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Yorkshire Naturalists' Union

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Yorkshire Naturalists' Union

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An asterisk* indicates a peer-reviewed paper.

Front cover. Particoloured Bat, photograph by V. Grantham (see p46).
Back cover. YNU members and friends at Brockadale, photograph by P. Simmons (see p60).

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Editorial

With the appearance of this first issue of 2011, *The Naturalist* assumes a new format, mainly the result of three changes. First, in addition to fulfilling its own previous role, it will also subsume into itself the role of the *Bulletin.* Secondly, there will be fewer issues each year. Thirdly, the journal will be managed by an editorial board. This absorption of the *Bulletin* into its eminent senior journal enables us to combine the roles of two publications within a single new format journal of economical design and attractive layout, which will be issued three times each year, each issue of 80 pages.

The journal will maintain continuity with the traditions and principles which governed its predecessors. This means that it will provide a forum for both peer-reviewed papers such as previously appeared in *The Naturalist* and also for articles and notes of the sort which appeared in the *Bulletin*. Like its predecessors it will be dependent upon the scientific calibre, intrinsic interest and liveliness of contributions from the Union's individual and affiliated memberships as well as from other interested scientists and naturalists.

Throughout its long and honourable history *The Naturalist* has been noted for its inclusiveness of subject matter. The appearance of the comparatively infant *Bulletin,* if anything, broadened that inclusiveness. A major concern of the editorial team is to reach a wider readership and authorship, and to continue to encourage contributions on the diverse subjects relevant to the Union's activities and, in particular of course, to its constitutional and charitable purposes. The Field Reports on the Union's five annual Excursions into the Watsonian vice-Counties are a spinal element in recording the Union's activities in the field, and we hope to encourage more field notes and accounts, general or detailed, on Yorkshire localities and conservation concerns, especially from the members of the Affiliated Societies and Union Sections. Illustrations and visuals accompanying submitted texts are welcomed. We would also welcome the development of a varied and lively correspondence column on matters relevant to inclusions in the journal.

Your editorial team hopes and intends to maintain in this new format publication the standards of recording and reporting on Yorkshire's "fauna, flora and physical features" which are exemplified in its predecessors. We are dependent on and rely upon you, the membership and others, amateur and professional from the wider biodiversity community, to provide us with the variety of material necessary to achieve this.

John Wint: President of the YNU, 2010 - 2011

Born in Chesterfield – which is why I never truly fulfilled my potential at cricket! – I grew up and was educated in south west Sheffield close to the Derbyshire border. I developed an interest in birds (the feathered variety!) as a child though I never really activated this interest until my late twenties. By this time I was pursuing a career in insurance, where I worked for thirty-five years handling claims, mainly related to motor and industrial accidents.

I wanted to investigate bird watching more closely and so took a bird watching holiday in East Scotland, immediately discovering a life-long passion. I returned to Scotland many times and almost embarked on a new life there, running a bird watching holiday partnership. I was living in Wakefield and found my way to Wintersett Reservoir where, to cut a long story short, I began a lasting involvement in ringing, an aspect of bird study which I continue to pursue to this day. My ringing exploits have included wader ringing on the Humber and the public demonstrations of ringing at the British Bird Watching Fair. I also ring locally, mainly at two adjacent sites in farmland alongside the River Aire and both about six miles south of Selby close to where I now live. One of these is a mining subsidence flash, now called Beal Carrs, which began to develop in late 1999. This has been my main area of study and has enabled me to learn much about arable farming and the current, desperate plight of farmland birds. I now have eleven years of data for the site and have amassed for it a bird list currently totalling 175 species.

I also train others to ring and through this I am now involved in an extremely successful programme of weekend courses run jointly by the British Trust for Ornithology and the Field Studies Council at Flatford Mill, in Suffolk, where ringing is introduced to those who have never experienced it previously. I am Vice-county Bird Recorder for VC63 (South and West Yorkshire), a position which has given me a much wider perspective on the importance of bird recording and also Deputy Chairman and Development Officer within the Union's Executive.

As a Trustee I would like to help increase the participation of the county's birding community in the centralised collation of data for the benefit of the county's avifauna generally. I hope eventually to see records for all taxa gathered into a county-wide database. Then the best possible information is available to decision makers at all levels as well as to those who wish to utilise the data for analysis and the promotion of the County's flora and fauna. This should encourage membership of and affiliation to YNU, bringing much needed 'new blood' into the Union to enhance its profile and ensure its long-term future.

Alien Plants – An Ecological Perspective

G.T.D. Wilmore

Presidential Address to the Yorkshire Naturalists' Union at Bingley on 20th November 2010

Introduction

Plant ecologists spend much of their time in carrying out field surveys of land use and habitat types. This paper seeks to examine the interrelationships between ecological field survey and the occurrence of alien plants. This is a huge topic to cover and two questions have to be asked, initially, to give us some terms of reference before we can proceed further.

Firstly, why is ecological survey undertaken, for whom, and what is involved? Secondly, what is an alien plant?

Ecological surveys are undertaken, principally, to gather data about the immediate environment for use by local government planning departments, Natural England, DEFRA and a host of other statutory and non-statutory users. This information is required to inform, among other things, the local government development control process, where some change of use or other proposed development is projected, and usually is geared towards making an ecological evaluation of the nature conservation value or wildlife importance of the site or habitat. Habitat and vegetation surveys are a good starting point because, in general, the vegetation is at the base of the food chain and all other types of organism are dependent on vegetation as a starting point. The first work to be undertaken in any area is the Phase 1 Habitat Survey defined by the Nature Conservancy Council (now Natural England) in 1990 and guidelines were produced by JNCC (1993). A Phase 1 Habitat Survey is a coarse survey to identify, record and map all major habitats and vegetation communities in a region, e.g., woodland, grassland, wetlands, mires and heathlands plus man-made habitats such as amenity grasslands, disused railway land, sports fields, golf courses, urban development and marginal land. A shorthand notation is used as prescribed by JNCC (1993) for transferring the Phase 1 Habitat information to 1:10,000 maps. During this initial survey, target notes are made which identify rarer or more interesting or noteworthy habitats or vegetation communities which have been thrown up by the survey. These target notes then form the basis of a second, Phase 2, extended or more in-depth vegetation survey at each site, involving the recording of a detailed plant species list often with DAFOR abundance ratings, the use of National Vegetation Classification (NVC) techniques, the writing of a report of the survey at a sufficient level of detail to highlight all the salient ecological/nature conservation features and, most crucially, an evaluation of the overall ecological importance of the site based on the information gathered. This evaluation is made with reference to the recently devised DEFRA criteria of i) size or extent; ii) diversity; iii) naturalness; iv) rare or exceptional features; v) fragility; vi) typicalness; vii) recorded history and cultural associations; viii) connectivity with the landscape; ix) value for appreciation of nature and x) value for learning, (DEFRA, 2006). These criteria have been adapted from, but largely mirror, the Ratcliffe nature conservation criteria which formed an integral part of *The Nature Conservation Review* (Ratcliffe, 1977).

The development and use of these criteria enable a site selection process to be devised and implemented for the district or region. This site selection process has been also somewhat aided in recent years by the development of a quantifiable scoring system relating to different habitats and vegetation communities, both in terms of size of the habitat and diversity

(particularly of plant species) that it contains. For example, a Magnesian Limestone woodland of a size greater than 0.5 hectares may need to score above 12 from the plant list specified for calcareous woodlands to qualify as a Local Wildlife Site. This score of 12 is made up of commoner indicator plant species such as Dog's Mercury (*Mercurialis perennis*), which score 1 each on the list, and rarer plants such as some orchids, which score 2 each. Thus, if the woodland scores, say, 16/12 in terms of its plant diversity, this is a good indication that it should be recommended for inclusion on the Schedule of Local Wildlife Sites for the district or region. In practice, an experienced ecological surveyor on the ground will invariably come up with a similar positive evaluation of the ecological significance of the site by gut reaction after a detailed walkover survey. It is stressed that the scoring system outlined above should not be used in isolation but in conjunction with the DEFRA criteria. It should also be stated that while the above comments and the basis of ecological survey are, in very many instances, heavily weighted towards the plant communities, the occurrence of notable populations of other groups, e.g., birds, butterflies and moths, where recorded, will also add to and/or confirm the ecological evaluation and status of the site.

Secondly, what is an alien plant or introduced species? The term 'introduced species' has been formally defined by Macpherson *et al.* (1996) as: 'one which was brought to the study area by man, intentionally or unintentionally, even if native to the source area, *or* one which has come into the area without man's intervention but from an area in which it is present as an introduction'.

I choose to retain the term 'alien plant', which distinguishes it quite clearly from 'native plants', the latter having been established here over variable periods of time since the last Ice Age but without man's intervention.

The term 'alien plant' , however, needs further clarification. In recent years, modern thinking has determined that alien plants should be classified in one of three categories: *Archaeophyte; Neophyte* or *Casual,* (Preston, Pearman & Dines, 2002). *Archaeophytes* are plants which became naturalised before AD 1500, in other words ancient introductions, such as Common Poppy (*Papaver rhoeas*), and Good-King-Henry (*Chenopodium bonus-henricus*), the latter present in Roman times and once grown for its edible leaves; the new classification has resulted in around 210 *Archaeophytes* being identified. *Neophytes* are plants which were first introduced after 1500 or were only present as casuals before 1500. Numerically, this is the largest group of the three (around 1420 taxa) with many familiar examples, including two of the most pernicious weeds, - Japanese Knotweed (*Fallopia japonica*), introduced from Japan and grown in British gardens since 1825 and known in the wild from 1886, and Indian Balsam (*Impatiens glandulifera*), introduced from the Himalayas as an ornamental garden plant in 1839 with a first 'wild' occurrence in 1855. *Casuals* are those species which are present only as populations which fail to persist in the wild for more than, say, five years and are, therefore, dependent on constant re-introduction (Preston, Pearman & Dines, 2002). These include ephemerals and garden and agricultural escapes from cultivation, such as Bread Wheat (*Triticum aestivum*) and Hemp (*Cannabis sativa*) and many rare pigweeds (*Amaranthus* spp.) and goosefoots (*Chenopodium* spp.); in total, they number around 280 species. In the case of *Archaeophytes* and *Neophytes,* certainly, the recognised date of introduction refers to the first known or recorded naturalised occurrence, i.e., ' in the wild.'

Having defined our terms of reference as regards ecological surveys and alien plants, we can now proceed to examine the interrelationships between them. In approaching this huge subject it may be appropriate to consider ecological survey as the constant feature for which there are

tried and tested, laid down methods of procedure and take alien plants as the variable feature, in which the 'unknown quantity' element is present and sometimes significant.

It is proposed to continue this examination by posing various questions, some of which it may be possible to answer, some of which it will not, and these latter, unanswered questions may concentrate the mind and give us food for thought and scope for further discussion. The first, fundamental question is: How many alien plants are there in the British Isles?

How many alien plants are there in the British Isles?

In trying to determine how many alien plants are presently recognised as occurring in the British Isles, three quantifiable points of reference have been taken, ranging over the last fifty or so years, where actual numbers of species are given. There are, inevitably, bound to be discrepancies between the respective totals from each source for a number of reasons: the arrival and discovery of new species; the re-evaluation of the alien status of some microspecies, hybrids and subspecies; and the extinction or, at least, non-occurrence (and removal from later lists) of some species over the fifty year period. Notwithstanding these discrepancies, one statistic which is probably of much greater significance, for the plant ecologist at least, is the relative percentage composition of native and alien plant species making up the British flora, throughout this time.

The three reference sources cited above are the *List of British Vascular Plants* (Dandy, 1958), the *List of Vascular Plants of the British Isles* (Kent, 1992) and the *New Atlas of the British & Irish Flora* (Preston, Pearman & Dines, 2002). The following table gives a breakdown of the totals of native and alien plants listed in these three works and shows the percentage composition of each group. A regional source, the *South Yorkshire Plant Atlas* (in prep.), is given for comparison. Finally, a fifth source, broken down into two items, combining the total taxa deliberated upon in *Alien Plants of the British Isles* (Clement & Foster, 1994) and *Alien Grasses of the British Isles* (Ryves, Clement & Foster, 1996), gives the sum total of all alien plants recorded in the British Isles by the end of the 20th century (4916 taxa).

Source	Native	Alien	Total	% Native	% Alien	Total
Dandy (1958)	2764	669	3433	80.5	19.5	100.00
Kent (1992)	3087	1186	4273	72.3	27.7	100.00
Preston et al. (2002)	2200	1911	4111	53.5	46.5	100.00
S. Yorks Plant Atlas	1095	944	2039	53.7	46.3	100.00
Clement & Foster (1994)		4206			100.00	
Ryves, Clement & Foster, (1996)		710			100.00	

The data in this table are of considerable interest but one or two qualifying statements need to be made before they can be discussed. Dandy's (1958) list did not contain any dandelion (*Taraxacum*) microspecies and there seems to be much lower numbers of alien species than would be generally expected. Kent's (1992) list seems, on balance, to contain the first reasonably accurate percentage composition of natives and aliens (roughly 70% to 30%) for the late 20th century and his list also contains details of all microspecies in critical genera. Preston *et al.*'s (2002) list shows a very high overall total of species (4111) with a correspondingly high total of aliens (15.5% more than in Kent's list) but the (2002) list does not cover any microspecies in the genera brambles (*Rubus*), hawkweeds (*Hieracium*) or dandelions (*Taraxacum*). The South Yorkshire Plant Atlas list shows very close correlation with

the Preston *et al.* (2002) list in terms of percentage figures and does include whatever microspecies of critical genera have been recorded.

The most striking feature in the above table is the gradual percentage increase in the alien plant component progressively through time from Dandy (22.6%) through Kent (30.9%) to Preston *et al.* (46.5%). This latest increase to 46.5% or nearly half of all taxa recorded is, to a large extent, explained by the decision to reassess the status of the total British and Irish flora by Preston et al. (2002) as a result of evidence that suggested that many common species formerly considered native had actually been introduced by humans. Examples include Common Poppy, Shepherd's-purse (*Capsella bursa-pastoris*), White and Red Dead-nettles (*Lamium album, L. purpureum*) and, among the trees, Crack Willow (*Salix fragilis*). This reassessment has added a further 107 alien species to the South Yorkshire list and has made a corresponding reduction to the native list.

As the evaluation of the overall ecological importance of a site is invariably based on the 'naturalness', 'rare or exceptional features' and 'typicalness' criteria etc. (DEFRA, 2006, *op. cit.*), an increase in the potential stock or diversity of alien plants because of the reassessment outlined above may be viewed as detrimental to the site's ecological value. But this isn't the whole story, by any means. The next question we need to ask is: How do alien plants fit into the NVC system ?

How do alien plants fit into the NVC system?

The NVC is a system of identifying and documenting the vegetation of all natural, semi-natural and major artificial habitats in Great Britain utilising a standard description of named and logically identified and arranged vegetation types. The system was developed at Lancaster University in the last quarter of the 20th century by a team of plant ecologists headed by Dr (now Professor) John Rodwell, resulting in the appearance of the authoritative five volume edition of *British Plant Communities* (Rodwell, 1991 – 2000) which is now recognised as the standard and definitive text. Utilising the NVC system now forms a mandatory requirement of any ecological survey undertaken for Natural England, DEFRA and other statutory bodies and it is increasingly being used by a host of larger ecological consultancy firms as well as by consultants working for planning organisations within Local Government. It follows, therefore, that where vegetation communities which match or approximate to NVC criteria are present at or within sites, as for example, W8 – Ash – Dog's Mercury (*Fraxinus excelsior – Mercurialis perennis*) woodland on Magnesian Limestone or MG5 species-rich Common Knapweed - Crested Dog's-tail (*Centaurea nigra – Cynosurus cristatus*) neutral grassland, then the recognition of such features invariably confers ecological character on the site. This does not mean that the NVC system purports to be an ecological evaluation tool for use in determining site significance or nature conservation value. Rather, it is, as stated above, a descriptive and classificatory means of identifying and logically arranging vegetation types. However, it can also influence and inform the site selection process and provide information which then complements any other intrinsic merit the site may have, such as species rarity, connectivity with the landscape, recorded history or educational value. Sometimes the interpretation of the plant ecologist results in only a fine line being drawn between these two scenarios, descriptive analysis and ecological evaluation.

How does all this relate to alien plants? There is, obviously, insufficient time (or space) to trawl through all five volumes of *British Plant Communities*, so one has to be very selective in examining how the NVC system treats or incorporates the alien plant element. It should be stated at the outset that, while the NVC system is the best analytical tool for vegetation that we have and does not exclude surveying vegetation types that are very common or which include

alien species, it does not describe every vegetation community in the British Isles. On the one hand, and quite correctly in the view of most ecologists, it makes little reference to introduced coniferous plantations and only mentions selected alien coniferous species such as larches (*Larix* spp.) and spruces (*Picea* spp.) as local dominants or subordinate elements of semi-natural deciduous woodland communities. On the other hand, the ubiquitous neophyte Sycamore (*Acer pseudoplatanus*), while not being identified as a major character species of any of the 25 woodland communities discussed, features widely and frequently as a subordinate element in no less than eleven of the above communities (Rodwell, 1991). Thus, for example, a species-rich and diverse Magnesian Limestone W8 woodland of Ash, Dog's Mercury, Hazel (*Corylus avellana*), Sanicle (*Sanicula europaea*) and Early-purple Orchid (*Orchis mascula*) might be rated quite highly in ecological terms even though it may contain locally frequent Sycamore as well, because Sycamore, in itself, does not represent a significant enough element to affect or lower the overall diversity and richness, and hence, ecological significance, of the habitat.

If we now consider aquatic and swamp vegetation, the very nature of the spatial arrangement and often more rigid zonation of these communities poses something of a problem for NVC interpretation, since many of the submerged, floating-leaved and emergent populations are formed virtually of single species which dominate the community. Native species such as Common Duckweed (*Lemna minor*), Bulrush (*Typha latifolia*), Common Reed (*Phragmites australis*) and Reed Sweet-grass (*Glyceria maxima*) are well known for occurring as virtually single species populations or monocultures. The NVC system documents these as single species and gives them appropriate alpha-numeric codes, e.g., A2 (*Lemna*), S12 (*Typha*), S4 (*Phragmites*) and S5 (*Glyceria maxima*). If reference is made to the floristic tables shown in Vol 4 of *British Plant Communities* it will be noted that variable lists of other associated species are given but that these species are usually wholly subordinate to the dominant named community species. In the same way, the NVC system documents and gives named priority of alpha-numeric codes to various alien species which also often form single-species stands or populations. Thus we have A15 - Canadian Waterweed (*Elodea canadensis*) community, including Nuttall's Waterweed (*E. nuttallii*), and S15 – Sweet Flag (*Acorus calamus*) swamp as well as A7 – White Water-lily (*Nymphaea alba*) and A8 – Yellow Water-lily (*Nuphar lutea*) communities, these latter two sometimes also inevitably arising from introduced stock. These alien species have to be included, it could be argued, to present a comprehensive survey of the aquatic community. In the final analysis, however, if a wetland site is diverse enough to support, say, eight or ten NVC communities (which several in the region do, in my experience) and scores highly in consequence, two or more of these may be of alien species for which the gut reaction of some ecologists would be to discount them! The correct approach, in my experience, is to conscientiously evaluate the entire wetland habitat using the DEFRA criteria listed above, incorporating the relative proportion of the alien element of the vegetation within one's overall assessment.

Finally, in considering NVC interpretation and alien plants, a striking and unique community of plants occurred regularly in the 1980s and 1990s in various arable and crop fields around East Ardsley, Rothwell and Wakefield in West Yorkshire. These plants, known as 'shoddy' weeds, have been well documented in *The West Yorkshire Plant Atlas* (Lavin & Wilmore, 1994) and in *Alien Plants of Yorkshire* (Wilmore, 2000), both as species entries and in the text of John Rodwell's piece on *The Vegetation of West Yorkshire* (in Lavin & Wilmore, 1994). This shoddy waste was the surplus from a mixture of rags from all over Europe or further afield which was ground up and mixed with new wool to produce low grade cloth in mills centred around Dewsbury and Ossett.

These strange and exotic plants were brought in as seed with the imported rags and resulted in many first records for Yorkshire and one or two species new to Britain when the shoddy waste was spread on to crop fields as a fertiliser, with the oil in the wool component providing the active ingredient in the 'manure'. This 'shoddy' industry has very much contracted in recent years and there has been a corresponding decline in the use of wool shoddy as a dressing for arable crops, certainly since 2000. Indeed, in recent years, agricultural practices in the Wakefield area have been moving over more to cereal production than vegetable crops. Rodwell, in Vol. 5 of *British Plant Communities*, mentions this interesting plant community as a distinctive manifestation of the OV14 - *Urtica urens – Lamium amplexicaule* (Small Nettle – Henbit Deadnettle) community, which itself is an alien plant assemblage. A few of the more exotic 'shoddy' species which used to occur reasonably regularly in West Yorkshire are False London Rocket (*Sisymbrium loeselii*), Cockspur Grass (*Echinochloa crus-galli*), Spiny Cocklebur (*Xanthium spinosum*), Caterpillar Plant (*Scorpiurus muricatus*), Thorn Apple (*Datura stramonium*) (see Fig.1) and Green Amaranth (*Amaranthus hybridus*). Whilst this community was not of sufficient ecological note and was too ephemeral, to be considered as meriting local wildlife site status nevertheless, for a number of years, it was a unique and interesting phenomenon. Of the 42 communities of open habitats described in Vol. 5 of *British Plant Communities* no less than eighteen contain named alien character species. The ecological surveyor has, therefore, to exercise common sense, caution and discretion when evaluating habitats and communities containing these assemblages and be concerned to look for permanence, stability and good establishment of such communities as positive criteria in site evaluation.

Figure 1. Thorn apple, a 'shoddy' species

What about the grey areas – native or alien?

Plant ecologists evaluating habitats and vegetation communities are faced, every day of their working lives, with the problems concerning the 'grey' areas – is a species native or alien?; how can they decide which?; and how important is all this as regards the potential ecological/nature conservation value of the site being surveyed? Before going into this, it is necessary to acknowledge that a wide range of native species (and some cultivars of these) are introduced and used in grass and wild flower seed mixes, in land reclamation and amenity planting schemes, in supplementary or new woodland planting and in other designedly ameliorative treatments. The ecologist should have no quibble with this. A reclaimed colliery spoil site, for example, which is planted up with an imaginative selection of acknowledged native tree and shrub species should be welcomed and should, in time, enhance the ecological, nature conservation and biodiversity value of its area. Similarly, a newly created wild flower meadow sown with a judiciously selected wholly native seed mix can be expected, given appropriate management, to have ecological merit in the years to come.

The problem comes when the plant ecologist has to evaluate sites containing a proportion of species for which the 'experts' cannot decide the geographical cut-off between native or alien occurrence. Wilmore (2000) contains an appendix listing plant species native elsewhere in Britain which have occurred as introduced or alien species in Yorkshire. A number of these, which fall into the 'grey' area are woodland trees, shrubs and herbs which often play an important part in the site evaluation process. The most striking and widespread example is, of course, Beech (*Fagus sylvatica*), which is allegedly native only in southern England (Edlin, 1956) and yet is an important element of much woodland in our area. Hornbeam (*Carpinus betulus*), while constituting only a minor element of our Yorkshire woodland flora, is also native only in south-east England (Edlin, 1956). Yew (*Taxus baccata*) is yet another example. But how much stock of these three 'introductions' to Yorkshire is self-sown and regenerating and, to all intents and purposes, now native? This question is impossible to answer. Regionally important investigative work undertaken recently to address the question of native or alien status has been carried out by Newbould (2001) on Large-leaved Lime (*Tilia platyphyllos*) in South Yorkshire. The native and alien distribution of this tree nationally is desperately difficult to determine with confidence. Rotherham District holds a significant resource of this quite scarce species in South Yorkshire with notable loci at King's Wood, Roche Abbey and Anston Stones Wood. The evidence for native or alien status of the lime is mixed: on the one hand, Anston Stones Wood contains very mature specimens and historical evidence indicates that the wood itself was in existence before the mid 16th century, while Roche Abbey had significant areas of woodland in the early 17th century and King's Wood similarly supports mature specimens of Large-leaved Lime at the present time. On the other hand, however, it is possible that many of the trees at both sites and elsewhere in the Roche Abbey corridor arose or were planted in the last two hundred years. Conversely, the later pollen zones of the Flandrian (Holocene) period reveal that lime pollen (probably mostly *Tilia cordata,* but perhaps also containing *T. platyphyllos* pollen) has been identified along the Magnesian Limestone belt of South and West Yorkshire (Godwin, 1975). This area includes the present sites of Roche Abbey and Anston Stones Woods, so it may just be possible that Large-leaved Lime has survived and reproduced here for upwards of 7000 years. So, evidence is inconclusive and we have to view the presence of significant numbers of Large-leaved Lime, whether native or alien, as a widespread and valuable element in terms of its regional rarity, contributing to the overall nature conservation/ecological value of the Roche Abbey and Anston Stones Wood complexes.

Figure 2. Fritillary at Owston

Another example of a classic 'grey' area species is Fritillary (*Fritillaria meleagris*) (Fig.2), a scarce plant in South Yorkshire which is largely restricted to two sites, Sandbeck Park near Maltby and Owston hay meadows near Askern. Whilst the national status is mapped as native in southern and eastern England with introductions elsewhere, there is considerable doubt whether the species has ever been native in traditionally managed floodplain habitats (Preston, Pearman & Dines, 2002). Consequently, the

ecological evaluation of both the Owston and Sandbeck sites, while being enhanced by the presence of the Fritillary, does rely also on the presence of considerable habitat and other species diversity with taxa such as Cowslip (*Primula veris*), Pepper Saxifrage (*Silaum silaus*) and False Oxlip (*Primula x polyantha*) in the species-rich Owston meadow and native Mistletoe (*Viscum album*), another regional rarity, occurring in the ancient parkland habitat at Sandbeck.

Finally, one can cite the case of the nationally rare Water Soldier (*Stratiotes aloides*), which is native only in the Norfolk Broads and very locally in Lincolnshire but occurs sparingly in West Yorkshire and has been a well established introduction for nearly forty years (to my knowledge) at Beechcliffe Ings in Keighley. While this species is, indisputably, alien at the Keighley site, its long, unbroken tenure ensures that it contributes significantly to the designation of Beechcliffe Ings as a SEGI (Site of Ecological/Geological Interest) in the Bradford Local Plan Site Schedule.

Why are alien plants on the Red Data List?

Three editions of the Red Data Book for vascular plants in Great Britain (Perring & Farrell, 1977, 1983; Wigginton, 1999) were published before the appearance of the *New Atlas* (Preston, Pearman & Dines, 2002). The appearance of the *New Atlas* enabled a comparison to be made between recent-past and current distributional data for all taxa with that contained forty years earlier in the *Atlas of the British Flora* (Perring & Walters, 1962). This stimulated the drawing up of a new Red Data list for vascular plants in which the status of **all** native species and newly designated archaeophytes was analysed. This was a far wider remit than just concentrating on those species previously identified as rare or scarce. This new publication – *The Vascular Plant Red Data List for Great Britain* (Cheffings & Farrell, 2005) - follows the commitment made in *Plant Diversity Challenge : The UK's response to the Global Strategy for Plant Conservation* (JNCC, 2004), whereby all UK vascular plants are assessed using IUCN (International Union for the Conservation of Nature and Natural Resources (now the World Conservation Union, WCU)) criteria.

So why are alien plants on the Red Data List? Cheffings & Farrell (2005) give three main reasons for including archaeophytes: i) there is evidence of decline, often because of agricultural improvement, not just here but also in Europe and, consequently, the need for conservation action; ii) there is lack of a known 'native' world distribution i.e., some archaeophytes are regarded as 'alien' throughout their known world range, and arguing that if such taxa are ignored this would perhaps result in them falling through the conservation net; and iii) they should be included because of their cultural and historic importance and their 'human' connection. Whether these are valid reasons for inclusion, it is not my purpose to discuss here, and I leave the reader to form his/her own opinion.

The Red Data list contains eight IUCN threat categories. These are i) Extinct (E); ii) Extinct in the Wild (EW) (i.e., only surviving in cultivation); iii) Critically Endangered (CR) e.g., national rarities such as *Cypripedium calceolus*; iv) Endangered (EN) e.g., several rare *Alchemilla* species in the Yorkshire Dales; v) Vulnerable (VU) e.g., *Carex flava,* known only at Roudsea and Malham; vi) Near Threatened (NT) e.g., *Carex muricata* ssp. *muricata,* known only from the Malham area and two or three other locations in England; vii) Least Concern (LC) which includes all widespread and abundant taxa together with those not so widespread and abundant; and viii) Data Deficient (DD) – where insufficient data exists to enable a direct or indirect assessment of the species' status to be made.

As regards alien plants (archaeophytes), the Red Data list includes 41 taxa in the Threat Categories E to NT inclusive, of which the overwhelming majority are annual weeds and other, often short-term, colonists of arable crops and nutrient-rich, disturbed or other marginal land. These include, for example, Shepherd's Needle (*Scandix pecten-veneris*) – (CR), Corn Chamomile (*Anthemis arvensis*) – (EN) and the grass Loose Silky-bent (*Apera spica-venti*) – (NT). None of these are at all common in West or South Yorkshire but there are two taxa mentioned in the list which do occur relatively widely. These are Good-King-Henry – (VU) occurring in 53 – 1 km. squares in S. Yorkshire and Corn Spurrey (*Spergula arvensis*) – (VU) occurring in 107 – 1 km. squares in S. Yorkshire. Other scattered but widespread species in S. Yorkshire include Field Woundwort (*Stachys arvensis*) – (NT) (47 – 1 km. sq.) and Large-flowered Hemp-nettle (*Galeopsis speciosa*) – (VU) (37 – 1 km. sq.).

The species and the predominantly arable or disturbed ground habitats identified here and the data occurrences presented, throw up various points. Firstly, from an ecological survey viewpoint, arable crops and associated disturbed, nutrient-rich or marginal habitats invariably, in my experience, come low down on the scale of nature conservation/ecological value ranking and appear very seldom, if at all, in the Schedules of Designated Local Wildlife Sites. This is because the habitats and species colonists involved are often of a transient or impermanent nature and do not enjoy long term, relatively undisturbed establishment. Secondly, it is often impossible to tell if the rare archaeophytes concerned are simply casuals, occurring sporadically, or are a fairly regular feature of 'semi'- established sites (whatever these are!) and, indeed, Cheffings & Farrell(2005) recognise this very point. On the other hand, while the habitats containing these rare archaeophytes may not be of especial ecological worth *per se*, the taxa themselves will require to be noted (and probably a target note made) by the ecological surveyor to register that they are Red Data species.

Which habitat is most at threat from alien species ?

The pace of modern day life and the impact we human beings have on the environment, both directly and indirectly, results in constant fluctuation, change and modification of all habitats and vegetation communities over the shorter or longer term with corresponding, often deleterious, effects upon their ecological value. Quite often, human impact on particular habitats is evidenced by the invasion and spread of the most competitive and aggressive plant colonists and, quite often, these are alien species.

We are all familiar with the rampant growth of Indian Balsam which, when it has suitably nutrient-enriched conditions, is the tallest and most robust annual plant we have. This species can invade many different habitats: damp woodland, the environs of sewage works, roadside verges, waste ground etc., and is now a pernicious weed, widespread throughout England, Wales and parts of Scotland. It was introduced as an ornamental garden plant from the Himalayas in the 1830s and first recorded from the wild in Middlesex in 1855 (Preston, Pearman & Dines, 2002).

However, the last thirty-six years of my working life as an ecologist have led me to believe that the habitat most at threat from alien species is the wetland (i.e. open water) habitat. Wetland zones are some of the most fragile and threatened habitats we have. The dry hot summers we experienced in the 1980s and 1990s reduced or dried out many small ponds, water-filled ditches and other aquatic habitats in the West and South Yorkshire regions, which have now largely been lost. Some of these lost wetland areas were SSIs(Sites of Scientific Interest)/SEGIs, now known as Local Wildlife Sites. This series of hot summers, heralding what we now recognise as human-induced climate change, also encouraged the spread and

invasion into open water bodies of a number of alien aquatic plants which thrive in a warmer climate.

The tiny Water Fern (*Azolla filiculoides*) from the warmer parts of N. and S. America is a prime example of a species which flourishes in warmer conditions, to the extent that it can cover the entire water surface of ponds with its orange or deep red fronds. It may be attractive to look at but such a blanket of surface vegetation stops sunlight reaching submerged species in the pond itself. Another even smaller colonist is Least Duckweed (*Lemna minuta*), again from the Americas, first recorded in this country in 1977 and a year or two later made its first appearance in South Yorkshire. Again, this species can blanket water surfaces.

Canadian Waterweed and the less widespread Nuttall's Waterweed, mentioned earlier and significant enough to qualify for NVC selection, have been with us for a hundred years or more and appear submerged in many water bodies, where they reproduce by rooting broken off fragments. Several other species have been grown by aquarists or pond keepers and have escaped into open water bodies with disastrous results. New Zealand Pigmyweed (*Crassula helmsii*), Curly Waterweed (*Lagarosiphon major*), Parrot's-feather (*Myriophyllum aquaticum*) and, most strikingly and recently of all, Floating Pennywort (*Hydrocotyle ranunculoides*), are all highly invasive and competitive species which can totally dominate water bodies and disrupt or destroy the fragile ecological balance (see centre pages Plate Ia). The last species arrived in England as recently as 1990 in Essex (Preston & Croft, 1997).

Another example of human-induced environmental effects producing irruptions or sizeable invasions of alien plants is demonstrated by the South African introduction Buttonweed (*Cotula coronopifolia*). This species, known in the wild from Middlesex since 1869 (Preston, Pearman & Dines, 2002), has an affinity with saline habitats so that it particularly becomes established in coastal areas but has also, in the last thirty years, colonised the margins of subsidence flashes resulting from open cast mining in West and South Yorkshire, where it benefits from the saline run off from the disused spoil heaps (see centre pages Plate Ib).

With the prospect of further climatic amelioration taking place in the future (probably despite our puny efforts to curb carbon dioxide emissions), the outlook for the broader wetland habitat does not look good, and how many more aggressive and invasive warmth-loving or sub-tropical aliens will colonise our ponds and lakes in the future? Similarly, how many more invaders will reach our shores and become established because of humanity's direct or indirect activities. Sadly, these are yet further questions that we cannot answer!

Conclusions

A number of conclusions can be drawn about the interrelationships between alien plants and ecological field survey. These are enumerated below.

1) The first tangible statistic concerning alien plants is that data sources over the last fifty years or so indicate that they have progressively become a far more significant element in our flora, rising from 22.6% of the listed vascular plant total in 1958 (Dandy, 1958) to 46.5% in 2002 (Preston, Pearman & Dines, 2002). Reassessment of the British flora by Preston *et al*. has led to many species formerly accepted as native now being classified as alien (archaeophyte, neophyte, casual). There has also probably been a greater awareness of, and interest in, the alien element of our flora, certainly in recent years, evidenced by the appearance both of identification books such as Stace (1991, 1997, 2010), which include many alien species not covered in previous floras (e.g., Clapham, Tutin & Warburg, 1962); and checklists such as

Clement & Foster (1994) and Ryves, Clement & Foster (1996). A larger proportion of aliens may suggest that the 'naturalness' of sites and habitats may be somewhat diminished.

2) The NVC system includes many alien species in the lists accompanying the community descriptions as, indeed, is necessary in providing standard descriptions of the various vegetation types. Use of the NVC system is mandatory in surveys for government agencies and other statutory bodies and, in many cases, more ecological significance is given to sites containing vegetation communities which conform well with the NVC national conspectus. It should be stressed, however, that while the NVC system may add weight to the site assessment process it was not primarily designed to be an ecological evaluation tool but rather a descriptive and classificatory one. Where identifiable communities of alien species occur at a site, as for example Canadian Waterweed at wetland sites, surveyors should employ the DEFRA criteria in making their overall site assessment and, if the alien element of the vegetation community is well established and notable (but not invasive), it would then be incorporated in the final site evaluation.

3) The vexed question of the 'grey' areas, whether a species is native or alien, often remains unresolved even by the 'experts' at the highest level. Where the 'grey' area species is widespread or contributes significantly to the overall site value, the surveyor should, again, assess the ecological importance/nature conservation value of the site in its entirety and view the 'grey' area species within that context. Where rare native/alien species form a significant part of the vegetation at a site and have been long established, as with Water Soldier at Beechcliffe Ings, then such species will add weight towards appropriate site designation.

4) The recent Red Data List (Cheffings & Farrell, 2005) now contains a range of alien plant species for the reasons given above. Many of these are scarce or declining alien plants of arable, nutrient-rich or disturbed ground habitats, which are often ephemeral and rarely establish themselves for long periods and which, usually, do not figure importantly in the plant ecologist's range of survey work. Few, if any, such habitats appear on Schedules or lists of Local Wildlife Sites but, nevertheless, where the surveyor encounters Red Data species they should be recorded and target noted.

5) Wetland is the author's personal choice of habitat most at threat from alien species. A range of factors including climatic amelioration in recent years, indiscriminate introduction or escape of exotic aquarium or other aquatic species and the vegetative reproduction of some species, have all contributed to significant invasions of some particularly aggressive aquatic species into our water bodies. These factors have, in many extreme cases, led to a complete loss of this fragile habitat or, at least, to a reduction in wildlife value. Sadly, this trend may be set to continue.

In summary, alien plants do form a significant element of our flora and may be on the increase as climatic change, the pace of modern living and the ease of global communication and travel are all factors aiding their spread. One final question requires to be asked and it is this: of what ecological importance are alien plants, in general, in the overall site evaluation process? This question, like several others posed in this paper, has no cut and dried answer. However, it is probable that, in a number cases, alien plants do not contribute significantly to the nature conservation/wildlife value of sites and in some habitats (e.g., wetlands, discussed above) they can be positively detrimental. But, then again, there are notable exceptions to this viewpoint!

The plant ecologists of the future will be required to take all the factors and variables discussed above into consideration when undertaking site survey and evaluation.

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Pellets: Coughing Up The Truth Or Flight Of Fancy?

Anthony Wardhaugh

Some time ago, when watching the birds in my garden I was surprised to see a European Robin (*Erithacus rubecula*) regurgitate a pellet. Why did it do this? The pellet appeared to be composed of grit, the exoskeletons of small insects, small seeds and other vegetable matter and was about 9mm in length (Fig. 1). Lack (1970) states that pellet production by the European Robin is not infrequent and describes similar contents to the above for four pellets. Owls are perhaps better known as producers of pellets but this is a widespread phenomenon among birds, occurring commonly in raptors, crows, gulls, waders, herons, shrikes, cuckoos, kingfishers and storks (Brown *et al.* 1999). For owls in particular, where pellets are often produced on a regular basis at the birds' daytime roosting site, these can be of considerable value in providing information about diet.

Figure 1. Robin pellet

What indigestible remains do the pellets of owls and other birds contain? How can they be studied in order to obtain meaningful information? What are the pitfalls that can affect interpretation of the data obtained? At a more fundamental level, why do birds produce pellets at all?

The layout of the alimentary canal of a bird is broadly similar to that of a mammal but there is a good deal of variation between species (Young 1981). When food is swallowed it passes down the oesophagus (or gullet). In many birds, notably grain and fish eating species, the lower end of this is expanded to form the crop which acts as a bag-like storage area. The crop is usually small, or not present at all, in insectivorous and carnivorous species, being absent in owls (Welty and Baptista 1988). Food then passes to the stomach which is typically divided into two parts, a glandular proventriculus and a muscular gizzard. The proventriculus produces protein digesting enzymes and the gizzard often has a horny lining which assists in maceration of food.

It appears that in a number of bird species the gizzard acts in part as a trap, preventing sharp, indigestible constituents of the food eaten from passing any further along the alimentary canal. This may include items such as bones and bone fragments, teeth, fur, feathers, insect exoskeletons or plant remains (Welty and Baptista 1988). These remains become compacted to form a more or less elliptical pellet which is then regurgitated.

In practice, obtaining pellets produced by many bird species is serendipitous but some, notably many owl species, produce pellets whilst at their roosting or nesting sites which allows the possibility of systematic collection and study. It should be noted that for some species, such as the Barn Owl (*Tyto alba*), it is necessary to obtain a licence from Natural England in order to visit a nest site. In essence, pellets can be teased apart dry with the aid of forceps, although they can be softened in water and detergent first. Skulls, lower jaws and any other bones or materials of note can be extracted, cleaned and identified as far as possible (Plate 1c, Centre pages). Brown *et al.* (1999) and Yalden (2009) provide excellent information on the study of pellets and the prey remains that they contain.

Thus far, working with pellets is comparatively straightforward but care needs to be taken in the interpretation of the data collected, notably in trying to assess the relative importance of different prey species in the diet if a series of pellets is being studied. The first, quite obvious problem is that not all prey species are of the same mass. For example a Pygmy Shrew (*Sorex minutus*) weighs as little as 4g but a Brown Rat (*Rattus norvegicus*) 100g or sometimes much more. This difficulty can be overcome to a reasonable extent by conversion of prey numbers to a notional mean mass for the species. Suitable figures are provided by Yalden (2009). The contribution of each prey species to the diet as a percentage by mass can then be estimated, as was first done by Southern (1954). The next problem is how to express these data for the purposes of comparison between pellet samples or different studies. Conventionally this is done per pellet, a procedure not entirely without its drawbacks. Firstly pellets of some species, notably those of the Tawny Owl (*Strix aluco*), can be quite soft on production and liable to break up on impact with the ground. Typically, Tawny Owls roost on a tree branch close to the trunk, a few metres above ground level. Pellet fragments from such sites can be grouped to make an estimate of an equivalent number of whole pellets but, as anyone who has attempted to do this will be aware, it can be a somewhat subjective process. Secondly, different species produce pellets of different sizes so a direct comparison between species of the relative importance of different prey is not easy. A partial solution is to convert mean prey masses to a percentage of the total prey mass identified but expression per pellet can remain a problem. There seem to be two possible alternatives to expression of data per pellet. Firstly, pellets could be dried to a constant mass in a cool oven (i.e. to remove variable amounts of water) and data expressed as estimated mass of prey species per unit mass of pellet. This would be a fairly simple procedure but only for those with access to suitable laboratory drying and weighing equipment[1]; there do not appear to have been any studies carried out on this basis. A simpler alternative is to express data as estimated mass of prey species per unit volume of pellet. Usually pellets can be collected in a fairly dry condition and their volume seems to be very little affected on further drying, although their mass may be. Volume can be estimated by simple displacement, not in water but in fine, dry sand using a large measuring cylinder; a technique that has been used in one study with satisfactory results (Wardhaugh, 1997).

Further interpretation of the data must be done with care and it should be remembered that, however expressed, any figures represent the estimated proportion of prey species identified in pellet samples and no more. Such problems have been discussed elsewhere (e.g. Wardhaugh 1983, Altringham *et al.* 1994). They include the complication that pellets collected at a roost site may be from more than one bird, something which may even be the case for species which are supposedly solitary outside the breeding season, such as the Tawny Owl (e.g. Mead 1987, Wardhaugh 1997). Prey may be incompletely eaten or shared by two or more birds. Furthermore, the bones of some species may be digested more easily than those of others. In one experimental study involving captive Tawny Owls, a careful record of food intake was kept and all pellets analysed. It was found that about 85% of the Short-tailed Voles (*Microtus agrestis*) eaten were represented by remains in pellets whereas 67% of Bank Voles (*Clethryonomys glareolus*), 60% of Wood Mice (*Apodemus sylvaticus*) and only 40% of House Mice (*Mus musculus*) were represented (data of V.P.W. Lowe, quoted in Southern 1969) (Centre pages plate 1c). Consequently data obtained from pellet analysis may show a bias toward the less digestible prey species and moreover, this may vary between different species of predator. Among raptors, the Common Buzzard (*Buteo buteo*) and Common Kestrel (*Falco tinnunculus*) are known to tear up their mammalian prey before eating it and they are able to

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[1] Editor's comment: A normal domestic food drier used for drying fungi, vegetables and fruit can be used for drying bird pellets. Food driers are available on line and from many kitchen shops. Any fine electronic or spring balance can be used for weighing.

digest some bones completely (Yalden 2009 and references therein). All of the above relates to the identification of vertebrate prey species and the significance of invertebrates in the diet even of species such as the Tawny Owl should not be overlooked. For example by using infra-red binoculars, Tawny Owls have been observed to eat significant numbers of earthworms (Macdonald 1976). For any species, diet may vary between different geographical regions or between habitats. It may also vary with season and there could be differences in diet between males, females and juveniles (e.g. Southern 1969). Careful study can reveal such variation but combining data (or pellet samples) from a variety of habitats or over a period of time will obscure any such details and provide a more general indication of diet.

At a more fundamental level there remains the question as to why birds produce pellets at all. In the case of owls reasons given include the fact that gastric juice secreted into the stomach is not very acidic and so is not well suited to the digestion of bones, the pyloric sphincter (the exit from the stomach) is rather small, sharp pieces of broken bone could damage the intestine wall and indigestible matter could block the intestines (Burton 1980). With respect to the first two reasons above, one might ask why natural selection has not equipped owls with more acidic gastric juice, better able to digest bone, as is the case in some raptors. And why is the pyloric sphincter not larger? It is perhaps true that bone fragments reaching the intestines could be harmful; grebes are known to pluck their own feathers and swallow them possibly either to line the stomach wall to protect it from damage by sharp fish bones or to plug the exit from the stomach for long enough to permit fish bones to be dissolved by stomach acid before passing on into the intestine. The stomach exit of the Anhinga (*Anhinga anhinga*) is said to be covered with a grating of hair-like fibres that seem to prevent the passage of undissolved fish bones (Welty & Baptista 1988).

Perhaps the phenomenon of pellet production by birds requires consideration from a different viewpoint; it could be a beneficial adaptation rather than a necessary consequence of the apparent inadequacies of the digestive system and that some of the latter, such as a narrow pyloric sphincter, are in fact adaptations to facilitate pellet production. Indigestible or unwanted material in the food can be voided much more rapidly by regurgitation in the form of pellets than if it were allowed to pass the full length of the alimentary canal. This could be of benefit to birds as a weight saving adaptation. Any reduction in mass will reduce the energy cost of flight and much of the anatomy of birds appears to be adapted to this end. For example bones of birds are typically thin and the long bones hollow and air filled. Female birds possess only one ovary and oviduct, not two as in mammals whilst in males, there is just one testis, dormant and much reduced in size outside the breeding season. Urine is excreted, at some energy cost to birds, in the form of the familiar white, semi-solid uric acid paste. This means birds have no need to store bulky liquid urine and so they have no urinary bladder.

But how close are birds to the maximum mass that they are able to support during take off and flight such that the ejection of pellets, or any other apparent mass saving adaptation, would be sufficient to represent a selective advantage? This is a question that it would be very difficult to investigate. Even the apparently simple question of the energy cost of flight itself has tested the ingenuity of investigators and proved to be beset with pitfalls (Videler 2005). Hence the relative contribution of apparent mass reduction adaptations to energy efficiency would be an even more problematic area of investigation.

Just why so many bird species produce pellets thus remains an intriguing question and the answer may not necessarily be the same for all. When fresh, the European Robin pellet in Figure 1 would be about 1.5 to 2% of the mass of a typical bird. Would this mass have any

significant effect on flight efficiency if not regurgitated? On the basis that every little helps it is tempting to suggest that it might.

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The Crackles Bequest Project

Michelle Farrell & Jane Bunting

This began in January 2010 at the University of Hull, is well underway and preliminary results will be presented at an open day on 22nd October 2011. The project is funded by a bequest from the will of Dr F. Eva Crackles, a former President of the YNU and a member since 1943.

In keeping with Eva's interests, the project is centred on field botany and has three main components: research into the relationships between plants and climate; education and training to help develop a new generation of field taxonomists; and the establishment of a longer-term research resource within the university, the Crackles Comparative Collection. The project has a northern European scope and will focus on species of three key habitats: traditionally managed nutrient-poor grassland, woodland and heath, which have considerable ecological and conservation value in the East Riding.

Preliminary results from fieldwork in the East Riding of Yorkshire, Sweden and Germany will be presented at a one-day workshop *The Crackles Legacy: Plants and Climate in East Yorkshire and Beyond*, to be held in the Cohen Building at the University. You will also hear about opportunities to get involved with the project. Registration is free and refreshments and lunch will be provided. The event will begin at 9.30am and finish at 3.00pm.

If you would like to attend please email your contact details to crackles@hull.ac.uk in order to register your interest, and further information will be sent to you in due course. Alternatively, you can write to us at Department of Geography, University of Hull, Cottingham Road, Hull, HU6 7RX.

Turnover of freshwater-plant taxa: the example of an ornamental lake in East Yorkshire*

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Abstract
Aquatic and wetland plants were recorded at Thwaite Lake, Cottingham, in 2008 to 2010 and comparison with pre-1988 records suggested that many species had apparently been gained and many lost (17 gains, 29 losses); introduced taxa were especially liable to be lost. Possible reasons for gains and losses included site management, year-to-year variation in climate, nutrient enrichment, natural colonization, anthropogenic introductions, and intermittent pollution. The study supports the suggestion that plant communities at artificial freshwater sites are unlikely to be static; they are subject to change driven by both natural events and human influence.

Introduction

Aquatic-plant species sometimes persist for many years at artificial freshwater sites; for example Greenwood (2005) listed 15 species of freshwater plants that had colonized the Lancaster Canal before 1907 and were still present in 2000. In East Yorkshire, Crackles (1968) concluded that the nationally rare species *Calamagrostis stricta* (Narrow Small-reed) found in the Leven Canal in 1951 had originated from lost meres through which the canal was excavated around 1802. Several authors (Robinson, 1923; Crackles, 1968; Goulder, 2000) have suggested that the species-rich aquatic-plant flora of the extensive system of drains in East Yorkshire, largely dating from the eighteenth and nineteenth centuries, is to an extent derived from the ancient post-glacial flora of the shallow lakes or meres that were once widespread but were lost from the medieval period onwards (Sheppard, 1957).

Notwithstanding the evidence for stasis there is likely to be a coming and going of plant species at artificial freshwater sites. Freshwater plants are surprisingly mobile (Preston and Croft, 1998). Seeds, turions, rhizomes and vegetative fragments are liable to distribution by a variety of mechanisms that include currents, floods, boats, fishing tackle, waterfowl, and wind. Water plants are also introduced for bank stabilization and amenity. New sites are, therefore, rapidly colonized; for example six gravel-pit lakes that were excavated on arable land at North Cave in East Yorkshire during the 1980s and 1990s had acquired 26 species of freshwater macrophyte by 2001 (Goulder, 2002). Environmental conditions at established freshwater sites are, however, liable to temporal change which can lead to loss of species; Braithwaite *et al.* (2006) suggest that adverse environmental pressures include: eutrophication; piling of channel margins causing loss of shallow water and marginal vegetation; restoration of disused canals to navigation; conversion of grazing marsh – with species rich dykes – to intensive arable farming; abstraction from aquifers leading to drying-out in summer; increased numbers of native and feral geese – which graze aquatic plants and cause enrichment through their droppings. Gain and loss is illustrated at the Lancaster Canal where Greenwood (2005) listed five aquatic species that were gained between 1940 and 2000 and 11 species that were present before 1940 but were apparently lost by 2000; three other taxa had been gained and then lost between 1940 and 2000. Similarly, in East Yorkshire, six aquatic plant species were recorded in the Pocklington Canal in 2002 that were not recorded in a 1986 survey, while 12 taxa recorded in 1986 were not found in 2002; one species, the alien *Azolla filiculoides* (Water Fern), was gained and lost between 1986 and 2002 (Goulder, 2003).

The purpose of the study described in the present contribution was to investigate gain and loss of aquatic plants at an artificial freshwater site: an ornamental lake in Cottingham, East Yorkshire. The lake (Grid Ref. TA 054 328) is within the 13 ha gardens of Thwaite House and was excavated sometime between 1872 and 1892 along the course of an existing stream (Raine, 1988). Around 1930 the house became student accommodation and the gardens and lake have since been maintained by the University of Hull. In 1992 the lake and gardens were listed Grade II on the English Heritage Register of Parks and Gardens of Special Historic Interest (Site Reference No. 1033) being an example of a nineteenth century garden and pleasure ground. The lake is long and narrow: length east-west about 390 m, width mostly 15-20 m, area 0.89 ha. It is shallow (<1 m), has a muddy bottom, and is fed by a small stream and springs at its west end; there is a weir that controls water level at the east end. There is lawn up to the water's edge along much of the south side while on the north side there is extensive tree cover of principally Horse-chestnut (*Aesculus hippocastanum*) with some Willow (*Salix* sp.) and Ash (*Fraxinus excelsior*).

Freshwater plants at Thwaite Lake

The author recorded freshwater plants in the lake and around its margin in May/June 2008 to 2010 and in September 2010. It is good practice to use a checklist when recording freshwater plants, to further comparisons between work at different times or sites or by different recorders (Goulder, 2008), hence a checklist of aquatic vascular plants that occur in England and Wales, compiled by Palmer and Newbold (1983), was used. In addition, all encountered species of *Carex* and *Juncus* plus additional wetland species (indicated in Table 1) were recorded.

Forty-three taxa were recorded in 2008 to 2010 (Table 1); nomenclature follows Stace (2010). Most were growing at the lake margin, either as emergent plants or terrestrially on damp soil. Amongst these the species that were sometimes abundant or locally dominant were *Carex pendula* (Pendulous Sedge), *C. riparia* (Greater Pond-sedge), *Epilobium hirsutum* (Great Willowherb), *Glyceria maxima* (Reed Sweet-grass), *Impatiens glandulifera* (Indian Balsam), *Iris pseudacorus* (Yellow Iris), *Juncus articulatus* (Jointed Rush), *J. bufonius* (Toad Rush), *J. effusus* (Soft-rush), *Lythrum salicaria* (Purple-loosestrife), *Mimulus guttatus* (Monkeyflower), *Myosotis scorpioides* (Water Forget-me-not), *Nasturtium officinale/microphyllum* (Water-cress), *Phragmites australis* (both Common Reed and a polyploid giant reed), *Ranunculus sceleratus* (Celery-leaved Buttercup), *Solanum dulcamara* (Bittersweet), *Typha latifolia* (Bulrush) and *Veronica beccabunga* (Brooklime). A *Callitriche* species, probably *C. obtusangula* (Blunt-fruited Water-starwort), which was abundant, was the only submerged plant observed. Floating-leaved plants were absent apart from fronds of *Lemna minor* (Common Duckweed) and *L. trisulca* (Ivy-leaved Duckweed).

Some of the plants recorded in 2008 to 2010 are aliens: Indian Balsam is a widespread invader of damp places; *Cyperus eragrostis* (Pale Galingale) and *Mimulus guttatus* are often planted in water gardens and the latter has become widely naturalized; *Primula pulverulenta* (Red Cowslip) is sometimes planted in water gardens while this record appears to be the first for it being naturalized in VC 61, SE Yorkshire, (Richard Middleton, *pers. comm.*); the giant reed, which reaches a height of 4 m and is conspicuous on the south side of the lake, is believed to be an octopolyploid (*Phragmites australis* var. *gigantissima*) with its origins in the Danube Delta (Raicu *et al.*, 1972) which was planted in the lake in the 1990s (Victor Swetez, pers. comm.). Some of the other plants recorded, while native, are often introduced into water gardens; e.g. *Caltha palustris* (Marsh-marigold), *Carex pendula*, *Iris pseudacorus* and *Lythrum salicaria*.

Table 1
Aquatic and wetland plants recorded at Thwaite Lake before 1988 and in 2008-2010.

Recorded both before 1988 and in 2008-2010

***Callitriche obtusangula* (Blunt-fruited Water-starwort)**[d]
Caltha palustris (Marsh-marigold)[ab]
Cardamine flexuosa (Wavy Bitter-cress)*[de]
Cardamine pratensis (Cuckooflower)*[adef]
Carex hirta (Hairy Sedge)*[ae]
Carex otrubae (False Fox-sedge)*[ace]
Carex pendula* (Pendulous Sedge)[a]
***Carex riparia* (Greater Pond-sedge)**[ad]
Epilobium hirsutum* (Great Willowherb)[adef]
Equisetum palustre (Marsh Horsetail)[df]
Filipendula ulmaria (Meadowsweet)*[aef]
***Iris pseudacorus* (Yellow Iris)**[abf]
***Juncus effusus* (Soft-rush)**[abef]
Juncus inflexus (Hard Rush)*[ae]
Lemna minor (Common Duckweed)[af]
Lythrum salicaria* (Purple-loosestrife)[ae]
Mentha aquatica (Water Mint)[a]
Mimulus guttatus* (Monkeyflower)[a]
***Myosotis scorpioides* (Water Forget-me-not)**[ae]
***Ranunculus sceleratus* (Celery-leaved Buttercup)**[af]
Rorippa palustris (Marsh Yellow-cress)*[df]
Scrophularia auriculata (Water Figwort)*[adef]
Senecio aquaticus (Marsh Ragwort)*[ae]
***Solanum dulcamara* (Bittersweet)**[a]
***Typha latifolia* (Bulrush)**[ab]
***Veronica beccabunga* (Brooklime)**[b]
n=26

Recorded in 2008-2010 but not before 1988

Agrostis stolonifera (Creeping Bent)
Apium nodiflorum (Fool's-water-cress)[ef]
Cyperus eragrostis (Pale Galingale)*
Epilobium parviflorum (Hoary Willowherb)*
Galium palustre (Common Marsh-bedstraw)[e]
Glyceria fluitans (Floating Sweet-grass)[f]
***Glyceria maxima* (Reed Sweet-grass)**
Impatiens glandulifera* (Indian Balsam)[f]
Juncus articulatus* (Jointed Rush)
Juncus bufonius* (Toad Rush)[ef]
Lemna trisulca (Ivy-leaved Duckweed)
***Nasturtium officinale* agg. (Water-cress)**[f]
Phalaris arundinacea (Reed Canary-grass)
***Phragmites australis* (Common Reed)**[ef]
Phragmites australis* var. *gigantissima* (Giant Reed)
Primula pulverulenta (Red Cowslip)*
Pulicaria dysenterica (Common Fleabane)*

n=17

Recorded before 1988 but not in 2008-2010

Acorus calamus (Sweet-flag)[ab]
Alisma lanceolatum (Narrow-leaved Water-plantain)[a]
Bolboschoenus maritimus (Sea Club-rush)[ab]
Callitriche stagnalis (Common Water-starwort)[a]
Carex acutiformis (Lesser Pond-sedge)[d]
Carex sylvatica (Wood-sedge)*[a]
Comarum palustre (Marsh Cinquefoil)[a]
Cyperus longus (Galingale)*[b]
Epilobium palustre (Marsh Willowherb)*[d]
Geum rivale (Water Avens)*[a]
Hippuris vulgaris (Mare's-tail)[b]
Hydrocotyle vulgaris (Marsh Pennywort)[ae]
Hypericum tetrapterum (Square-stemmed St John's-wort)*[de]
Iris spuria (Blue Iris)*[b]
Juncus conglomeratus (Compact Rush)*[a]
Juncus tenuis (Slender Rush)*[ace]
Menyanthes trifoliata (Bogbean)[a]
Oenanthe sp. (Water-dropwort)[a]
Potamogeton natans (Broad-leaved Pondweed)[a]
Ranunculus aquatilis (Common Water-crowfoot)[d]
Ranunculus flammula (Lesser Spearwort)[ae]
Ranunculus lingua (Greater Spearwort)[a]
Ranunculus trichophyllus (Thread-leaved Water-crowfoot)[d]
Rumex hydrolapathum (Water Dock)[ae]
Schoenoplectus lacustris (Common Club-rush)[ab]
Silene flos-cuculi (Ragged-Robin)*[ae]
Sium latifolium (Greater Water-parsnip)[ae]
Sparganium erectum (Branched Bur-reed)[a]
Stratiotes aloides (Water-soldier)[a]

n=29

Bold type indicates plants that were abundant or in places dominant sometime in 2008-2010.
*Indicates wetland taxa not on the Palmer & Newbold (1983) checklist of aquatic plants (all *Carex* and *Juncus* spp. encountered were recorded in 2008-2010).
[a]Included in the Raine (1988) list of herbs "British natives, endemic and introduced" at Thwaite Hall Gardens.
[b]Included on the probably 1950s or 1960s sketch map of the bog garden; exotic taxa, not reconcilable with Stace (2010) have been disregarded.
[c]Herbarium specimens in the Hull Museums Collection (HLMA) (collected 1985).
[d]Herbarium specimens in the University of Hull Herbarium (HLU) (collected 1929-1957).
[e]Taxa cultivated at the University Botanic Gardens in the 1980s for aerenchyma research (listed by Justin and Armstrong, 1987).
[f]Taxa recorded in 1 km square TA0532 in 1998 and/or 2000 for the *Millennium Atlas* (an unspecified *Callitriche* was also recorded); these records are not necessarily for Thwaite Lake.

There are also some published and unpublished records of freshwater plants at Thwaite Lake. Raine (1988) includes a list of 114 herbs recorded in Thwaite Gardens. Twenty six of these are freshwater plants, in the sense that they appear on the Palmer and Newbold (1983) checklist; others are wetland plants. It is evident, therefore, that plants in and around the lake were recorded and included in this list. The origin of the list is uncertain (Pat Raine, *pers. comm.*), and it is incomplete in that no grasses are included, but it dates possibly from the 1980s when it was obtained by the Cottingham Civic Society which at that time was collecting information about the gardens because they were threatened by development. This suggestion is supported by the botanical nomenclature used, which is largely that of Clapham, Tutin and Warburg's *Flora of the British Isles*. The second edition (Clapham *et al.*, 1962) appears to have been followed. This is suggested by, for example, the use of "*Silene alba"* for White Campion rather than "*Melandrium album"* which is used in the first edition (Clapham *et al.*, 1952), and by the use of "*Scrophularia aquatica"* for Water Figwort instead of "*Scrophularia auriculata"* which is used in the third edition (Clapham *et al.*, 1987).

Twenty-one of the wetland and water plants that feature on the Raine (1988) list were recorded in 2008 to 2010 (Table 1). There were also 21 wetland/aquatic taxa that are on the Raine (1988) list but were not recorded in 2008 to 2010. In addition, however, there were 22 wetland/aquatic taxa that were recorded in 2008 to 2010 that are not on the Raine (1988) list.

A further source of information, specifically about introduced plants, is an unpublished sketch map of a bog garden that once existed at the western end of the lake; this bog garden is described as being "used for growing bog plants with *Primula* species" in an undated guide to the gardens that, from textual clues, is later than 1970 and appears to date from the early 1970s (Anon., undated). The sketch map is of uncertain date and origin but is likely to have been drawn in the 1950s or 1960s (Anne Braithwaite, *pers. comm.*). It shows location and names of plants, although it lacks a scale and reconciliation with specific locations on the ground is no longer possible. The water and wetland plants that are shown on this sketch map are a mixture of native taxa, some of which are horticultural varieties, and aliens. These native plants, plus the alien taxa that are reconcilable with species that feature in Stace (2010), are included in Table 1. Five of these sketch-map taxa were recorded in 2008 to 2010; six were not.

More information is provided by preserved plant specimens that were collected from Thwaite Hall Gardens and are held in herbaria at Hull City Museums (HLMA) and Hull University (HLU). The catalogues of these herbaria are available on-line through the BSBI Small British Herbaria Project (www.herb.hull.ac.uk/SBHP). The Hull Museums' herbarium includes two wetland taxa from Thwaite Hall Gardens, *Juncus tenuis* (Slender Rush) and *Carex otrubae* (False Fox-sedge), both collected in 1985; of these the sedge was also recorded in 2008 to 2010 (Table 1). The Hull University herbarium has 13 aquatic and wetland taxa that were collected from Thwaite Hall Gardens between 1929 and 1957; eight of these were recorded in 2008 to 2010 (Table 1).

Also relevant is the fact that diverse water and wetland plants were introduced to the bog garden area in the mid 1980s (Anne Braithwaite and Victor Swetez, pers. comm.). These plants had been grown for physiological research, on soil-water regime and the development of aerenchyma, at the University Botanic Garden. Ninety-one taxa were used in this research, including 62 water/wetland- and intermediate-wetland species, some freshwater and some salt-marsh plants which were mostly native species; the species used are listed by Justin and Armstrong (1987). There are no records as to which of these species were planted at the lake side but those that were recorded in 2008 to 2010 are indicated in Table 1.

More information about plants at Thwaite Lake is provided by *The Plants of Hull: a Millennium Atlas*. This is a web-based resource (Hull Natural History Society, 2000) which maps the distribution of plants in Hull and its suburbs based upon records for 1 km squares. Recorders visited the lake in June 1998 and July 2000 (Richard Middleton, *pers. comm.*). 174 taxa were recorded for the square that includes Thwaite Lake (TA0532); these included 16 water/wetland taxa that were also recorded at Thwaite Lake in 2008 to 2010 (indicated in Table 1). One freshwater species (*Persicaria amphibia*, Amphibious Bistort) features in the *Millennium Atlas* but was not recorded at the lake in 2008 to 2010. Note, however, that the square TA0532 includes aquatic sites other than Thwaite Lake (becks and at least one pond) hence the *Millennium Atlas* records may not all pertain to Thwaite Lake.

Discussion

There have clearly been many gains and losses in the freshwater and wetland plants at Thwaite Lake (Table 1). The evidence for gains is that only 26 of the 43 taxa recorded in 2008 to 2010 had also been recorded before 1988, i.e. they were included in the Raine (1988) list and/or featured on the earlier sketch map of the bog garden and/or were in the herbarium collections. Seventeen taxa were new. Some of these are relatively inconspicuous (e.g. *Juncus bufonius*, and *Lemna trisulca*) and may have been overlooked by the compiler of the Raine (1998) list, and would have been omitted from the sketch map because they had not been planted in the bog garden; others, however, are conspicuous and are less likely to have been overlooked (e.g. *Glyceria maxima*, *Impatiens glandulifera*, and *Phragmites australis*). The evidence for losses is that there were 29 species that were recorded pre-1988 but were not found in 2008 to 2010.

There are many processes that have potentially contributed to these gains and losses.

(1) Management. The lake is shallow and left to itself would undergo silting, hydroseral succession and terrestrialization; a process that involves natural change in the species composition of plants with favouring of wetland and emergent aquatic species over submerged and floating-leaved species. Throughout the lake's history dredging will from time to time have been undertaken. In recent years, for example, there was some dredging around 2004 and extensive dredging was undertaken in autumn 2009 along with some tree clearance on the north side of the lake (Joe Garner, pers. comm.). The evidence of this most recent work, as observed in March 2010, was that the dredged silt had been dumped along the long southern margin of the lake forming a lumpy mound along the lake side, an island at the west end of the lake had been restored, and the inflow stream had been deeply dredged. By May 2010 it was evident that the emergent aquatic vegetation along the south margin was thriving. Plants were growing through the spoil and there was also extensive growth from displaced rhizomes within the heaped spoil; most conspicuous being *Iris pseudacorus* and *Phragmites australis*. Furthermore *Ranunculus sceleratus* and *Callitriche* seedlings were widespread on muddy surfaces; although many of these seedlings did not survive to September. Also, the inflow stream had become widely colonized by *Apium nodiflorum* (Fool's-water-cress) and *Nasturtium officinale* agg. An extensive seed bank had clearly been disturbed by the dredging operation. A significant apparent loss, however, was *Primula pulverulenta* which had become naturalized on silt that had accumulated between the island and the shore at the west end of the lake. On the whole it is likely that dredging, by maintaining diversity of habitat and by disturbing the seed bank, leads to continuance of high plant-species richness.

(2) Variation in climate. There are substantial year-to-year variations in water level in the lake; in dry summers the lake bed is liable to become largely dry whereas in wet years the water level remains high and the lawns to the south of the lake are waterlogged. The author has no

specific information about how the aquatic plants at Thwaite Lake have responded to this variation but change in the plant community in response to a series of dry years, as in 1988-1992 (Marsh *et al.*, 1994), or wet years as in the late 2000s, is possible. Many of the 17 species that were recorded in 2008 to 2010, but not before 1988 (Table 1), may have benefited from the high water levels that prevailed through the late 2000s – indeed at this time many aquatic species were colonizing waterlogged areas of lawn to the south of the lake.

(3) Nutrient enrichment. There is the potential for long-term increase in inorganic-nutrient status and biological enrichment at Thwaite Lake. The inflow stream collects water from the urban environment of Cottingham village and ground-water inputs originate from within the intensively cultivated Thwaite Gardens – sources that are liable to be nutrient rich. There are also nutrient inputs with falling leaves from surrounding trees. A clue to the nutrient status of a site is often given by the plants that are present; particular species tend to be associated with specific nutrient conditions. Ellenberg's N values for British plants (Hill *et al.*, 1999) indicate the soil-fertility preference of plant species on a numerical scale of 1-9, with 1 indicating plants of extremely infertile sites and 9 indicating preference for extremely rich conditions. The mean Ellenberg's N value for the 26 taxa recorded at Thwaite Lake both before 1988 and in 2008 to 2010 (Table 1) equalled 5.81, while for the species that were recorded before 1988 but not in 2008 to 2010 the mean value (for the 27 taxa for which Ellenberg's N values are available) was 5.00. Six of the apparently lost taxa have an Ellenberg's N value of 3; *Comarum palustre* (Marsh Cinquefoil), *Epilobium palustre* (Marsh Willowherb), *Hydrocotyle vulgaris* (Marsh Pennywort), *Juncus conglomeratus* (Compact Rush), *Menyanthes trifoliata* (Bogbean) (Fig.1) and *Ranunculus flammula* (Lesser Spearwort). In contrast only one (*Equisetum palustre*, Marsh Horsetail) of the 26 taxa that were still to be found in 2008 to 2010 has an Ellenberg's N value as low as 3. It is likely that some of the losses are related to enrichment; the plants that are adapted to low-nutrient conditions being less-able competitors in more nutrient-rich conditions.

4) Colonization. Some gains in species are likely to be through natural colonization. The becks and ditches in Cottingham that merge to become the inflow stream of Thwaite Lake support freshwater and wetland plants; in May 2010, for example, the author recorded *Agrostis stolonifera* (Creeping Bent), *Alisma plantago-aquatica* (Water-plantain), *Angelica sylvestris* (Wild Angelica), *Apium nodiflorum*, *Callitriche* sp., *Cardamine pratensis* (Cuckooflower), *Epilobium hirsutum*, *Lemna minor*, *Myosotis scorpioides*, *Nasturtium officinale* agg., *Ranunculus sceleratus*, and *Scrophularia auriculata.* The inflow stream is, therefore, likely to carry seeds and vegetative propagules into the lake, to found new populations or reinforce existing ones. Most (10 out of 12) of the beck/ditch taxa were also found in the lake in 2008 to 2010; these

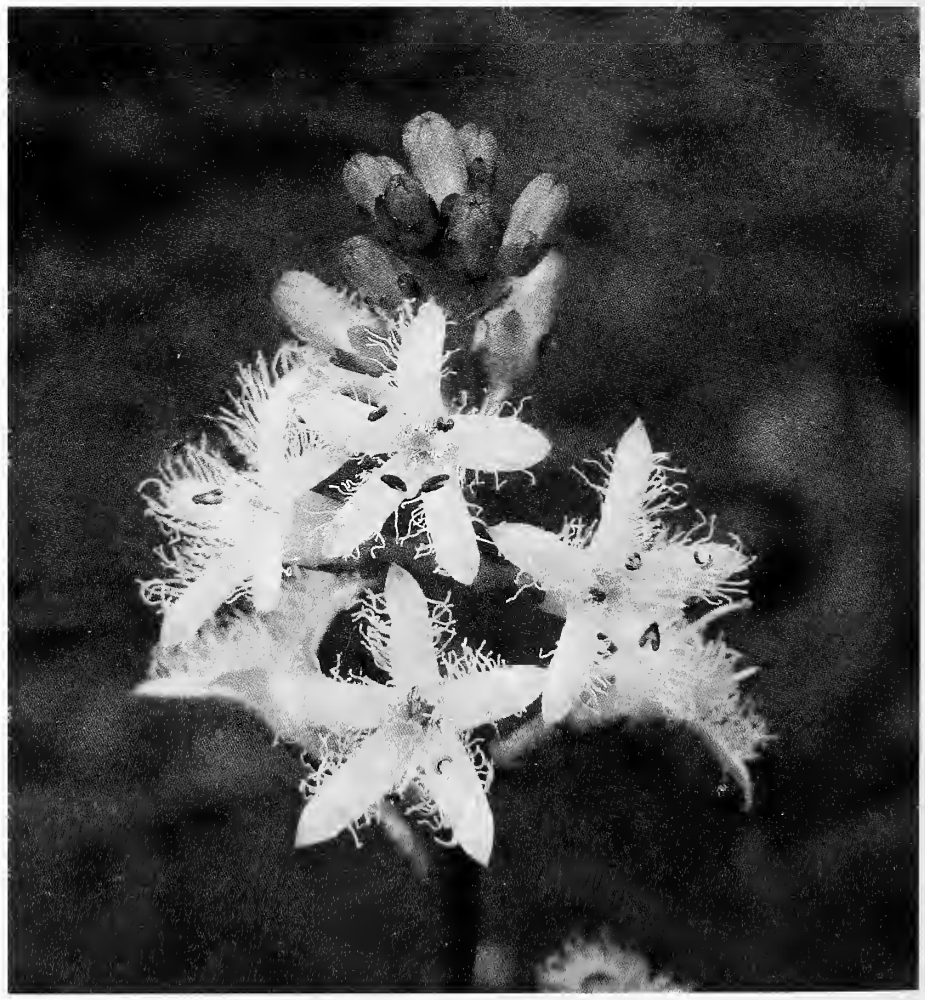

Figure 1. Bogbean *Menyanthes trifoliata*

included *Apium nodiflorum* and *Nasturtium officinale* agg., which were not recorded in the lake before 1988. *Angelica sylvestris* and *Alisma plantago-aquatica* were present in the becks/ditches but not at the lake: they are potential future colonizers. Waterfowl are another potential source of new plant species to the lake. Seeds can be transported over long distances in the digestive tracts of waterfowl (*e.g.* Figuerola *et al.*, 2003; Soons *et al.*, 2008); hence the ducks and geese that are often seen at Thwaite Lake are a potential source of new plant species – some of which may be from beyond the local environs.

(5) Introductions. Thwaite Lake is part of an ornamental garden and is associated with the University Botanic Garden; unsurprisingly, a major and significant source of new plants, over many years, has been their deliberate introduction by humans. Some of the species that are known from the sketch map to have been planted in the bog garden at the west end of the lake (Table 1) and now thrive at the site (i.e. *Caltha palustris*, *Iris pseudacorus*, *Juncus effusus*, *Typha latifolia*, *Veronica beccabunga*), may have their origin in these introductions. The octopolyploid giant reed, *Phragmites australis* var. *gigantissima* is another introduction that continues to thrive. Furthermore, it is possible that some of the species recorded in 2008 to 2010 originate from plants used for physiological research at the University Botanic Garden, although the 12 species that were used by Justin and Armstrong (1987), and which were recorded in the lake by 1988 and in 2008 to 2010 (Table 1), are widespread in East Yorkshire (Crackles, 1990) and may well have established themselves naturally.

A notable feature of plants deliberately introduced to the lake is that many of them have not persisted. Many of the 29 taxa that were recorded before 1988 but did not persist to 2008 to 2010 (Table 1) are obvious or probable introductions. *Acorus calamus* (Sweet-flag), *Bolboschoenus maritimus* (Sea Club-rush), *Cyperus longus* (Galingale), *Hippuris vulgaris* (Mare's-tail), *Iris spuria* (Blue Iris) and *Schoenoplectus lacustris* (Common Club-rush) are known from the sketch map to have been planted in the bog garden. A further group of lost plants comprises species that may have originated from the physiological research of Justin and Armstrong (1987). This group includes *Hydrocotyle vulgaris*, *Juncus tenuis* (Slender Rush), *Ranunculus flammula*, *Rumex hydrolapathum* (Water Dock), *Silene flos-cuculi* (Ragged-Robin) and *Sium latifolium* (Greater Water-parsnip). Other lost taxa, although they appear neither on the sketch map nor amongst the species used by Justin and Armstrong (1987) are uncommon in East Yorkshire (Crackles, 1990) and were also almost certainly anthropogenic introductions; i.e. *Alisma lanceolatum* (Narrow-leaved Water plantain), *Comarum palustre*, *Menyanthes trifoliata*, *Ranunculus lingua* (Greater Spearwort) and *Stratiotes aloides* (Water-soldier). It is likely that the substantial loss amongst the species that have been deliberately introduced is a reflection of the inherent inappropriateness of these plants for the Thwaite Lake habitat: some are clearly more appropriate to less-eutrophic sites. The physical and chemical conditions and competition regime at Thwaite Lake were probably such that these plants were unable to survive.

(6) Additional environmental constraints. There are other environmental pressures that may have contributed to losses of plants; perhaps more so to the taxa that are not inherently adapted to the Thwaite Lake habitat. There has been intermittent pollution by creosote in the inflow stream: Raine (1988) describes the release through vandalism of 900 litres of creosote which caused extensive damage to the fauna and flora of the lake; Richard Middleton (*pers. comm.*) mentions a creosote spillage having occurred sometime before his June 1998 recording visit for the *Millennium Atlas*. Another pressure on water plants might be ducks and geese. Grazing by waterfowl can suppress the growth of water plants (e.g. Lauridsen *et al.*, 1993; Søndergaard *et al.*, 1996) and probably contributes to a dearth of water plants in some East Yorkshire village ponds (Linton and Goulder, 2000).

It is perplexing that the recorders for the *Millennium Atlas*, who visited Thwaite Lake in June 1998 and July 2000, recorded in the relevant 1 km square only 16 of the 43 water and wetland taxa that this author recorded at Thwaite Lake in 2008 to 2010 (Table 1). The number of taxa recorded in botanical surveys increases with the time spent recording, the number of visits and length of route followed (Rich and Smith, 1996); more visits were made for the 2008 to 2010 survey and possibly more time was taken and more ground covered. Furthermore the *Millennium Atlas* recorders avoided cultivars (Richard Middleton, *pers. comm.*). Nevertheless, the discrepancy suggests that, within a longer-term pattern of change, there might be year-to-year fluctuation in observable species, perhaps related to intermittent pollution events and/or drought or flood years. Temporarily-lost species may survive underground as roots and rhizomes and/or within the seed bank or be replaced by seeds and vegetative propagules carried into the lake by the inflow stream.

The diversity of water and wetland plants, and their recorded change, contribute to the botanical interest of the lake and ensure that it continues to be a valuable component of the Grade II listed Thwaite Hall Gardens. Furthermore the lake and its flora contribute to the gardens' status as an important learning and teaching resource; for first-year undergraduate ecology classes but also for schools (Swetez, 2009) and wildlife groups (Humphries, 2010). The recent dredging (autumn 2009) by the University, as well as maintaining the depth and shape of the lake and restoring the historical island at the west end, appears to have had a generally positive outcome in terms of the continuance of the plants recorded in the two previous summers. Additional maintenance of the lake area, e.g. pulling of the invasive alien *Impatiens glandulifera* during the summers of 2007-2009 (Allison, 2009), has been undertaken by the voluntary group *Friends of Thwaite Gardens* (www.hull.ac.uk/thwaite-gardens). Membership of the *Friends* allows entry to the gardens during weekday afternoons.

In a broader context the work described in this contribution supports the suggestion that plant communities at artificial freshwater sites are unlikely to be static. There will be coming and going of species; both natural events and human influences are likely to drive these changes.

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Community development among Hemiptera and other insects on a brownfield site in south Leeds*

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Brownfield ecology is an important and growing area of conservation research. There has been some previous work based specifically in Leeds (e.g. Millard 2004), indicating that opportunistic, "spontaneous" vegetation covers around 13% of recent development land in the city. However, as yet there appears to have been little research looking specifically at the detailed development of particular habitats or locations in the area. This paper is based on relatively informal observations and surveys of a brownfield site in Leeds over three years.

The Leeds Museum Discovery Centre (LMDC) opened in 2007 and was built in the industrial sector of Hunslet (SE31013257 and surroundings) on the site of a former foundry. The site was previously sealed with concrete and some very stony, clay soil was deposited on top during construction (see Fig. 1 for general view). The area covered by old concrete is now roughly 4500m^2 and about 3000m^2 with some soil cover, mostly in the form of broad banks up to 2m deep. A small area adjacent to the building itself (SE31023256) was covered in a thin layer of soil rather than a bank. The imported soil includes broad banks that were seeded with wildflowers, although it is not known which species were introduced in this way. A line of cherry (*Prunus* sp. cultivars) was planted along the entrance road and car park and on one side also a Hornbeam (*Carpinus*) hedge.

Figure 1. The site in May 2008, with the area of thin soil in the foreground, and a *Buddleia*-covered bank beyond.

The surrounding areas include active and derelict industrial units, including Allied Glass, Braimes' steelworks, and warehouse units. Although there is a range of wasteland areas with sparse vegetation at least at their edges, there are no significant green corridors. The River Aire is about 330m away, across residential and brownfield areas.

During preparation for the construction of a small wildlife garden area, limited surveys were conducted of the area adjacent to the LMDC. Several groups of invertebrates and plants were considered to some degree, though Hemiptera were studied in most detail due to available expertise. The fauna and flora were examined regularly during 2008, 2009 and 2010, during which period significant changes in the Hemiptera and other groups occurred.

Development of the site during 2008 to 2010

One year after the museum opened in 2008, *Buddleia* bushes were already established around the site margins, as well as thistles, small areas of nettles and large patches of trefoils among sparse grasses. The remainder of the ground was bare earth or patchily moss-covered with small, often extremely stunted examples of plants such as mayweed and willowherbs, usually at most 5cm tall. Larger plant growth was possible in shelter along the edges of walls and a more diverse flora developed. The area of thin soil was notably mud-cracked in summer and the crevices were seen to be used by many invertebrates, including beetles, ants, heteropterans and arachnids. The open concrete surface supported small clumps of various mosses and flowering plants in areas where soil had become thinly established.

By 2009, growth of *Buddleia* had accelerated, forming dense areas of large shrubs, with bare soil being limited to smaller patches and significant mud-cracking being correspondingly reduced. Most of the low ground cover consisted of large patches of trefoils and clovers with scattered grasses and a wide range of small herbaceous plants, still mostly stunted. Nettle patches and thistles, in particular, were becoming noticeably larger.

By the summer of 2010 the faster-growing shrubs and herbaceous plants had taken over large areas of the previously open ground, with *Buddleia* the dominant species. Although the soil was still bare in small patches, most of the colonised ground surface had become covered by mosses with trefoils, thistles, grasses and stunted willowherbs. Thistles had become well established in a few areas, creating dense patches and with individual plants occurring widely over the surrounding areas. The soil banks were, by this stage, largely covered by *Buddleia* along one margin but with much bare soil around them, and by grass and trefoils over much of the remainder. In rubbly areas there was still a range of other plants, including thistles, *Senecios* and nettles. The open concrete had changed least at this stage, being still largely barren with small but expanding pockets of plant colonisation on very thin soils. These soils tend to crack in dry weather, either forming mud-cracks or a loose veneer of thin plates where the soil had been cemented by moss or plant roots.

Rabbit populations were established prior to 2008 and had expanded by 2010 to the extent that all grasses and many herbaceous plants were very short-cropped during the entire summer. Although Foxes are present on the site, they do not appear to have a significant impact on Rabbit populations. Birds are more limited, with corvids and gulls being the most obvious elements, although nesting Blue Tits in 2010, together with sightings of Great Tits, Goldfinches, Dunnocks and Blackbirds indicate that more diverse bird communities are becoming established.

Invertebrate fauna and flora

The biota is typical of many immature brownfield sites but the concrete basement adds a calcareous element to the chemistry leading, for example, to an abundance of the woodlouse *Armadillidium vulgare* [or the Common Pill Woodlouse]. The site also supports pools of standing water for long periods over the winter, large enough to be colonised by water beetles and to support populations of *Daphnia*. This had led to the appearance of several wetland plants, such as Water Figwort (*Scrophula aquatica*) and Marsh Thistle (*Cirsium palustre*), despite the area being almost entirely dry in summer except after heavy rain.

Hemiptera (Centre pages, Plate 2)

Forty-one species of Hemiptera have been recorded at the site, 13 Auchenorrhyncha and 28 Heteroptera. Most of these are common or ubiquitous species but there are also a significant number of brownfield specialists. The grassbug *Trigonotylus caelestialum* (Plate 2a) is a widely-scattered species that is typical of dry, sparsely-vegetated ground and was found in significant populations on the thin soil area, especially in 2008. *Nysius* species of groundbugs (probably both *ericae* and *thymi*; Plate 2b) were also present in abundance in the same area of this soil in 2008 but less so in 2009. They appeared in 2010 in some abundance in different parts of the area, often amongst detritus in Rabbit scrapes on semi-base earth with very short-cropped grass. The shorebugs *Saldula orthochila*, *Chlamydatus saltitans* (Plate 2e) and *Chlamydatus pullus* were also found in significant numbers in 2008, but fewer in 2009 and only very rarely in 2010; *S. orthochila* and *C. pullus* have not been seen in 2010 (although a specimen resembling *Chlamydatus wilkinsoni* was seen but not captured). In 2008 and 2009 these species were found dominantly in the thin soil areas adjacent to the building, particularly on sparsely-vegetated and cracked ground, and to a lesser degree, among vegetation on the open concrete areas. Very few specimens of *Saldula orthochila*, *Nysius* spp. or *Chlamydatus* spp. were found prior to 2010 on the broad banks nor in areas with dense vegetation at any time. In 2010, the areas that yielded dense populations in 2008 were almost devoid of these species, which primarily occurred instead on sparsely-vegetated mossy patches on concrete and on the cropped, extremely well-drained bank areas amongst sparse grasses and trefoils.

Areas of denser vegetation have more universal species, such as the leafhoppers *Macrosteles laevis* (Plate 2g) and *Euscelis incisus*. There is also a number of very common host-specialists, including *Tingis cardui* (Plate 2d) on Spear Thistle and *Liocoris tripustulatus*, *Eupteryx aurata*, *Eupteryx urticae* and *Heterogaster urticae* (2008 only) on small patches of nettles. All these species were present in 2008 and have become more abundant since then, with the exception of *Macrosteles laevis*, which has probably declined slightly, and *Heterogaster urticae*. In contrast, the populations of *Plagiognathus chrysanthemi* have expanded dramatically and notable new populations of *Aphrodes bicinctus* agg. and *Pithanus maerkeli* have become established amongst the densest vegetation (longer, but still cropped grass with trefoils). The abundance of *Closterotomus norwegicus* has also increased dramatically, whereas populations of *Lygus rugulipennis* have remained low.

The Hornbeam hedge supported a large population of *Oncopsis carpini* in 2010, a species that was probably present in low levels in previous years, and the inconspicuous leafhopper *Alnetoidea alneti* has also been found on the hedge in low numbers in all years. *Kleidocerys resedae*, the Birch Catkin Seed Bug is present as a substantial population feeding on *Buddleia* as an alternative host.

Other Auchenorrhyncha include the ubiquitous froghoppers *Philaenus spumarius* and *Neophilaenus lineatus* but also the much less common *Neophilaenus campestris* (2008 only; Plate 2f), all in the areas of densest plant growth. Occasional specimens of dispersing taxa

(e.g. *Zyginella pulchra* in 2008) have been found on the site, despite the absence of their host plants.

Coleoptera
The beetle fauna has not been thoroughly surveyed but a one-day survey by R. Marsh (2009) combined with casual recording has resulted in a list of around 40 species. This includes five species of ladybirds (including *Propylea quatuordecimpunctata*, and the relatively uncommon *Hippodamia variegata*). The most unusual record was of the small ant-mimic *Anthicus tobias*, the third record for Yorkshire, but most species recorded to date are ubiquitous taxa. Many are typical of brownfield and disturbed land, although the most heavily vegetated area of the bank also supports a more diverse wayside community including *Rhagonycha fulva*, *Cantharis nigra*, *Lagria hirta* and *Oedemera lurida*. Trefoils and clovers support several beetles, such as the weevils *Ischnopterapion loti* and *Protapion fulvipes*.

Some specialist plant feeders such as the Weld leaf beetle *Phyllotreta nodicornis* and the Notable B flea beetle *Longitarsus dorsalis* on *Senecio* are well established, and the Hornbeam supports large numbers of *Polydrusus* weevil. Most areas of both sparse and well-established ground cover yield a reasonable diversity of rove beetles, including familiar larger (*Ocypus olens*, *Quedius boops*) and smaller (*Tachyporus hypnorum*, *T. obtusus*) taxa. A substantial number of other small species are known to exist at the site but have not been determined.

The presence of water beetles in the temporary ponds is not unexpected but, as there are no bodies of standing fresh water close by, it shows that colonisation is occurring regularly and rapidly from some distance.

Lepidoptera
No survey of Lepidoptera has yet been performed, largely because most taxa known to be present are 'micromoths'. Some of these, such as *Chrysoteuchia culmella*, are well established and abundant. No butterflies appear to be established at the site as breeding populations, although several common species (e.g Peacock *Inachis io*, Red Admiral *Vanessa cardui*, Large White *Pieris brassicae*, Comma *Polygonia c-album*) have been seen visiting it.

Hymenoptera
The most abundant species is the Small Black Ant (*Lasius niger*), which has established large colonies across the area. *Myrmica rubra* is more localised and has been found for the first time in 2010. Bees are represented by common bumblebees (*Bombus* sp.), Honey Bee (*Apis* mellifera) and several solitary bees. The most interesting of these is the Notable B species *Hylaeus signatus*, feeding on Weld, which is here at the northern limit of its range.

Parasitic wasps are abundant and diverse, but have not been studied. They include braconids and ichneumonoids associated with a variety of plants but perhaps particularly with the trefoils. Other notable associations include some taxa found in association with host insects feeding on thistles, nettles, and on the ornamental cherries.

Diptera
The flies have not been studied in any detail but include increasingly large populations of *Nephrotoma* cf. *appendiculata* and other craneflies, the larvae feeding on grass roots. There are few hoverflies at the site, although some undetermined larvae have been seen predating small invertebrates on *Buddleia*.

Collembola
Springtails are a potentially interesting component in colonisation studies as they are unable to disperse by flight. Collembola also show a wide range of chemical tolerance in pH and heavy metal contamination, including some species that are known to be able to survive highly contaminated and acidic sites (e.g. Chauvat and Ponge 2005), a factor that is probably relevant for the deeper soil-dwelling species at this site. Eleven species have so far been recorded, of which most will have been introduced in the soil or building materials (e.g. *Isotomurus maculatus*), and the others probably represent the existing community at the site prior to building works. None of the species so far, however, are particularly informative, and most are soil-living or cryptic species that are widespread in brownfield areas. Others, such as *Sminthurus viridis*, feed on live plants (in this case mainly clovers) and probably came into the site since the construction of the banks and colonisation by herbaceous plants, although the method of transport into the site is not known.

Crustacea
Crustaceans are mostly limited to several woodlice, including all the most common species, except for *Oniscus asellus* and *Trichoniscus pusillus*. Within the building's loading bay, *Porcellio spinicornis* was also recorded in a pest monitoring blunder trap, and this also is likely to have entered from the region under study. The woodlouse fauna is however dominated by *Armadillidium vulgare*.

The only other crustacean recorded is a water flea, *Daphnia* sp., which reliably appears in large numbers in the standing water on concrete. It is not clear whether they are repeatedly reintroduced through their eggs being transported by other aquatic insects (e.g van de Meutter et al. 2008), or whether the populations survive through drought-resistant resting stages (Altermatt et al. 2009).

Araneae
Spiders have not been studied in any detail, but a substantial diversity is present. These are probably all common species but include a variety of crab spiders (*Xystichus* sp., *Philodromus* sp.), jumping spiders (*Euophrys frontalis*, *Salticus* sp.) and orb-weavers (*e.g. Araniella curcurbitiana*).

Discussion
There have been many published studies of brownfield sites and this type of locality is now widely recognised as a high-diversity habitat with many specialist species. The particular species present at any one site vary significantly according to the exact characteristics of the sediment, vegetation and microclimate, leading to much lower homogeneity than in, for example, wildflower meadows. It is common for brownfield sites, as seen here, to have highly segregated biotas on small spatial scales, contributing to the high total diversity. It might seem surprising that many species specialise in semi-bare, artificially-disturbed ground. This may be explained by the artificial loss of ecologically similar, disturbance-prone habitats such as river terraces and unprotected, eroding coasts (which share many Hemiptera, at least, with brownfield sites). Similarity to such habitats as fluvial sediments and sandy heaths is thought to be behind the important occurrences of beetles at brownfield locations (Eyre et al.2003).

The loss of brownfield habitats through succession invariably leads to the loss of many of their specialist invertebrates, as plant communities transform into more normal scrub and eventually woodland vegetation. Plant succession and diversity in such sites has been studied in detail by numerous authors with some (e.g. Schadek *et al*. 2008) linking soil resources to the ideal disturbance intervals in order to maintain species richness. In general, they found that poorer

soils lead to slower successional changes and, therefore, the contaminated, thin, stony soils at the LMDC might be expected to maintain a diverse biota through a relatively long interval (at least 5 years); in reality, dramatic changes in the invertebrate fauna have been observed over only three years, including a large reduction in the populations of some of the more unusual species.

These species reductions appear to be related to a range of relatively subtle changes. One of the most important factors in encouraging specialist, ground-dwelling hemipterans at the site may be the formation of soil cracking, encouraged by poor soil, wind exposure and rapid drainage. Several of the specialist Heteroptera have been seen entering and emerging from these cracks on a regular basis. This microhabitat, therefore, appears to provide shelter for at least some species and is greatly reduced by extensive moss cover and particularly by the growth of plant roots. The surprising absence of these species on the rubbly bank areas, which also provide shelter and sparse vegetation, imply that it is not merely access to the subsurface that it important. The decline of some species also appears to be correlated with increased abundance of ants in the areas affected, and it may be that a direct predation element, particularly on juveniles, is significant. These observations and ideas have not, however, been tested, and remain speculations only.

The presence of a diverse flora encourages a large number of specialist herbivores. This flora, however, appears to have begun to decline in diversity, with some of the smaller and less robust species being out-competed by *Buddleia* and expansive clumps of Birds' Foot Trefoil. Intense Rabbit grazing is also having an effect, probably directly killing some plants and reducing the size of others so that they are less able to compete with faster-growing species. The development of ground cover also acts to retain moisture, reducing water-stress conditions that may allow some species to flourish. Once grasses are widely established at the site, it is likely that many of the more unusual plants currently present will be lost. The site will then enter a different successional phase with different colonising taxa. Regular monitoring over the next five years would allow a more complete interpretation of the successional sequence to be established, and hopefully provide further information on the requirements of individual taxa.

In spite of the wide recognition of the importance of brownfield sites for biodiversity, there is still a broader view that these sites should ideally be converted into public-access green spaces, often with mixed success (Doick *et al*. 2009). This may be largely due to the negative public perception of semi-natural urban vegetation (Millard 2004), despite the ecological benefits of brownfield ecosystems and their encouragement of perceptually "positive" wildlife such as birds and butterflies. Remediation of derelict sites can take place in a way that maintains or recreates high diversity ecosystems (e.g. Box and Stanhope 2004) but, in most such cases, the distinctive small-scale characteristics of the brownfield areas are lost. The purpose of most remediation projects is to create important, but more standard wildlife habitats, such as calcareous grassland, reedbeds and so forth. These may be valuable additions to the local ecology but, in many cases, will only be colonised by those species which are already widespread and relatively common in such habitats. Many of the rarest species specialising in these environments are also very poor at dispersing and are now restricted largely to ancient sites. There are many species, for example, that are indicators of ancient woodland or wetland (primarily plants but also invertebrates of low dispersal ability).

The uniqueness of the brownfield habitats such as the ex-industrial land at LMDC lies in its suitability for species that require unstable, often stressed habitats and for which dispersal is not difficult. Long-term preservation of such sites in their existing state is not viable with

regular, deliberate disturbance to prevent succession. Continuity of the populations of brownfield-reliant species is dependent instead on continued creation of new habitats through sympathetic redevelopment. In south Leeds, there are large areas of industrial sites that are in the process of being redeveloped into residential and commercial areas (e.g. Clarence Dock). In contrast to the LMDC, the area of Clarence Dock has been built with complete cover by paving slabs and concrete, without any green spaces (bar some enclosed trees and a border with non-native plants), wasteland or marginal habitats. As a result, in its current form, it is largely inhospitable to wildlife and will remain so until the area starts to become derelict. The disturbance adjacent to such developments or the natural reclamation of neglected corners of it, however, can be sufficient to allow brownfield specialists to colonise the area and a new processional cycle to begin. The size of such green islands has also been shown to be related to hemipteran diversity in the case of roundabout islands (Helden and Leather 2004). This study also confirmed the importance of careful choice of trees planted, and showed a decline in diversity linked to high frequency of grass mowing.

Based on the changes seen in the LMDC surroundings, brownfield faunas in South Leeds appear to constitute a community type that is difficult to conserve actively, particularly given the likely continued redevelopment. The most important element in the conservation process will be to ensure that only parts of an area are redeveloped at a time, but also to encourage redevelopment to some degree in order to prevent community loss through succession. I suggest that it is the balance of short-term (decadal) stability with regular localised disturbance that is critical to the faunas currently established in the area. Even regular disturbance may be insufficient, however, unless areas of semi-natural, "untidy" vegetation are allowed to remain.

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Editors' note: A full list of species recorded on this site during the author's researches can be found on the website at www.ynu.org.uk/The_Naturalist

The state of the Union's ichneumon records

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The history

In 1856 Desvignes described the ichneumon *Anomalon capitatum* from Yorkshire specimens. The same species had already been described by Fabricius as *Ichneumon amictum* in 1775 and we now know it as *Heteropelma amictum,* a member of the Anomaloninae subfamily. This species has never been refound in Yorkshire but it was not the earliest ichneumon record in the county. That distinction goes to A.H.Davis, who collected *Metopius dentatus* (Fabricius 1779), a Metopiine, from Halifax in August 1831 (Roebuck 1877), followed by J.Curtis, who reported *Sympherta obligator* (Thunberg 1824), a Ctenopelmatine, from the River Nidd at Knaresborough and from Settle (Curtis 1837), and J.C.Dale, who recorded *Enicospilus inflexus* (Ratzeburg 1844), an Ophionine, from Thorne Moors in 1837. Presumably Dale's specimen was identified some time later as the species had not been described when he caught it!

Yorkshire's Parasitic Hymenoptera recording really began when the Rev Thomas Ansell Marshall was appointed Curate of the Parish of Lastingham in the early 1860s in the area now known as the North Yorkshire Moors National Park. He was only there for a couple of years but collected over 60 species of ichneumons, which formed the bulk of the first list of the county's Hymenoptera (Roebuck 1877). Marshall was a hymenopterist (principally interested in the Braconidae) and identified his own material, most of which is preserved in the Natural History Museum in London. Yorkshire's first home-grown ichneumonologist was S.D.Bairstow from Huddersfield (Bairstow 1878) but, unfortunately for us, he emigrated to South Africa in the early 1880s. I have found evidence through the internet that butterflies collected by a S.D.Bairstow (presumably the same one) are preseved in the Iziko Museums of Cape Town, South Africa.

Since that time only a handful of Yorkshire entomologists have taken an interest in identifying ichneumons (or any Parasitic Hymenoptera for that matter). G.T.Lyle (a braconid worker) and Ross Butterfield (curator of Cliffe Castle Museum in Keighley and YNU Hymenoptera Recorder) were active in the 1920s while the Harry Brittens (father and son) were active particularly around Whitby during the 1930s and their collections are now in the Manchester and Leeds City Museums. The major worker in the county during the 1930s, 1940s and 1950s was William Douglas Hincks, whose collections are also mainly housed in the Manchester Museum with some at Leeds. J.H.Elliott collected around York from the mid-1940s to the mid-1950s and identified some of the material he collected, now housed in the Yorkshire Museum, Peter Skidmore began work on the Parasitica (in addition to everything else) in the early 1970s (collection in Doncaster Museum & Art Gallery) and I started a few years later (some material in Rotherham Museum).

A significant proportion of the Yorkshire ichneumon records are the result of entomologists who are not primarily interested in the Parasitica but who collect specimens and pass them on to be identified. William Denison Roebuck started the trend in the 1870s when he encouraged work on all the Hymenoptera. He summed up his philosophy by saying that each one of us can only till a small corner of the field of knowledge but there is no reason for us all to till the same small corner. Around the turn of the C19th a number of Yorkshire lepidopterists retained the ichneumons which appeared in the cages where they were hoping to rear butterflies and moths. These specimens, like Roebuck's, were passed to Claude Morley, the principal

ichneumonologist in Britain during the latter part of the C19th and the first third of the C20th. Many of these were published in Morley's books and papers (e.g.Morley 1908). William John Fordham collected assiduously around the valley of the Yorkshire Derwent from the period of the First World War until the early 1930s and compiled extensive information on insects of all kinds throughout Yorkshire and beyond. When I took over as the YNU Recorder for the Parasitic Hymenoptera the records compiled by Ross Butterfield and Douglas Hincks were not available, so Fordham's card index provided the basis for a new Yorkshire list. Fordham also sent his specimens to Claude Morley for identification and published many of the species which were new to the county (e.g. Fordham 1929), so the majority of the Yorkshire records before Douglas Hincks took over as the YNU Hymenoptera Recorder are the result of Claude Morley's identifications. Morley willingly provided the sort of service which the YNU's Recorders provide to our members, but on a national scale, identifying specimens from all over the country. It is a great shame, therefore, that his identifications have proved to be unreliable. Part of Fordham's ichneumon collection is preserved at the National Museums on Merseyside and I have had the opportunity to check the identications. In the Pimplinae I found the error rate to be about 50% and subsequently I have found specimens named by Morley in the collections of the Manchester and Leeds City Museums. They have often been incorrectly named. Dr Mark Shaw, recently retired from the National Museums of Scotland, has provided a similar service to entomologists across the country in recent decades but his determinations are reliable!

From the mid-1920s until the late 1940s John Wood collected insects from the Keighley area. Vast collections of his Parasitica exist in the Manchester Museum with smaller ones in Leeds and Keighley. They were passed on to the YNU Recorders Butterfield at first and Hincks later. I had thought that Wood was purely a collector but I recently found a few specimens in the Leeds Museum Discovery Centre with “J.W.” determination labels, so perhaps he did name a few of them himself. The Scarborough area was studied by G.B.Walsh for thirty years (Walsh & Rimington 1956) while D.H.Smith has collected from a similar area to the one studied by Marshall a hundred years earlier. In recent years many Yorkshire entomologists have collected ichneumons and passed them to Peter Skidmore or myself for identification. Derek Whiteley and Austen Brackenbury have been particularly active in the Sheffield area, Joyce Payne has provided many specimens of the noctural species which have come to her moth traps at Colton and then Cawood while Les Barringer did the same in Rotherham, Peter Kendall has collected around Goole and David Maude made extensive collections around Huddersfield in the mid-1980s. All of them have contributed to our knowledge of the county's ichneumon fauna and I am grateful to them all for their efforts.

In order to build on the records in Fordham's card index (which ran until the mid-1930s and is principally responsible for the Yorkshire records up to that time) I have visited museums which have collections of Yorkshire Parasitica. The Natural History Museum, National Museums on Merseyside, Manchester Museum, Yorkshire Museum, Doncaster Museum & Art Gallery, Rotherham Museum, Leeds City Museum (now the Discovery Centre) and Cliffe Castle Museum have already been mentioned but they also include Sheffield City Museum, Cambridge University Museum and Norwich Museum. I am grateful to the curators past and present at all these repositories for allowing me access to their collections and the opportunity to check or identify specimens in their care. There are still some collections that I have not visited that may contain specimens of Yorkshire Parasitica and I would be grateful for information about them.

The results

The results of all this work are summarised in Fig 1., which shows the number of species of ichneumon reported from each of Yorkshire's hectads (10km squares). This map is inclusive - C19th records count the same as C21st ones and unconfirmed records count the same as confirmed ones. Unconfirmed records are not incorrect but simply have not been checked, either because I have not seen them or because they belong to subfamilies or genera where I have neither literature nor experience. This may over-estimate the number of species in some squares but I think the error will be small and I consider that is better than ignoring the contributions of earlier generations of entomologists. Not all records fit neatly into one hectad, of course. Towns and cities such as York, Leeds and Wakefield extend into more than one square and I have tried to assign equal numbers to each possible hectad in such cases.

It is clear from Fig.1 that the area around York has been well-recorded over the past century and a half. Hectad SE74, which includes Allerthorpe, the Pocklington Canal and the Derwent, is the best recorded square in the county with over 250 recorded species. Even this figure is only 10% of the British list! W.J.Fordham was the first to realise this area's potential and numerous entomologists have followed his example more recently.

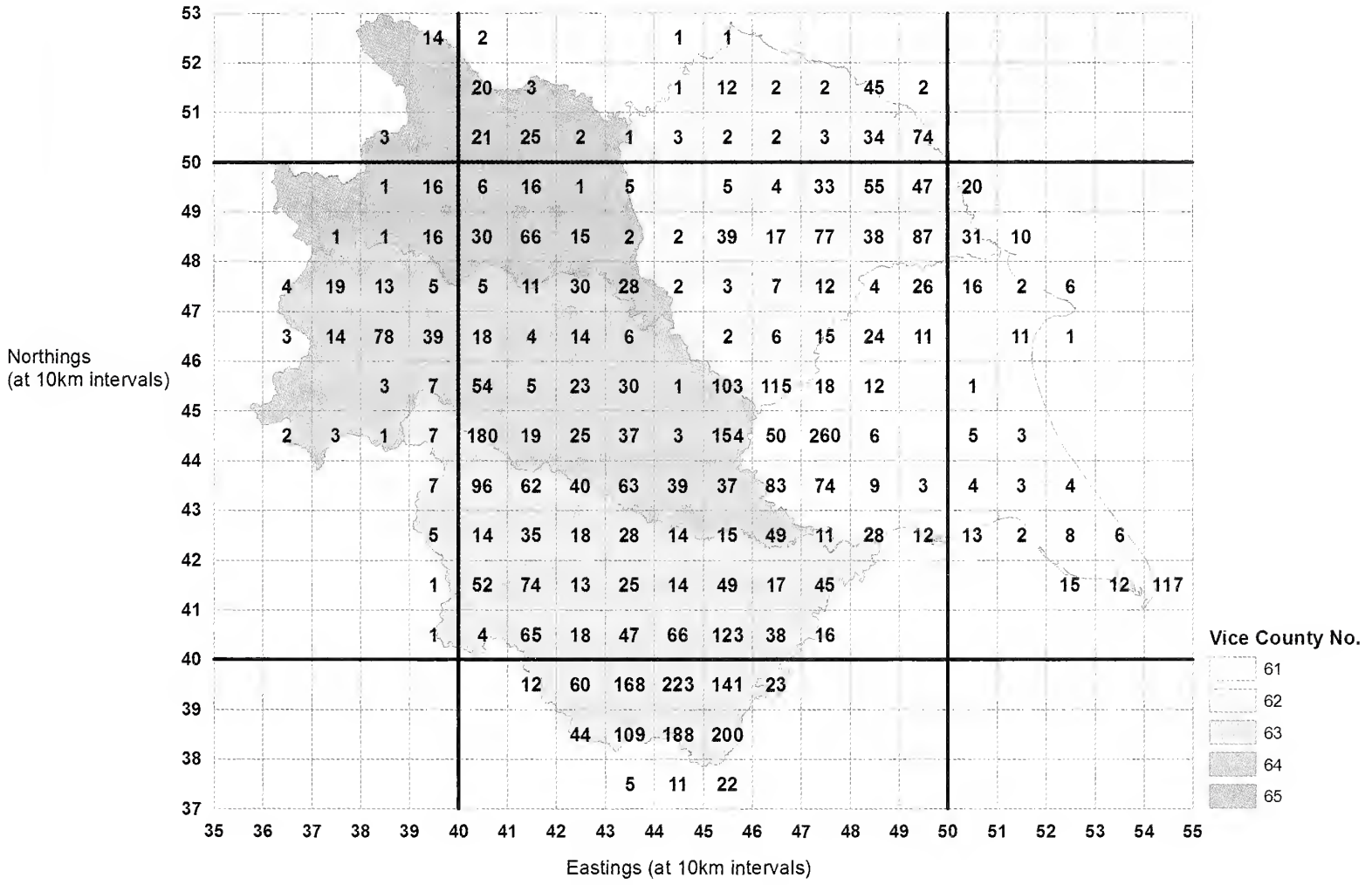

Figure 1. The number of species of ichneumon recorded from each hectad in Yorkshire.

J.H.Elliott worked around York half a century ago, W.D.Hincks visited Askham Bog on many occasions and York University carried out an intensive survey around the city in 2003-4 (Mayhew, Dytham, Shaw, & Fraser 2009). The Sheffield-Rotherham-Doncaster corridor has also been well-worked with seven hectads scoring over 100 species. P.Skidmore, A.Brackenbury, D.Whiteley and I have worked this area over the last forty years. The

Rotherham square, SK49, is the only other square in the county with over 200 species but even this is only a quarter of the species recorded from Yorkshire. There is much more to find in even the best-recorded areas! John Wood's efforts are reflected in SE04, the fifth best recorded hectad. Other well-recorded areas are the north-east of the county, where G.B.Walsh and H.Britten in particular have built on the foundation provided by T.A.Marshall; Spurn Point, the focus of the YNU Entomological Section's activities in the early 1950s; and Huddersfield, where some of the earliest recording took place, supplemented by D.Maude's more recent efforts.

Those are the positives but the negatives are equally clear. Most of Holderness is severely under-recorded for ichneumons (and probably a lot more besides) while the western and northern fringes of Yorkshire are also lacking in records. The A1 corridor from Wetherby northwards is another under-worked area which spreads out to the north of York. When I prepared this map in late summer 2010 and saw the imbalances I visited a few squares in South and West Yorkshire in order to boost their numbers into double figures. A short wander along a roadside verge in late September, for example, saved Halifax, the site of Yorkshire's first record, from the ignominy of single figures!

As mentioned earlier, both confirmed and unconfirmed records have contributed to Fig. 1. The list of Yorkshire ichneumons on the YNU website is restricted to the ones I am confident are correctly identified. I accept all determinations by Douglas Hincks, Dr Peter Skidmore, Dr Mark Shaw and staff of the Natural History Museum as correct unless proved otherwise but other records are flagged as unconfirmed. I have checked the collection at Leeds Museum Discovery Centre during 2010 and confirmed or corrected many of the specimens there and made smaller improvements to the Doncaster Museum & Art Gallery collection. To see the list at www.ynu.org follow the links on the right-hand panel.

The next steps

You cannot apply a sweep net to a hedgerow between April and October without picking up ichneumons. They are everywhere in abundance. Unfortunately, the Yorkshire records fail to reflect that. My rather modest objective is to raise as many hectads in the county as possible to double figures while continuing to identify specimens from other areas. I need your help as well. The recent contributions of Joyce Payne, Derek Whiteley and Austen Brackenbury have been mentioned and during 2010 Terry Whitaker and Terry Crawford have collected ichneumons from their moth traps. The former has contributed the first records from SD66 while the latter has boosted SE65 into treble figures. Those specimens have enhanced the collections at Leeds, Doncaster and York. I am keen to receive more specimens from any part of Yorkshire, especially the poorly worked ones. Ichneumons can be killed by placing them in a freezer and then stored in a container which will allow them to dry out and not be affected by mould - a match box or cigarette packet is ideal. The usual details (where, when, who) are needed and grid references are particularly useful. Do not feel squeamish about killing these insects - their life cycle involves eating a living host and nature is without compassion, it does not make a habit of anaesthetising its victims. You will be saving a few caterpillars from a far worse fate. Photographs are not usually identifiable as the main characters are structural rather than tonal. By all means take a photograph and then send me the specimen and I will try and give you a name for it!

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The Aculeate Hymenoptera (wasps, ants and bees) of the Lindrick area in Watsonian Yorkshire*

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The Lindrick area (SK58, VC63), just off the A57, is situated about 2km south-east of South Anston and about 5km north-east of Workshop. With 101 recorded aculeate species, including three species of national importance, the area has proved well worth exploring. Three sites within the Lindrick area have been investigated. Lindrick Golf Course (SK5482-5582) consists of calcareous grassland with a golf course, scrub and some bare earth areas and is bordered by mixed deciduous woodland. Lindrick Dale (SK5382-5482) is a valley with houses on one side and a stream on the other. Lindrick Dale Quarry has been closed since the early 1970s and consists of many bare flat and vertical rock surfaces, sometimes sparsely vegetated, scrub and deciduous woodland.

Methods

The Watsonian Yorkshire electronic database contains aculeate wasp, ant and bee records mainly made by M.E. Archer, W.A. Ely and S.J. Hayhow with a smaller number of records by J.E. Addey, T.H. Riley, P.C. Stenton, C.G. Vasey and D. Whiteley. The ant records were derived from J.E. Addey, W.A. Ely and C.G. Vasey, with the dryinid record from W.A. Ely. All the records were made between 1975-2003. The records of M.E. Archer were made casually from Lindrick Golf Course and Vale but with a more serious approach at Lindrick Dale Quarry.

Between 1987 and 2003, 14 visits were made by M.E. Archer to Lindrick Dale Quarry, distributed throughout the year as follows: April (1 visit), May (3), June (2), July (4) and August (4). During each visit, all species of aculeate wasps and bees were recorded and usually collected with a hand net for identification. In the following account, the nomenclature can be related to that given by Kloet and Hincks (1978). An up-to-date check list can be found on the Bees, Wasps and Ants Recording Society (BWARS) web pages at www.bwars.com

Species present

Table 1 shows the number of species recorded from the Lindrick area and the Archer records from Lindrick Dale Quarry. A full list of recorded species is given in the Appendix. With 94 species of wasps and bees, the Lindrick area can be given a very good status (Archer, 2002).

The Archer data for Lindrick Dale Quarry of 64 wasp and bee species would be considered a good site.

Table 2 shows the number of solitary wasp and bee species recorded each month from Lindrick Dale Quarry. The number of species recorded each month was similar, perhaps with a decline during August.

An outstanding feature of the Archer Lindrick Dale Quarry data is the high percentage of species only found on one visit (55.8%) or one and two visits (80.8%). This feature is more characteristic of the solitary wasps, with 14 records for 13 species, than the solitary bees and probably indicates the low population densities of the solitary species and hence the greater difficulty in finding them.

Table 1
The number of species from the Lindrick area (All) and the Archer Lindrick Dale Quarry (LDC)

	LDC	All		LDC	All
Solitary wasps			**Solitary bees**		
Dryinidae	0	1	Colletidae	5	5
Chrysididae	2	3	Andrenidae	10	13
Mutillidae	1	1	Halictidae	15	18
Pompilidae	2	4	Megachilidae	4	5
Eumeninae	1	4	Apidae	5	8
Crabronidae	7	19			
Total solitary wasps	13	32	Total solitary bees	39	49
			Total solitary species	52	82
Social species			Formicidae	0	7
			Vespinae	3	4
			Apidae	9	9
			Total social species	12	20
			Total aculeate species	64	101

Table 2
Mean number (and range) of solitary species recorded per month between 1987 and 2003 from the Archer Lindrick Dale Quarry.

April	May	June	July	August
8.0 (8)	7.0 (5-10)	7.5 (5-10)	7.5 (6-12)	5.0 (1-7)

Species quality
A national species quality scoring scheme has been developed by Archer (1999, 2002) because the quality species statuses given in Shirt (1987) and Falk (1991) are becoming, to some extent, out-of-date in relation to the new information being assembled by the Bees, Wasps and Ants Society. The schemes of Shirt and Falk only consider the rare and scarce species. The Archer scheme gives an up-to-date quality status to all species.

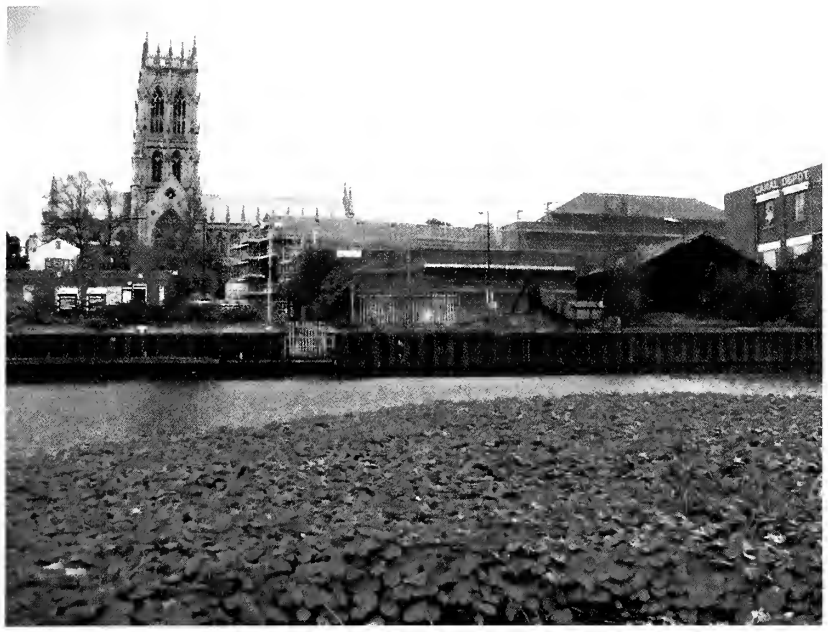

Plate 1a. Floating pennywort on the River Don in Doncaster.

Plate 1b. Buttonweed, a South African species, growing on colliery waste.

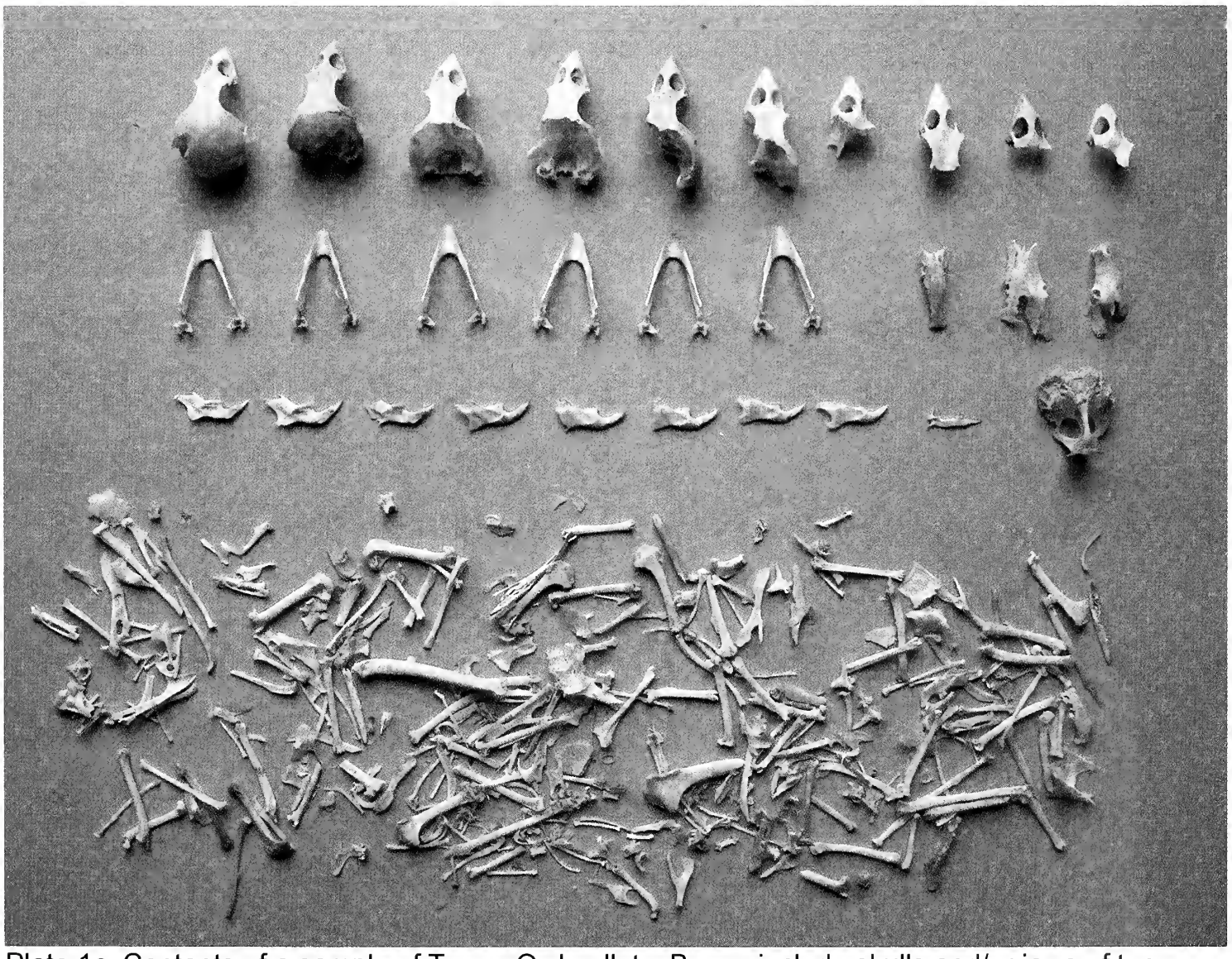

Plate 1c. Contents of a sample of Tawny Owl pellets. Bones include skulls and/or jaws of ten House Sparrows, four Wood Mice and one Common Shrew.

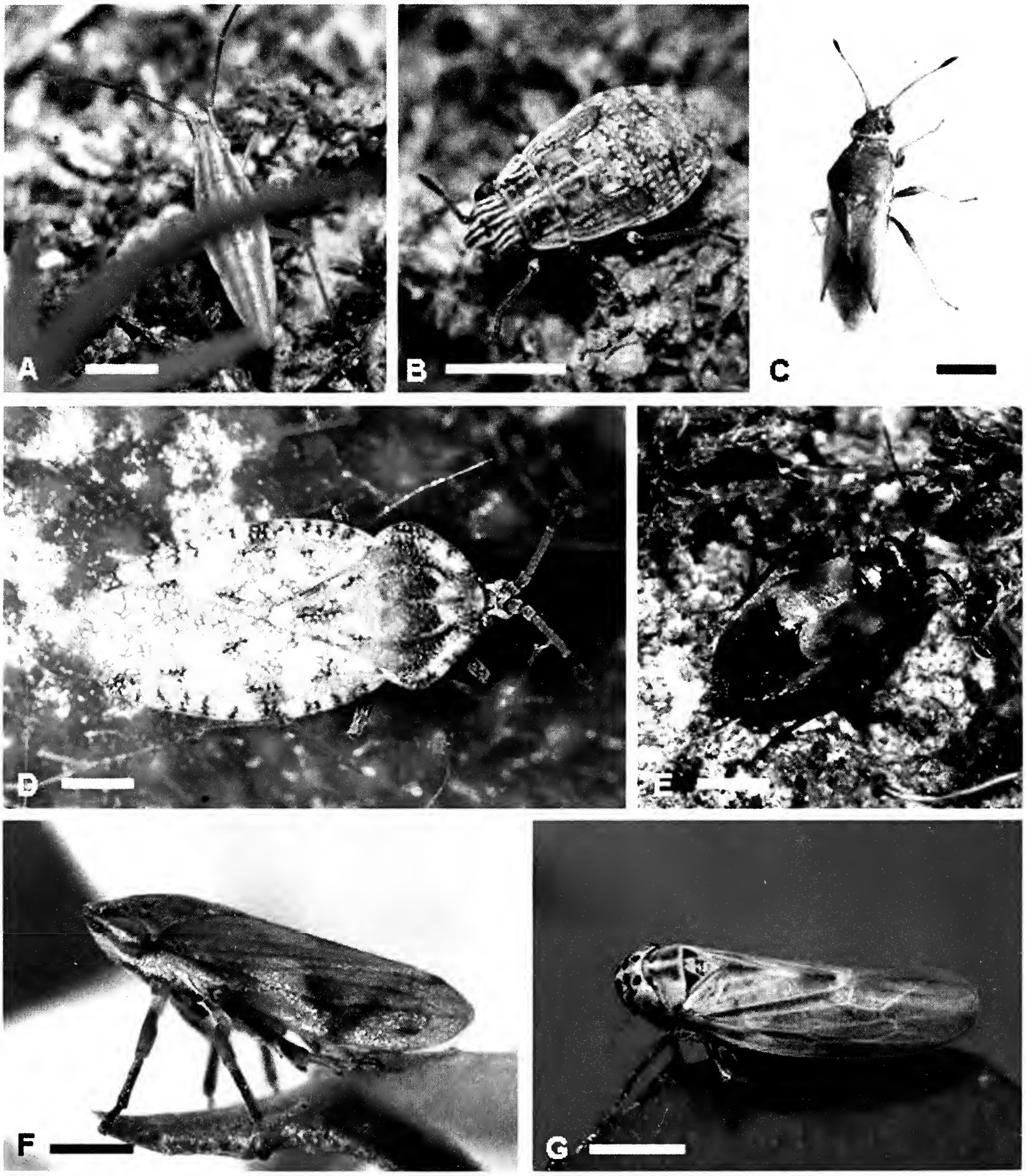

Plate 2. Various Hemiptera from the Leeds Museum Discovery Centre site (see p30). The bar represents 1mm.

Plate 3a. *Bombus terrestris* mating pair.

Plate 3b. *Urophora cardui* gall on Creeping Thistle.

Plate 4a. Leisler's Bat in the (well-protected) hand.

Plate 4b. Slender Slug, a new species for Yorkshire.

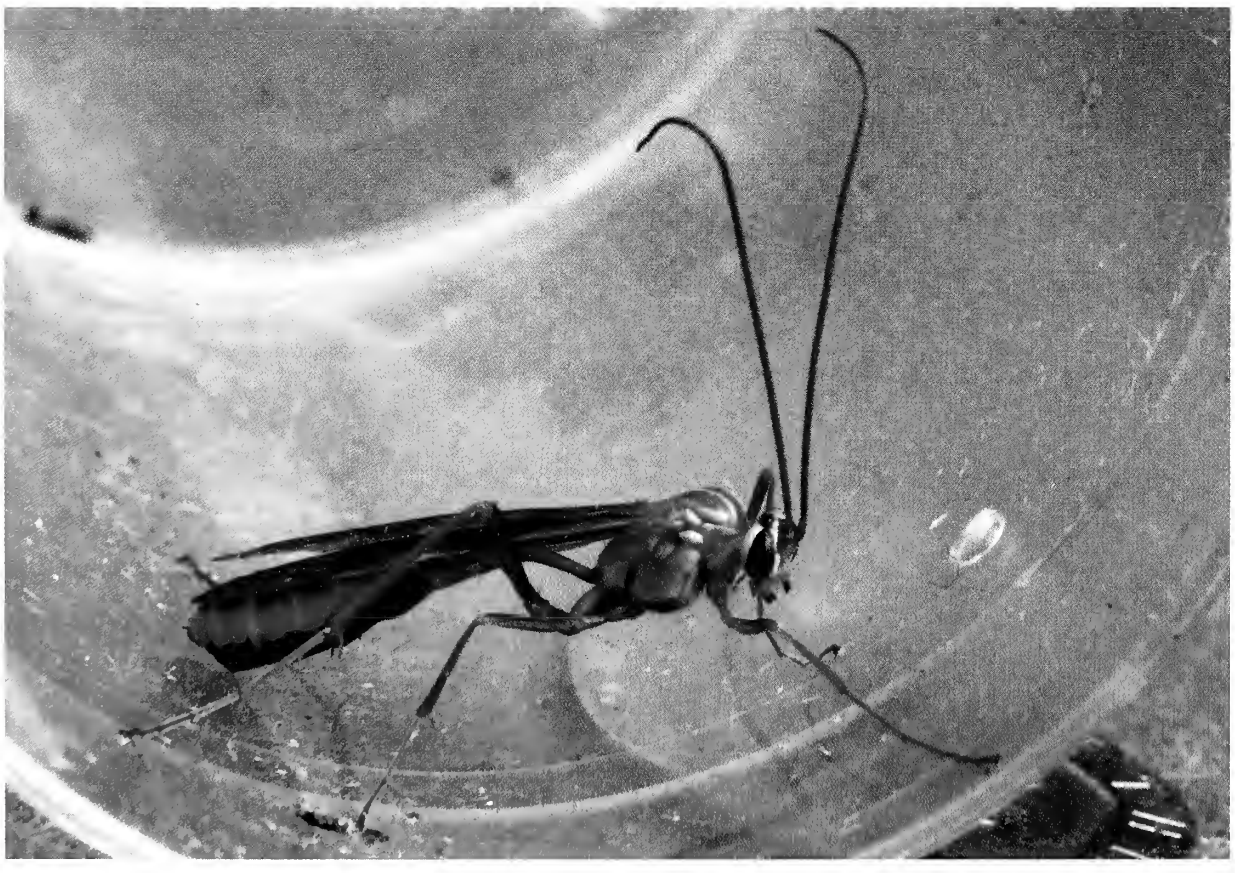

Plate 4c. *Ophion obscuratus,* a relatively common Ichneumon species.

Table 3
The Archer national quality scores of the solitary species from the Lindrick area

National Status	Status Value (A)	No. Species (B)	Quality Scores (A x B)
Universal	1	52	52
Widespread	2	25	50
Scarce	8	3	24
Total		**80***	**126**

Species Quality Score (SQS) 126/80 = 1.58. * Dryinid species excluded as it does not have a national status.

By giving each of the solitary species, excluding the dryinid, a national status, a national quality score of 126 can be calculated with a species quality score (SQS) of 1.58 (Table 3). How does this SQS compare with SQSs from other Watsonian Yorkshire sites? Archer (2003) divided the SQSs of studied Yorkshire sites into three classes as follows: first class 2.4-2.9; second class 1.8-2.3; and third class 1.2-1.7. The SQS for the Lindrick area indicates only a third class because of the lack of rare and scarce species. Only three nationally scarce species were recorded: *Nysson dimidiatus*, *Andrena similis* and *Nomada ferruginatus*.

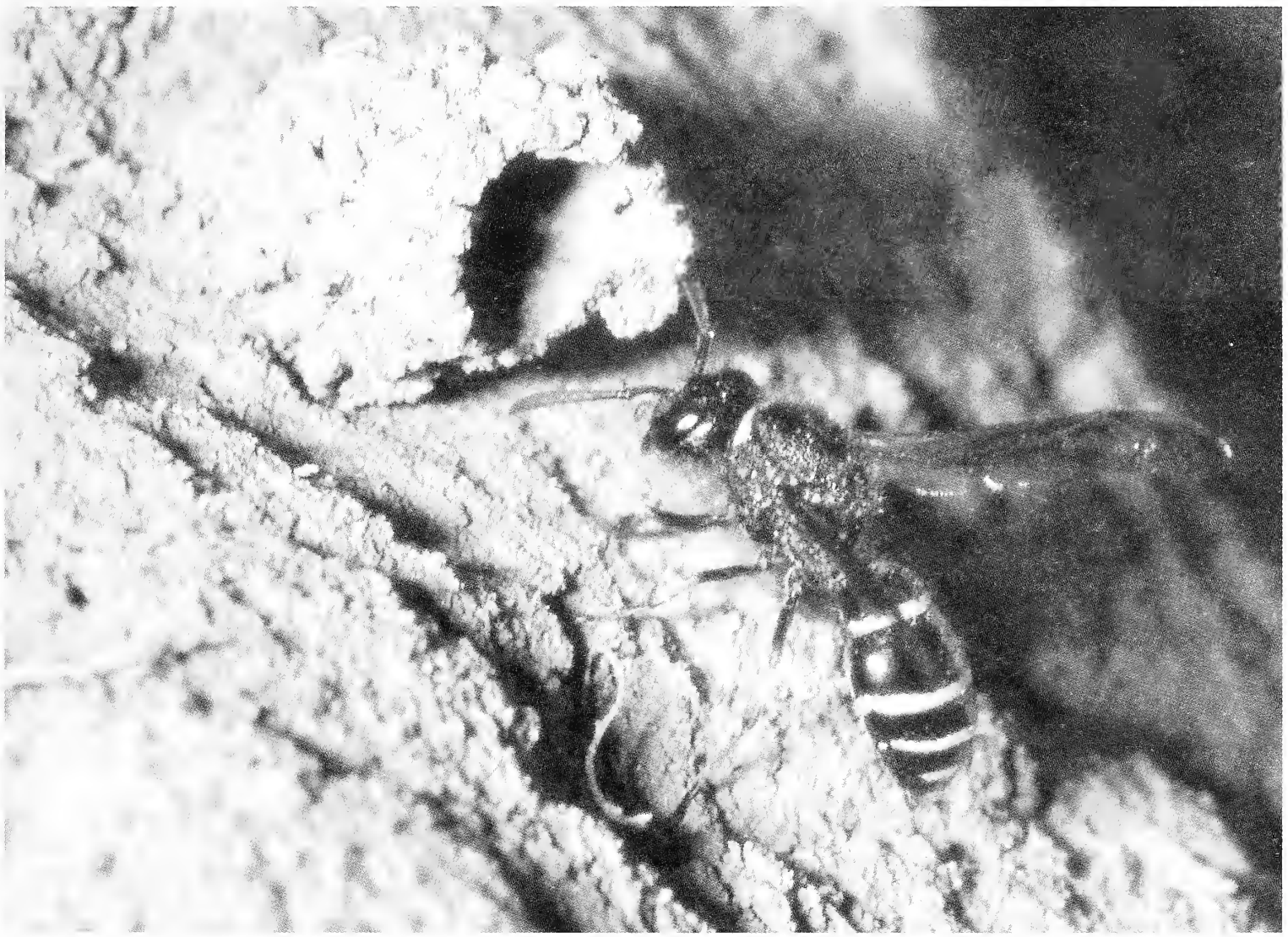

Figure 1. *Odynerus spinipes,* a solitary wasp (Eumeninae)

All the social species are common and widespread, although *Dolichovespula media* is a relatively new species for Yorkshire.

Cleptoparastic load

The cleptoparasitic load (CL) is the percentage of aculeate species that are cleptoparasitic (or parasitoids) on other host aculeates. Wcislo (1987) showed that parasite behaviour among aculeate Hymenoptera correlated with geographical latitude. Thus the parasitic rates are higher in temperate regions, as host populations are more synchronised in their life-history characteristics than in tropical regions. This finding probably does not hold for desert regions where the occurrence of rainfall would tend to synchronise life-history characteristics.

For 27 Yorkshire sites, the author found that CLs for solitary bees vary from 25.6%-40.0% giving a range of 14.4%, and for solitary wasps, CLs vary from 10.3%-25.0% giving a range of 14.7%%. The CLs for the solitary wasps and bees for the Lindrick area (Table 4) fall within their respective ranges. These narrow ranges support Wcislo's hypothesis and probably indicates for the Lindrick area self-contained assemblages of hosts and parasites.

Table 4
The relative frequency of the cleptoparasitic (or parasitoid) species among the solitary species from the Lindrick area.

	No. non- parasites (H)	No. Cleptoparasites (C)	Cleptoparastic Load [100 x C/ (H+C)]
Solitary wasps	25	6*	19.4%
Solitary bees	35	14	28.6%

*Dryinid species excluded as its host is not an aculeate

Aerial nester frequency

The aerial nester frequency (AF) is the percentage of non-parasitic aculeate species that have aerial nest sites. Aerial nesters use old beetle burrows in dead wood, central stem cavities (e.g. bramble), crevices in old walls or exposed on the surface of rock or other hard material. Subterranean nesters nest in the soil, usually in burrows dug by themselves, but sometimes holes and crevices are used after being altered. The AFs for all the British species of solitary wasps is 46.2% and solitary bees is 17.9%. Depending on the availability of aerial nesting sites, the AFs from 29 Yorkshire sites for solitary wasps has been found to vary from 0% to 90% and for solitary bees from 6.7% to 40.0%.

Compared with the British data, the AFs for the Lindrick area (Table 5) are higher, particularly for the solitary wasps, indicating a relative lack of subterranean nesters. Certainly the bare rock surfaces of the Lindrick Dale Quarry often lack the friable soil needed by subterranean nesters.

Table 5
The nesting habits of the non-parasite solitary species from the Lindrick area

	No. Aerial nesters (A)	No. Subterranean nesters (S)	Aerial Nester Frequency [100 x A/(A+S)]
Solitary wasps	18	7	72.0%
Solitary bees	10	25	28.6%

Conclusions

1. With over 80 solitary species, Lindrick can be considered a very good area.
2. The low species quality score is due to the lack of national rare and scarce species, with only three scarce species recorded.
3. The high percentage of solitary species found only on one or two visits probably indicates their low population densities.
4. The index of Cleptoparasitic Load indicates a self-contained assemblage of hosts and their parasites and the Aerial Nester Frequency the presence of relatively more aerial nesters.

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Appendix

List of the aculeate Hymenoptera recorded from Lindrick area.

Dryinidae: *Anteon pubicorne* (Dalman).

Chrysididae: *Chrysis angustula* Schenck, *C. impressa* Schenck, *Trichrysis cyanea* (Linn.).

Mutillidae: *Myrmosa atra* Panzer.

Formicidae: *Formica fusca* Linn., *F. lemani* Bondroit, *Lasius flavus* (Fab.), *L. niger* (Linn.), *Myrmica rubra* (Linn.), *M. ruginodis* Nylander, *M. scabrinodis* Nylander.

Pompilidae: *Priocnemis perturbator* (Harris), *Dipogon subintermedius* (Magretti), *D. variegatus* (Linn.), *Anoplius nigerrimus* (Scopoli).

Eumeninae: *Odynerus spinipes* (Linn.), *Ancistrocerus parietinus* (Linn.), *A. parietum* (Linn.), *A. trifasciatus* (Müller).

Vespinae: *Dolichovespula media* (Retzius), *D. sylvestris* (Scopoli), *Vespula rufa* (Linn.), *V. vulgaris* (Linn.).

Crabronidae: *Trypoxylon attenuatum* Smith, *T. figulus* (Linn.), *Crossocerus annulipes* (Lepeletier & Brullé), *C. capitosus* (Shuckard), *C. dimidiatus* (Fab.), *C. elongatulus* (Van der Linden), *C. megacephalus* (Rossi), *C. ovalis* Lepeletier & Brullé, *C. podagricus* (Van der Linden), *C. quadrimaculatus* (Fab.), *C. wesmaeli* (Van der Linden), *Ectemnius cavifrons* (Thomson), *E. sexcinctus* (Fab.), *Pemphredon inornatus* Say, *Passaloecus gracilis* (Curtis), *P. singularis* Dahlbom, *Nysson dimidiatus* Jurine, *N. spinosus* (Forster), *Argogorytes mystaceus* (Linn.).

Colletidae: *Colletes daviesanus* Smith, *Hylaeus brevicornis* Nylander, *H. communis* Nylander, *H. confusus* Nylander, *H. hyalinatus* Smith.

Andrenidae: *Andrena barbilabris* (Kirby), *A. bicolor* Fab., *A. chrysosceles* (Kirby), *A. fucata* Smith, *A. fulva* (Müller *in* Allioni), *A. haemorrhoa* (Fab.), *A. minutula* (Kirby), *A. nigroaenea* (Kirby), *A. similis* Smith, *A. semilaevis* Pérez, *A. scotica* Perkins, *A. subopaca* Nylander, *A. wilkella* (Kirby).

Halictidae: *Halictus rubicundus* (Christ), *H. tumulorum* (Linn.), *Lasioglossum albipes* (Fab.), *L. calceatum* (Scopoli), *L. cupromicans* (Pérez), *L. fratellum* (Pérez), *L. fulvicorne* (Kirby), *L. leucopus* (Kirby), *L. rufitarse* (Zetterstedt), *L. smeathmanellum* (Kirby), *L. villosulum* (Kirby), *Sphecodes ephippius* (Linn.), *S. ferruginatus* von Hagens, *S. geoffrellus* (Kirby), *S. gibbus* (Linn.), *S. hyalinatus* von Hagens, *S. monilicornis* (Kirby), *S. pellucidus* Smith.

Megachilidae: *Chelostoma florisomne* (Linn.), *Osmia leaiana* (Kirby), *O. rufa* (Linn.), *Megachile centuncularis* (Linn.), *M. versicolor* Smith.

Apidae: *Nomada fabriciana* (Linn.), *N. flava* Panzer, *N. flavoguttata* (Kirby), *N. goodeniana* (Kirby), *N. marshamella* (Kirby), *N. panzeri* Lepeletier, *N. ruficornis* (Linn.), *Anthophora furcata* (Panzer), *Bombus hortorum* (Linn.), *B. lapidarius* (Linn.), *B. lucorum* (Linn.), *B. pascuorum* (Scopoli), *B. pratorum* (Linn.), *B. terrestris* (Linn.), *B. bohemicus* (Seidl), *B. vestalis* (Geoffroy *in* Fourcroy), *Apis mellifera* Linn.

Letter to the Editors:

Hornbeam C*arpinus betulus* near the RHS Harlow Carr garden

With reference to John Newbould's article "Hornbeam in VC64 at Harlow Carr....." on page 19 of *Bulletin* 54 I would like to make a comment about an older tree in the vicinity of Harlow Carr.

I live approximately 1 mile due east of the tree with the fungal gall *Taphrina carpini*. My house is built where the now demolished Victorian hotel 'Harlow Manor' stood, but a number of the mature trees that were in the grounds were retained and now have preservation orders. As a result I have a very large mature Hornbeam in my garden. It is about 70ft tall and with a girth of 195cm at 4ft. The tree at Harlow Carr is, I think, much younger: it is about half the height and its girth at 4ft is 110cm. There is no sign of *Taphrina carpini* on my tree and since this fungal disease is otherwise unknown in this area I suspect that the Harlow Carr tree was infected when it was purchased.

Roger Henson 9 Harlow Manor Park, Harrogate, HG2 0EG

The Slender Slug *Malacolimax tenellus* in Yorkshire

Adrian Norris, 17, West Park Drive, Leeds, LS16 5BL
David Lindley, 46, Sutherland Avenue, Leeds, LS8 1BZ

The discovery of a large colony of the Slender (or Tender) Slug, *Malacolimax tenellus* in Beech woodland on Swinton Park Estate near Masham, VC65 (SE197800 and SE19197884), makes it one of the most important new sites for this species in Yorkshire. This very local slug is recorded from a scattering of locations throughout the British mainland and is mainly restricted to ancient, undisturbed or traditionally-managed coniferous and deciduous woodland. It feeds on fungi, mainly *Russula* species, which grow in open areas with little in the way of a ground flora. It shelters mainly under ground litter but can also be found under bark. The slug is usually yellow with a dark head and yellowish slime. It is relatively small, measuring up to 4cm in length (Centre pages Plate 4b). As its main food items are fungi it is usually only noted in the latter part of the year when it can be observed feeding on its favoured species.

In Yorkshire it has been recorded from a handful of sites, mainly as single examples. The earliest Yorkshire record appears to date back to 1888 when it was reported from Sharlston (SE3918) in VC63 by J.Wilcock. No other records of this species from South-west Yorkshire have ever been reported. The second oldest record is from Hall Wood near Masham, found by W.A.Thwaites in October 1904. A recent examination of this area suggests that the woodland from which this slug was recorded was felled many years ago. All the other Yorkshire records have been found over the last 40 years.

VC62 Egg Griff, Bridestones, Dalby Forest SE8791 A. Norris 23.08.1987
Dovedale Griff, Dalby Forest SE8790 Tony Wardhaugh 16.08.1988
East Arncliffe Wood, Egton Bridge NZ7804 A. Norris 28.08.1992
West Arncliffe Wood, Egton Bridge NZ7804 Tony Wardhaugh 21.07.2007

VC63 Sharlston SE3918 J. Wilcock 1888

VC64 Raven Ghyll, (Strikes Wood), Pateley Bridge SE152640 John Armitage 02.10.1971
(Various recorders have reported this species from this site since, all in the month of October. The last recorded sighting was in 2008).
Grewelthorpe Woods SE243770 L. Lloyd-Evans 10.10.1971

VC65 Hall Wood near Masham SE170797 W.A.Thwaites 10.1904
Birk Gill near Masham SE135813 Keith Alexander 05.10.1985
Swinton Park near Masham A. Norris & D. Lindley SE197800 16.10.2010
Swinton Park near Masham A. Norris & D. Lindley SE19197884 16.10.2010

A close examination of the sites suggests that we have only four core areas for this species: the Bridestones area of the Dalby Forest; Arncliffe Wood at Egton Bridge; Ravens Ghyll near Pateley Bridge and the old woodland areas surrounding Masham. The Swinton Park sites are important as they are situated within areas of old woodland running along the banks of the River Ure and its tributary the River Burn, and include sites in both VC64 and VC65.

The Swinton Park sites are in large areas of Beech woodland situated beside the road but the nearby walls and the extremely steep sides to the site prevented further investigation. The surrounding estate has large areas of Beech woodland both within the estate walls and externally, suggesting that this species could be far more widespread within the estate than just these initial finds indicate.

The Particoloured Bat *Vespertilio murinus* found in the East Riding of Yorkshire (VC61)

Anthony Lane, 7, Orchard Road, Skidby, Cottingham, HU16 5TL. (East Yorkshire Bat Group)

The Particoloured Bat (*Vespertilio murinus)* (front cover) is rare throughout its distribution in northern Europe and considered to be migratory throughout its range and a vagrant in the British Isles (Harris and Yalden, 2008). Up until 2000 there were only five records from locations in mainland Britain plus two records from the Shetlands and an offshore oilrig (Richardson, 2000). Since 2000 there have been additional mainland records of individuals from the Isle of Wight, 2001 and 2006; Sussex, 2001 and 2005; Wiltshire, 2002 and East Yorkshire, 2002. Also over this period there have been three records from North Sea oilrigs off Scotland which attest to the species being a vagrant to Britain. The Particoloured Bat has a striking appearance with broad rounded ears and a short tragus which is broadest towards the tip. The dorsal fur is long and dark with silvery tips, resulting in a rather attractive frosty appearance. In contrast, the ventral fur is a creamy white colour with the chin having a fringe of chestnut brown fur. Altogether this is an exceptionally handsome bat matched only in the UK by the foxy-brown fur of the Noctule (*Nyctalus noctula*).

The first record of the Particoloured Bat in East Yorkshire arose as a result of bat rescue and rehabilitation activity undertaken by members of the East Yorkshire Bat Group. Philip and Jennie Moodie were alerted to a grounded bat at Hornsea (TA205463) on 4th March, 2002, which they took into care. The bat appeared unharmed but was very underweight at 9.25g (species range 11-24g, Corbet & Southern 1977). The female bat had a forearm measurement of 43.9mm (species range 40-50mm). The identification as a Particoloured Bat was confirmed by John Drewett (North Yorkshire Bat Group) and was the first record of this species in VC61. (The discovery was reported initially as an item in *Bat News*, July, 2002). The bat had a good appetite and ate in excess of 20 mealworms daily, thereby gaining weight rapidly to 17g. The bat was released close to its place of capture at Hornsea on 20th April, 2002.

The second record for this species in the East Riding occurred on 14th October, 2010, when I was requested to extricate a bat from the bedroom of a dwelling in Copandale Road, Beverley (TA032407). The female Particoloured Bat was taken into care. It was apparently unharmed but underweight at 11.5g. She had a forearm measurement of 45.7mm and possessed a voracious appetite, consuming 30 mealworms daily. By 22nd October she had gained weight to 17g and was released near to her place of capture.

Acknowledgement

I am indebted to Vaughan Grantham (Hull Valley Wildlife Group) and Philip Moodie (EYBG) for their excellent images of the bats found in Beverley and Hornsea respectively.

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First records of Leisler's Bat *Nyctalus leisleri* in the East Riding of Yorkshire (VC61)

Anthony Lane, 7, Orchard Road, Skidby, Cottingham, HU16 5TL. (East Yorkshire Bat Group)

East Yorkshire Bat Group (EYBG) has been involved in bat rescue and rehabilitation since the Group was established in 1990. Since then several hundred bats of up to nine different species have been dealt with.

An underweight female Leisler's Bat (*Nyctalus leisleri)* (Centre pages Plate 4a) was found grounded at Marfleet Avenue, Kingston upon Hull (TA138294) on 18th June, 2010, and brought to the attention of Tony Lane and the EYBG rescue facility. Inspection of the bat indicated that it was apparently uninjured but unable to sustain flight, possibly due to being underweight at 11g and just within the accepted weight range for the species of 11-20g (Corbet & Southern 1977). The bat quickly became accustomed to its unfamiliar captive diet of mealworms, consuming 30 or more daily and commencing to pass droppings. After a few days she had gained weight to an acceptable 15g and was successfully released near to the place of discovery on 1st July, 2010. It is possible that the bat was trapped as part of a consignment of goods and brought unwittingly to Hull, either by land or sea, before gaining its liberty in the dockland area.

The identification of the bat was kindly carried out by John Gregory of West Yorkshire Bat Group (WYBG), who has had extensive experience of Leisler's Bat, frequently encountered roosting and breeding in the Wakefield area. Similar in appearance to the Noctule *Nvctalus noctula* with a mushroom-shaped tragus, it may be distinguished by its smaller size (forearm <48mm) and the bicoloured fur that is darker at the roots. The fur extends to the wings and forearm which gives rise to the alternative common name of the "Hairy-armed Bat" (Harris and Yalden, 2008). The Marfleet Avenue bat had a forearm measurement of 43.3 mm, close to the species mean of 42.7mm and within the range of 41-44mm (n – 23) (Shiel,1999.)

On 12th September, 2010 Philip Moodie collected a grounded bat found trapped in a cellar at Sands Lane near North Marine Drive, Bridlington (TA190679). The bat's identification was confirmed by Tony Lane and provided an unexpected second record of a female Leisler's Bat in VC61. The bat was found to be underweight at l0g with a forearm measurement 44.4mm. It soon went up to 15g weight when fed on mealworms and was released on 20th September, 2010. It is possible that this bat had dispersed after the nursery season's conclusion and had followed the coastline from known roost sites in the southern part of Lincolnshire or that it was even blown across the North Sea from mainland Europe.

Distribution records for Leisler's Bat in the British Isles (Richardson, 2000) suggest that, although recorded in the Dumfries and Galloway areas of Scotland, it is found predominantly from roost sites in Sheffield, South Yorkshire and Wakefield, West Yorkshire then southwards to Bristol where the largest roosts have been found. Ireland is considered to be the world stronghold for Leisler's Bat where, rather surprisingly, the Noctule is not found. There are several recent unconfirmed reports of Leisler's Bat in North Yorkshire, obtained from using ultrasound detecting and recording equipment (John Drewett, pers.com. North Yorkshire Bat Group) The most recent mammal distribution mapping for North Yorkshire (Oxford et al, 2007) suggests that the species is under-recorded with just one location noted. To date there have not been any ultrasound records or sightings of Leisler's Bat from VC61.

Acknowledgements
The author wishes to acknowledge Philip Moodie of the EYBG for his photograph of the Leisler's bat from Marfleet Avenue and the vital statistics of the Leisler's he collected from Sands Lane, Bridlington. Thanks also for the valuable assistance of John Gregory of the WYBG in the examination and confirmation of the species of the Marfleet Avenue bat.

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Letter to the Editors:

Wild Tulips

The article on Wild Tulip in *YNU Bulletin* issue 54 raises an interesting issue. The description of large, densely packed populations of a species which is not native to the UK suggests that this plant was, at one time, an aggressively invasive alien. Some change has, presumably, caused it to go into reverse. Whatever it was did not affect Sycamore in the same way! The comment that Wild Tulip may be associated with viticuture suggests that it may be climate-induced and Yorkshire may now be too cold for it.

I recall that Canadian Waterweed enjoyed a population explosion after it arrived in this country but, after a period of years of exponential growth, it suffered a decline in the late C19th and almost disappeared. It has since stabilised to be a normal but not overwhelming constituent of aquatic environments.

Nature's dynamism keeps us on our toes.

Bill Ely

A joint meeting to Melton Wood

Tom Higginbottom

On Sunday 5th September 2010 naturalists from the Yorkshire Naturalists' Union, the Sorby Natural History Society, the Doncaster Naturalists' Society and the British Plant Gall Society gathered together at Melton Wood in South Yorkshire. One of the first galls recorded was the swelling in the stem of Creeping Thistle caused by the tephritid fly *Urophora cardui (Centre pages Plate 3b)*. The first Yorkshire record for this gall causer was in 2006 near Fishlake but by 2010 there had been records at a number of sites in VC63. Galls on the herbaceous plants were not so common but the tips of the pinnules of some Bracken fronds had been rolled downwards by the fly *Chirosia grossicauda* and the shiny black-pudding midge galls of *Dasineura filicina* were seen on some pinnules. Margaret Redfern eased apart the flower head of Lesser Burdock to reveal another tephritid causer, *Terellia tussilaginis*. After careful searching along one of the more open rides the lighthouse gall, caused by the midge *Rondaniola bursaria,* was found on the leaves of Ground-ivy, while the fungal galler *Puccinia glechomatis* was also present on the lower surface of a number of leaves. There were also examples of other midge galls: *Jaapiella veronicae* on Germander Speedwell and the often-overlooked midge *Dasineura trifolii* swelling the leaves of clover was finally discovered. After searching through the stands of Rosebay Willowherb the leaf roll indicating the presence of the midge *Dasineura kieferiana* was found. The purplish ergots of *Claviceps purpurea* were seen projecting from the florets of Wood False-brome (*Brachypodium sylavaticum*), the host being identified by botanist John Scott. In a marshy area blister-like swellings were also found on the leaves of Creeping Buttercup, caused by another fungal galler *Urocystis ranunculi.*

Beech is a common tree in the wood and, not surprisingly, a number of galls were discovered on the leaves. The mite galler *Acalitus stenaspis* had caused the upward roll on the edges of the leaves while another mite, *Aceria nervisequus,* had formed white erineum patches along the veins on the upper surfaces. Another mite, *Aceria fagineus,* had formed an erineum between the veins on the undersides of the leaves. The midge *Hartigiola annulipes* had also formed a cylindrical gall projecting from the upper surfaces of the leaves. Ash flowers were galled by the mite *Aceria fraxinivorus,* transforming them into brown, irregular, cauliflower-like growths. There were also two midge galls: *Dasineura fraxini,* which causes the main vein of the leaf to swell, and *D. fraxinea,* which produces black, circular blisters on the leaf. Common and Silk-button Spangle Galls *Neuroterus quercusbaccarum* and *N. numismalis* were abundant on oaks but, unlike previous years, there were no records of any of the *Cynips* species which had been a significant feature of plant gall meetings in 2010. There were also records of some of the common bud galls with Artichoke *Andricus fecundator* and Marble Galls *A. kollari* being reasonably common. Thanks to the sharp eyes of Ian Farmer some of the more unusual bud galls were discovered, such as the small, lightly curved pointed gall of *Andricus solitarius* and the rounded gall of *A. corruptrix*, each of which is only a few millimetres in length. There were two galls on Yew: the tight cluster of leaves forming the artichoke *Taxomyia taxi* and the enlarged bud formed by the mite *Cecidophyopsis psilaspis*. A lime tree planted in recent years provided a host for a number of mite galls: the erineum on the undersides of the leaves caused by *Eriophyes leiosoma*, the distinctive nail galls of *E. tiliae* and the leaf roll of *Phytoptus tetratrichus*. The rivet gall caused by the midge *Didymomyia tiliacea* was also present. On poplar a loose leaf roll covered in white hairs was discovered and eventually identified as *Dasineura populeti*. *Massalongia ruber,* another gall midge, caused a swelling to the midrib of a single birch leaf with the distinctive swelling more prominent on the underside. Few of the searchers had recorded these last two galls before. A number of stems

of Dewberry showed evidence of newly-formed galls of the wasp *Diastrophus rubi*. There were also stems with old galls and their many chambers clearly visible.

While sweeping with his net along one of the more open rides, entomologist Bill Ely collected a stilt bug *Metatropis rufescens* which Jim Flanaghan reports is the first Yorkshire record. The ichneumon *Aclastus eugracilis* was collected, which was the second Doncaster record with the first record, also by Bill, being found in the nearby Pot Riding Wood in 1988. Curious naturalists were also shown four examples of *Stenichneumon culpator* which, while reasonably common, is only the second Doncaster record.

Sorby mycologist Carol Hobart was unable to record many fungi because of the dry conditions, but there were some interesting records. *Cyathus striatus* (Fig. 1), an uncommon 'bird's-nest' species, was seen in several places on woody debris and a young fruitbody of *Pleurotus dryinus* was discovered growing out of the side of a Beech tree. More commonly, there were several examples of *Coprinopsis lagopus* fruiting on wood chip. There were also some rather unusual pale, lemon-coloured specimens of *Suillus grevillei*. *Inocybe rimosa* was growing on the edge of a path beneath poplar, an unusual host. *Hirneola auricular-judae* was spotted on Elder in its dried state. There were also some *Lactarius* species in amongst the Beeches but these were not collected or examined.

Figure 1. *Cyathus striatus*

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Letter to the Editors:

Fasciation in Daisy *Bellis perennis*

Bob Marsh's photo in *Bulletin* 54 reminded me of a very similar Daisy I saw in my grandfather's council house garden in Grantham (VC53) in the late 1940s. It seemed to be about the same size, but straighter. It didn't last long, because, in the spirit of times past - and my boyish wonder - I promptly picked it!

Michael Atkinson 7 Old Bridge Rise, Ilkley, West Yorkshire LS29 9HH

"When we try to pick out anything by itself, we find it hitched to everything else in the universe." (John Muir)

Book Reviews

Seeds, Sex & Civilisation by **Peter Thompson.** Pp. 260, including 32 pages of black and white illustrations. Publishers: Thames & Hudson, London, 2010. £19.95 hardback.

Every morning, the modern world wakes up and sits down to its cereals and toast and marmalade, without ever giving these items a second thought. When the loaf is finished or the cereal packet empty, we merely go to the supermarket to replenish our stocks. Yet without the raw material, seeds, of these staple food items, our modern lifestyle, which we take for granted, would not be possible.

This book takes the humble seed on a long, ten thousand year journey, beginning with the early primitive farming communities of Anatolia and Mesopotamia and a scatter of other, similar early settlements across the world, where emmer and einkorn, the ancestors of our modern wheat, were rudely cultivated by shifting agricultural methods. The end of that journey sees the seed brought into mass cultivation to feed a burgeoning world population in the 21st Century with the staples of wheat, maize and rice. The journey in between strikingly charts human beings' relationship with, and dependence on, the seed.

The early philosophers, Aristotle and his followers, did not believe that plants reproduced sexually. To be able to do that, a creature had to be capable of movement, and plants did not move by themselves. This misguided conception was further compounded by the religious dogmas resulting from the general belief in biblical accounts of the Creation. This erroneous belief persisted in a very tangible form until Charles Darwin and Alfred Russel Wallace revolutionised 19th Century thinking by their revelations about evolution, natural selection and the origin of species. After nearly two thousand years, from the time of Aristotle, light gradually began to dawn at the end of the tunnel and the obvious potential of large scale seed cultivation began to be realised. From the time of Rudolph Camerarius in the late seventeenth century, the sexual nature of seeds was realised, in the transference of pollen from male anthers to female stigmas. From then, a succession of university academics and more practical gardeners, and particularly people like the monk Gregor Mendel, in the mid-19th Century, brought the science of plant breeding and seed cultivation forward. Mendel's study of inheritance in various types of pea crop heralded the science of genetics. Shortly after, other workers, notably Edouard Strasburger in Germany, investigated the new science of cytology or cell structure in plants. A third giant in the march of progress was the Soviet geneticist Nikolai Vavilov who, in the early 20th Century, was one of the pioneers in understanding genetic variation in crops. He was the prime mover in establishing the concept of founding seed banks across the world later in the century, for the conservation of different types and cultivars of seed. The Kew Millennium Seed Bank, opened in 2000, signifies Britain's involvement in this trend.

These rapid developments in the last hundred or so years, have culminated in the large scale modern commercial production of wheat, rice and other cereal crops across the world. Norman Borlaug, an American agronomist, is considered to be the father of this Green Revolution, in which improved strains of major cereal crops have worked hand in hand with genetic homogeneity. The book ends with a projection of future prospects in large scale cereal and agricultural production. High on the list of concerns are those environmental changes which we can see taking place now. These include soil erosion – the American 'Dustbowl' effect of the 1930s; forest clearance – the Amazon equatorial rain forest effect; and, perhaps most

significantly of all, man-made climate change. These are all major scenarios on which human beings now and in the future will have to decide the best course of action.

This book provides a very comprehensive and readable account of man's involvement with the seed since earliest times of primitive agriculture through to the present day, when a worldwide network of seed banks and plant breeding centres is the norm. The author can be congratulated on giving a lucid and succinct account of this ten thousand year journey within the compass of a mere 230 or so pages of text. The book is a very informative read for agriculturalists, crop managers and environmentalists generally.

GTDW

People, Places and Species – a History of the Study of Wasps, Ants and Bees in Watsonian Yorkshire by **Michael Archer.** Pp.78, 3 colour plates (incl. front cover) plus numerous colour and b/w photographic portraits. Vespid Studies, York. 2011. £3.00 paperback.

Michael Archer's latest publication is a most interesting and informative study of Yorkshire's aculeate hymenoptera – from the viewpoint of the entomologists who recorded them and the special places where the scarcer species have been found.

The Introduction briefly considers the characteristics of the main workers of aculeate hymenoptera in Yorkshire, followed by a short account of the biology and ecology of the insects themselves. Numerous Yorkshire localities are used to illustrate points made. The main section of the book 'People and Places', profiles the leading personalities who contributed most to aculeate recording in the county from the mid-19th Century onwards, with interesting notes on the sites they studied. All students of Yorkshire natural history will find this section fascinating and the author is to be congratulated on the careful research involved in bringing this scattered information together. The following section 'Species', outlines some of the problems that beset an aculeate Recorder, whether they relate to name changes, difficult groups, records with insufficient data etc. There follows tables showing the number of species in Watsonian Yorkshire and recorders' names associated with first records, then a very useful list of references and lastly more tables providing information regarding the eras in which new Yorkshire aculeates were discovered with the names of the species involved.

The text seems relatively free of errors although the reviewer noticed the name Derek Whiteley appearing both as Derek Whitely and Whitley in Austin Brackenbury's entry and everyone profiled is born '*during*' their particular year, which struck a slightly odd note. But these are minor quibbles. This is an excellent publication at a bargain price, evidently conceived out of a love and pride in Yorkshire; all the more remarkable then, as we *now* know that the author was born in Bristol.

JDC

Yorkshire Naturalists' Union Excursions in 2010

Compiled by **Albert Henderson** and **Adrian Norris**

Lower Derwent Valley (VC61) 15 May 2010 (NGR Centrum SE752441)

INTRODUCTION (Sarah Priest)
The VC61 Excursion on 15th May was blessed with a sunny day after weeks, it seemed, of cloudy, cold weather and strong easterly winds.

Perhaps the sunshine or the attractive location tempted a record 34 members and friends to assemble in the Lower Derwent Valley by kind permission of English Nature. Roy Crossley, a voluntary warden for EN, introduced the options for the day with a range of habitats including the Pocklington Canal, adjacent water meadows, tall-herb fen and woodland. Effort was concentrated on land owned by EN, who had asked for records and advice on management.

At the end of the afternoon, over tea and cakes at Melbourne Village Hall, reports were given at a meeting chaired by Terry Crawford. A total of 62 bird species had been seen, including proof of breeding for nine species. Highlights were large numbers of singing Sedge Warblers along the canal, Curlews, breeding Tree Sparrows, a singing Grasshopper Warbler, Little Owl and Barn Owl. 36 species of molluscs were found (including 22 from the canal), six different ladybirds and Large Red Damselfly (*Pyrrhosoma nymphula*) and Common Blue Damselfly (*Enallagma cyathigerum*)– the first damselflies of the season. The botanists were pleased to find Marsh Cinquefoil (*Potentilla palustris*), Wood Stitchwort (*Stellaria nemorum*), Bladder Sedge (*Carex vesicaria*) and Meadow-rue (*Thalictrum flavum*). Five species of pollution-sensitive bryophytes were also found.

The meeting was attended by a number of students from the University of York and it was particularly good to be able to welcome a new generation of field naturalists to the Excursion.

ORNITHOLOGY (Ken White and Sarah Priest)
This report combines records from many of the members who attended the Excursion. A total of 64 species were recorded, of which nine provided evidence of confirmed breeding, making a very useful contribution to the BTO Atlas database. Highlights were Barn Owl and Little Owl; several pairs of Yellow Wagtail; a thriving colony of Tree Sparrows nesting in the farmhouse roof at Thornton Ellers; a vigorously singing Grasshopper Warbler and displaying Curlew over the ings meadows. The canal banks abounded with singing Sedge Warblers and Reed Buntings; Willow Warbler and Cuckoo were also heard. Swallows were feeding over the meadows and Swifts circled over Melbourne village.

CONCHOLOGY (David Lindley, Adrian Norris & Terry Crawford)
Conchologists have visited the Melbourne area fairly often in recent years primarily due to a 1k survey of the Pocklington canal which has recently been completed. During the course of the day 3 members visited the canal as well as the surrounding area. Records were made from five 1k squares with a total of 41 species being recorded, 20 land and 21 freshwater species were found.

There were a number of interesting records from the canal itself the most noteworthy being a single fresh dead shell of a *Stagnicola* species. Formally known as *Lymnaea palustris* the

species has recently been split and dissection is essential to confirm identity. This species had not been found in recent years in the canal so was a good addition to the recent survey. *Pisidium subtruncatum* was found in SE7544, SE7644 and SE7744. During the recent survey it had only been found in one square out of 16.

Of the larger mussels, *Anodonta anatina* is fairly common in the canal between the River Derwent and the Melbourne arm but extremely scarce from there towards Canal Head. On this occasion it was not found in the canal so the small stream to the north of Church Bridge was looked at in detail for the larger mussels. A stretch of about 140 metres was surveyed and over 250 specimens were seen. A single specimen of *Anadonta cygnaea* was found in the canal at Church Bridge, which was new to that 1k square.

Of the terrestrial species there was nothing of great note though *Candidula intersecta* and *Candidula virgata* were both found on roadside verges in the area.

LEPIDOPTERA (Terry Crawford)
Given the time of year and the damp meadow habitats it is not surprising that spells of sunshine were accompanied by good numbers of Green-veined White and Orange-tip. Other species noted were Brimstone (*Gonepteryx rhamni*), Small White (*Pieris rapae*), Small Tortoiseshell (*Aglais urticae*), Peacock (*Inachis io*), Speckled Wood (*Pararge aegeria*) and the geometrid moth Common Carpet (*Epirrhoe alternata*).

ENTOMOLOGY (Andrew Grayson)
The writer surveyed two areas adjacent to Pocklington Canal in the vicinity of Melbourne, where the local weather was generally fine and pleasantly warm in areas sheltered from cooling breezes. The Church Bridge area (SE747445) was investigated during the morning and Pocklington Canal was investigated along its towpath between SE747445 and SE733453 in the afternoon. Species marked with an asterisk were found in both areas.

The hoverfly *Leucozona lucorum** was unusually abundant around developing scrub and flowers by the canal banks and adjacent ditches and pools near Church Bridge in SE753443. Also near Church Bridge were the damselflies *Pyrrhosoma nymphula* and *Enallagma cyathigerum*; the alder-fly *Sialis lutaria*; the ladybird *Coccinella septempunctata**; the hymenopterans *Vespula vulgaris*, *Andrena haemorrhoa*, *Bombus pascuorum**, *B. pratorum* and *B. vestalis*; and the dipterans *Bibio johannis*, *B. leucopterus*, *B. marci**, *Dilophus febrilis**, *Beris chalybata*, *Nemotelus nigrinus*, *Empis trigramma*, *Hilara maura**, *Rhamphomyia crassirostris**, *R. sulcata**, *Platycheirus albimanus**, *P. clypeatus* s.s.*, *Cheilosia albitarsis* s.s.*, *C. pagana**, *Rhingia campestris**, *Eristalis pertinax**, *Helophilus pendulus**, *Melanogaster hirtella**, *Neoascia meticulosa*, *N. tenur*, *Syritta pipiens**, *Mesembrina meridiana** and *Calliphora vomitoria*.

The most noteworthy find of the day was the local marshland hoverfly *Anasimyia transfuga* which was present in small numbers beside the canal at SE747445. The cardinal beetle *Pyrochroa serraticornis* was also present in small numbers at SE733453. The following were also found along the towpath between SE747445 and SE733453: the ladybird *Adalia bipunctata*: the hymenopterans *Vespula germanica*, *Apis mellifera*, *Bombus lapidarius*, *B. lucorum* and *B. terrestris*; and the dipterans *Rhagio scolopaceus*, *Bombylius major*, *Ocydromia glabricula*, *Platypalpus longicornis*, *Empis opaca*, *E. tessellata*, *Melanostoma mellinum*, *M. scalare*, *Platycheirus peltatus s.s.*, *P. scutatus s.s.*, *Syrphus ribesii*, *S. torvus*, *Eristalis arbustorum*, *E. interruptus*, *E. intricarius*, *Helophilus hybridus*, *Xylota segnis*, *Calliphora vicina* and *Gymnocheta viridis*.

HEMIPTERA – HETEROPTERA (Joe Botting)
The Hemipteran fauna recognised was surprisingly limited with a total of 28 species including four psyllids and 12 Auchenorrhyncha. Almost all taxa are common species that would be expected at most sites with similar habitats. The psyllids are among the most common species and show no surprises, except in the remarkable rarity of the normally abundant *Trioza urticae* and *Cacopsylla melanoneura* (one specimen each). The leafhoppers showed similar low abundance, even of extremely common taxa such as *Empoasca vitis* and *E. decipiens* (a widespread trend this year). *Macustus grisescens* was common on clumps of rushes but was not seen elsewhere. No specimens were taken of the ubiquitous grassland species *Zyginidia scutellaris* nor of *Dikraneura variata*, despite a variety of grassy areas being examined. Nymphs of *Oncopsis flavicollis* were seen occasionally on birch but were not present on all trees. Remarkably, no leafhoppers or psyllids were recovered from the abundant alder trees. The planthoppers included two relatively interesting species: a single specimen of *Stenocranus major,* beaten from peat bog vegetation by the hump-back road bridge, and a single specimen probably of *Struebingianella lugubrina* seen but not captured on *Glyceria* on the canal. Both are local species but probably widely overlooked.

The Heteropteran fauna was similarly depauperate with even common species encountered only rarely. A single adult of *Tritomegas bicolor* on White Deadnettle with a first-instar nymph of probably that species were the only shieldbugs recorded (although another was apparently sighted but not identified in Ellers Wood). Two specimens of the lacebug *Tingis ampliata* were beaten from an area of long grass with its host Creeping Thistle. Rushes yielded one specimen of *Cymus melanocephalus* and the peat bogs yielded enormous numbers (thousands) of nymphs of *Ischnodemus sabuleti*, associated with small numbers of adults; nymphs were also seen regularly on *Glyceria* in the canal. Two aquatic heteropterans were caught by A. Norris: *Notonecta glauca* and a corixid, probably *Sigara dorsalis*, both from single specimens. The only notable species was a nymph of *Monosynamma* sp., collected close to the moorings but not on its host plant of *Salix*. Any *S. repens* at the site should be carefully checked for adults as all species are at least Notable and some are RDB.

The early date and delayed spring this year probably contributed to this remarkably low number of species but the rarity of most of the species present (despite fine sunny weather) is also surprising. I would expect a later summer visit to yield much more.

PLANT GALLS (Tom Higginbottom)
Few plant galls were discovered, which is not surprising so early in the year. Two mite galls were discovered on Hawthorn leaves: white pimples caused by *Aceria crataegi* and the leaf roll caused by *Phyllocoptes goniothorax.* The most interesting mite gall was discovered on Crab Apple leaves in a hedgerow to the west of Thornton where there were a number of the leaf rolls induced by *Eriophyes malimarginemtorquens.* Surrounding the churchyard at Thornton was an English Elm hedgerow. On many of the leaves there was an abundance of the pimples caused by the mite *Aceria ulmicola*. Some micro-fungi are regarded as gall causers. Orange aecia of *Puccinia coronata* were discovered on the leaves of Buckthorn and *Triphragmium ulmariae* on Meadowsweet, although the most distinctive fungal gall was the unusual distortion of the stem of Stinging Nettle caused by *Puccinia urticata.*

BOTANY (Richard Middleton)
The botanical party were fortunate to be granted access to the previously little-recorded area of Thornton Ellers, a large area consisting of wet pastureland to the east of a wet Alder wood. Unfortunately, the late spring made identification in the heavily-grazed grassland difficult but careful searching revealed many of the plants that might be expected in such an environment, albeit often in small quantities. More notable finds from the rushy, wetter and more species-rich area near a spring line along the northern break of slope yielded *Thalictrum flavum, Valeriana officinalis, Ranunculus flammula*, *Lotus pedunculatus*, *Potentilla palustris, Carex disticha* and *C. hirta*. Towards the western end, as the wood was approached, the character of the flora changed with *Viola palustris*, *Lysimachia vulgaris* and *Carex acutiformis* being found. A slightly raised area of short turf north-east of the woodland was notable for an abundance of *Luzula multiflora* subsp. *congesta* growing with *Succisa pratensis, Potentilla erecta* and an abundance of *Dactylorhiza* sp., unfortunately not yet in flower.

The woodland was without doubt the highlight of the visit and revealed a rich, if somewhat patchy and scattered, flora. Trees accompanying the Alder included *Quercus* x *rosacea, Fraxinus excelsior*, *Frangula alnus, Sorbus aucuparia, Salix fragilis* and *Malus* sp. Many of the more usual woodland plants such as *Anemone nemorosa, Oxalis acetosella, Primula vulgaris, Hyacinthoides non-scripta, Ceratocapnos claviculata, Carex remota and Milium effusum* were present along with several more locally scarce taxa including *Calamagrostis canescens*, *Carex vesicaria*, *Stellaria nemorum, Viola palustris* and, surprisingly, vigorous patches of a hybrid violet, possibly *Viola* x *bavarica*, the cross between *V. riviniana* and *V. reichenbachiana*. It was pleasing to see a good scattering of large tussocks of *Carex paniculata* but the presence of the invasive alien *Impatiens glandulifera* was of some concern and this, along with the *Pteridium aquilinum*, may need controlling.

BRYOLOGY (Colin Wall)
Most of the day was spent in Ellers Wood at Thornton Ings. Apart from the usual woodland species there were good quantities of *Leptodictyum riparium* and *Leskea polycarpa* on willow roots and boles by Blackfoss Beck, suggesting periodic inundation. Also of interest was *Isothecium alopecuroides* around the bole of a mature ash tree. Of the 35 species found during the day, 25 were in Ellers Wood.

Certain epiphytic bryophytes have responded well to recent reduced levels of atmospheric sulphur dioxide and five of these taxa were found on willow in Ellers Wood. *Ulota crispa s.l.* was quite common on both willow and Ash but could not be ascribed definitely to either *U. crispa* or the closely related *U. bruchii* because the capsules were immature. *U. phyllantha* was found at two sites on willow, as were *Orthotrichum pulchellum* and *Cryphaea heteromalla*. The leafy liverwort *Frullania dilatata* was also found on willow.

At Westfield House Farm, masses of the thalloid liverwort *Marchantia polymorpha* subsp. *ruderalis* coated areas of the farmyard. Also found was *Orthotrichum anomalum* on a section of concrete drainage pipe.

The Pocklington canal was visited during the afternoon. The aquatic species *Platyhypnidium riparioides* and *Fontinalis antipyretica* were recorded near the lock gates where fast-flowing water emerged from a culvert. *Syntrichia montana* was on an old railway sleeper.

Dalby Forest (VC62) 12 June 2010
(NGR Centrum SE852860)

INTRODUCTION (Adrian Norris)
Thirty-one members and friends, representing 15 affiliated societies, met at Haygate in the Dalby Forest in what turned out to be warm and sunny weather conditions. The warm weather resulted in the discovery of a Slow-worm under a stone be the side of the wall close to the entrance to the Ellerburn Bank Nature Reserve. At the indoor meeting members also reported Adder, Common Frog, Toad and Palmate Newt from the reserve area, bringing the total of reptiles and amphibians to five. A shortage of entomologists on the day resulted in very few insects being recorded.

ORNITHOLOGY (Mick Carroll)
A greyish start turned into a fine day from 11am onwards. Green Woodpecker was calling along Haygate and members also observed Coal Tit, Goldcrest, Blackbird, Chaffinch, Siskin and Wren. At the Pextor Bank end of Haygate Wood Warbler and Garden Warbler were very vocal. Hobby was seen twice, once attacking a Swift, all in vain, and a Buzzard thermalled up above Ellerburn Valley just after 1300 hours. Other members, following their various disciplines, observed Willow Warbler, Chiffchaff , Jackdaw, Rook, Carrion Crow, Robin and Mistle Thrush. Jay was observed whilst the Honorary Secretary was shown various remains of the old managed Rabbit warrens of the area and another Wood Warbler was heard at the top of Flech Dale. Garden Warblers were much in evidence by their song on the Dale up to Dixon's Hollow.

The mycology team went to Bridestones (SE877903) where they observed Goldcrest, Grey Wagtail, Garden Warbler, Blackcap, Chiff Chaff, Marsh Tit, Siskin, Chaffinch, Song Thrush, Great Spotted Woodpecker and Wren. At High Staindale (SE881903) Tufted Duck, Willow Warbler, Blackcap and Whitethroat were recorded. Those who went further down Ellerburn Valley towards Thornton-le-Dale observed Swift, Mallard and Greylag Goose. Around Low Dalby village, where we finished our wanderings, House Sparrows, Swallows and House Martins were in evidence. The final bird observed was Pied Wagtail in the courtyard after a very enjoyable day.

CONCHOLOGY (Adrian Norris)
The four members of the section explored the molluscan fauna of Ellerburn Bank and the area of forest both below and to the north of the nature reserve. A total of 23 species and 46 records were gathered from four 1k squares, over half of which proved to be new to the Section's recording scheme. Most of the species recorded were typical of open dry grassland with the confines of the reserve providing a list of some 19 molluscan species. Perhaps the most interesting of these were *Monacha cantiana* and *Cornu aspersum*, both of which are additions to the reserve list. The former is a species of tall herbage, usually associated with roadside verges, whilst the latter, the Common Garden Snail, is a species associated with gardens and open areas with lots of rubbish.

LEPIDOPTERA (Terry Crawford)
The weather was quite good for Lepidoptera and 23 species were noted (15 butterflies, three micro- and five macro-moths) but numbers of individuals were rather low, as is often the case at this time of year. All three whites were well distributed with Green-veined White the most common and a single late Orange-tip was seen in Ellers Wood. Common Blue and Small Heath were foraging on the calcareous grassland at Ellerburn Bank but it was a little too early for the Marbled White to be flying. Large Skipper were present in the more open grassland and

scrubby areas and Speckled Wood in the deciduous woodlands. There were scattered sightings of Small Copper, Holly Blue, Red Admiral, Painted Lady, Small Tortoiseshell and Comma. The area is one of the Yorkshire strongholds of the localised Dingy Skipper and these were seen in Heckdale Quarry. Three species of micro-moths (all Pyralidae) were recorded: *Chrysoteuchia culmella,* a common grass-moth, *Scoparia ambigualis*, commonly resting on tree-trunks, and *Pyrausta aurata*, considerably rarer (the larvae feed on labiates and this adult was visiting Marjoram). Four adult macro-moths were observed: good numbers of Silver-ground Carpet and the migrant Silver Y and fewer Brown Silver-line and Clouded Silver. All moths (micros and macros) are species that readily fly during the day. One larva was identified, a Common Quaker feeding on oak.

ODONATA (Bill Hall)
Only three Odonata species were recorded in the day, a good number (10+) of Common Blue Damselfly (m&f) (*Enallagma cyathigerum*), one Large Red Damselfly (*Pyrrhosoma nymphula*) and one Common Hawker (*Aeshna juncea*). The low numbers seen were, in part, due to the normal absence of true dragonflies (Anisoptera) in the early part of the season but mainly to the closing off of access to Paper Mill Pond.

PLANT GALLS (Tom Higginbottom)
Leaves of many of the common deciduous trees had been galled by mites with the typical erinea visible on the lower leaf surface and there were also mite-induced leaf-rolls on the edge of some leaves. There were some interesting midge galls with the locally common *Dasineura acrophila* folding the leaflets of Ash into a pod-like shape. There were two midge galls on oak leaves. *Macrodiplosis pustularis* rolls the lobes of oak leaves downwards while *M. roboris* rolls the leaf between the lobes upwards. *Rabdophaga cinerearum,* another midge galler, had modified a terminal bud of Goat Willow to form a rosette. Just visible on the upper surface of another Goat Willow leaf was a small scar which indicated the presence on the lower surface of a small, hairy, spherical gall structure formed by the sawfly galler *Eupontania peduncili.* The spring generation of the spangle galls *Neuroterus quercusbaccarum* and *N. numismalis* were quite common on a number of oak leaves. Old galls of *Andricus fecundator, A. kollari* and A. *lignicolus* indicated that there had been quite a few oak galls in the previous year.

Few galls on herbaceous plants were recorded, the only midge gall being *Jaapiella veronicae,* which forms a hairy pouch on the terminal leaves of Germander Speedwell. However, there were some interesting galls caused by micro-fungi. At the meeting Chris Yeates presented a leaf of lady's mantle with the lower leaf surface covered in the brilliant orange rust fungus *Trachyspora intrusa*. Another orange rust fungus *Puccinia violae* had galled a violet leaf. In a small colony of Red Campion a few of the anthers had been galled by the purple smut *Microbotryum violaceum.*

BOTANY (John Newbould)
The morning session was spent surveying the margins of a ride running in a southerly direction on the west side of Thornton Dale. The eastern boundary is marked by an earth bank, below which is a mainly *Fagus sylvatica* plantation. *Domesday* offers a possible interpretation of this bank indicating that, at the time of the first OS Sheet, Ellerburn had existed as a separate parish associated with the now lost township of Farmanby, which was absorbed into Thornton le Dale in the 19th century. Without the intervention of forestry, the land would be supporting the NVC woodland community W10 based on *Quercus robur-Pteridium aquilinum-Rubus fruticosus* community. The woodland had much Bluebell *Hyacinthoides non-scripta.* In places the trackside was wet; here there is *Lotus pedunculatus* and *Deschampsia cespitosa.*

Figure 1 Botanists at Ellerburn Bank

Only on reaching Ellerburn Bank Nature Reserve, with its view over large areas of Thornton Dale, did the sheer scale of Dalby Forest become apparent. After lunch a move was made by car over some miles of forest roads to the High Dalby Warren (SE848184549). Here, in a forest clearing surrounded by conifers and hidden (in summer) by dense NVC woodland community NVC W25 *Pteridium aquilinum-Rubus fruticosus* under-scrub is a large, wooden cover protecting a stone pillar mound which would have made a significant contribution to the 25,000 Rabbits exported from the area annually in the 18th and 19th centuries. Instead of forest trees, turnips were grown to feed the Rabbits and now there is acid grassland under *Pteridium*. Moving further into the forest, we stopped by a fairly recent Larch plantation (SE8485). Here Nightjar is resident together with many Garden Warblers. The acid verge had a single plant of *Filipendula vulgaris* together with *Dactylorhizza fuschi, Lotus corniculatus* and *Potentilla erecta.*

The final stop was at the head of Heck Dale (SE881879). Here, in an area rich in archaeology, is the site of a warrener's hut and wall enclosure. At the side of the modern track is a hollow-way, believed to have formed the Hackness to Kinghope road. To the north, running through a plantation of Beech, is a boundary bank, the present day boundary of the parishes of Aleston to the east and Lockton to the west. To the south is a shallow disused quarry outcropping limestone. Here we saw a single Dingy Skipper and Brian Walker showed me the longhorn beetle *Rhagium bifasciatum,* associated with the nearby pines. Botanically this small calcareous site, which receives minimum maintenance, had *Trachystemon orientalis* (det. D.R. Grant), *Briza media, Fragaria vesca, Thymus polytrichus, Pilosella officinarum* and *Poterium sanguisorba.*

Brockadale YWT Nature Reserve (VC63) 20 June 2009 (NGR Centrum SE513174)

INTRODUCTION (Joyce Simmons)
Saturday 3rd July was a perfect summer's day following a very dry June. This meant that some species of flora on the dry, south-facing slopes had dried up and virtually disappeared but conditions for insects were favourable. The meeting was attended by 30 members and friends from the YNU and eight associated societies, with a wide range of interests represented. Brockadale offers a variety of habitats: the relatively clean River Went bordered by damp grasslands on alluvial soils; dry Magnesian Limestone slopes, both south- and north-facing, with different characteristics; woodland with many different conditions, on thin calcareous soils and on wet riverine soils. Woodlands face both north and south and include a good range of tree species of a variety of ages with many large specimens well over 100 years old; the largest trees are Beech, Yew, Ash, Wych Elm, willow, Sycamore and oak; woodland clearings have piles of logs in various stages of decay. A feast of habitats to be investigated.

Most groups concentrated on one area of the reserve, as limited time meant that none could cover all habitats in the time available. Conchologists confirmed the continued presence of the very rare snail *Truncatellina cylindrica*, which thrilled the botanists too. Plant gall specialists found galls on the only Hornbeam specimen in the reserve, unusual for Yorkshire. *Antitrichia curtipendula,* a moss sensitive to sulphur pollution and not recorded in south Yorkshire for over 200 years, was found on an Elder. This is a very significant record since three coal-fired power stations can be seen from the reserve. The clean-up of their emissions must be successful!

Lepidoptera were particularly fine, with probably three Dark-green Fritillaries being seen. It is hoped that this species is colonising the valley as violets, the food plant, are abundant. A moth-trapping evening (5th July) produced the first adult records for Yorkshire of *Melanthia procellata* (Pretty Chalk Carpet) and other scarce Yorkshire moths. There have been few moth-trapping sessions in Brockadale in recent decades and so a programme of discovery of the valley's species is underway.

CONCHOLOGY (Adrian Norris)
The five conchologists spent all morning searching for specimens of the rare Cylindrical Whorl-snail (*Truncatellina cylindrica*) in its only known Yorkshire location. This nationally rare snail is currently only known from a few locations in Britain and this Yorkshire site is perhaps one of the most important for this species. First recorded from Brockadale by Charles Ashford in 1874 as *Vertigo minutissima*, it was over 100 years before it was re-found and its identity confirmed. In September 1975 Dr L. Lloyd Evans noted its occurrence in the old quarry area of Went Vale. This site has been monitored regularly since that date and, although found only in very small numbers, this species can still be found in the same location identified by him. On this occasion we only noted one adult and one half-grown shell. The very hot dry conditions made it very difficult to locate many of the more damp-loving species and so the main part of the afternoon was spent on the dry, exposed grassland near to the main areas of open crag at which a colony of another local species, *Helicella itala,* can be found.

David Lindley took the opportunity to examine the River Went, with limited success; however, he did find fragmentary remains of two large freshwater bivalves, *Anodonta anatina* and *Unio tumidus*. The *A. anatina* record is new to the river but *U. tumidus* had previously been reported by Mrs E.M. Morehouse on June 12th 1948.

ENTOMOLOGY (Andrew Grayson)
From the car park the writer descended through the flower-rich grassland of Smeaton Pasture towards the River Went (SE5017), then ascended Long Crag (SE5117) before entering Brockadale Plantation (SE5017). Flying insects were plentiful in the generally warm and sunny weather.

Recording effort was concentrated in the lower section of Smeaton Pasture and the lush vegetation by the river-margin where the large damselfly *Calopteryx splendens* was locally common and a male *Anax imperator* dragonfly flew ceaselessly. The beetles *Rhagonycha fulva* and *Coccinella septempunctata* were conspicuous in Smeaton Pasture and the following were also found: the social wasp *Vespula germanica*; the bumblebee *Bombus pascuorum*; and the flies *Chloromyia formosa*, *Leptogaster cylindrica*, *Empis livida*, *Epistrophe grossulariae*, *Episyrphus balteatus*, *Eupeodes luniger*, *Melangyna compositarum*, *Cheilosia illustrata*, *Volucella bombylans* and *Lucilia caesar*. The grasshopper *Omocestus viridulus* was present on the upper dryer grassland.

Brockadale Plantation contained: a queen of the bumblebee *Bombus hypnorum*, a recent colonist to Britain, plus *B. lapidarius*, *B. lucorum* and *B. pascuorum*; the dolichopodid fly *Dolichopus ungulatus* and the hoverflies *Syrphus ribesii* and *Xylota segnis*. The ruby-tailed wasp *Chrysis angustula* and the robber-fly *Machimus atricapillus* were found along the footpath at the top of Long Crag.

PLANT GALLS (Tom Higginbottom)
The various plants and different habitats have always made Brockadale a fascinating site for the study of plant galls. While looking in the hedgerows on the leaves of Buckthorn, rolls on the edges of the leaves were soon discovered, caused by psyllid *Trichochermes walkeri*. The orange aecia of the fungal gall *Puccinia coronata,* were also visible on the lower surface of quite a number of leaves. On the edge of the woodland the rivet gall caused by the midge *Didymomia tiliacea* was quite common on the limes. Most of the common galls were discovered on Ash, Beech and Sycamore but it was surprising to discover the mite gall *Aceria tenellus* on a single example of Hornbeam, a rather uncommon tree in southern Yorkshire. Two galls caused by aphids were found on Wych Elm: *Eriosoma ulmi,* which rolls the edge of the leaf; and *Tetraneura ulmi*, which forms a stalked, club-shaped gall on the leaf surface. There were also galls caused by sawflies on the willows. A small scar on the upper leaf surface of Goat Willow indicated the hairy spherical gall of *Eupontania pedunculi* on the lower surface. There were many examples of another sawfly gall, the red bean-like *Pontania proxima* on the leaves of the Crack Willows beside the footbridge. Fifteen different galls were found on the oaks. The more unusual gallers were the wasps *Andricus corruptrix,* which forms a bud gall, and *A. quercusradicis,* which forms a series of spindle-shaped swellings on the new growth on an oak twig. Gall wasps also caused some interesting galls on herbaceous plants. *Aulacidea pilosellae* was found to have made a series of small swellings along the midrib on the underside of a leaf of Mouse-ear Hawkweed. Another wasp, *Liposthenes glechomae,* had made globular hairy swellings on the underside of a leaf of Ground Ivy. In a successful day over 60 different galls were discovered.

BOTANY (Louise Hill)
This was a great day at this varied site with over 230 species being recorded. The following description uses location names and compartment numbers as shown on the map of the site provided on the day by Joyce Simmons. The Botany Section commenced their tour in the north-eastern corner of the newly-acquired set-aside land (Asquith's Field) at SE51141735.

The Marbled White butterflies were out in high numbers despite the strong breeze and the sun shone most of the day. Our first stop was in the corner of an adjacent arable field (north of the track at the boundary of Asquith's field and Horse Field) where our attention was drawn to the rare weed of cultivation *Legousia hybrida*. Having passed through the limestone woodland of Brockadale Plantation we entered Compartment 2, an area which has been cleared of most trees in an attempt to revert the area to limestone grassland, the few remaining elms having succumbed to exposure. The area was noted for the large swathe of *Calamagrostis epigejos*, a number of healthy specimens of *Helleborus foetidis* and several plants of *Symphytum asperum* which had all collapsed due to the drought. Several flowering stems of *Aconitum napellus* were seen in the woodland edge adjacent to the south-western corner of this compartment.

We then moved downhill, past the large specimen of *Lonicera xylosteum*. to the pastures on the river floodplain (Compartment 20). Here we found several specimens of *Cirsium acaule* not yet in flower but certainly a hazard to unwary picnickers. Moving eastwards along the edge of the woodland, towards what remains of Glover's Hut, we passed several specimens of *Cynoglossum officinale, Campanula latifolia,* a profusion of *Lithospermum officinale* and also the Simmons' tour group who were marvelling at the abundance of 6-spot Burnet Moths clustered on scabious flowers. We followed the path leading to the footbridge, passing a steep bank of short calcareous turf supporting *Potentilla tabernaemontani,* and over the River Went into Thompson's Field (Compartment 17a) to view the *Filipendula vulgaris* and *Dactylorhiza fuchsii* whilst Don Grant raced off in search of the *Botrychium ophioglossum* in the adjacent field (Compartment 17b). Unfortunately that field was thigh-high in rather prickly ruderals making it far from suitable either for the *Botrychium* or for Don (who had chosen shorts as his botanising attire). A small number of the group then took a short detour along the riverside path into the woodland of Compartment 21 to view a large colony of *Ranunculus auricomus* growing beside the path. We returned to the footbridge and scurried at full speed along the footpath, trailing behind Don as he led the group along Smeaton Crags towards Long Crag Meadow (Compartment 14d). There we collided with the conchologists on the limestone crag where we searched in vain for the *Saxifraga tridactylites* (suspecting that the very dry season may have desiccated this species beyond all recognition). We did, however, find *Astragalus glycyphyllos* on the steep slopes and then several plants of *Salvia verbenaca* growing next to some rock outcrops at the eastern end of this compartment. Most members of the group then hastened back to the cars, keen for refreshments at the village hall, whilst a small number returned via the lower slopes of Asquith's field and were rewarded with numerous *Anacamptis pyramidalis* to round off a wonderful day.

BRYOLOGY (Colin Wall)

Some interesting calcicolous mosses were found on the crags, including *Neckera crispa, Gymnostomum calcareum, Ctenidium molluscum, Encalypta streptocarpa, Fissidens dubius, Plagiomnium cuspidatum, Tortella tortuosa, Tortula marginata* and the leafy liverwort *Jungermannia atrovirens*. On soil and debris at the foot of the crags were *Plagiothecium nemorale* and *Oxyrrhynchium (=Eurhynchium) pumilum*. The most alluring epiphyte-covered trees seemed to be surrounded by impenetrable nettle beds. The moss *Cryphaea heteromalla* and the liverwort *Metzgeria violacea (M. fruticulosa),* both found on Elder, have been occurring recently in suitable habitats throughout SW Yorkshire, so it was gratifying to find them at this locality. However, a third epiphyte, also found on Elder by the Went, was totally unexpected and has not been seen in SW Yorkshire for well over two hundred years. This was *Antitrichia curtipendula,* and I am indebted to Tom Blockeel for the following account of the previous record of this moss in VC63: The record was published in a list of bryophytes included in a book by J. Watson, *History and Antiquities of the Parish of Halifax* published in 1775. The list

is anonymous but may have been compiled by James Bolton (better known as a mycologist) and/or his brother Thomas. Tom Blockeel also reports that, according to the British Bryological Society database, the most recent records of this moss in Yorkshire are from the Ingleborough area in 1977 and Swaledale in 1979. It was known to have declined badly in England when air pollution was at its worst. Its presence at Brockadale may be an extreme example of the more general recovery of pollution-sensitive species in response to the decrease of atmospheric sulphur dioxide. Thirty-nine species were found on the day.

Buckden (VC64) 23 July 2010 (NGR Centrum SD942773)

INTRODUCTION (Terry Whitaker)
Around Buckden there is a tremendous diversity of semi-natural habitats, many of excellent quality with an extremely rich flora and numerous nationally scarce invertebrates. The breeding bird communities are rich and varied and include nationally important numbers of some species. The area is also of considerable earth science interest, with caves and abandoned lead mines. The rocky landscape and waterfalls associated in Buckden Beck Valley is particularly biologically rich and scenically spectacular. Much of the area is owned by the National Trust. Approximately 24 members met up in the YDNP car park and they and the public were treated to the identification of the catches in several moth traps. They then dispersed to pursue their own interests, mainly up Buckden Gill or in the meadows alongside the River Wharfe. Initially the weather was pleasant and sunny but it deteriorated as the day progressed. The group reassembled for tea and a reporting meeting in the Buckden Memorial Hall. Thanks are due to Stephen Morley of the National Trust for background information and to the Trust and Mr. Gary Schofield of Heber Farm for pemission to visit their land.

ORNITHOLOGY (Ken White and Sarah Priest)
A total of 34 species was recorded along a route from Buckden car park, south along the east side of the dale above the woodland to Starbotton and back along the riverside. Highlights were three broods of newly-fledged Spotted Flycatchers and a juvenile Redstart in the scrub above Buckden village; numerous Swallows, House Martins and Swifts; 6-8 Buzzards, a juvenile Kestrel, a large flock (50+) of House Sparrows at Starbotton, Sand Martins nesting in the riverside banks below Buckden and both Grey and Pied Wagtails with juveniles. Elsewhere in the valley Dippers were seen at Hubberholme and Deepdale bridge, there was a Common Sandpiper with two well-grown young above Yockenthwaite and there was a family of Wheatears above Deepdale Farm. The following day, on our way home, we saw a pair of Short-eared Owls hunting at 9am in the Fleet Moss area at the head of Langstrothdale. In all 14 species were confirmed breeding and the records have been submitted for inclusion in the BTO Atlas.

CONCHOLOGY (David Lindley)
Buckden is an area often visited by conchologists over the last 130 or so years. Yet, as with many groups, there are still interesting observations to make. During the morning Eddie Sutcliffe and I walked part of the way up Buckden Gill (SD9477). In 1986 I had discovered a small colony of the Brown-lipped Snail *Cepaea nemoralis* here, all of which had pure white lips to the shell. This occasionally happens but not often with a large colony. At that time all the specimens found in the upper reaches of the Gill were white-lipped with a lemon-coloured shell. On the present occasion, after much fruitless searching, we managed to find two live and two dead shells of this variety but the majority of specimens were banded with a brown lip.

Of the 29 species found within this 1km. square, four of them (*Arion hortensis, Deroceras leave, D. panormitanum* and *Oxyloma elegans*) were new to that square. Both *A. hortensis* and *D. panormitanum* were found around the car park. It was interesting to confirm that the species of *Balea* in the Gill was *B. heydani* and not *B. perversa,* from which it has recently been separated.

During the afternoon we were joined by Terry Crawford and investigated the meadows south of the village in SD9476, a square from which there were no definitive records. A total of 18 species were found within this square including five new 10k records; *Potamapyrgus antipodarum, Anisus leucostoma, Armiger crista, Stagnicola* agg (another recently split species and unfortunately the specimens were too small to dissect to specific level) and *Boettgerilla pallens*. It is interesting to note that *P. antipodarum* is not usually found so high in the Dales and was not found in the main river but in a small stretch of stream.

The most interesting find was *A. crista,* which was found in a small oxbow. This is a very widespread species in Britain but a glance at the most recent 10km survey map shows a huge gap where the Yorkshire Dales National Park sits. Although this is probably due to a lack of permanent small water bodies there are still a number of these sites within the Dales from which it is absent.

Although only 36 species were found during the day many of the records were of great value, both on a 1km and 10km scale.

LEPIDOPTERA - Butterflies (Terry Whitaker)
Despite the mainly cloudy conditions the few flashes of sun brought out a good showing of 12 species of butterfly on the Saturday, both in Buckden Gill and on the Dalesway by the riverside. These were: Small Skipper (*Thymelicus sylvestris*), Large White (*Pieris brassicae*), Small White (*P. rapae*), Green-veined White (*P. napi*), Small Skipper (*Thymelicus sylvestris*), Common Blue (*Polyommatus icarus*), Small Copper (*Lycaena phlaeas*), Dark green Fritillary (*Argynnis aglaja*), Meadow Brown (*Maniola jurtina*), Ringlet (*Aphantopus hyperantus*), Small Heath (*Coenonympha pamphilus*). The Dark Green fritillary colony high up in Buckden Gill was associated with fencing off and tree planting and is a new site for the species.

Day-flying moths included Six-spot Burnet (*Zygaena filipendulae*), Yellow Shell (*Camptogramma bilineata*) and Chimney Sweeper (*Odezia atrata*).

LEPIDOPTERA - Moths (Charles Fletcher)
The YNU lepidoptera group was invited to trap on the night of Friday 23rd July. Traps were set up in Rakes Wood, Buckden Gill and the garden of Hartrigg House. After several weeks of warm weather the temperature dropped to a chilly 6.5°C under a clear sky and a full moon. Despite this, 70 species of moths were logged and shown to onlookers on the Saturday morning; 38 of these were new for the 10k square SD97.

Most of the interesting moths were upland specialists. Several specimens of Confused (*Apamea furva*) were trapped and it was interesting to compare these with the much commoner Dusky Brocade (*Apamea remissa*). A single Northern Rustic (*Standfussiana lucernea*) was a nice find and several Heart and Club (*Agrotis clavis*) were also trapped. Square-spotted Clay (*Xestia rhomboidea*) is proving to be commoner than expected in wooded areas of the uplands and other interesting moths included Latticed Heath (*Chiasmia* clathrata), Purple Bar (*Diarsia brunnea*) and Lempke's Gold Spot (*Plusia putnami* gracilis).

The commonest member of the Microlepidoptera was *Eana osseana*. Other interesting micros included *Catopria margaritella*, *Acompsia cinerella* and *Ypsolopha sequella*. Larval feeding signs of *Caloptilia rufipennella* were found on *Acer pseudoplatanus* and *C. syringella* on *Syringa vulgaris*.

ENTOMOLOGY (Andrew Grayson)
The weather was rather agreeable to the field naturalist, being generally warm but not oppressively so and with generally light winds. The writer investigated three areas: the margins of a stream which passed through two ungrazed fields near Buckden, centred on SD942766; two sheep-grazed fields containing much *Juncus* and their margin with the River Wharfe, centred on SD943761; and a steep hillside at East Side with rocky-outcrops and a couple of mossy-flushes towards its base beside Buckden Beck, centred on SD945773. Species marked with an asterisk were found both by the stream and in the fields.

The margins of the stream produced the marsh-flies *Hydromya dorsalis*, *Ilione albiseta**, *Pherbina coryleti*, *Tetanocera elata** and *T. punctifrons*. The last-mentioned species is categorized as Nationally Notable and is an addition to the list for VC64. The lush vegetation engulfing the stream also produced the beetles *Rhagonycha fulva* and *Coccinella septempunctata*, the bumblebee *Bombus pascuorum* and the flies *Nephrotoma flavescens*, *Rhagio scolopaceus*, *R. tringarius**, *Beris vallata*, *Chloromyia formosa*, *Ocydromia glabricula**, *Empis livida**, *Hilara chorica**, *Dolichopus plumipes**, *D. trivialis*, *Gymnopternus celer**, *Sympycnus aeneicoxa*, *S. desoutteri**, *Lonchoptera lutea*, *Melanostoma mellinum*, *Platycheirus clypeatus* s.s., *P. granditarsus*, *Episyrphus balteatus*, *Eupeodes latifasciatus*, *Xylota segnis*, *Sepsis fulgens**, *Geomyza tripunctata*, *Calliphora vicina*, *C. vomitoria* and *Lucilia caesar*.

Most Diptera in the sheep-fields were found amongst *Juncus*. These included *Tipula oleracea*, *Hilara obscura*, *Neoascia podagrica*, *Syritta pipiens*, *Nemopoda nitidula*, and *Sepsis punctum*. An exception was *Haematopota pluvialis* which approached the writer on the margin of the River Wharfe. The mossy flushes at East Side produced the local hoverfly *Platycheirus ramsarensis* and the marsh-fly *Hydromya dorsalis*. Elsewhere on East Side were *Rhagonycha fulva*, *Bombus pascuorum*, *Empis livida* and *Platycheirus angustatus*.

AQUATIC INVERTEBRATES (Sharon & Peter Flint)
Samples were taken in Buckden Beck and the River Wharfe. A total of 16 species were identified. Nine species of Trichoptera (caddis flies): *Potamophylax latipennis*, *Halesus digitatus*, *Odontocerum albicorne*, *Diplectrona felix*, *Agapetus delicatulus*, *Rhyacophila munda*, *Sericostoma personatum*, *Philopotamus montanus*, *Beraea maurus*; four species of Ephemeroptera (mayflies): *Ephemera danica*, *Ephemerella ignita*, *Ecdyonurus dispar*, *Baetis rhodani*; two Plecoptera (stoneflies): *Amphinemura sulcicollis* and *Leuctra inermis*; and one species of Coleoptera (beetles): *Limnius volckmari*.

BOTANY (Phyl Abbott)
The Botanists had a very rewarding day, in the morning following Buckden Beck up to the waterfall. The stream banks and adjacent calcareous grassland were very species-rich. There were over 30 spikes of Fragrant Orchid (*Gymnadenia conopsea*) but only one Common Spotted Orchid (*Dactylorhiza fuchsii*). Bird's-eye Primrose (*Primula farinosa*) was well past its flowering time. Grass of Parnassus (*Parnassia palustris*) was about to open its buds but Autumn Gentian (*Gentianella amarella*) was recognisable only by its leaves. It was pleasing to see even a small amount of Lesser Clubmoss (*Selaginella selaginoides*) at the southern edge of its range in England. The rock faces were enhanced by the ferns: Wall Rue (*Asplenium*

ruta-muraria), Maidenhair Spleenwort (*Asplenium trichmanes*) and Brittle Bladder-fern (*Cystopteris fragilis*). We had fun sorting out the 'little white jobs' Thyme-leaved Sandwort (*Arenaria serpyllifolia*), Fairy Flax (*Linum catharticum*), Knotted Pearlwort (*Sagina nodosa*) and Spring Sandwort (*Minuartia verna*)

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After lunch we descended to the village and then walked south along the road towards Starbotton with the aim of searching for the Northern Spike-rush (*Eleocharis austriaca,* formerly *E. mamillata*) in the pool in an oxbow of the river where it was first discovered in Britain in 1947. Of plants along the roadside the first of note were two plants of Rustyback Fern (*Ceterach officinarum*) on a wall. On the way back we paused by a bush laden with tasty Gooseberries. When we arrived in the relevant area the Northern Spike-rush proved elusive and the Common Spike-rush (*E. palustris*) was there demanding attention. Eventually we succeeded in finding the Northern Spike-rush and the difference between the two species was immediately obvious, the Northern Spike-rush having conical fruiting heads while those of the Common Spike-rush were cylindrical. 179 species were recorded in the course of the day.

BRYOLOGY (Tom Blockeel)
Bryophytes were recorded principally along Buckden Gill. Before then, a brief stop at Buckden Bridge produced *Orthotrichum rivulare* on tree roots as well as *Leskea polycarpa*, *Schistidium rivulare* and *Homalia trichomanoides*. As usual in the Dales, the moist and wet limestone rock faces in Buckden Gill were productive, with *Hymenostylium recurvirostrum*, *Seligeria pusilla*, *Cololejeunea calcarea*, *Leiocolea alpestris*, *Preissia quadrata*, *Pedinophyllum interruptum* and *Scapania aspera* among others. *Pohlia cruda* and *Mnium thomsonii* were recorded in rock crevices. Among larger species of the grassy ledges and slopes were *Climacium dendroides*, *Rhytidiadelphus triquetrus* and *Breutelia chrysocoma*, the latter only seen in one small area. *Didymodon spadiceus* was noted on boulders in the stream and *Palustriella falcata* and *Philonotis calcarea* in flushes. Scattered gritstone boulders supported some species of less calcareous substrates, including *Grimmia trichophylla*, *Campylopus fragilis*, *Blindia acuta* and *Racomitrium affine*. There were few epiphytes to be had in the gill but it was interesting to see *Orthotrichum pulchellum* on Bird Cherry (*Prunus padus*). Higher up the gill, in the vicinity of the old mine workings, there was a little *Racomitrium elongatum* on a grassy area of old spoil, and *Bryoerythrophyllum ferruginascens* on bare ground.

Only a little time was spent on the open moorland, where *Rhytidiadelphus loreus* and *Racomitrium lanuginosum* were recorded, the latter on grit boulders. Eshber Wood was visited briefly but was not particularly productive. *Nowellia curvifolia* was on old logs.

Ballowfield LNR (VC65) 7 August 2010 (NGR Centrum SD987897)

INTRODUCTION (Adrian Norris & Terry Whitaker)
The landscape is dominated by the underlying Carboniferous geology. Pastures and meadows cover the wide valley of the Ure and small woods run along the lower slopes. Much of the area of the Ballowfield LNR and Ox Close SSSI is underlain by fine, mineral-rich sediments and spoil from the Wet Grooves Mines. The streams which drain it, particularly Eller Beck, comprise a site outstanding for its assemblage of plants indicative of metal-rich soils. Some plant species are more typically found on the sea coast. Ballowfield LNR mainly comprises a small but extremely interesting patch of dry calcareous grassland with abundant Thrift (*Armeria maritimal*. This is the only remaining site in VC65 for the Forester Moth (*Adisca*

statices). The Northern Brown Argus butterfly (*Aricia artaxerxes artaxerxes*) also nectars here, moving in from the eastern end of Haw Bank which has Hawthorn and Hazel scrub and calcareous grassland. Broad-leaved Ash-Hazel coppice woodland covers the limestone screes of the scarp. Specimens of Small-leaved Lime (*Tilia cordata*) and Large-leaved Lime (*T. platyphyllos*) can also be found. As in most of the lowland Dales woods, the remains of large Wych Elms (*Ulmus glabra)* killed by Dutch Elm Disease are in evidence. Much of the ground vegetation near the scar is devastated by an abundance of Rabbits, probably the descendants of the conies once kept in the walled area near Warren House just to the south. Adjacent to the Eller Beck are marshy pastures with interesting calcareous flushes.

Twenty members representing 16 affiliated societies attended the meeting on what turned out to be a day of mixed fortunes. Members explored both the low-lying areas close to the stream and the scar just above the steep woodland. The morning remained fair but, shortly after lunch, the rain drove those who ventured up to the higher levels down to the relative protection of the lower parts of the reserve and finally to the refuge of the Wheatsheaf in Carperby and early hot and cold drinks. Although the meeting for the less hardy was a little curtaile, it was agreed by everyone that the visit had been successful.

Thanks are due to the Yorkshire Dales National Park Authority, Robert Fawcett (R. Fawcett & Sons) of Woodhall Park Farm and Roger Dinsdale, West Grove Farm, Carperby, for permission to visit parts of the site.

GEOLOGY (Michael Ridealgh)

The lithology of this area consists of a cyclic sequence of upward- coarsening facies consisting of grey mudstone, siltstone, sandstone and marine limestone with subordinate seatearth and coal seams. In the Ballowfields area these sediments of the Lower Carboniferous (Dinantian) form part of the Visean Stage entirely within the Brigantian Substage. These sediments reflect the advance of a large delta into the area from the north. The sequence ranges from the Simonstone Cyclothem, the limestone of which underlies Ballowfields, through the Middle, 5-Yard, 3-Yard and Underset Cyclothems up to the Main Cyclothem. Under Ox Close SSSI a mineralised faulted basin structure at the southern end of the Brownfields Vein exhibits an unusually thick sequence of the Underset Cyclothem (<15m of limestone). The limestone above Ballowfields on Haw Bank is the Middle Limestone and is where the fossils found in the scree near Disher Force came from. There is a layer of *Gigantoproductus* and a coral layer in the Middle Limestone at Disher Force. *Gigantoproductus giganteus* is found in the screes, but the two productids that were found were probably a *Gigantoproductus* species similar to *G. edelburgensis* or *G. moderatus* and a productid species similar to *Antiquatonia hindi*. The coral is harder to identify but is probably *Lithostrotion junceum*.

Above Haw Bank lies the next major outcrop of Ivy Scar in the Underset Limestone which is intersected by a number of mineral veins, notably the Knot Vein, which is marked by an area of mine workings. The Knot itself is thought to be a detached block of Underset Limestone which slipped down from above. This is honeycombed with old, mined-out cavities of the Wet Grooves Mines. Minerals found here included Galena (PbS), Sphalerite (ZnS), Barite ($BaSO_4$) and Fluorite (CaF_2). Fragments of a green fluorite cube with 5 cm sides were found, as well as a honey coloured variety with 1 cm sides. Barite crystals varied from small (0.5 cm) white blades to damaged large 2 cm blades as well as stalactitic forms. Evidence of secondary mineralisation was seen with thin coatings of a hydrozincite mineral, mainly whitish but occasionally pale bluish.

The main period of mining was in the 18th and 19th centuries with some reworking of the spoil heaps for fluorite following the Second World War.

CONCHOLOGY (Adrian Norris)
The steep wooded escarpment and the limestone crag just above the woodland to the north of the stream cutting through the Ballowfield Reserve dominated the day's activities. Three of our most interesting species, specialities of the high limestone outcrops, *Vitrea subrimata, Clausilia dubia* and *Helicigona lapicida,* have all been recorded within a kilometre or so from Ballowfield and yet we were unable to find any sign of these local specialities. The limestone crag in particular proved to be unaccountably poor; however, a number of interesting new records were made. In the early afternoon we made our way back down to the road and spent some time checking the drystone walls and established that *Balea heydeni,* a recently segregated species, occurred throughout the area. The marshy field by the stream, almost totally dry due to the dry weather which prevailed throughout the spring, also produced a few additional records. In total 26 species were found, 21 in the western square SD9890 and 19 in the eastern part SD9889. The showers that dominated the early afternoon and drove several members of the party to the shelter of the Wheatsheaf in Carperby also resulted in a small number of records from the garden, including one additional species bringing our total for the day to 27 species with a total of 44 new records entering our database.

LEPIDOPTERA (Charles Fletcher)
The YNU lepidoptera group was invited to trap on the night of Friday 6th August. Several MV traps were set up in the reserve proper and on adjacent land towards Ox Close. This arrangement meant that records could be logged for two 10k squares, SD98 and SD99. The night was warm with a little rain and the temperature only dropped to 13°C. This resulted in a bumper catch of 3,366 moths of 109 species. 53 species were new for SD98 and 53 for SD99.

Despite huge numbers of Large Yellow Underwing (*Noctua pronuba*) and Dark Arches (*Apamea monoglypha*) there was much of interest in the traps to show to onlookers on the Saturday morning. A total of 71 Square-spotted Clay (*Xestia rhomboidea*) was encouraging as this moth was a national BAP species until recently. Interesting upland moths included Scarce Silver Y (*Syngrapha interrogationis*), Confused (*Apamea furva*) and Barred Chestnut (*Diarsia dahlia*) many of which were new for observers watching the traps being emptied. Several Plain Clay (*Eugnorisma depuncta*) were found, extending the known range of this species which is probably retreating further north with climatic warming. All the ear moths (*Amphipoea* spp) from the reserve proper along the stream proved, on dissection, to be Crinan Ear (*A. crinanensis),* whose larvae probably feed on *Iris pseudacorus*. All those from drier areas proved to be Ear Moth (*A. oculea*). Other interesting moths were Ash Pug (*Eupithecia innotata f. fraxinata*) and Garden Dart (*Euxoa nigricans*). The latter is in decline in the county and has become scarce in recent years.

Amongst the microlepidoptara, there were huge numbers of *Yponomeuta evonymella* in all the traps. Larval webs on *Prunus padus* have been very prominent this year. Other interesting micros included *Opostega salaciella*, *Depressaria pulcherrimella*, *Carpatolechia fugitivella, Hypatima rhomboidella and Catoptria margaritella*. There were some very attractive colour forms of *Epinotia tenerana*.

Eight species of Butterfly were seen on the Saturday. These were Small Heath (*Coenonympha pamphilus*), Meadow Brown (*Maniola jurtina*), Large White (*Pieris brassicae*), Small White (*P. rapae*), Green-veined White (*P. napi*), Small Skipper (*Thymelicus sylvestris*), Common Blue (*Polyommatus icarus*) and Small Copper (*Lycaena phlaeas*).

Other insects attracted to the light traps included Common Ground Hopper (*Tetrix undulate*), the Sexton beetles *Nicrophorus investigator*, *N. humator* and *Necrodes littoralis*, two very late Common Cockchafers (*Melolontha melolontha*) and Orange Ladybird (*Halyzia sedecimguttata*). Other beetles included *Aphodius rufipes* and *Serica brunnea*.

ENTOMOLOGY (Andrew Grayson)
The writer's late arrival coincided with a prolonged heavy downpour which later abated. Thereafter insect activity resumed in overcast, but rather pleasantly warm weather. Earlier in the day Colin Howes found *Tachina grossa* [det. A. Grayson] by *Pinus* near the car park (SD987897). This large, black, parasitic tachinid fly is an addition to the list for VC65. Another tachinid fly, *Dexia vacua*, was found by the writer in the rich-floral grassland of Ballowfields LNR (SD987897). This species was previously reported from Bishopdale by Chris Cheetham (*The Naturalist* 47: 315-316), but the YNU records contain no other VC65 records, probably due to a lack of recording in VC65. Also found in the Ballowfields LNR were the grasshopper *Omocestus viridulus*; the soldier-beetle *Rhagonycha fulva*; the empidoid flies *Hybos culiciformis*, *Hilara chorica*, *Empis livida* and *Sympycnus desoutteri*; the hoverflies *Melanostoma mellinum*, *Platycheirus clypeatus* s.s., *Episyrphus balteatus* and *Rhingia campestris* and the picture-winged opomyzid-fly *Opomyza germinationis*.

Sweeping vegetation in the adjacent Ox Close SSSI (SD987898) produced the solitary wasp *Ectemnius continuus* and the flies *Rhagio tringarius*, *Hybos culiciformis*, *H. femoratus*, *Platycheirus granditarsus* and *Neoascia podagrica*.

ICHNEUMONS (Bill Ely)
Charles Fletcher's moth traps attracted the following ichneumons: the Tryphonines *Netelia inedita, N.cristata* and *N.virgata,* the Ophionine *Ophion parvulus* and the Ctenopelmatine *Alexeter nebulator*. These are all parasitoids of moth caterpillars which hide during the day and come out to feed at night - just part of nature's arms race. Although in different subfamiles they all have large eyes and ocelli (three single-lenses on top of the head between the compound eyes) and mostly lack melanin. Their orange-yellow colouration is not a disadvantage in the dark. *Alexeter nebulator* was new to VC65 and I also swept one from the scrub-covered slopes above the trapping site. In the same scrub I found the Tryphonine *Grypocentrus cinctellus* which has been found in Yorkshire only once before, about three miles further down the valley! After the heavy shower I collected the Pimpline *Pimpla wilchristi* in the car park, which is a new species to Yorkshire.

AQUATIC INVERTEBRATES (Sharon & Peter Flint)
Sampling of Ellerbeck through the Ballowfield LNR and through the woodland to the east and of a small stream running into it, east of the reserve from the marshy area to the north, was undertaken in the morning. During this time the weather was dull and overcast with intermittent sunshine but sampling was cut short by persistent rainfall. Kick samples were taken with a standard pond net at intervals along the length of the stream and invertebrates were picked off rocks and coarse woody debris in the stream. Adult stoneflies and caddis flies were collected using a sweep net.

A total of 23 species was identified, including six species of stoneflies, *Protonemura meyeri*, *Amphinemura sulcicollis*, *Nemurella pictetii*, *Leuctra moselyi*, *Chloroperla tripunctata*, all as juveniles, and *Isoperla grammatica* as an adult; eleven species of caddis flies: *Melampophylax mucoreus*, *Chaetopteryx villosa, Potamophylax cingulatus, Silo pallipes*, *Agapetus fuscipes, Odontocerum albicorne, Rhyacophila dorsalis, R.obliterata, Polycentropus flavomaculatus,* all as juveniles; *Psychomyia pusilla* and *Tinodes dives* as adult males; two species of mayflies,

Baetis rhodani as a juvenile and *Ephemerella notata* as a sub-imago; four species of beetles, *Platambus maculatus, Oreodytes sanmarkii, Helophorus brevipalpis* and *Anacaena globulus*.

BOTANY (G. Wilmore)
Members met in the roadside car park of the small Ballowfield LNR on a grey, overcast day to explore the LNR itself and the adjacent Ox Close SSSI, which occupies rising ground at the base of Haw Bank.

The narrow LNR is essentially an area of damp, mesotrophic, marshy grassland grading into drier grassland westwards nearer the end of the site. Typical species encountered here included *Filipendula ulmaria, Juncus inflexus, J. effusus, Angelica sylvestris, Agrostis stolonifera, Succisa pratensis* and *Geum rivale*. The area is also famous for the unusual occurrence of *Armeria maritima* at a very rare inland station as well as containing metallophytes derived from the underlying influence of the deposited spoil from the lead mines which were worked in the 19th century. Populations of the lead spoil plants *Minuartia verna,* and *Cochlearia pyrenaica* were present, although *Noccaea caerulescens* was not seen at this late season of the year. More acidic terrain at the western end contained *Molinia caerulea, Potentilla erecta, Anthoxanthum odoratum* and *Agrostis capillaris.* Nearer Eller Beck in damper ground a few late-flowering *Dactylorhiza fuchsii* plants were seen together with locally frequent *Parnassia palustris.*

Ox Close, which is reached by crossing the stepping stones over the stream, occupies rising ground of short, Rabbit-grazed, calcareous grassland and lead spoil mounds, typically containing *Thymus polytrichus, Festuca ovina, Helianthemum nummularium, Avenula pratensis, Lotus corniculatus, Carex flacca* and *Sesleria caerulea.* Where the slope descends to level ground nearer the stream one encounters a sizeable area of sedge swamp, dominated by *C. rostrata* with scattered to locally frequent *Valeriana officinalis, Equistum palustre,* more *Geum rivale* and *Cirsium palustre.* Woodland rising up the slope comprises *Fraxinus excelsior, Corylus avellana, Crataegus monogyna* and *Prunus padus* with a herb layer dominated by *Mercurialis perennis*. The rarity of the day turned out to be *Hippocrepis comosa*, growing on the limestone scars higher up the slope.

The Naturalist 1076 - Photograph credits

Front Cover: Particoloured bat V. Grantham
Back Cover: YNU members and friends at Brockadale P.Simmons

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3a *Ophion obscuratus* P. Crowther
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3c *Urophora cardui* T. Higginbottom
Plate 4
4a *Diastrophus rubi* T. Higginbottom
4b Slender slug A. Norris
4c Leisler's bat P. Moodie

Circular No 870

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Joyce Simmons 16 Springfield Crescent, Kirk Smeaton, Pontefract WF8 3LE
Tel: 01977 620725

The excursion will be on Saturday 21 May 2011 to Sykehouse in the Humberhead Levels. Party leader: Joyce Simmons.

Map: Explorer sheet 279 Doncaster

Meeting Place: Meet at 10.30am in the car park of Sykehouse Village Hall (SE633172) (postcode for a sat. nav. DN14 9AX). To reach here leave the M62 at junction 34, travel south on the A19 to Askern. Turn left at the lights and follow the minor road through Moss to Sykehouse. Pass the Old George Pub on the right. The village hall is just beyond on the left. Park to the right hand side of the car park. From here we can share cars to the smaller car parks beside the New Junction Canal (SE645175). Routes via J36 (M62) and J6 (M18) are possible but beware, as there are not as many bridges as you might hope!

Indoor Meeting: In Sykehouse Village Hall, which is booked from 4 - 6pm. There will be a small charge to cover the cost of hiring the room. Tea/coffee will be available.

The area: In this secluded corner of Yorkshire tiny meadows are protected by impressive hedges, a rarity in these times of agricultural prairies. The area is part of the Humberhead levels, lying below 5m, which was subject to drainage and the re-routing of the River Don by Vermuyden in the 1620s. Two major canals (Aire & Calder and New Junction) meet at the northern edge of this area. An aqueduct carries the New Junction Canal over the River Went, and a footbridge allows access to each side of that canal.

Figure 1. The River Went at Sykehouse

The fields are small and surrounded by ditches and thick, high hawthorn hedges with many mature oaks and willows as well as some Alder and Ash. The alluvial soil is silty clay and often waterlogged. Several of the unimproved haymeadows are traditionally managed SSSIs showing a gradation from wet neutral grassland to tall fen vegetation. Great Burnet is dominant in the flowery meadows but many other species, including Dyer's Greenweed, Pepper Saxifrage and Common Meadow Rue are found there too. Several species of sedge are present. Aquatic habitats are well represented by ponds in some of the meadows, wet ditches, canals and a river. The chemical-free environment encourages abundant invertebrates and breeding birds are numerous in the scrubby ditches, plentiful hedges and wet meadows. We are grateful to The Burnet Trust, The Carstairs Trust and local farmers for permission to visit some of these rare gems, now very scarce in agri-business Yorkshire.

Circular No 871

Divisional Secretary VC62
Mick J. Carroll, Lo Crofts Avenue, Pickering, YO18 7HP
Tel: 01751 476550
E-mail: michcarroll47@btinternet.com

The VC62 excursion will be on Saturday 9 June 2011 to Upper Newtondale. Party leader: Mick Carroll.

Map: 1:50000 Landranger sheet 94 Whitby
1:25000 Explorer sheet OL27

Meeting place: Meet at 10.00am in the Picnic area at Papers Farm (SE824940). A169 from Pickering, turn left to Lockton. Follow the road to Leversham and at Leversham Station turn up Newton Dale to Rapers Farm Picnic area.

Indoor meeting: This will be held at 16.30pm at Newton upon Rawcliffe Village Hall (SE812906). Turn out of the forest onto the Stape Egton road and head south to Newton. Parking is on the village green near the White Swan pub. Tea and Coffee will be provided in the Village Hall but those requiring food should bring this with them.

The area: The area is mostly forest with some ancient woodland. However, the area also includes a field that was last ploughed for wheat during the Napoleonic wars of 1815. Upland streams, flushes and bogs also occur in the area. Situated as it is at the top of Newtondale and just to the south of Fen Bog, the area should be of special interest to all naturalists and should excite particular interest with the possible discovery of new rare and local specialities to add to those already recorded from the area.

The North-York Moors Railway runs through the valley and special care should be taken when crossing the railway tracks. Other hazards may include the risk from tripping and falling. Please take reasonable care at all times, particularly in the very boggy areas, and wear appropriate clothing. Any children in the party must be supervised by a parent or guardian.

Circular No. 872

Divisional Secretary VC61
Sarah Priest, Yonder Cottage, Ashford Hill, Thatcham, Berkshire, RG19 8AX.
Tel: 01635 268442
Email: sarahpriest656@btinternet.com

The VC61 excursion will be held on Saturday 18 June at Spurn. Party leader: Sarah Priest

Maps: 1:50 000 Landranger Sheet: 107 Kingston upon Hull
1:25 000 Explorer Sheet: 292 Withernsea and Spurn Head

Meeting Place: Meet at 10.30am in the car park of the Blue Bell Tearooms, Kilnsea (TA417158). It is possible to leave cars at the Blue Bell and walk onto the reserve or to drive down the peninsula and park at various points at a cost of £3.

The tearoom will open specially early for us at 10am, so please do patronise them for coffee when you arrive. There are also toilets there. Lunchtime food may be purchased from the Blue Bell on the day; packed lunches (cheese, ham, beef or turkey sandwich, crisps, chocolate bar and bottle of soft drink) may be ordered in advance at £5 each. Please order no later than 5pm on 16th June from Petra (01964 650 099).

At 10.30am Andrew Gibson, the YWT site manager, will give us a brief introduction to the reserve and will suggest options for fieldwork as well as areas to be avoided because of ground-nesting birds. The canal scrape area and an adjacent field will be one option with easy access from the Blue Bell car park and there should be some newly-created scrapes there.

For those requiring overnight accommodation, the following B&Bs have been recommended:
Westmere Farm (www.westmerefarm.co.uk 0844 559 6091)
Elm Tree Farm (cft-mcox@supanet.com)
The Ivy at Patrington (theivybandb@fastmail.fm)
Rysome Garth at Holmpton (01964 631248)

Tea and Meeting: This will be at 4.15pm at the Blue Bell Tearooms. Tea, coffee and cake may be purchased individually there and a contribution will be requested to cover the hire of the room. We will need to leave by 6pm.

The Area: Spurn is a Yorkshire Wildlife Trust reserve, part of the Humber Estuary SSSI and designated Heritage Coast. Spurn Bird Observatory has been operational here since 1945. The Lagoons to the north are also a separate SSSI.

The coastal geomorphology of Spurn is of national importance: it is an outstanding example of a dynamic spit system with sediment from the Holderness coast feeding its extension across the mouth of the Humber estuary. Its position shifts continuously in response to erosion of the coastline to the north.

The peninsula supports a range of coastal habitats including intertidal sand and mud, sand dunes, herb-rich grassland, scrub (in particular of Sea Buckthorn *Hippophae rhamnoides*) and brackish pools. The area is well-recorded, both historically and currently, particularly for birds (Chislett, 1996 and Pashby, 1988) and flowering plants (Crackles, 1975). The illustrated report 'Spurn Wildlife' is produced annually by Spurn Bird Observatory, covering birds, dragonflies & damselflies, butterflies and moths.

The most recent YNU Excursions to the area were in 1994 (Kilnsea); 1998 (Welwick Saltmarsh) and 2003 (Old Hall Farm, Skeffling).

References:

Chislett, R. 1996. *Birds on the Spurn Peninsula*. Peregrine Books, Leeds.
Crackles, F.E. 1975. The Flowering Plants of Spurn Point. Naturalist, 1975: 59-65. (Reprinted and updated as a separate leaflet, 1986).
Pashby, B.S. 1988. *A List of the Birds of Spurn 1946-1985*. Spurn Bird Observatory.
Spurn Bird Observatory Trust, 2010. *Spurn Wildlife 2009*. www.spurnbirdobservatory.co.uk

Circular No 873

Divisional Secretary VC65
Dr Terry Whitaker, 4 Crowtrees, Low Bentham, Lancaster LA2 7EE
Tel. 015242 62269; email t.whitaker1@btinternet.com

The VC65 meeting will be on Saturday 13th August 2011 to Gunnerside & Low Row, Middle Swaledale. The moths group is invited to trap on Friday night (no power sources). Party leader Terry Whitaker.

Map: 1:25000 Explorer sheet OL30 Yorks Dales North & Central

Meeting place: Meet at 10.30am in the centre of Gunnerside Village (SD950981). There is parking scattered around the village.

Access: From the east and north it is best to use the B6270 Richmond - Kirkby Stephen road. From the west it is best to come via Hawes and the Buttertubs Pass to join the B6270 west of Gunnerside.

Indoors meeting: to be arranged from 1630pm to 1730pm.

The area: The meeting will concentrate on investigating Rowleth Great Wood (SD964978) and its surroundings. This is midway between Gunnerside and Low Row and can be reached after 1km by the footpath that passes eastward through heights about 100m above the valley floor.

Woodland and scrub are very restricted habitats within Swaledale, although there are notable areas of Juniper scrub near Thwaite and Grinton. Small areas of ancient, semi-natural woodland exist in the very large SSSI of Arkengarthdale, Gunnerside and Reeth Moors which encompasses much of the upper valley. Few of the woodlands within the dale are of ancient origin but examples of ancient broadleaved woodland remain at Elias's Stot Wood (SD931985) above Ivelet, along Barney Beck, Birbeck Wood (SD942990), Gunnerside Gill and Rowleth Great Wood (SD964978). This is by far the most extensive woodland in the area occupying about 20ha of the south-facing slope of the valley side above Strands. Barney Beck and Gunnerside Gill support Sessile Oak (*Quercus petraea)* and Downy Birch (*Betula pubescens)* woods with occasional Rowan (*Sorbus aucuparia)*, Hazel (*Corylus avellana*), Birch Cherry (*Prunus padus)* and Holly (*Ilex aquilinum)*. Elias's Stot Wood and Great Rowleth Wood are dominated by Ash *Fraxinus excelsior*, Hazel and Hawthorn *Crataegus monogyna* with occasional Rowan and Wych Elm (*Ulmus glabra*). The ground layers support Dog's Mercury (*Mercurialis perennis*), Wood Sorrel (*Oxalis acetosella*), Ramsons (*Allium ursinum*) and Bluebell (*Hyacinthoides non-scripta*).

The natural history of this area is under-recorded and, given its unpolluted location and the old growth woodland, it is expected to support a rich epiphyte flora and insect assemblages. The invertebrates are virtually unstudied with even the Lepidoptera fauna poorly known. Rabbits (*Oryctolagus cuniculus*) abound, especially on the mine spoil, and European Brown Hares (*Lepus europaeus*) are common, with their predators of Stoat, Weasel and Fox. Roe Deer have spread up valley into the woodlands. The usual suite of woodland birds is present with Meadow Pipit (*Anthus pratensis*) common in rough grasslands of the uplands. Raven (*Corvus corax*) and the occasional Common Buzzard (*Buteo buteo*) can be seen.

Geologically the wood is set a spectacular upland landscape dominated by rocks of the Carboniferous Wensleydale [Yordale] Group with alternating layers of limestones, cherts and sandstones of the Underset Cyclothem [Brigantian Regional Stage].

Lead mining has occurred in Swaledale since Roman times and in the 9th century the dale produced half the lead mined in Yorkshire. The higher ground of Melbecks Moor is dominated by an extensive lead mining landscape created by the large 18th and 19th century mines centred on the Friarfolds lead vein system. However, smaller mines occur nearer to Gunnerside and Low Row, including the Friar Intake level close to the eastern limits of Rowleth Wood; its waste heaps and metalophyte flora, easily reached from the B6270 road at SD973975. Although mining has played an important part in the development of the present landscape, the most significant influence has been the centuries of pastoral farming, responsible for the pattern of dry stone walls, barns and meadows in the valley bottom. The small field barns, which occur in almost every meadow, are distinctive features of the Swaledale landscape, particularly as they occur at a very high density. The barns housed a small herd of cows and their feed hay for the winter in the loft above. The hay was also used for sheep, brought down from the fells during winter. In summer, the manure from the cows was spread over the land to enrich the hay crop. The barns occur within a pattern of dry stone walls, which is particularly well represented at Muker and near Gunnerside. It is thought that many of the present day field systems could date back to the prehistoric period. The position of the dispersed Iron Age farmsteads are sometimes visible as small platforms of flat land dug out of the hillside, their lands separated by a system of rectangular fields running up the hillside. Scattered in this part of Swaledale are many coaxial field systems and settlements ascribed as being transhumance settlements dating from the Bronze Age (<2kA BP). In an isolated stone walled intake at the northwest corner of Rowleth Wood at SD96389805 is a settlement of six house platforms with two adjacent scooped and banked enclosures. A trackway leads upward where a coaxial field system crosses the calcareous grassland above the outcrops of the Five Yard and Three Yard Limestones towards the acidic moorland over sandstone of Low Row below Stoops Rigg. This field system seems to be associated with the Rowleth Wood settlement. Within the field system on Low Row Pasture are a few small cairns and remains of a heavily reduced round cairn located at a viewpoint on a limestone pavement knoll on the southern edge of the track above Barf Side. Lithic scatters and a burnt mound at the spring head on Stoops Rigg at SDSD96649858, 425m OD complete this interesting settlement complex.

Previous YNU Visits

Excursion 73 (2-4.8.1890)	Upper Swaledale	*Naturalist* (1890). **15**: 200-208.
Excursion124 (4.6.1900)	Reeth/Arkengarthdale	No formal report
Excursion 219 (22-24.5.1920)	Reeth/Mid-Swaledale	*Naturalist* (1920). **45**: 253-258.
Excursion 302 (15-17.5.1937)	Keld/Upper Swaledale	*Naturalist* (1937). **62**: 161-171.
Excursion 382 (22-25.5.1953)	Grinton/Reeth	*Naturalist* (1953). **78**: 173-175.
Excursion 441. (26.7.1964)	Low Row/Gunnerside	*Naturalist* (1964). **89**: 151-152.
Excursion 501 (17-18.7.1976)	Arkengarthdale & Reeth	*Naturalist* (1976). **101**: 143-146.
Excursion 547 (31.5.1986)	Muker & Keld	*Naturalist* (1987). **112**: 141-144.

Circular No 874

Divisional Secretary VC64
Dr Terry Whitaker, 4 Crowtrees Low Bentham, Lancaster LA2 7EE
Tel. 015242 62269; email t.whitaker1@btinternet.com

The VC64 meeting will be a full weekend from Saturday 29th to Monday 31st August 2011 at Malham Tarn Field Centre. The moths group is invited to trap on all nights, starting Friday. Party leader: Terry Whitaker.

Maps: 1:50000 Landranger sheet 098
1:25000 Explorer sheets OL2, OL41

Meeting place: Meet at 10.30am on Saturday 30th July 2011 and park near Low Trenhouse Water Outlet (SD894658).

Indoor reporting meeting: At 16:15 at Malham Tarn Field Centre (SD893672), Tarn House in the Paul Holmes Library. Refreshment will be provided at 15:45 for residents (included) and for day visitors (at small charge).

Sunday 31st July: *Ad Hoc* field excursions from 9.00am. onwards. Meet at Tarn House - please park near High Stables (SD892673).

The area: Malham Tarn lies at the northern edge of an upland plateaux above the rising of the River Aire at Malham Cove. Most of the area, owned by the National Trust, has had a long history of habitation with numerous settlement remains dating from the Mesolithic which are especially common on Malham Lings (SD898654). Geologically, the area is dominated by the Lower Carboniferous Great Scar Limestone, which comprises a number of limestone beds of varying thickness and hardness and up to 200m in thickness. The oldest layer is the dark grey Kilnsey Limestone. Overlying this is the Cove Limestone, which forms the spectacular cliff at Malham Cove (SD897641), the lower half of Gordale Scar and the brow of Kilnsey Crag, and above is the Kingsdale Limestone, light grey in colour and about 120 metres thick, which forms the stepped upper cliffs at Gordale Scar, Great Close Scar (SD902668) and Highfolds Scar (SD894674). The underlying Ordovician basement beds are close to the surface because of the influence of the Middle Craven fault belt whose scarp falls steeply towards Malhamdale. The large (62ha), shallow, calcareous, mesotrophic lake of Malham Tarn (SD893667) lies in a depression over these impervious beds. The Pleistocene glaciation left a patchy cover of glacial drift ranging from boulder clay to sand and gravel. The variability and patchy calcareous nature of the drift has given a mosaic character to the grassland of Malham Lings and reduced drainage led to the development of extensive areas of peat around the Tarn. Calcareous grassland and limestone rock habitats are fairly common but many surrounding the Field Centre have been impoverished by past overgrazing. The richest grassland areas are Tarn Close (SD893671) and the grassland bordering High Scree wood under Highfolds Scar on whose top is a small rather degraded limestone pavement. The richest biotope in the area is a unique suite of RAMSAR mire habitats which surround the Tarn, part of which are incorporated in the Tarn Moss NNR. Tarn Moss (SD884667) is a raised peat bog, Tarn Fen (SD886671) is a rich complex mosaic of habitats and vegetation types. To the east, Ha Mire (SD898666) and Great Close Mire (SD906664) are mainly calcareous mires with impeded drainage. In addition to the fen carr at Tarn Fen there are extensive but rather biologically uninteresting plantation woodland habitats unusual at an altitude of nearly 400m. To the north, by Cowside Beck, is the

small but botanically interesting enclosure of Thoragill Plantation SD890701 The calcareous flushes and grassland merit further investigation and it is hoped that moth trapping will be conducted here as well as around the Tarn.

In previous years several workers have reported on the geology, geomorphology and hydrology and recorded many species in the Cowside Beck catchment. (Gilbert, O., Goldie, H, Hodgson, D., Marker, M., Allan Pentecost, A., Proctor, M. & Richardson, D. 2005 Unpubl., and *The ecology of Cowside Beck, a tributary of the River Skirfare in the Malham area of Yorkshire*, available on line or data CD available through the FSC). In addition to reporting the invertebrates from Cowside, Richardson recorded some lesser-known orders in the Malham Tarn House area: (8 species of woodlouse, 6 centipede, 13 millipede, 5 harvestman, 6 leech and 1 freshwater sponge) (Malham Tarn Research Seminar November 2001).

With such a diversity of habitats in a small area it is difficult to choose a few of the large number of the notable species that have been recorded around Malham. Of the Lepidoptera. 21 spp of butterfly have been recorded at Malham Tarn. The most notable is a small colony of Northern Brown Argus Northern Brown Argus (*Aricia artaxerxes*) on Highfolds. The YNU study (Henson 1963) listed the moths but this is unlikely to have been exhaustive and microlepidoptera are notably under represented and is certain that many more species are present than the 246 recorded. For example the Nationally Scarce (Notable Nb) Marsh Oblique-barred (*Hypenodes humidalis*) has since been sighted but needs confirmation.

The biology, water chemistry and sedimentology of the Tarn is moderately well known and has been subject to many studies, the first on the botany by Lund (1963). In recent years Alan Pentecost and Pietro Coletta have published several important papers. The YNU study listed many aquatic insects. Recently there are records of 12 spp. of Odonata in the area. There have been a small number of records of White-clawed Crayfish (*Austropotamobius pallipes*) at Malham Tarn over the last 25 years However, it is clear that a very substantial decline occurred during the 1970s, leaving only a small fragment of the former population at this site. This small isolated threatened population has been extensively studied by Paul Bradley. It is hoped that the planned workshop by Sharon and Peter Flint during the planned excursion will add to the aquatic invertebrate lists.

The Malham Tarn area hosts many resident birds and spring and autumn migrant records of wetland birds are can be nationally important. Recent years has seen the annual publication by the FSC of bird records by Brian Shorrock and Robin Sutton (*Malham Tarn Wildlife & Weather Report*, Series).

Several unusual mollusca occur in the area. The Craven Door Snail (*Clausilia dubia*) being locally quite common on limestone rocks. However, the finding by Adrian Norris of the RDB Round-mouthed Whorl Snail (*Vertigo genesii*), whose English population was thought to be restricted to upper Teesdale, in a calcareous flush near Goredale Beck (SD910656) (*British Wildlife*, June 2006 edn.) was a recent surprise.

Tarn Moss has a small population of one of Britain's rarest plants; Yellow Sedge (*Carex flava)*, and the area hosts several other unusual wetland species which include Lesser Bladderwort (*Utricularia minor*), and the Variegated Horsetail (*Equisetum variegatum*). Unfortunately, the Dark-red Helleborine (*Epipactis atrorubens*) on Highfolds has not been seen for some decades but several other unusual calcicole orchids and plants are to be found in the area.

Previous YNU Visits

Surprisingly the YNU has only made excursions to the area on seven occasions since 1883:

Excursion 40 (1.9.1883)	Malham Tarn & Cove	*Naturalist* (1883-84). **9**: 73-76
Excursion 74 (11.9.1890)	Malham	*Naturalist* (1890). **15** 171-178
Excursion 175 (4.6.1910)	Malham	*Naturalist* (1910). **35** 333-338
Excursion 247 (1-3.8.1925)	Malham	*Naturalist* (1925). **50** 277-280
Excursion 358 (5.6.1948)	Malham	*Naturalist* (1948). **73** 164-166
Excursion 584 (5-6.6.1993)	Malham Tarn	*Naturalist* (1995). **120** 82-86
Excursion 617 (14.8.1999)	Darnbrook Farm, Malham	*Naturalist* (2001). **126** 44-48

In-depth entomological recording was started by an extensive study by the YNU entomological section from 1954 to 1958 (Henson 1963), which produced extensive lists of most groups of Insecta. Associated with that study Sinker (1960) produced a detailed description of the vegetation of the area. These historical studies are now largely outdated and an update of most groups is urgently needed. The records associated with the Cowside Beck project is a valuable resource on that adjacent area.

References

There are a very large number of publications relevant to the area, many published by the FSC. The following are just a small selection as an introduction:

Abbott, P.P. (2005). *Plant Atlas of Mid-West Yorkshire*. Yorkshire Naturalists Union.

Henson, H. (1963) The insects of the Malham Tarn Area, *Leeds Phil. & Lit. Soc.*, 9 (2), 15-91.

Holmes, P.F.(1965) The natural history of Malham Tarn. *Field Studies*, 2, 199-223.

Lund, J.W.G., (1961) The algae of the Malham Tarn district. *Field Studies*, 1 (3), 85-119.

Proctor, M.C.F. (1960) Mosses and liverworts of the Malham Tarn district. *Field Studies*, 1: 61-84.

Round, F.E. 1960. The diatom flora of streams around Malham Tarn, Yorkshire. *Arch. Protistenk.*, 104: 524-540.

Seaward, M.R.D. & Pentecost, A. (2001) Lichen flora of the Malham Tarn area. *Field Studies*, 10: 57-92.

Sinker, C.A. (1960) The vegetation of the Malham Tarn Area, *Leeds Phil. & Lit. Soc.,* 8 (5), 1-37.

Williamson, K. (1968) Bird Communities in the Malham Tarn Regions of the Pennines. *Field Studies*, 2: (5) 651-658.

Hazards of the area:

There is always risk from tripping and falling especially on wet limestone. There is deep water around. Please take reasonable care at all times and wear clothing appropriate to the mountain climate. Any children in the party must be supervised by a parent or guardian at all times.

Calendar of Events 2011

Apr 07/08 /11 **National Federation for Biological Recording Annual Conference and AGM: *The Future of Biological Recording*.** Holiday Inn, Filton, Bristol BS16 1QX. Web: www.nfbr.org.uk Enquiries: John Newbould

9 Conchological Section. Joint meeting with Doncaster Naturalists' Society. Don Gorge. Meet at burial ground on Guest Lane, Warmsworth SE549013

9 Entomological Section: Wilberfoss Community Centre 2.00pm. Recorders Reports and conversazione

May 3-4 **Leeds University Training Days**

Day 1:Leeds Museum Discovery Centre from 12 noon to 4.45pm. Introducing the M.Sc. Conservation students to the YNU and Recording. Coordinator: John Newbould.

Day 2: St Chad's Parish Centre. Introduction to field work. YNU volunteers wanted, each to work with about four students. 9.00am. to 5.00pm.

5 Hedgerow recording training day based Ripley. Booking essential through OPAL Sarah West 01904 434577 or email: sm579@york.ac.uk

7 Bryological Section: Croft on Tees. Meet at Church NZ288098 10.30am

14 Botanical Section Cadeby Common. Meet on road side at SE520995 at 10.30am.

14 Conchological Section. Leeds Liverpool Canal meet in the main car park in Gargrave SD932543

21 **VC63 Excursion** Went Ings, Sykehouse SE 645176

Jun 2-4 **BioBlitz Scarborough**. Details: Adrian Norris

18 **VC61 Excursion** Spurn NNR

25 Botanical Section: Semer Water SD922875 at 10.30am.

Jul 2 **How to identify Dragonflies** Leeds Museum Discovery Centre and Rodley Nature Reserve Booking essential 0113 2141548 (John Bowers). Booking essential 0113 2141548 (John Bowers) (£10 charge)

3 **Insect Fair** in York Museum Gardens (Royal Entomological Society). YNU stand organised by R Crossley and D. Chesmore

8-9 **How to identify moths.** Leeds Museum Discovery Centre and Thwaite Mills (£10 charge)

9 **VC62 Excursion** Newtondale

	16	Botanical Section. Priory Meadow, West Hull TA053314 at 10.30am.
	27	Join John Bowers to empty the overnight moth trap at Thwaite Mills Museum, Leeds 10.00am – noon
Jul/Aug	30-1	**VC64 Excursion Malham Tarn**. Residential if required.
Aug	6	Marine & Coastal Section meeting at Flamborough information from Paula Lightfoot (p.lightfoot@btinternet.com or 01904 449675)
	6	Botanical Section: Clifton Backies, York. Meet Water Lane SE595544 at 10.30am.
	13	**VC65 Excursion** Low Row and Gunnerside
Sep	3	Marine & Coastal Section meeting and Conchological Section Skinningrove car park NZ713201 at 10.30am.
	17	Natural Sciences Committee, St Chad's parish centre, Leeds 10.00am. followed by Botanical Section A.G.M. St Chad's parish centre 2.00pm.
Oct	1	Conchological Section Settrington area 1km sq recording. Meet in village centre SE834703
	7	Education Committee 2.00pm. St William's College.
	8	Executive, Leeds.
	15	Entomological Section Annual General Meeting, Doncaster Museum and Art Gallery. 10.30am AGM. 2.00pm Exhibits and Conversazione
	15	Bryological Section meet at Washburn Valley Car Park, Norwood SE209509
Nov	1	Conchological Section meeting, Leeds at 1.00pm. Contact D. Lindley 01132 697047
	19	**YNU Annual General Meeting** Ripon Spa Hotel

The Naturalist

This publication is issued free to individual members of the Yorkshire Naturalists' Union and to Affiliated Societies. The Editorial Board of *The Naturalist* is currently:
J. Bowers, W. Ely, A. Henderson, A. Millard, P. Simmons, S. West

Notice to contributors

Contributors should indicate whether they wish their manuscripts to be subjected to anonymous peer review. All other manuscripts will be reviewed by the Editorial Board who at their discretion may send them to third parties for comment and advice.

Articles should be submitted electronically as an MS Word document to Dr A. Millard at a.millard@leedsmet.ac.uk. Scientific names should be italicised. Please **avoid** the following:

- using tabs to tabulate information (please use MS Word table format or separate the column entries in a single row with commas and enter a paragraph mark at the end of the row).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send as separate files.

Good quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS Word file containing the caption and name of the person to whom the image should be attributed.

If electronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 Bachelor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482)
Articles should be typed double-spaced and on one side only of the paper. Scientific names of genera and species, but nothing else, should be underlined. Tables and text figures should be prepared on separate sheets of good quality white paper and executed in jet-black Indian ink at 1.5 times the size at which they are intended to appear in *The Naturalist*. Legends etc. should be submitted on a separate sheet. Hand-written material is acceptable and welcome but should be submitted a month in advance of the copy date.

Contributors should ensure the accuracy of reference citations. The Editorial Board and Council accept no responsibility for opinions expressed by contributors.

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