heavy pressure of a superinduced stratum,) are sufficient reasons for this opinion.

VIRAL INFECTIONS IN MOTH LARVAE

Annette and Allan Binding

In May 2014 we collected two moth larvae, both Angle Shades found in our garden. On 5th May Annette noticed the first one at the top of an honesty plant. It was still there on the following day but by this time it was bloated and green with black blotches. It had lost all of its original markings and was hanging by two legs. It was clear that it was not behaving like a healthy larva. So after Allan had photographed it Annette collected it.

Infected larva on Honesty Allan Binding

Infected larva on Lemon Balm Allan Binding

Allan remembered speaking to Dr Helen Roy from the Centre for Ecology and Hydrology about her interest in viral infections in Lepidoptera larvae at a Butterfly Conservation Conference in Birmingham and decided to contact her. Dr. Roy put us in contact with Dr Helen Hesketh also at CEH. Dr. Hesketh asked us to send her the larva. By this time we had found another larva with the same problem this time on lemon balm. Allan again photographed the larva although like the first one, it was not a pretty sight. Certainly not the usual subject of a wildlife photograph!

We sent the larvae and copies of Allan's photographs to Dr Hesketh. She replied telling us that both larvae had died from a viral infection, a type of virus called baculovirus that infects Lepidoptera. She told us that these viruses are very specific to the hosts, only infecting a few closely related Lepidoptera species, often, as in our case, Noctuid larvae. The pest species have been studied but very few from the natural environment like ours.

Dr Hesketh went on to describe the fascinating life cycle of the virus. The larva picks up the virus from the plant it feeds on. Once inside the larva's gut the protective coat on the virus particle breaks down and releases the infectious 'virions'. These contain the genetic makeup of the virus. From the gut they enter the circulatory system of the host and go on to infect cells throughout the insect. Eventually all the host's tissues are dissolved and the insect becomes a bag of new virus particles. Just before it dies, the larva climbs to the top of the plant and fixes itself there. Dr Hesketh told us that this behaviour is controlled by the virus so that when the insect cuticle eventually ruptures, the virus spreads all over the plant. The next larva comes along, eats the leaves and becomes infected and the whole cycle begins again.

The virus which had infected our larvae turned out to be an exciting new strain for Dr Hesketh's culture collection. She was also very keen to have copies of Allan's photographs as very few people photograph such things. Dr Hesketh told us that the yellow-green larva in the first photograph had either just died or was about to die. The second brown larva had been dead for between 24 and 48 hours. Eventually the yellow-green larva would also become completely dark brown. Allan's photographs of the two larvae accompany this report.

We are grateful to Dr. Helen Roy and Dr. Helen Hesketh for their help in explaining the cause of death of these larvae.

LICHENOLOGY in 2014

M. R. D. Seaward

Regretfully I have no bryological report this year due to the death of one of our two key workers, Frank Lammiman, and the retirement of the other, Christine Rieser. Their contribution to our knowledge of the county's bryophytes has been exemplary, the former's kindly and most helpful manner over the past 27 years will be sorely missed by us all. However, the recorder has been able to continue his lichenological researches by frequent visits to the county. These have confirmed on the one hand the increase in the biodiversity of epiphytes, but, sadly, on the other hand, the decline in lichen assemblages in many of our churchyards. In some cases there have been increases in lichen diversity, but this has been mainly as a result of taxonomic revisions where two or more taxa have been delimited from a former single taxon as, for example, in the case of the genera *Caloplaca* and *Lecanora*. Nevertheless, further work on churches and churchyards has furnished additional records, as well as interesting ecological and distributional data; in all, 16 more churchyards were visited for the first time and 10 others were revisited during the past year. To date, 642 (representing 91.3% of the C. of E. churchyards in the county) have now been lichenologically surveyed; of the 61 yet to be studied by the recorder, 9 have

been surveyed by visiting lichenologists – thus 92.6% of the county's churchyards have been studied at least once in the past 48 years. Of those studied for the first time in 2014, it was pleasing to note the presence of the national rarity, *Ramalina capitata*, in the south of the county; its presence on the apices of 20 siliceous gravestones (dated from 1882 until 1926) at Martin further extends the range of this rare British lichen. Of similar importance was the new county record of *R. siliquosa* in Irby-in-the-Marsh graveyard, it being necessary, unfortunately, to remove a small fragment of the only thallus present to confirm its identity chemically by thin layer chromatography. It is interesting to note that ten species of *Ramalina* have now been recorded from the county, of which nine are extant, *R. calicaris* having disappeared in the 19th century. Of those which have been recorded in recent years, *R. canariensis*, *R. capitata*, *R. lacera*, *R. pollinaria*, *R. siliquosa* and *R. subfarinacea* have been recorded from church walls or gravestones. Of those locally recorded from trees, by far the commonest is *R. farinacea*, but it is pleasing to note the return of *R. fastigiata* and *R. fraxinea* after an absence of more than 100 years. It cannot be stressed enough how important churches and churchyards are for the conservation of lichens, their survival in these oases sadly in jeopardy due to vandalism and insensitive management; the status of targetted species and assemblages will continue to be monitored in churchyards throughout the county. A further habitat receiving special attention involve lignicolous substrata, as in the case of wooden fence rails and posts, where diverse and interesting lichen assemblages are often to be found.

All the lichen records have been contributed by M.R.D.Seaward (MRDS) for 2014 (unless otherwise indicated), except in two cases where examination of herbarium material collected by J.H.Chandler (JHC) added two new divisional records. As a consequence of this work, one county (*Ramalina siliquosa*), three vice-county (*Fuscidea lightfootii*, *Micarea erratica*, *Ramalina capitata*), 27 divisional and numerous grid square records have been added to our registers. Rare lichens have been confirmed or identified by B.J.Coppins and A.Orange.

Arthonia radiata (Pers.) Ach. + 4 (MRDS)
Aspicilia calcarea ssp. *hoffmanniana* S.Ekman & Fröberg + 14 (MRDS)
A. radiosa (Hoffm.) Poelt & Leuckert + 11 (MRDS)
Cladonia ramulosa (With.) J.R.Laundon + 5 (MRDS)
Dimerella pineti (Ach.) Vězda + 3 (MRDS)
Flavoparmelia soredians (Nyl.) Hale + 4 (MRDS)
Fuscidea lightfootii (Sm.) Coppins & P.James + 4 (on wooden fence, Cleethorpes Country Park, MRDS, **VCR**)
Hyperphyscia adglutinata (Flörke) H.Mayrhofer & Poelt + 2 (MRDS)
Hypotrachyna revoluta (Flörke) Hale [s.str.] + 5 (MRDS)
Lecania inundata (Hepp ex Körb.) M.Mayrhofer + 15 (MRDS), 16 (JHC 1965)
Lecanora carpinea (L.) Vain. + 4 (MRDS)
L. hagenii (Ach.) Ach. + 5 (MRDS)
L. persimilis (Th.Fr.) Nyl. + 11 (MRDS)
L. varia (Hoffm.) Ach. + 4 (MRDS)
Lepraria lobificans Nyl. + 7 (MRDS)
Micarea denigrata (Fr.) Hedl. + 5 (MRDS)
M. erratica (Körb.) Hertel et al. + 13 (on pebbles, Whisby Nature Reserve, MRDS 2008, **VCR**)
Parmotrema perlatum (Huds.) M.Choisy + 5 (MRDS)
Physcia stellaris (L.) Nyl. + 8 (MRDS)
Punctelia jeckeri (Roum.) Kalb. + 5 (MRDS)
Ramalina capitata (Ach.) Nyl. + 10 (MRDS 2013), 13 (on siliceous gravestones, Martin, MRDS, **VCR**)
R. fastigiata (Pers.) Ach. + 5, 8, 14 (MRDS)
R. siliquosa (Huds.) A.L.Sm. + 11 (on a single siliceous gravestone, Irby-in-the-Marsh, MRDS 2013, **NCR**)

BOTANY IN 2014

Paul Kirby

Eight field meetings were held in 2014:

April 27	Sweeting Thorns, Scunthorpe, SE90
May 18	Shire Wood, Revesby, TF26
May 31	Sutterby Mediaeval Village, TF37
June 20 & 21	Willow Tree Fen LWT Reserve, TF12
July 6	Sloothby, TF57
August 2	Norton Big Wood, Norton Disney, SK86
September 7	Frampton Marsh RSPB Reserve, TF33
October 12	Fungus Foray. High Wood, North Rauceby, SK94

Among the plants found at the meetings were: Wood Anemone *Anemone nemorosa*, Heather *Calluna vulgaris*, Broom *Cytisus scoparius*, Wavy Hair-grass *Deschampsia flexuosa*, Cross-leaved Heath *Erica tetralix*, Heath Bedstraw *Galium saxatile*, Marsh Pennywort *Hydrocotyle vulgaris* and Wood-sorrel *Oxalis acetosella* at Sweeting Thorns: — Giant Bellflower *Campanula latifolia*, Pignut *Conopodium majus*, Water Avens *Geum rivale*, Wood Avens *G. urbanum*, Hybrid Avens *G. x intermedium*, Yellow Archangel *Lamiastrum galeobdolon* ssp. *montanum*, Early Purple-orchid *Orchis mascula*, Primrose *Primula vulgaris* and Wood Speedwell *Veronica montana* in Shire Wood: — Meadow Crane's-bill *Geranium pratense*, abundant Great Burnet *Sanguisorba officinalis* and 21 species of grass in the meadows at Sloothby: — Oval Sedge *Carex leporina*, Wood Sedge *C. sylvatica*, Marsh Bedstaw *Galium palustre*, Foxglove *Digitalis purpurea*, Hairy Wood-rush *Luzula pilosa*, Water-purslane *Lythrum portula*, Water-pepper *Persicaria hydropiper*, Small Pondweed *Potamogeton berchtoldii* and Skullcap *Scutellaria galericulata* in Norton Big Wood: — Sea Wormwood *Artemisia maritima*, Cut-leaved Teasel *Dipsacus laciniatus* and Knotted Hedge-parsley *Torilis nodosa* at Frampton Marsh.

New County Records

Date 2014 unless stated otherwise.

White Helleborine *Cephalanthera damasonium*, Grimsby, TA20, Chris Heaton. At least 40 plants. A real surprise! This orchid is most frequently found on the bare floor of beech woods on chalk in southern England but also can occur in chalk scrub and in grassland. In Grimsby most of the orchids were growing among sparse vegetation under mature common limes with a few plants in the adjacent grassland. Lang [2004] gives the flowering period as early May to the end of June and when this colony was first discovered in the first week of June, flowering was all but over. At present this is by far the most northerly British population though there are past records [1920 & 1952] from woodland just north of the Humber, near North Ferriby (Crackles 1990).

Dappled Hawkweed *Hieracium scotostictum*, Baytree Garden Centre, Spalding, TF22, L. Saunders. An introduction into Britain, first recorded from a railway cutting in Surrey in 1920. Since then it has been recorded from scattered localities around England on road & railway banks, (Sell & Murrell 2006).

Garden Mignonette *Reseda odorata*, Tetney Haven, TA30, David Harrison. Disturbed ground adjacent Tetney Haven. Native to the southeast Mediterranean region and grown in British gardens since 1752 (Preston et al. 2002).

Pale Yellow-eyed Grass *Sisyrinchium striatum*, Kirkby on Bain Gravel Pits, TF26, Keith Robertson. Garden escape on disturbed ground.

New Vice-county records

Vc53, South Lincs

Hairy Garlic *Allium subhirsutum*, Stamford, TF00, SL & Peter Kirby. Native to the Mediterranean area and being grown in British gardens by 1596 (Preston et al. 2002).

Atlas Poppy *Papaver atlanticum*, Fleet, TF32, JOM. Naturalised in churchyard grassland and on walls of St. Mary Magdalene. Found in 2013.

Oriental Poppy *Papaver orientale*, Boston, TF24, JOM. Established on the banks of the North Forty Foot Drain.

Both these poppies are perennials, long grown in gardens and frequently escaping and becoming established in the wild. Oriental Poppy is native to Southeast Asia and has been grown in Britain since 1714 whereas Atlas Poppy, native to Morocco, arrived much later in 1889 (Preston et al. 2002).

Matted Pratia *Pratia pedunculata,* Weston Hills, TF22, JOM. Naturalised on road verge.

Hoary Mullein *Verbascum pulverulentum*, Sutton Bridge, TF42, JOM & L. Saunders - Tallington Lakes, TF00, J. Squirrell, G. C. French & L. Farrell. Native in East Anglia but elsewhere usually a casual of waste ground. New for Vc53 and only the second & third records for Lincolnshire.

Vc54, North Lincs

Common Ramping Fumitory *Fumaria muralis* ssp. *boraei*, Moor Side, TF25, JOM. Along the headland of an arable field. Fumitories, apart from Common Fumitory *F. officinalis*, are scarce in Lincolnshire. *F. muralis* sens. lat. has been recorded in only 4 hectads in the county and there is just one record for ssp. *boraei* in each Vice-county.

Red Duckweed *Lemna turionifera*, Belton Grange, SE71, Richard Lansdown. Mixed with Fat Duckweed *L. gibba* in a pumping station inlet linking a field drain to Hatfield Waste Drain. It was first recorded in Lincolnshire by Richard Lansdown in the South Forty Foot Drain, TF13 in 2008. It may well be quite wide-spread and has previously been overlooked.

A sample of the other records received in 2014

Corn Chamomile *Anthemis arvensis*, Kirkby on Bain, Wellsyke Lane, TF26, David Harrison. Road verge.

Stinking Chamomile *Anthemis cotula*, Dole Wood, TF01, Alyson Freeman - Glentham, SK99, PK. At edge of road - Bishop Norton, SK98, PK. In the corner of a cereal field.

These two chamomiles were once widespread arable weeds in the county with records from 32 hectads all time for Corn Chamomile and 51 for Stinking Chamomile, but both have undergone a major decline and since 2000 have been recorded from only 9 and 13 hectads respectively.

Lesser Water-plantain *Baldellia ranunculoides*, Borough Fen, TF20, JOM - Baston Fen, TF11, JF & SL. In a farm ditch – Saltfleetby/Theddlethorpe NNR, TF49, PK.

Blunt-flowered Rush *Juncus compressus*, Bishop Norton, SK99, PK - Grimsthorpe Park, TF02, Alyson Freeman, Bob Johnson, Paul Stevens & SL. A very large population in The Stew Pond. This is a re-find. Malcolm Pool first recorded it here in 1999.

The above two species were included in the recent BSBI Threatened Plant Survey and a report of the findings appeared in Transactions 2012. Since then there have been some new records and the distribution figures have changed significantly. Lesser Water-plantain has now been recorded from 38 [29] hectads all time and 15 [9] since 2000 and Blunt-flowered Rush from 45 [40] and 15 [9]. The figures in brackets are those given in the 2012 report. Neither plant qualifies as scarce in Lincolnshire.

Hungarian Brome *Bromopsis inermis*, Nocton Fen, TF16, JOM. Only the second record for Vc53. Formerly sown as a fodder grass but now introduced only as a seed contaminant (Preston et al. 2002). There are 4 post-2000 records for Vc54.

Hybrid Bindweed *Calystegia x lucana*, (*Calystegia sepium* x *C. silvatica*) Barholm, TF01, SL & Peter Stroh. First record of this hybrid in Vc53 since 1960. Hedge Bindweed & Large Bindweed, the parents, are both widespread throughout the county.

Slender Thistle *Carduus tenuiflorus*, Foston, SK84, J. Squirrell & G. C. French.

Star Sedge *Carex echinata*, Skellingthorpe Old Wood, SK97, David Harrison. Found in 2013. Recorded from 9 hectads post-2000 in Vc54 but this is the only post-2000 record for Vc53 where it has always been rare.

Small-fruited Yellow-sedge *Carex oederi*, Baston Fen, TF11, JF & SL. In a farm ditch. This is the third record post-2000 for TF11. It is rare in the county and has been recorded from only 2 hectads post-2000, one in each Vice-county.

Thin-spiked Wood-sedge *Carex strigosa*, Morkery Wood, SK91, JF. Found in 2013. Scarce in Lincolnshire with woodland in the southwest of the county being one of its strongholds.

Cornflower *Centaurea cyanus*, Nene Outfall, Sutton Bridge, TF42, Steven Heathcote.

Chalk Knapweed *Centaurea debeauxii*, Baston Farm, TF11, JOM. Very little is known about this taxon in the county. There is some doubt as to whether it is truly a distinct species (Stace 2010) and not just one extreme of the *Centaurea nigra* spectrum.

Galingale *Cyperus longus*, Bitchfield, SK92, M. A. Creedy & P. J. Horton – Tattershall, TF25, PK. Both records are from roadside ponds. Not native in Lincolnshire. Planted in pond margins and becoming more widespread.

Dune Helleborine *Epipactis dunensis* Middle Rasen Plantation, TF19, David Harrison. 13 robust plants along the margins of a woodland ride, very different in stature to those at the other Lincolnshire sites – Osgodby Plantation, TF09, Chris Heaton & Mark Johnson. 2 spindly plants. An interesting re-find. The orchid was regularly recorded here from 1978 – 1989 with a peak count of 46 flower spikes in 1982. It is very likely that plants have appeared occasionally over subsequent years but remained undetected.

Dune Helleborine has now been recorded at 5 sites in Lincolnshire since 2000, namely Crowle Moors NNR SE71, Laughton Forest SE80, Messingham Sand Quarry NR SE90, Osgodby Plantation TF09 & Middle Rasen Plantation TF19. It is a Nationally Scarce species.

Green-flowered Helleborine *Epipactis phyllanthes*, Willingham Woods, TF18, Bill & Steve Meek. A fruiting helleborine was noted, but not positively identified, at this site in 2013 by the same recorders. This is a new location for this orchid which currently occurs at three sites in the county.

Mediterranean Spurge *Euphorbia characias* ssp. *characias,* Kirkby on Bain Gravel Pits, TF26, Keith Robertson. A garden escape on a rubble heap.

Wall Bedstraw *Galium parisiense*, Kirkby Moor NR, TF26, Neil Harris. Scattered along the sandy margins of the main track across the moor. Until very recently there was only one historic record for this bedstraw in Lincolnshire, namely Boston in 1836. In 2013 it was recorded at three separate sites on the Scunthorpe steelworks, SE90/91 and now has been found on heathland in TF26. Is it really becoming more widespread? It is a small, threadlike plant that is very easy to miss.

Chalk Fragrant Orchid *Gymnadenia conopsea*, Holywell Banks SSSI, SK91, Geoff & Wendy Thwaites. 20 plants in 2012 - Scunthorpe Steelworks, Yarborough Mine, SE 91, PK. 50 plants. Fruiting orchids, thought to be this taxon, were noted here by JF & PK in 2013. Fragrant Orchids have been recorded from 20 hectads all time in Lincolnshire but from only five since 2000: Chalk Fragrant Orchid in SK91, SK94 [last seen in 2004], SE91 and SE92 [a tiny population] and Marsh Fragrant orchid *Gymnadenia densiflora* in SE90, the only site where it has ever been positively identified in Lincolnshire.

Corn Marigold *Glebionis segetum*, Marston, SK84, M. A. Creedy - Keelby, TA11, Angela Buckle & Stuart Smith - Coningsby, TF25, CH & PK – Market Rasen, TF19, David Harrison & PK – Wellsyke Lane, TF26, JF. There were also records of it as an introduction at Tetney Haven, TA30, David Harrison and East Keal, TF36, PK & CH.

Henbane *Hyoscyamus niger*, Grimsthorpe Park, TF02, Neil Harris.

Golden Samphire *Inula crithmoides*, Sandilands, Boy Grift Drain outfall, TF57, Richard Davidson. A nationally scarce plant of sea cliffs and saltmarshes and found mainly on the southern and western coasts of England and Wales. Always a rare plant in Lincolnshire where it is at the northern limit of its distribution in eastern England. This is the first record since 1976 when it was recorded at this same location by Vyvyan Pennell. Most likely it has been growing there un-noticed in the intervening years.

Corn Gromwell *Lithospermum arvense*, Stowgate, TF11, JOM - Langftoft Fen, TF11, JOM & J Redshaw - Gedney, TF42, JOM & C. R. Stevenson. At one time a quite widespread arable weed on lighter soils but now scarce in Lincolnshire where it has been recorded from only 6 hectads since 2000. PK & CH were therefore somewhat surprised to come across thousands of plants at Claythorpe, TF47. However these were all growing in neat drilled lines in a 35 acre monoculture. An entry on the web-site of The National Institute of Agricultural Botany states: "Corn Gromwell. A new oil crop for UK farmers, containing stearidonic acid, an omega-3 fatty acid from plants with the health benefits of fish oils".

Whorled Mint *Mentha x verticillata*, (*Mentha arvensis* x *M. aquatica*) Rauceby Warren, TF04, Neil Harris. There are only a few records for this Corn Mint x Water Mint hybrid in Lincolnshire and only one from each Vice-county since 2000.

Antarctic Beech *Nothofagus antarctica*, an interesting introduction in St Peter's churchyard, East Stockwith, SK79, PK. A small bushy tree with very distinctive, tiny, deep green, glossy, crinkly leaves.

Pale Pink-sorrel *Oxalis incarnata*, Sutton Bridge, TF42, JOM - Spalding, TF22, SL. The third and fourth records respectively for Vc53 and the first since 2000. A native of South Africa which has long been grown in British gardens. It spreads by bulblets produced in the axils of stem branches (Preston et al. 2002).

Sulphur Cinquefoil *Potentilla recta*, Kirkby on Bain Gravel Pits, TF26, Keith Robertson. A garden escape on a rubble heap. There are a few scattered records in Lincolnshire including one in each Vice-county post-2000.

Small-flowered Buttercup *Ranunculus parviflora*, Tallington Lakes, TF00, J. Squirrell, G. C. French & L. Farrell. Locally abundant at the site.

Greek Mallow *Sidalcea malviflora*, Keddington, TF38, PK & CH. An introduction in St Margaret's churchyard. Native to North America, introduced into Britain in 1838 and widely grown in gardens (Preston et al. 2002).

Small-flowered Catchfly *Silene gallica*, Woodhall Spa old airfield, TF26, Dave Bromwich. At least 35 plants growing in bare rabbit disturbed sandy ground. This site is only a few miles from Moorby where the plant was first recorded in Lincolnshire by Sir Joseph Banks in 1785. His specimen is in the Natural History Museum Herbarium. It is an extreme rarity in Lincolnshire and this is the first record since 1992 when Clare Harrison found it at Low Toynton, TF27.

Tolypella glomerata, Four Mile Bar, TF21, SL & Peter Kirby. Very abundant in a shallow ditch. First post-2000 record.

Spreading Hedge-parsley *Torilis arvensis*, Borough Fen, TF20, JOM. A rare plant in Lincolnshire, only recorded in 3 hectads post-2000, all in Vc53.

Bird's-foot Clover *Trifolium ornithopodioides*, Sandilands, TF57, JF. In close-mown turf by the coast. A second site for this tiny clover and the most northerly native population on the east coast of England.

Subterranean Clover *Trifolium subterraneum*, Tattershall Pits, TF25, Keith Robertson. Two separate colonies. A new site for this clover which was previously known only from the west of the county. In Lincolnshire it is close to the northern limit of its native distribution in Britain

Many thanks to all who sent in records in 2014.

Work continues to update 'Atlas 2000'. The recording is now based on tetrads [2km squares of the O.S. grid]. If anyone would like to help with the recording would they please get in touch?

Key to initials in text

JF, Jeremy Fraser - CH, Colin Hutchinson - PK, Paul Kirby - SL, Sarah Lambert - JOM, Owen Mountford.

Bibliography and References

CRACKLES, E. (1990). *Flara af the East Riding af Yarkshire*. Hull University Press.
GIBBONS, E.J. (1975). *The Flara af Lincalnshire*. Lincalnshire Natural Histary Brachure Na. 6. Lincalnshire Naturalists' Unian. Lincaln.
PERRING, F. H. & WALTERS, S. M. (1962). *Atlas af the British Flara*. BSBI.
PRESTON, C.D., PEARMAN, D.A. & DYNES, T.D. (2002). *New Atlas af the British & Irish Flara*. OUP.
SELL, P. & MURREL, G. 2006. *Flara af Great Britain and Ireland*. Val. 4. CUP.
STACE, C.A. (2010). *New Flara af the British Isles.* 3rd Editian. CUP.
STEWART, A., PEARMAN, D. A. & PRESTON, C. D. (1994). *Scarce Plants in Britain.* JNCC.
WIGGINGTON, M. J. (1999). *British Red Data Baaks 1. Vascular plants*. 3rd Edition. JNCC.

ODONATA IN 2014

Nick Tribe

Whisby Nature Park hosted a male Lesser Emperor *Anax parthenope* from the 18th June (Grahame Hopwood) until the 20th June (Hugh Middleton). This is the second time this site has recorded this migrant species, the previous occasion being in July 2006.

A male Red-veined Darter *Sympetrum fonscolombii* was seen at RPSB Frampton Marsh on July 4th (Trisha Thompson et al), an unsexed individual was seen on 4th August (RSPB) and a female was seen on 5th August (Trisha Thompson). This site is probably the most reliable place to find this species in Lincoln-

shire and it is interesting to speculate whether the shallow, sparsely vegetated and slightly saline water-bodies host a breeding population. Trisha Thompson also found Emerald Damselfly *Lestes sponsa* at Frampton on 4th and 5th August which took the species list for TF33 to 14 species.

The Bioblitz at Lincolnshire Wildlife Trust's Willow Tree Fen on 20th and 21st June yielded an impressive 16 species including Variable Damselfly *Coenagrion pulchellum* (Brian Hedley, Trisha Thompson and Dave Mainwaring).

Phil Lee successfully followed up old reports of Variable Damselfly beside the River Idle on the Nottinghamshire/Lincolnshire border on 25th June. Phil found three more at the same site on 8th July.

In my Transactions article for 2013 I speculated about the impact of the storm surge of 5th/6th December 2013. I visited Gibraltar Point NNR on 27th July and noted 8 species. This was a poor count for a day-list for this site at this time of year and the numbers observed were low. A large and obvious population of Small Red-eyed Damselfly *Erythromma viridulum* has been a conspicuous feature of this site for several years and I saw none on my visit.

Ian Merrill, Odonata Recorder for Leicestershire reports that 2 male Scarce Chasers *Libellula fulva* were found in 2014 very close to the Lincolnshire border. One was found on the River Welland at Tinwell on 18 July and the other on the River Gwash at Belmesthorpe on 15 July.

2014 saw the publication of the Atlas of Dragonflies in Britain and Ireland. It is a visually attractive and clearly written publication based on 1 million records and it comprehensively updates the previous 1996 Atlas. Lincolnshire has witnessed significant changes to its Odonata over the last 30 years and the county's story reflects the wider story within the Atlas. Large maps display losses and gains, accompanied by up-to-date species accounts for 53 species including regular migrants and vagrants. The Atlas highlights the possible loss of Variable Damselfly from some hectads within the county and captures the range expansion by others such as Red-eyed Damselfly *Erythromma najas*, Small Red-eyed Damselfly, Hairy Dragonfly *Brachytron pratense* and Black-tailed Skimmer *Orthetrum cancellatum*. The large sample size has allowed a detailed examination of population trends for 39 resident species. Climate change is identified as the only large scale factor driving obvious population change, namely the unprecedented arrival of new species on our shores.

References

CHAM, S. et al *Atlas of Draganflies in Britain and Ireland* 2014 NERC with British Dragonfly Society
MERRITT R. et al *Atlas of the draganflies of Britain and Ireland* 1996 ITE/NERC

BEETLES IN 2014

Charlie Barnes

Following the discovery of the chrysomelid *Cassida nebulosa* in the Lincolnshire Limewoods by Adrian Royle in 2010 and a further record from Lincoln recorded by Mick Talbot in 2012, it has also now been recorded in the north of the county. Phil Lee discovered a specimen on nettle during April at Haxey Turbary. Previously considered as RDBK (Indeterminate) it is now given the status of Nationally Scarce following the review of the beetles of Great Britain commissioned by Natural England, with some evidence of a decline nationally.

One species I have been on the look-out for is the tenebrionid *Diaperis boleti*. Until recently it was classified as RDB2 (vulnerable), but following the review of the beetles of Great Britain it is now

considered Nationally Scarce. It appears to be expanding its range, with a record of John Lamin's from Grimsthorpe Park in May being the first for Lincolnshire. *Diaperis boleti* can be found in association with various fungi species in which the larvae develop; specimens of *Laetiporus sulphreus, Piptoporus betulinus* and *Polyporus squamosus* should be examined.

During May, David Sheppard collected a specimen of the chrysomelid *Phyllotreta tetrastigma* from Muckton Wood. Despite being widespread throughout England and Wales, it is noted for its absence in Lincolnshire and fenland in Cox's Atlas of Seed and Leaf Beetles of Britain and Ireland (2007). This appears slightly at odds with the habitats given for the species, which state it is "usually found in wet areas such as fens"! The adults feed on the leaves of various plants including *Rorippa* sp. and *Cardamine* sp. amongst others. Whether or not its absence from the fenland is genuine, there should be suitable habitat for it in the north of the county, as David's record may suggest. Further searches in similar woodlands and in carr and marshes in the area may prove it to be more widespread.

Members of the family Nitidulidae tend to be rather neglected when compared to other members of the coleoptera; the scope for adding to our knowledge of the family in the county is high. Alan Lazenby recorded *Meligethes brunnicornis* in Scopwick during May. This appears to be the first record for South Lincolnshire (VC53), the species having been recorded in North Lincolnshire on number of occasions and apparently quite widespread. *Meligethes brunnicornis* can be found in woodlands, hedgerows and margins of cultivated land where the larvae feed on *Stachys sylvatica*.

Two new species for South Lincolnshire (VC53) were found by the author at the LNU field meeting to Norton Big Wood in August: the small weevil *Amalorrhynchus melanarius* and ground beetle *Pterostichus quadrifoveolatus*. Both have been recorded in North Lincolnshire but remain scarce. *Amalorrhynchus melanarius* feeds on *Rorippa sp.*, the larvae feeding in the seed pods. *Pterostichus quadrifoveolatus* is a recent arrival in Britain and is slowly colonising the east of England. It can be found in woodlands.

At a visit to Messingham Sand Quarry in August, David Sheppard found the small scirtid beetle, *Cyphon pubescens*. This is the second record of the species for Lincolnshire, the first also being from Messingham Sand Quarry (Bob Merritt, 2006).

In November, Wil Heeney, John Lamin and Mark Telfer investigated Bourne Woods and found the phloiophilid *Phloiophilus edwardsii* and rove beetle *Trichophya pilicornis*. *Phloiophilus edwardsii* has recently been given the status of Nationally Scarce following the review of the beetles of Great Britain, with *Trichophya pilicornis* retaining its Nationally Notable B status for the time being. Nationally both species are widespread and both have been recorded in Lincolnshire before, however these records represent the only modern records for the species.

Finally, a belated record from 2012. In February of that year the author collected a small unknown beetle from a road verge near Bloxholm. Some three years later, it was identified as the Nationally Notable A species *Anommatus duodecimstriatus*, a member of the Bothrideridae family. One of our few blind beetles, they are associated with decaying vegetable matter and rotten wood. Almost certainly more widespread, at 1.5mm to 2mm they are probably very under-recorded. Being such a small family of beetles, this appears to be Lincolnshire's first record of the family as well.

DIPTERA IN 2014

Phil Porter

2014 was characterised by material from intensive Malaise trapping at Snipe Dales by David Sheppard, and a series of visits to Lincolnshire Wildlife Trust reserves by Richard Davidson.

I received the Dolichopodidae, Hybotidae and Empididae from David and have only got round to identifying a quite small proportion of these, about 50 species so far. This material introduced me to some very small species such as *Kowarzia bipunctata* (Empididae) and *Tachydromia umbrarum* (Hybotidae) among others.

Richard's visits in July produced a number of coastal specialists such as *Fucellia tergina* and *F. maritima* (Anthomyiidae), which are much easier to identify than most of this troublesome family, at locations in the Coastal Country Park; *Philonicus albiceps* (Asilidae) up and down the coast throughout the month, and *Nemotelus uliginosus* (Stratiomyidae) also from the Coastal Country Park area.

Richard also brought me a number of flies with striking markings or structural adaptations; *Rhaphium fasciatum* (Dolichopodidae) from Donna Nook 25th June; *Pelatachina tibialis* (Tachinidae) and *Phaonia trimaculata* (Muscidae) from Moulton Marsh 12th June; *Tripetoptera punctulata* (Sciomyzidae) all summer from a number of locations; and finally *Merzomyia westermanni* (Tephritidae) and *Brachyopa scutellaris* (Syrphidae) from Chambers' Farm Wood on 27th July and 20th May respectively.

SHIELDBUGS IN 2014

Annette Binding

In 2014 there were records of fifteen of the twenty species with post-2000 records.

Among these was a single specimen of the Heather Shieldbug *Rhacognathus punctatus* which was found near the car park at Kirkby Moor LWT Reserve on the 21st June by Karen and Sarah Hand. Although widespread in the United Kingdom it is always scarce and in very small numbers. Adults can be found all the year round. It has been recorded from all the large heathlands in the county.

The only record of the Bishop's Mitre *Aelia acuminata* was from Richard Davidson who found one in North Hykeham on the 15th May, a new site for this species.

Another species with only a single record was the predatory bug the Spiked Shieldbug *Picromerus bidens*. It was found at Messingham Sand Quarry LWT Reserve on the 5th June by John Davison.

Charlie Barnes found the only Juniper Shieldbug *Cyphostethus tristriatus* at Willow Tree Fen LWT Reserve on the 20th June. It was last recorded in Lincolnshire in 2012 and has a widespread but very scattered distribution in the county.

All the other species had four or more records. The species with the most records was once again the Green Shieldbug *Palomena prasina*.

My thanks to the people who sent me records, specimens and photographs in 2014.

PSEUDOSCORPIONS IN 2014

Annette Binding

Four people sent me records and specimens of pseudoscorpions in 2014.

Charlie Barnes sent me a number of specimens from various locations in the county. They included *Chernes cimicoides* which Charlie found in dead wood at Protection Wood in south Lincolnshire on the 12th December. Widespread across the southern half of the United Kingdom, it is scarce in Lincolnshire. There are only five previous records from four other sites for this species which has not been recorded in the county since 1995 when it was found at Grimsthorpe Park.

Dactylochelifer latreillei, was found by Richard Davidson at the Lincolnshire Coastal Country Park, near Wolla Bank, in north Lincolnshire on the 27th August. Charlie Barnes found the same species at the same site in the dunes on the 20th September. There are only 29 previous records and the species was last recorded in the Huttoft area in April 1903 by H. Wallis Kew.

Charlie Barnes found *Chthonius ischnocheles* at South Ferriby on the 9th August and at Frampton Marsh on the 7th September. Phil Porter found the same species in a brash and grass heap at Whisby Nature Park on the 24th December. This species is widespread in the United Kingdom and is usually found in leaf litter, soil and under stones and general debris.

As in previous years *Lamprochernes nodosus* continues to occur in Silvia Fowler's compost bin in her garden near Louth. In April Charlie Barnes found one attached to a fly (Diptera sp.) at Nocton Rise. The pseudoscorpion is not parasitic on the fly, it is simply using the fly as a form of transport in order to assist its dispersal. All three species of *Lamprochernes* are known to do this.

Also found at Nocton Rise by Charlie Barnes was a single specimen of *Cheiridium museorum*. It was found on the 23rd November in an insect store box. *C. museorum* is a species mainly associated with man and man-made habitats and is also known as the 'book scorpion'.

My thanks to the four people mentioned above for their records.

SPIDERS IN 2014

Annette Binding

Two species were recorded new to the county in 2014. In August Karen and Sarah Hand sent me a photograph of a spider which they had found at their home in Addlethorpe on the 25th of August which they thought was *Steatoda nobilis*. Karen and Sarah told me that the spider had been accidently trapped in a window and since it was dead, I requested the specimen. Although it got lost in the post and took eight days to reach me I was able to confirm it as a female *Steatoda nobilis*.

The second species new to the county in 2014 was a linyphid, *Lepthyphantes insignis.* A female was recorded by Jon Daws on the 15th September in 'the sewer' near Acacia Avenue at Chapel St Leonards. This species is Notable B.

As well as the new county records there were a number of other interesting species found in 2014, some of which had not been recorded in the county for decades. These included a salticid or jumping spider

Marpissa nivoyi which Richard Davidson found on 23rd July on his car door while he was visiting friends at Chapel St Leonards. The car was parked close to the dunes where there was lots of marram grass. There are only six previous Lincolnshire records of this Notable B species, all from Gibraltar Point between 1950 and 1975, making this the first record for thirty-nine years and a new site record.

The second species with no recent records was *Cercidia prominens,* again found by Richard Davidson. Richard collected a single female from Scotton Common LWT Reserve on the 13th August. There are only four previous Lincolnshire records of this species, one from Market Rasen in 1960 and three from Linwood Warren LWT Reserve between 1964 and 1965, all found by George W Whatmough. This is the first record for 49 years and a new site record.

There are always species found at new locations and two of the more uncommon ones were *Larinioides sclopetarius* and *Nigma walckenaeri*. *Larinioides sclopetarius* has been known from only two sites in recent years but in 2014 I was contacted by Tom Beardwell who had been given my details by Froglife with whom he had been doing work experience. Tom told me that he was very interested in spiders, particularly the big house spiders *Tegenaria sp.* On the 25th of July Tom sent me several photographs of a spider he had been unable to identify. I was able to tell him that it was *Larinioides sclopetarius.* Since this species is usually found on buildings and other similar structures near water, I asked Tom where he found his spider and if it was near water. He told me that he collected it by torchlight from a wheelie bin on his driveway which is approximately 25 metres from the River Glenn at Surfleet, South Lincolnshire.

The tiny green spider *Nigma walckenaeri* ,Notable A, was found at two new locations in 2014. The species was new to Lincolnshire in 2011 when it was found at Stamford by Ian Dawson. Since it appears to be associated with ivy I have looked at ivy wherever I could but with no success. However on the 31st of August my husband, Allan having read about these spiders went to see if he could find any on a large ivy hedge growing near the garage block of our Court. He returned with a number of containers in each of which was a curled ivy leaf with the right looking webbing across the leaf. I examined each leaf using a lens but although there were egg sacs in several of the leaves there did not appear to be any spiders. Then, in one of the last tubes I noticed a slight movement inside the small retreat, followed by a fleeting glimpse of a green body. Eventually we managed to coax the spider out and were then able to get a good look at it. It turned out to be a male *Nigma walckenaeri*. This was the second Lincolnshire record and one of the most northerly in the country. On the 25th September Allan found two further specimens, this time two females, on the same ivy bush. We showed the spiders and the typical webs in curled leaves to Richard Davidson. A few weeks later Richard came to see us with two green spiders which he had collected on the 28th October from his garden in Lincoln, one of which had been found on the leaves of a viburnum bush. After confirming that the spiders were two male *Nigma walckenaeri*, they were returned to Richard, so that he could release them where he had found them.

Other interesting species recorded in 2014 included two specimens of the RDB2 species *Ero aphana*. This species was new to the county in 2013 when two females were collected from my garden. In 2014 two more specimens were found, this time two males. Also recorded in our garden in 2014 was a single specimen of *Milleriana inerrans* found on the 18th May. Richard Davidson found two *Clubiona subtilis* at Wolla Bank near Chapel St Leonards, on the 27th August. This species had not been recorded in the county since 2009 and has only been found at four other locations. *Clubiona subtilis* are tiny, only about 3mm long, so it is possible that it is overlooked or released as immature due to its small size. *Scytodes thoracica,* known as the 'Spitting Spider' due to its method of catching its prey, was found by Mick Talbot in two houses in south Lincoln in January and February. Known from only two other sites, it was last recorded in the county in 2001.

Finally, the ivy bush mentioned earlier in this report was brought down by heavy wet snow in December on Boxing Day night. One of our neighbours came to tell us that the ivy had fallen and was blocking the entrance to several of the garages. Helped by our neighbour, we spent the best part of that day, cutting back the ivy bush. We were careful to leave as much as we could so hopefully we will be able to find

Nigma walckenaeri there again.

My thanks to those people who sent me records, photographs and specimens in 2014.

HARVESTMEN IN 2014

Annette Binding

Ten species of harvestmen were recorded in the county in 2014.

These included *Odiellus spinosus* which turned up at two more sites in the county in 2014 having been found in 2013 at Addlethorpe after a gap of 22 years. The new sites were both in the Lincoln area, Bracebridge Heath in August and Maxwell Avenue, Lincoln in November and were found by Richard Davidson. Primarily a ground living species it prefers sheltered places especially in gardens and other man-made habitats.

I received only one record of another ground-living species, *Nemastoma bimaculatum*. It was found by Alan Dale on the 2nd September at Low Hammeringham.

Opilio canestrinii which was new to the county in 2012 when it was found in our tiny back garden at Washingborough, is now the commonest species in the garden. They are quite distinctive, the male is orange-red and the female darker orange-brown with two rows of black and white bars on the dorsal side. In both sexes the dark legs contrast with the orange trochanters. In our garden they can usually be seen on the Spurge Laurel and Lemon Balm and are most active in the evening.

Dicranopalpus ramosus Alan Dale

Two female *Dicranopalpus ramosus* were found by myself on ivy near the garage block at Willow Court, Washingborough on the 7th September. They remained in the same position for several days. This is another new site for this species.

Our visit to Longholt Wood on the 7th September produced the only record of *Oligolophus hanseni* as well as *Dicranopalpus ramosus* and *Mitopus morio*.

Alan Dale sent me a photograph of a harvest-man which he had taken in 2013 but had been unable to identify despite the obvious anatomical features at the rear end and the silver-grey colouration. I was able to identify it as a female *Dicranopalpus ramosus*. This species is usually fairly easy to identify by the distinctive apophyses on the pedipalps, those on the patella often likened to a 'tuning fork'. These 'tuning fork' apophyses are just visible in the photograph but the eye is drawn to the protuberance and tail on tergites 5 and 6. Female *D. ramosus* have what the books describe as 'a bulge' but it is only the unusual

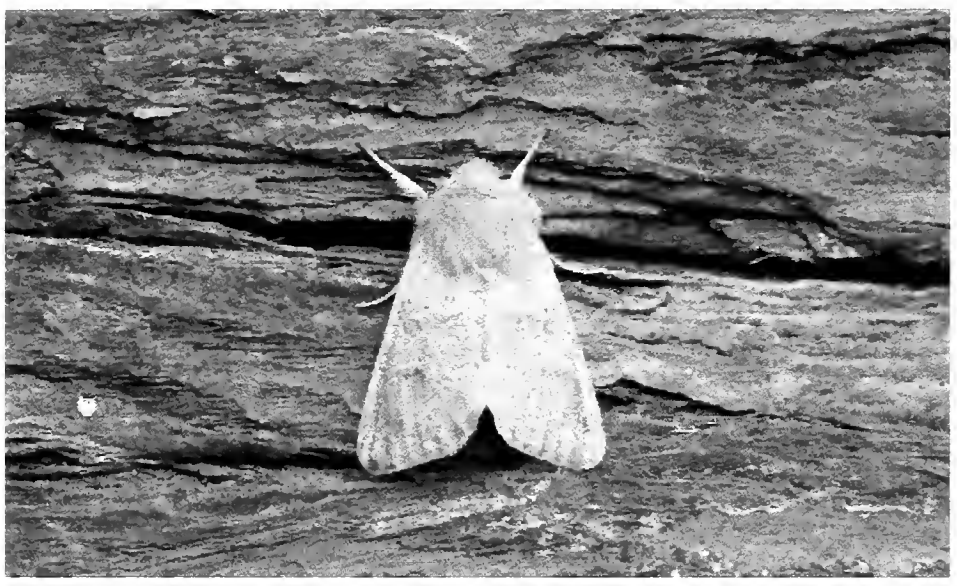
angle at which the photograph was taken that makes this feature so visible on this specimen. *D. ramosus* are also variable in colour from brown to the silver-grey of this female. Alan Dale's photograph accompanies this report.

My thanks to those people who sent me records, photographs and specimens in 2014.

MOTHS IN 2014

Martin Gray

2014 proved to be an average year as regards to the number of species recorded in Lincolnshire, and the weather certainly did not help being wetter than normal in at least five of the months and again with no prolonged heatwave. Moth numbers are certainly still on the decline nationally with Lincolnshire no different; records received by the vice-county recorders have also reduced mainly due to the fact that a number of contacts have diminished somewhat either by moving to pastures new or generally losing interest. Lincolnshire has a wide array of habitats compared to a number of counties and is vastly under-recorded especially with regards to the micro moths, I hope to plan a leaf-mining walk in the Autumn to try and inspire moth recording is not just about looking into traps in the mornings.



Blossom Underwing, Addlethorpe Karen & Sarah Hand

Conditions for the migrant moths were not the best with the usual species such as The Delicate *Mythimna vitellina*, Vestal *Rhodometra sacraria*, Dark Sword-grass *Agrotis ipsilon* and the micro *Udea ferrugalis* being seen in small numbers. The inland record of The Delicate in Broughton by Colin Pumfrett was most unusual. The Blossom Underwing *Orthosia miniosa* trapped at Karen and Sarah Hand's Addlethorpe home is a rarely recorded moth in Lincolnshire and was probably a genuine migrant. Death's-head Hawkmoth *Acherontia atropos* is everyone's 'must-see' moth and a larva in an Algekirk garden was bred through to an adult and photographed. Another one was photographed at Holbeach Bank on 20 September with no further details. A Great Brocade *Eurois occulta* was enticed to Chris Howes garden at Irnham on the 26 July; in fact I have yet to see any recorded elsewhere as a genuine migrant in the country.

Death's-head Hawkmoth, Algekirk

Peter Aldridge

In June Karen & Sarah Hand trapped a *Monochroa palustrella* at their Addlethorpe home. This species is restricted generally to East Anglia occupying dry

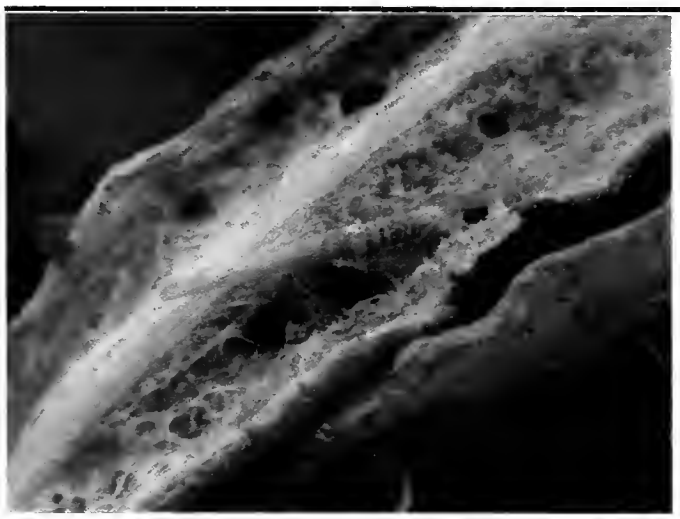
Monochroa palustrella, Addlethorpe
Karen & Sarah Hand

Crambus pratella, Addlethorpe Karen & Sarah Hand

sandy areas with the larva feeding on mainly Curled Dock *Rumex crispus* . This is a Nationally Scarce B species, and a first for Lincolnshire. Also in June the Hands recorded a *Crambus pratella*; this is one of the grass moths and closely resembles *Crambus lathoniellus* with a few minor differences. Again this is a new record for Lincolnshire. The larva feed on the roots and stems of many grasses.

Coleophora lithargyrinella, Martin Gray

Coleophora badiipennella Martin Gray



Coleophora inulae, Martin Gray

The author again concentrated on the leaf-miners and grazers and was successful in recording three new records for Lincolnshire. On the 16 September I visited a small wood near Ancaster and recorded the larval case of *Coleophora badiipennella* feeding on English Elm *Ulmus minor* var. *vulgaris.* On the 19 September a regular visit to my local wood near Skellingthorpe resulted in finding many cases of *Coleophora lithargyrinella* on the abundant Greater Stichwort *Stellaria holostea.* Perhaps the rarest larval case found in the year was that of *Coleophora inulae* which feeds on Common Fleabane *Pulicaria dysenterica* at Stainfield Nature Reserve and the nearby wood where they

Ectoedemia sericopeza, Odder Martin Gray

individual species. The author also found the leaf-mine of *Ectoedemia sericopeza* on the samara and seeds of a Norway Maple *Acer platanoides* at Odder near Lincoln. This tiny species, only 3-4mm long, is working its way slowly through Britain and this is the first Lincolnshire record.

Other highlights of the year involved a group trapping at Chamber's Farm Wood. Moths recorded included a Gold Spangle *Autographa bractea,* a moth that is not seen often in Lincolnshire.

A surprising and pleasing record was the larva of Small Chocolate-tip *Clostera pigra* was found and photographed in Laughton Forest on the 15 July by John Petyt and John Davison. The last record came from the same area back in 1997 by former county recorder Rex Johnson. The larva feed on predominately Creeping Willow *Salix repens* and Eared Willow *Salix aurita* and other similar *Salix* species in boggy conditions. This moth is found sparsely in Britain mainly due to the lack of favorable habitat.

were found in abundance. This is a scarce and very local species which has a small number of tiny colonies in the south of England, principally in Hampshire and the Isle of Wight. There is one previous record of an adult trapped near Scunthorpe in June 2011 by a Robert Wood. The *Coleophora*e are a fascinating genus; the larva initially feed on the seeds, flowers or leaves of the host plant, but when larger, they feed externally and construct distinctive protective silken cases, often incorporating plant material. Many species have specific host plants; discarded larval cases are often scattered thickly on affected plants. Many can be identified just from the case as some are distinctive, but some like the ones feeding on Blackthorn *Prunus spinosa* must be bred through to determine the

Gold Spangle, Chambers Farm Wood Matthew Blissett

Scarce moths in Lincolnshire continue to keep a foothold; these include Marsh Moth *Athetis pallustris,* (Lincolnshire Coast), White-marked *Cerastis leucographa,* (South Lincolnshire), The Four Spotted *Tyta luctuosa*,(South Lincolnshire) and Waved Black *Parascotia fuliginaria* (Langworth) some of which are showing signs of expanding their range.

MAMMALS

Chris J. Manning

With 2,215 records entered onto the mammal database, 2014 is the most successful year yet. Five recorders submitted more than 100 records: Phil Lee, (207) Julie Ellison (201), Anna Moody (116) Geoff & Wendy Handford, (115) and Brian Hedley (113). It is particularly pleasing to see more records from the Isle of Axholme and North West Lincolnshire thanks to Phil Lee, Julie Ellison and Anna Moody the site manager of Alkborough Flats.

Otter Records	2014
Trail Camera	13
Sighting	13
Spraint	12
Tracks / trail	11
Road casualty	6
Field Signs	2
Grand Total	57

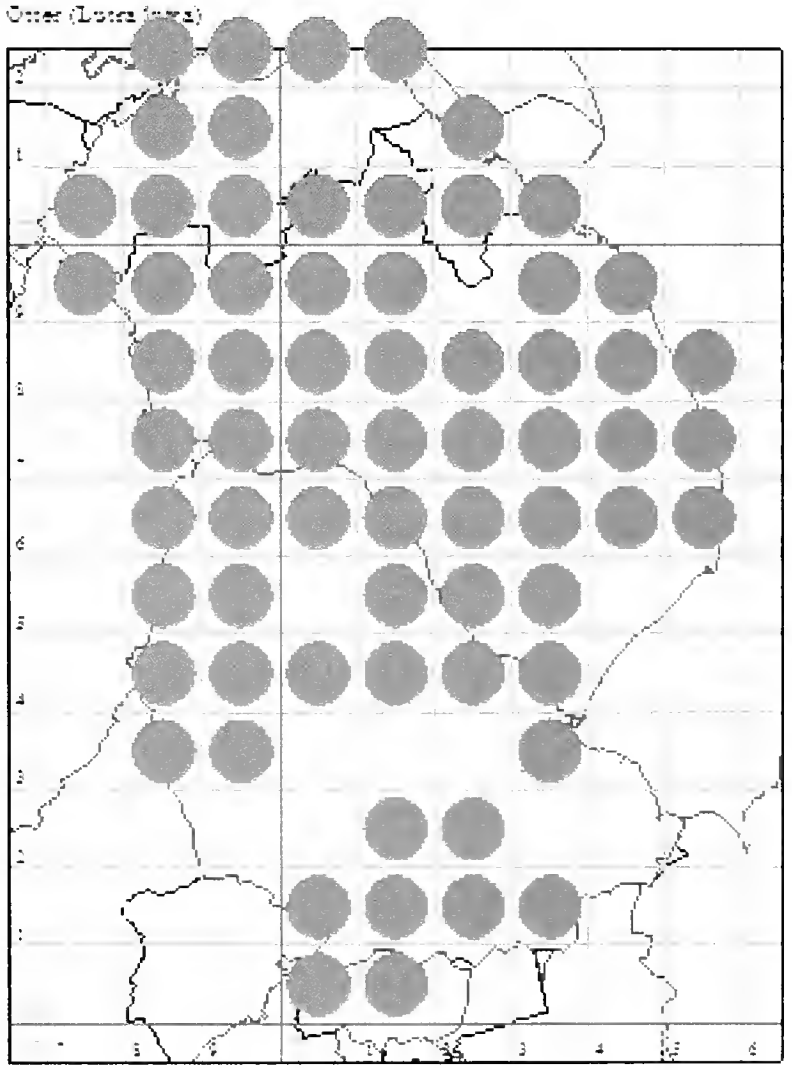
The most commonly recorded species were: Brown Hare *Lepus europaeus* (245), Western Hedgehog *Erinaceus europaeus* (231), Badger *Meles meles* (220), Northern Mole *Talpa europaea* (212) and Rabbit *Oryctolagus cuniculus* (199).

Most records (1,180) are of sightings but 18.7% (416) are road casualities with over 50% of the: Ferret *Mustela putorius* f. *furo* 64.7%, Badger 62.2% and Western Hedgehog *Erinaceus europaeus* 58.8% recorded by this method. Trail cameras 7.5% (166) are increasingly popular for recording our mammals.

It is pleasing that Otter *Lutra lutra* records increased to 57 (35 records in 2013) with 13 recorders lucky enough to see an Otter in 2014. 22% of our Otter records are via trail cameras.

Currently Otters have not been recorded in every 10km square but these are large mammals with adult males know to range over large distances 39km and females up to 22km (Harris & Yalden, 2008) so they can be expected across Lincolnshire, a county from which they were never extinct (Manning, 2009).

Perhaps the most unusual record was two unfortunate Roe *Capreolus capreolus* bucks found at Theddlethorpe on 1st April. Roe grow their antlers over the winter and clear the velvet off in the spring when the bucks establish territories. These animals had presumably been fighting when their antlers interlocked leaving them locked together and eventually falling into a watercourse and drowning.



References:
HARRIS, S. & Yalden, D. 2008. *Mammals of the British Isles*, The Mammal Society.
MANNING, C. 2009. *Mammal Review and Atlas Update: A Century Of Recarding, Pragress And Oppartunities*. Transactions Volume 27 Part 3, Lincolnshire Naturalists' Union.

Dead Roe bucks, Theddlethorpe Chris Manning

2014 LNU FIELD MEETING SUMMARIES

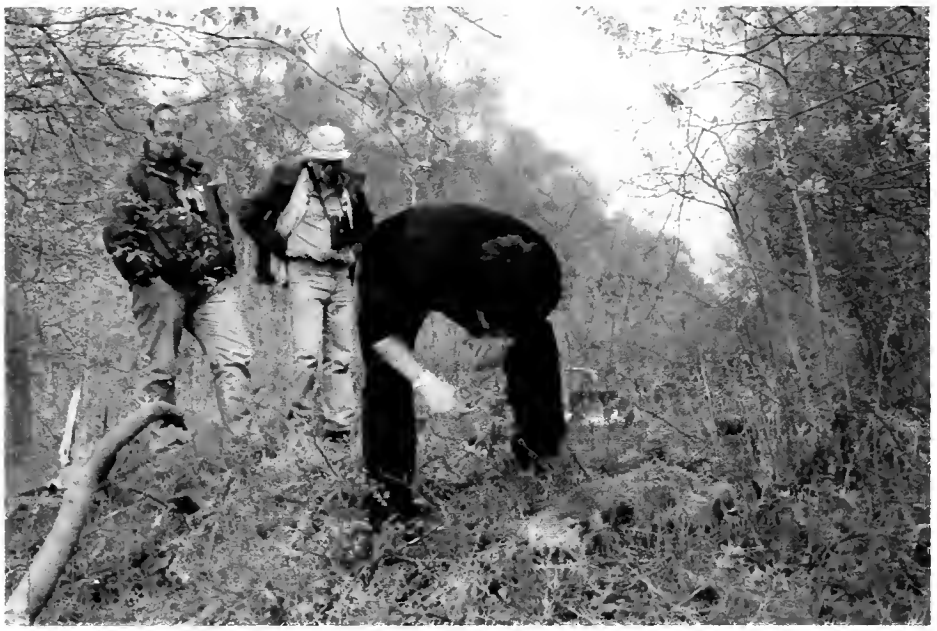
Brian Hedley

27 April, Sweeting Thorns, Holme, Near Scunthorpe
SE932076
First field meeting of the year to a private woodland site courtesy of Philip Marshall and led by Brian Hedley. Attended by 15 people on a dry and partly sunny afternoon.

A wide variety of plants mirrored the variety of habitats present (dry woodland, wet woodland, marsh, ponds, ditches, acid grassland and disturbed areas). Plants included Lady Fern *Anthyrium felix-femina*, Wood Sorrel *Oxalis acetosella*, Angelica *Angelica sylvestris*, Wood Small-reed *Calamagrostis epijegos*, Marsh Bedstraw *Galium palustre*, Three-nerved Sandwort *Moerhingia trinervia* and Bugle *Ajuga reptans*. A restricted selection of fungi were noted including Hoof Fungus *Fomes fomentarius*, Birch Polypore *Piptoporus betulinus*, Witch's Butter *Exidia plana* and a *Peziza* cup fungus species.

Thirty three bird species noted including Nuthatch *Sitta europea*, Treecreeper *Certhia familiaris*, Buzzard *Buteo buteo*, Sparrowhawk *Accipiter nisus*, Green *Picus viridis* and Great Spotted Woodpeckers *Dendrocopos major*, Blackcap *Sylvia atricapilla* and Bullfinch *Pyrrhula pyrrhula*. Seven mammal species were from sight or signs and included Roe Deer *Capreolus capreolus*, Common Shrew *Sorex araneus* and Fox *Vulpes vulpes*. Several young Common Frogs *Rana temporaria* were seen.

A good selection of invertebrates comprised at least 24 beetle species mainly recorded by Charlie Barnes



Searching dead fox for beetles, Sweeting Thorns.
Brian Hedley

(including *Corticeus unicolor*, a RDB3 species). Many of the beetles were noted under or around a dead fox! A good variety of flies were noted by John Flynn. Butterflies comprised Brimstone *Gonepteryx rhamni*, Green-veined White *Pieris napi*, Orange-tip *Anthocharis cardamines* and Peacock *Inachis io*. Moths included Drinker *Euthrix potatoria* caterpillars and various micro-moths including *Stigmella aurella*. Other invertebrates included 2-spot *Adalia bipunctata* and 14-spot Ladybirds *Propylia 14-punctata*, Birch Shieldbug *Elasmostethus interstinctus*, Green Shield-bug *Palomena prasina*, Forest Bug *Pentatoma rufipes*, Red-tailed *Bombus lapidarius*, Buff-tailed *B. terrestris* and White-tailed Bumblebees *B. lucorum*, Common Carder-bee *B. pascuorum* and Pill Woodlouse *Armadillidium vulgare*.

18 May, Shire Wood, Revesby
TF289619
A large private woodland with access courtesy of the Revesby Estate. Attended by 10 members and led by Brian Hedley.

28 bird species were noted including Tawny Owl *Strix aluco*, Buzzard, Sparrowhawk, Green Woodpecker, Garden Warbler *Sylvia borin* and Bullfinch. Six mammals noted including Brown Hare *Lepus europaeus* and Roe Deer. Both Common Frog and Common Toad *Bufo bufo* were present in small numbers.

Six butterfly species: Brimstone, Large White *Pieris brassicae*, Green-veined White, Orange-tip, Peacock and Speckled Wood *Pararge aegeria*. Moths included Rivulet *Perizoma affinitata*, Yellow Shell *Camptogramma bilineata*, and Silver-ground Carpet *Xanthorhoe montanata*. Common Blue *Enallagma cyathigerum* and Blue-tailed Damselflies *Ischnura elegans* were recorded along central ride ditches.
A selection of beetles included *Melasis buprestoides* (a Notable B species of false click beetle and 3rd record for VC54), *Tetropium gabrieli* (Ramsons Beetle and 8th record for VC54) and *Rhagium mordax*. David Sheppard noted two sawfly species which are new county records: *Empria pallimacula* (*baltica*) and *Metallus albipes*.

Over 150 plant species noted including Giant Bellflower *Campanula latifolia*, Yellow Pimpernel *Lysimachia nemorum*, Yellow Archangel *Lamiastrum galeobdolon*, Ramsons *Allium ursinum*, Wood Anemone *Anemone nemorosa* and Wood Melick *Melica uniflora*.

31 May, Sutterby Village
TF386723
As part of the 'Down Your Wold' project, (a community heritage project hosted by Heritage Lincolnshire and funded by the Heritage Lottery Fund and Lincolnshire Wolds Countryside Service), a group of like-minded individuals set out to find out more about the deserted mediaeval village of Sutterby.

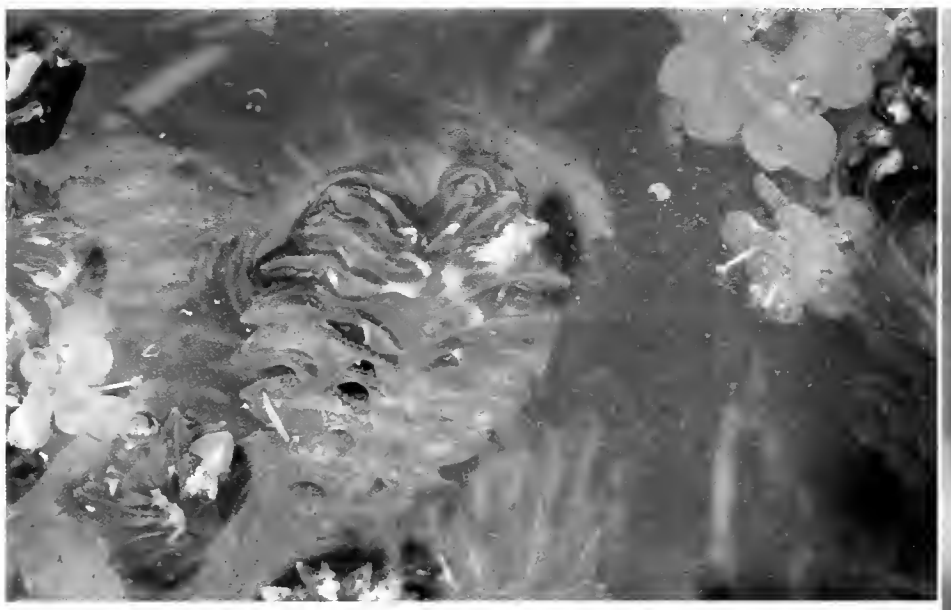
Along with research into the church, churchyard and associated settlements, the LNU (particularly Charlie Barnes) helped organise a mini-Bioblitz to further investigate the natural history of the area. During the day 54 beetles, 51 plants and 18 bees, ants and wasps were recorded, which along with other groups, brought the day's total to 191 species. Highlights included new county records of the hoverfly *Orthonevra*

nobilis, a species associated with springs and flushes, and the Nationally Scarce bee, *Andrena similis*. Following on from the mini-BioBlitz the project team have continued to record and are amassing an amazing amount of information for such a small site.

20 & 21 June, Willow Tree Fen Bioblitz Event

TF174223

A weekend-long BioBlitz led by Charlie Barnes was held at Willow Tree Fen which is a Lincolnshire Wildlife Trust reserve that has been transformed from arable land into a traditional fenland landscape of flooded pastures, meadows and reedbeds.



Opposite-leafed Pondweed, Willow Tree Fen Brian Hedley

Variable Damselfly, Willow Tree Fen Brian Hedley

Over 600 species were recorded during the two-day event, including 202 plants, 128 beetles, and, despite a clear night and cold temperatures, 69 moths. Two leafhoppers, *Oncopsis carpini* and *Oncopsis alni* were new records for the county, along with the Nationally Scarce wasp *Microdynerus exilis*. Other notable finds included the Nationally Scarce bugs *Amblytylus brevicollis* and *Saldula opacula* and the bee, *Lasioglossum malachurum*. Noteworthy plants included Lesser Water-plantain *Baldellia ranunculoides*, Opposite-leaved Pondweed *Groenlandia densa*, Flat-stalked Pondweed *Potamogeton friesii*,Night-flowering Catchfly *Silene noctiflora*, Greater Water-parsnip *Sium latifolium* and Milk Thistle *Silybum marianum*. A total of 16 dragonfly and damselfly species were recorded over the two days including Variable *Coenagrion pulchellum* and Red-eyed Damselflies *Erythromma najas* and Hairy Dragonfly *Brachytron pratense* which highlights the importance of this site for odonata.

6 July, Sloothby

TF500712

A meeting led by Brian Hedley to a private farm courtesy of George and Natalie Rutter. Attended by 11 people in sunny and dry conditions.

Some marvellous meadows were present with an abundance of species such as Great Burnet *Sanguisorba officinalis*, Meadowsweet *Filipendula ulmaria*, Meadow Barley *Hordeum secalinum*, Yellow Rattle *Rhinanthus minor* and Tufted Vetch *Vicia cracca*. Other plants included Zigzag Clover *Trifolium medium*, Marsh Cudweed *Gnaphalium uliginosum* and Bee Orchid *Ophrys apifera*. At least 34 bird species were noted including Buzzard, Hobby *Falco subbuteo*, Tree Sparrow *Passer montanus*, Lesser Whitethroat *Sylvia curruca* and Bullfinch. Mammals included Brown Hare and droppings of Brown Long-eared Bat *Plecotus auritus* at a known roost site.

Meadow at Sloothby Brain Hedley

Eleven butterfly species recorded including Red Admiral *Vanessa atalanta*, Gatekeeper *Pyronia tithonus* and hundreds of Meadow Browns *Maniola jurtina*. At least 32 moth species were noted during daytime recording plus from a trap set the previous evening and included: Kent Black Arches *Meganola albula* (usually only recorded at Gibraltar Point), Short-cloaked Moth *Nola cucullatella*, Poplar Hawk-moth *Laothoe populi*, Beautiful Hook-tip *Laspeyria flexula*, Buff Arches *Habrosyne pyritoides*, Barred Yellow *Cidaria fulvata*, Barred Straw *Gandaritis pyraliata* (abundant) and Burnished Brass *Diachrysia chrysitis*. Twenty seven beetle species were identified including the 5th county record of *Neliocarus nebulosus* (found by David Sheppard), an uncommon weevil that feeds on various herbaceous plants. The large willows bordering the meadows also provided further records of the RDB weevil *Isochnus sequensi* which was first found in the county in 2009 and has since become widespread. Other notable records include the rove beetle *Quedius cruentus* which is currently known from 5 tetrads in VC54 and is usually found under bark and in old bracket fungi.

2 August, Norton Big Wood (Norton Disney)

SK881605

A meeting with an afternoon and evening bat/moth element. Access courtesy of the Hill Holt Wood organisation. Attended by 11 people over the course of the afternoon and evening and led by Brian Hedley. A few light showers in the afternoon but otherwise mainly sunny and dry.

Larva of *Athalia scutellariae* , Norton Big Wood Brian Hedley

Plant-wise, there was a mixture of species associated with woodland, acid grassland and marsh habitats including Water-purslane *Lythrum portula*, Skullcap *Scutellaria galericulata*, Greater Stitchwort *Stellaria holostea*, Tormentil *Potentilla erecta*, Bog Stitchwort *Stellaria alsine*, Bugle, Common Valerian *Valeriana officinalis*, Wavy Hair-grass *Deschampsia flexuosa*, Wood Sorrel and Hairy Wood-rush *Luzula pilosa*. Fungi included Hoof Fungus, Turkey-tail *Trametes versicolor*, Common Earthball *Scleroderma citrinum* and Stinkhorn *Phallus impudicus*.

Fifteen mammal species were noted from sightings, signs or from bat detector

recordings including Noctule Bat *Nyctalus noctula*, Leisler's Bat *N. leisleri*, Barbastelle Bat *Barbastella barbastellus*, Brown Long-eared Bat, Muntjac Deer, Common Shrew and Hedgehog *Erinaceus europaeus*. An immature Grass Snake *Natrix natrix* was noted beneath a log and both Common Toad and Common Frog were seen.
Thirty bird species were noted including Nuthatch, Tawny Owls (up to three males calling), Green and Great Spotted Woodpeckers, Treecreeper, Jay *Garrulus glandarius*, Bullfinch, Buzzard and a Willow Warbler *Phylloscopus trochilus* still in song.

Maiden's Blush, Norton Big Wood Brian Hedley

The evening moth-trapping session produced at least 54 species including Angle-striped Sallow *Enargia paleacea,* Maiden's Blush *Cyclophora punctaria*, Black Arches *Lymantria monacha*, Pebble Hook-tip *Drepana falcataria*, Oak Hook-tip *Watsonalla binaria*, Canary-shouldered Thorn *Ennomos alniaria*, Dusky Thorn *Ennomos fuscantaria*, Antler Moth *Cerapteryx graminis* and the colourful micro *Rhyacionia pinicolana*. Additionally, the caterpillar of Red-necked Footman *Atolmis rubricollis* was also found. Butterflies comprised only six species but did include two Purple Hairstreaks *Neozephyrus quercus*. Dragonflies/damselflies fared slightly better with seven species including Southern Hawker *Aeshna cyanea*, Brown Hawker *A. grandis*, Ruddy Darter *Sympetrum sanguineum* and swarms of Migrant Hawkers *Aeshna mixta*. Charlie Barnes recorded 35 species of beetle in total, including 15 ground beetle and seven weevil species. Particular highlights included the weevil *Cionus tuberculosus* which in Lincolnshire is restricted to 'nice' woodlands (e.g. Limewoods) and the ground beetle *Pterostichus quadrifoveolatus*, which is a relatively recent arrival in Britain. The very large click beetle *Stenagastus rhombeus* was attracted to a sugar solution near the car park and was previously only known from Grimsthorpe Park in Lincolnshire. Other invertebrates included Horntail or Giant Wood Wasp *Urocerus gigas* , many Hornets *Vespa crabro*, Dark Bush-cricket *Pholidoptera griseoaptera*, various shield-bugs and a larva of the Skullcap Sawfly, *Athalia scutellariae*, which turned out to be a joint county first (with Richard Davidson finding another one around the same time).

7 September, Frampton Marsh RSPB Reserve
TF367387
Led by Brian Hedley and attended by six members. A sunny, fairly warm and dry day.

Birds, as you would expect, were a key feature of the meeting with about 72 species seen between us including Barred Warbler, *Sylvia nisoria*, Little Stint *Calidris minuta*, Temminck's Stint *C. temminckii*, Spoonbill *Platalea leucorodia*, Curlew Sandpiper *Calidris ferruginea*, Spotted Redshank *Tringa erythropus*, Wimbrel *Numenius phaeopus*, Greenshank *Tringa nebularia*, Marsh Harrier *Circus aeruginosus*, Turtle Dove *Streptopelia turtur*, Yellow Wagtail *Motacilla flava* (50+), Wheatear *Oenanthe oenanthe* and Peregrine *Falco peregrinus*. Mammals included Weasel *Mustela nivalis* and signs of Water Vole *Arvicola amphibius*.

Plants included a good selection of coastal species including Slender Hare's-ear *Bupleurum tenuissimum*, Sea Wormwood *Artemisia maritimum*, Sea Arrow-grass *Triglochin maritima*, Sea Plantain *Plantago maritima*, Sea Milkwort *Glaux maritima* and Sea Purslane *Halimione portulacoides*.

Saltmarsh, Frampton Marsh Brian Hedley

Eight butterfly species were seen including Painted Lady *Cynthia cardui*, Small Heath *Coenonympha pamphilus* and Red Admiral. Dragonflies included many Migrant Hawkers plus Southern Hawker and Ruddy Darter. About 26 beetle species were noted by Charlie Barnes including the RDB leaf mining weevil *Isochnus sequensi* which was present on the willows in the upper car park. Although an RDB species, it can now be found throughout Lincolnshire in abundance following a rapid range expansion in recent years. The weevil *Oxystoma cerdo* is a Nationally Notable B species that is rarely recorded, but may also be expanding. It is associated with *Vicia* sp and there are only five other records for Lincolnshire. The leaf beetle *Cassida vibex* was also noted and although represented by over 20 records in Lincolnshire, it is restricted to the Limewoods and south-west corner of Lincolnshire. This record from Frampton represents a significant find outside its known Lincolnshire range.

12 October, High Wood near North Rauceby

TF976461

Annual LNU fungi foray led by Ray Halstead and attended by 20 people and a dry and mainly sunny after-noon.

Fluted Bird's-nest Fungus, High Wood, North Rauceby
Brian Hedley

Forty-five fungi species were recorded in a couple of hours and amongst those were some really special finds, most notably, Oak Maze-gill *Daedalea quercina*, *Pleurotus dryinus* and Fluted Bird's-nest Fungus *Cyathus striatus*. A fantastic find was Fenugreek Stalkball *Phleogina faginea* which was found by John Lamin on a dead elm. Until 2013 this had not been recorded in Lincolnshire before it turned up in a garden in Caistor and has only been recorded a few times since. Other species found that only turn up occasionally were Tripe Fungus *Auricularia mesenterica*, *Mycena pseudocorticola, Mycena rorida,* Funeral Bell *Galerina marginata* and *Rutstroemia firma*.

Additional fauna comprised 20 bird species including Treecreeper, Green Woodpecker and Siskin *Carduelis spinus*. Amphibians did well with both Great Crested *Triturus cristatus* and Smooth Newts *Lissotriton vulgaris* found beneath logs plus several Common Frogs were also seen.

FROM THE EDITOR

Phil Porter

A few of our valued recorders have been indisposed for a variety of unavoidable reasons and so Transactions had threatened to be a very thin volume this year. Thanks are therefore due to a number of our colleagues who responded to my request for material with a wide range of articles to bridge the gap to a large extent. We look forward to a resumption of 'normal service' in the future.

For the benefit of those using family names, it is worth noting that in zoology, the latinized form is suffixed by 'idae', e.g. Muscidae = 'house fly family', (and other similar higher designations ending in 'ini' or 'inae' for example) and should have a capital initial, whereas the anglicised version 'muscid' is a simple adjective and should not have a capital. In the world of plants, fungi and algae the terminology is different. The latinized form is suffixed by 'aceae', e.g. Poaceae = 'grass family', and needs a capital in the same way, but there seems to be no anglicised form.

Although there is an unequal distribution of pictures in this year's offering, there has been an increase in the occurrence of graphs, maps and tables recently, and as these usually come as coloured files, they count as pictures in the charges for the production. Where some input is possible, I will generally attempt to render them into 'greyscale' so as to reduce cost. However, complicated colour graphs or maps seldom yield a completely effective result in this department if there are only subtle differences in shade.

Tables copied into Publisher, (the programme I use to produce Transactions), take up a disproportional amount of space, so the large examples in this year's issue have been produced 'long-hand' as it were, in Word. Given the small page size, there is a limit to the amount of information, not to mention the number of columns that is practical to reproduce. This limit has never been reached but the issue is worth bearing in mind.

Finally, the 'brief note' type of contribution, that anyone could send in, comprising just a paragraph or two to illustrate an interesting occurrence, remains an endangered species. Apart from broadening the contributor base, such articles are extremely useful for taking up a small space at the top or bottom of a page and I will commit to providing a couple myself next year to lead the way, unless this suggestion bears abundant fruit in which case I will be pleased to leave mine at the back of the queue!

FROM THE HON. SECRETARY

Charlie Barnes

By far the most time-consuming activity over the last year has been the development of the Herbarium project, with the LNU meeting with colleagues from the Lincolnshire Wildlife Trust, Sir Joseph Banks Society and the Natural History Museum to appraise the options for the future.

The Executive Committee itself met five times over the year and discussed a range of topics from the future of biological recording, housing of collections and the LNU's involvement with other organisations.

To a successful field meeting season was added LNU attendance at the Lincolnshire Show and the Willow Tree Fen Bioblitz. Volunteers are always needed for LNU events - not only to record wildlife, but also engage with members of the public. If you can spare a few hours get in touch with a member of the Executive Committee - we can guarantee your skills will be put to good use!

TRANSACTIONS OF THE LINCOLNSHIRE NATURALISTS' UNION

Officers of the Union in 2014
(Year of election to the Executive Committee)

President	Mr. Nick Tribe (2004)
President-elect	Mr. Mark Scholfield (2014)
Honorary Secretary	Mr. Charlie Barnes (2010)
Honorary Treasurer	Mr. Ian Macalpine-Leny (2001)
Membership Secretary	via LWT
Publicity Secretary	Mr. Roger Parsons (2010)
Programme Secretary (winter)	Vacant
Programme Secretary (summer)	Mr. Brian Hedley (2007)
Editor of Transactions	Mr. Phil Porter (2008)

Executive Committee

Mr. Colin Smith (2001), Mr. Chris Manning (2001), Mr. Richard Chadd (2002), Mr. Nick Tribe (2004), Mr. John Flynn (2012), Mr. Alan Phillips (2012)

External representatives

Lincolnshire Biodiversity Partnership	Mr. Ian Macalpine-Leny,
Lincolnshire Bird Club Committee	Mr. Ian Macalpine-Leny,
Lincolnshire Wildlife Trust Biodiversity Team	Mr. Richard Chadd,
Local Wildlife Sites Panel	Mr. Richard Chadd

Section Recorders

Ants Bees and Wasps	Mr. Alan Phillips
Bats	Mrs. Annette Faulkner
Beetles	Mr. Charlie Barnes
Bryophytes/Lichens	Professor Mark Seaward
Butterflies	vacant
Dragonflies	Mr. Nick Tribe/Mr. Richard Chadd
Fish	Mr. Ian Macalpine-Leny/Mr. Nick Bromidge
Flies	Mr. Andrew Godfrey (co-ordinators Mr. John Flynn/Mr. Phil Porter)
Freshwater Invertebrates	Mr. Richard Chadd
Freshwater Algae	Mr Bill Brierley
Fungi	Mr. Ray Halstead
Geology	co-ordinator Ms. Helen Gamble
Grasshoppers and Crickets	Mr Brian Redman
Higher Plants	Mr. Paul Kirby
Mammals	Mr. Chris Manning
Marine Invertebrates	Mr. Helgi Gudmundsson
Molluscs (non marine)	Mr. Alex Pickwell
Moths	Mr. Martin Gray
Plant Galls	Mr. Graeme Clayton
Sawflies	Dr. David Sheppard
Shieldbugs	Mrs. Annette Binding
Pseudoscorpions	Mrs. Annette Binding
Spiders	Mrs. Annette Binding
True Bugs	Mr. Colin Smith

THE LINCOLNSHIRE NATURALIST

including

Transactions of the Lincolnshire Naturalists' Union

for 2014

Volume 28, Part 4, 2014

CONTENTS