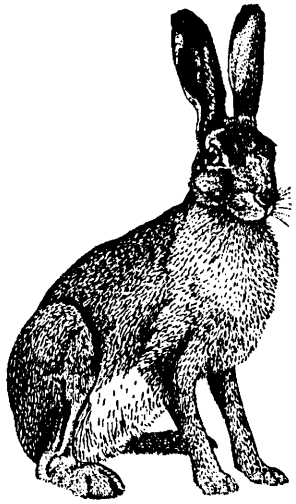
IMPRINT

The Yorkshire Mammal Group Newsletter

No. 26 (1999)



ISSN 0264 - 6781

Editor:

Geoff Oxford
519 Huntington Road
Huntington
York YO32 9PY

Copy data for next issue: 31st. August, 2000

Contents

Editor's Report

Geoff Oxford

Last year was an important one for the YMG, for two main reasons. First, the Group organised a regional Mammal Society meeting, *More about Mammals*, on Saturday 24 October, 1998; its first such event for nearly nine years. Judging by the remarks made by participants the meeting was extremely well received, not only for the uniformly high quality and fascinating talks but also for the organisation and smooth running of the day. Indeed our chairman, Professor Stephen Harris, suggested we should put on a similar event every two years – praise indeed! The proceedings of the meeting were recorded by John Ray and his account appears on p. 18 of this issue. Very many thanks to the organiser, Michael Thompson, and all who played vital roles on the day.

The second memorable happening during 1999 was the fruition of a scheme to re-introduce dormice to Yorkshire, spearheaded by Dr Pat Morris and funded by English Nature. Unfortunately, only a very small number of YMG members could be involved in the release in deference to the wishes of the site owner. An outline of the history of dormice in the county and details of the re-introduction are presented on p. 9.

During 3-11 July, The Mammal Society organised the first National Mammal Week. The YMG contributed a *Morning of Mammals* held in York Cemetery (4 July) and aimed specifically at children and their parents. Although we could cater for only a limited number of people, all who attended seemed to have had an enjoyable time. A report of this event is included on p. 17. Once again, many thanks to the small band who helped to make the morning a success.

Many current members of the YMG may be unaware of the pivotal role the group has played over the years in charting the distribution of mammals in Yorkshire. Colin Howes (Doncaster Museum) recently collated the large number of small mammal surveys undertaken in the county in a paper in the *Naturalist* (1998). At my suggestion, he has produced a separate article on this topic for *Imprint* (p. 21) which highlights the contribution of the YMG.

Finally, I sincerely thank all who have contributed articles to *Imprint* 1999 – your efforts are very much appreciated.

Cutting *Edge* – Mammal Snippets

Compiled by Geoff Oxford

Minimising the mole menace

Moles are a real nuisance on farms, sports fields and nature reserves because of the molehills they produce. However, present methods of control e.g. the use of mole traps or poisoning with strychnine, are perceived as inhumane and/or dangerous. A recent paper by Edwards, Crawley and Heard (1999) examined the possibility of mole control through the management of their staple diet, earthworms. They investigated the occurrence of mole hills in a variety of habitats subjected to a number of management regimes over a period of two years. In their experimental area of 4608m^2 a total of 1062 molehills formed during the study producing a disturbance rate equivalent to 3.2% of the soil surface over the two years. Treatments that had fewer molehills had fewer earthworms indicating that the effect on the moles was indirect and via their food supply. Using techniques that reduce the earthworm population can therefore humanely reduce mole activity. Their recommended methods for deterring moles were either by (i) encouraging soil pH to fall (e.g. by withholding lime applications), (ii) creating herb-rich swards or (iii) preventing plant biomass from accumulating for long periods. These methods would be more applicable to gardens, sports fields and nature reserves than to farms, where conflicts with normal farming practices would make them difficult to implement.

Reference

Edwards, G. R., Crawley, M. J. & Heard, M. S. (1999) Factors influencing molehill distribution in grassland: implications for controlling the damage caused by molehills. *J. App. Ecol.*, **36**: 434-442

Do Danish otters hunt selectively?

Although the general prey taken by otters is fairly well established, the question of whether they just take whatever is there, or whether they hunt selectively, has not received so much attention. A paper by Taastrøm and

Jacobsen (1999) addresses this issue using otter populations in Denmark. They collected spraints from five different localities and analysed them for fish remains and those of other vertebrates (e.g. frogs and birds). Lengths of key fish vertebrae were used to estimate the size distribution of fish caught. Electrofishing was carried out at the same time spraints were collected to give an indication of the potential fish prey available. In total 978 otter spraints were analysed and showed that fish, as expected, comprised the major component of the diet with other items (frogs, birds, invertebrates) being taken most frequently in spring and summer. Comparisons of spraint and electrofishing results suggested that the fish species composition of the diet generally reflected that of the foraging area, with the exceptions that otters seemed to take trout less often, and sticklebacks more often, that might be expected on this basis. The apparent dearth of trout in the diet might be a consequence of their being difficult to catch. Although other studies have also shown a preference for stickle-backs under certain conditions, these fish are not easy to electrofish and an underestimation of their population size would lead to an apparent preference for this species by otters. All this goes to show how difficult it is to draw sensible and robust conclusions from hard-won field data.

Reference

Taastrøm, H.-M. & Jacobsen, L. (1999) The diet of otters (*Lutra lutra* L.) in Danish freshwater habitats: comparisons of prey fish populations. *J. Zool. Lond.*, **248**: 1-13

Foraging ecology of Leisler's bat

Leisler's bat (*Nyctalus leisleri*) has been newly recorded at several locations in Yorkshire in recent years although it is not clear whether this is a result of the species increasing its range or just being accurately identified more frequently. Leisler's bat is similar in size to the Noctule (*Nyctalus noctula*) but its diet has not been as well studied. A recent paper by Waters, Jones and Furlong (1999) provides information on diet and foraging patterns at two sites in southern England, in Kent and near Bristol. Dietary composition was assessed by faecal analyses and habitat usage by radiotracking and bat-detector transects. The diet was shown to vary seasonally and also between the two sites and consisted predominantly of small Diptera plus smaller numbers of Coleoptera and Lepidoptera. In theory, bats such as Leisler's with low frequency echolocation calls should

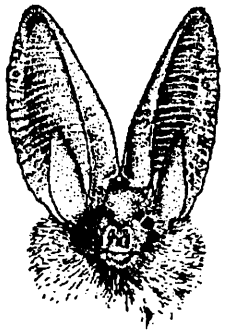
not be adept at catching small insects. One possibility is that they pick up swarms of small insects, rather than individuals, and 'filter feed' while flying through these. Foraging ranges of radiotracked individuals were relatively large with bats flying an average of 4.2km from the roost with home-range areas averaging 7.4km^2 (but up to 18.4km^2). Comparisons of the proportions of habitat features within flying distance of their roosts with those present in their home ranges showed that they preferred foraging in areas of woodland and along scrub-lined roads in Kent, but over pasture around Bristol. Urban and arable areas were avoided at both locations. The bat detector transects suggested that woodland margins were heavily used by feeding bats. In terms of conservation, the authors point out that the large home-range size and their predicted fast flying speed should make the species less vulnerable to habitat fragmentation, and that barriers to commuting routes such as roads appear to have little effect on their movements. Reliance on a number of communal roost sites might make Leisler's bat vulnerable to woodland clearance. The marked differences in usage of habitat types between the Kent and Bristol sites suggest that the species is highly adaptable and, as such, one might expect the species distribution to be much greater than it is across mainland Britain. Presumably other factor(s) limit both distribution and abundance.

Reference

Waters, D., Jones, G. & Furlong, M. (1999) Foraging ecology of Leisler's bat (*Nyctalus leisleri*) at two sites in southern Britain. *J. Zool. Lond.*, **249**: 173-180

A Year in the Life of the North Yorkshire Bat Group

John Drewett



Each year this report becomes harder to write as I search back through my mind and files in an attempt to summarise something of the vast amount of work carried out by the Group. To those not routinely involved in the work of the Group, it might seem that all we do is to organise a few walks and indoor meetings and produce a monthly newsletter. However, this is far from the reality of the situation.

One of our most important activities is responding to calls from householders to English Nature for advice on bat matters. These calls are handled by a small number of licensed bat workers who, so far this year, have dealt with more than 200 calls. In an attempt to spread the load we have, for the past two years, run an extensive programme of training for new licence holders. This is starting to bear fruit as more bat workers come on stream, although training does not always progress as quickly as we would like, mainly due to the pressure of the very bat work that we are training people to assist with.

Often, increasing awareness of bat conservation is more valuable than actually doing something ourselves. A particularly valuable area is liaison with local authorities. Early in 1999, with the support of English Nature and North Yorkshire County Council, we held a training day at Fountains Abbey for development control officers, and building and bridge inspectors, to alert them to the requirements of bats and legislation relating to them and how this ties in with their everyday work. This has done much to further the conservation of bats in the planning process but, of course, has also increased our workload.

Another area where forward planning can assist bat conservation is through the Biodiversity Action Plan (BAP) system. National and local plans are being drawn up for various areas, incorporating specific targets for certain protected species. The Group has commented on the draft BAP for the City

of York and is involved in various other plans currently being developed. Often the drafts of these plans can be rather vague, but considered comments can considerably strengthen their policies, which can also help unlock funding for bat conservation.

Partly out of the BAP process, we have also begun to work more closely with the county's two National Parks. In particular we are concerned about the impact that restoration of traditional Dales barns may be having on bat populations. The use of these barns by bats has not been previously studied and we have been awarded a small grant towards the cost of a pilot study in upper Swaledale. Similarly, we are currently working on proposals for a detailed study of Daubenton's bats in the Ripon area following a large drop in the number of bats at one long-established roost this summer. This may well involve radio-tracking techniques, which we have flirted with this year in association with the Central Science Laboratory and East Yorkshire Bat Group in connection with Brown long-eared bats.

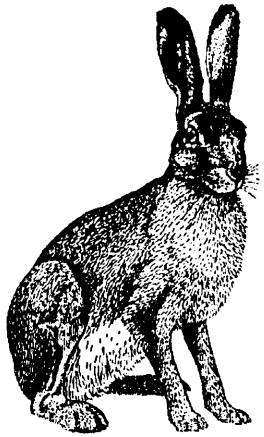
There is a vast amount going on in the world of bat conservation so bat groups and bat workers must continually work together in order to keep up-to-date. This year we have reinstated a series of regular regional meetings for bat groups in north-east England, a region which stretches from Sheffield to Berwick-on-Tweed and from the east coast to the Cumbria and Lancashire borders. At these meetings, which alternate between York and Darlington, we are able to discuss issues of common concern and to pass matters forward to the national Bat Groups Forum organised by the Bat Conservation Trust.

In August I was fortunate to be able to attend the European Bat Research Symposium in Krakow, Poland where much useful information was imparted and where I met with fellow bat workers from 24 nations stretching from Ireland to Ukraine. Shortly afterwards, it was the turn of the North Yorkshire Bat Group to host the 1999 National Bat Conference in Ripon. More than 200 bat workers from across the United Kingdom met for a most fruitful weekend of discussions, lectures and socialising. It was a great honour to have this important meeting within our area. Reports of both of these conferences are included in the 1999 edition of *Plecotus*, published by the Group.

As will be evident, there is no shortage of activity in the North Yorkshire Bat Group, with plenty of opportunities to become involved, whatever your abilities. More general mammalogists are certainly encouraged to join in.

Second National Brown Hare Survey

Ann Hanson



The Second National Brown Hare Survey was carried out during winter 1997/98 and 1998/99. It was again co-ordinated by Bristol University and funded by the People's Trust for Endangered Species. For methodology and results of the First National Brown Hare Survey (winter 1991/92 and 1992/93) see *Imprint* Nos. 19, 20 and 21.

Volunteers were asked to walk randomly allocated 1km squares, counting and mapping hares *en route*, and recording habitat types within the squares.

The aims of the hare survey are as follows:

1. To determine the current size of the brown hare population and compare it with the estimate for the early 1990s (i.e. the first survey results). Also to determine if the reduction in levels of agricultural intensification and other landscape changes have benefited hare populations at all.

2. To assess the impact of habitat fragmentation on hare populations.

3. To use the information to predict future hare population changes in response to different landscape management plans.

One particular 1km square allocated to the YMG was in an area of farmland and forestry plantations on Cold Kirby Moor, North Yorkshire. The relevant landowner permission was sought and granted, and the survey carried out on a rather cold, windy day in January 1999.

The transect route for each survey had to be as close as possible to a square, running approximately 150m inside the boundaries of the 1km square allocated. It was important to traverse different habitats randomly and not select a route which seemed more likely for spotting hares.

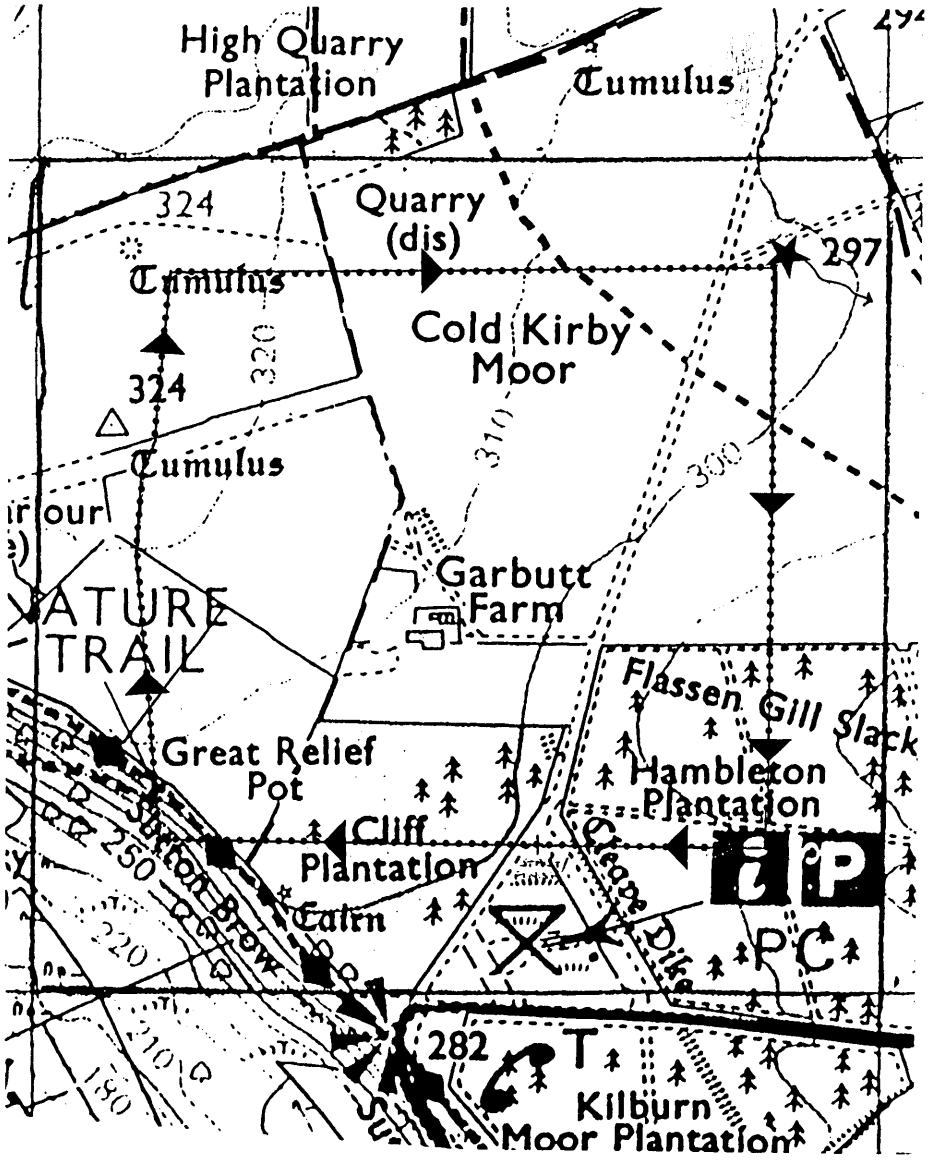
A suitable transect was plotted for our 1km square (see map on p.8) and walked between 12.30 and 14.15hr. This was to give ourselves the best chance of seeing hares, as they tend to lie up in their forms during the middle of the day in winter. The transect was walked at a slow pace, scanning a semicircle of about 100m radius in front and to the sides. Hares would hopefully either be spotted lying in their forms or be flushed, in which case it was important to note where the hare had been lying up. Each hare spotted was marked on the transect map, its behaviour noted and also a description of the habitat where it was seen.

On our particular 1km square only one hare was flushed during the survey, but still managed to cause great excitement amongst the survey team! The area it was lying up in was a large grass field, with a fairly close sward (about 10cm maximum), yet the hare remained hidden until it stood up to run even though we were only about four to five metres away from it. This demonstrated how good hares are at avoiding being spotted, simply by staying very still and flattening themselves to the ground. Young leverets especially use this technique to avoid predators they would be unlikely to outrun.

The habitat in the 1km square on Cold Kirby Moor was mainly open farmland, with areas of arable and also areas of short grass used as gallops for training horses. This should be ideal hare habitat, and the landowner informed us there is a decent hare population in the area, despite problems with poaching and lamping. The square also had areas of forestry plantation, some of which had been recently felled and replanted, providing the hares with cover and alternative feeding habitat. A full habitat survey of the square was undertaken, following the guidelines provided, and a habitat map produced for analysis by the team at Bristol University.

Thanks are due to my partners in crime for their company and hare spotting abilities, and also to the landowners at Cold Kirby Moor for permission to carry out the survey and their helpful comments on the resident hare population. Also, many thanks to other intrepid YMG members who bravely attempted hare surveys, despite difficult terrain, atrocious weather and a bit of a lack of hares! Your help and enthusiasm was greatly appreciated.

The 1km square on Cold Kirby Moor surveyed for brown hares. The transect is shown as a dotted line with direction arrows, and the position of the only hare seem indicated by a star.



Dormice in Yorkshire – The Return of the Native

Geoff Oxford

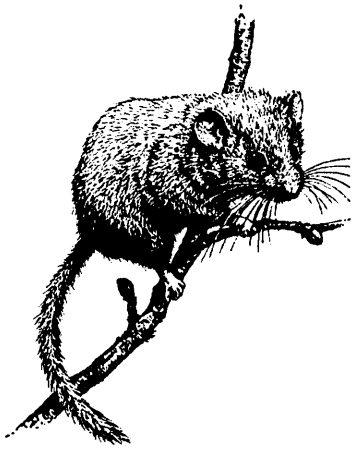


Illustration from Bright & Morris (1989)

The common dormouse, *Muscardinus avellanarius*, is a species whose range in Britain has contracted markedly over the past century. Howes (1985) summarised the records for Yorkshire and noted that most come from the 19th and early 20th centuries although a few are much more recent with a number of sightings from the 1950s and 1960s. The latest claims mentioned by Howes came from the Esk Valley where remains were apparently found in an owl pellet and an animal sighted (1979), and from near Kirkbymoorside where a hibernating individual was discovered (January 1980). It is not clear to what extent these important records were verified by other mammalogists.

The current distribution of the dormouse was determined by the results of the 'Great Nut Hunt' organised by Pat Morris, Paul Bright and supported by English Nature in 1993. The hunt, for characteristically opened hazelnuts, indicated numerous populations in the southern counties, Wales and the Welsh Marches but the species was apparently absent from central, eastern and northern England (Fig. 1). However, pre-1900 there were many populations of dormice throughout England, even as far north as the Glasgow area (Yalden, 1999: 121). In 1997 a Victorian Nut Hunt, funded by the People's Trust for Endangered Species and English Nature, was organised by Paul Bright. This survey, using the same techniques as before, focused specifically on woods in northern England in which the species was recorded by Victorian naturalists. In the Yorkshire woods investigated, no

signs were found; it seemed highly likely that the dormouse was extinct in the county.

The reasons for the general decline in dormouse fortunes is complex but it is thought that habitat fragmentation might be one important factor (Bright & Morris, 1996). If the population in a particular wood goes extinct for whatever reason, it can only be restored by the migration of animals from neighbouring colonies. If these are few and far between, and if there are no suitable corridors for potential migrants to use, re-colonisation may not occur – colonies are extinguished one by one. Thus there may be very suitable sites still available that do not currently have dormouse populations.

The dormouse was one of the first mammals to be included in English Nature's Species Recovery Plan. The overall aim was to reintroduce dormice into all counties from which they had been lost, and to boost numbers in counties where there were very few. Over the past five years, dormouse re-introduction schemes have been initiated in six counties. With the exception of Cheshire, most of these are located in the southern half of England. In 1998, Pat Morris began searching for locations in Yorkshire suitable for a re-introduction attempt. One highly favourable site was identified and in 1999 the seventh re-introduction programme became a reality. The site of the re-introduction must remain secret in accordance with the wishes of the owner, but it is a south-facing, oak-dominated wood with abundant hazel and honeysuckle. Hazel and honeysuckle are important habitat components, with the latter furnishing nesting material and both providing food.

On 27 June cages and nestboxes were delivered to the site. Two students, Jenny Armstrong and Carl Whitehead, set out 150 nestboxes (see illustration below) in a grid covering the release area and 12 release cages were spaced out over the site to avoid conflicts between males. The animals were introduced to their new quarters on 1 July. In total 27 captive-bred animals were released, eight males and 19 females, from four different sources (Devon, Burnham Beeches, London Zoo and Whipsnade Wild Animal Park). The mesh cages were attached to hazel coppice and contained wooden dormouse boxes for accommodation, a water bottle and a squirrel-proof food delivery system. After the first 10 days, during which time they were fed by Jenny Armstrong, a small hole was cut in the top of each release cage next to a trunk to allow the dormice to come and go as they pleased. From then on, feeding was undertaken in rota by a small team (again, as stipulated by the owner) including Rob Caton, Geoff Oxford, Michael Thompson and Gordon Woodroffe. Initially fresh food

was introduced almost every day. The diet supplied to each cage consisted of a small handful of mixed shelled peanuts and sunflower seeds, two slices of red apple and a Rich Tea biscuit. During July and August the frequency of feeds and the amount supplied were both gradually reduced to encourage the dormice to forage for themselves on natural foods. By then, green hazelnuts were abundant in the wood. At the time of writing, early September, the dormice are on their own. The release cages will be collected by Pat Morris later in the year.

The fate of the dormice will be followed by periodic inspection of the nest boxes – a monitoring technique proven elsewhere. Only time will tell if the re-introduction has been a success. I'm sure we all keep our fingers crossed that a healthy, thriving and, we hope, expanding population of dormice will once again grace our county.

Acknowledgement

Thanks to The Mammal Society for permission to reproduce the two illustrations used in this article.

References

Bright, P. & Morris, P. (1989) *A Practical Guide to Dormouse Conservation*. Mammal Society Occasional Publication No.11

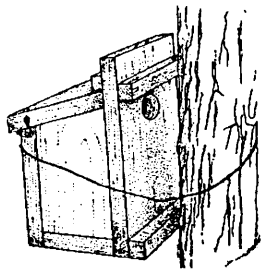
Bright, P. W. & Morris, P. A. (1996) Why are Dormice rare? A case study in conservation biology. *Mammal Rev.*, **26**: 157-187

Howes, C. A. (1985) Dormouse, *Muscardinus avellanarius*. In: M. J. Delany (ed.) *Yorkshire Mammals*. University of Bradford. pp.132-135

Yalden, D (1999) *The History of British Mammals*. Poyser, London

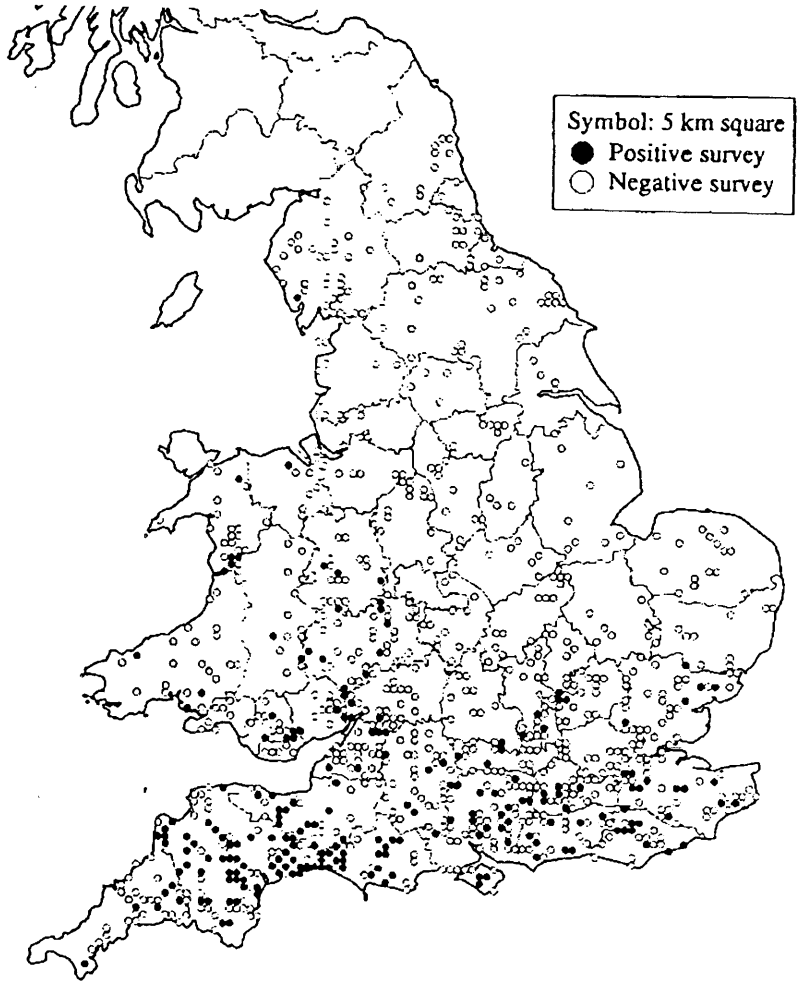
---

A dormouse nest-box.



Note that unlike a bird box the entrance hole is at the back rather than the front so that the animal can access the box from the tree trunk (illustration from Bright & Morris (1989))

Figure 1. Results of 'The Great Nut Hunt' taken from an English Nature press release (1994)



Dormouse release – STOP PRESS

The dormouse boxes were initially checked in early October and revealed no fewer than 35 fully-made nests, one incomplete nest, 16 adults and 27 young. Sadly, some nests just contained dead juveniles, presumably a result of the mother either being predated or abandoning her young for other reasons. It was clear from the distribution of nests that the dormice had dispersed away from the vicinity of the release cages. Interestingly, it seemed that the animals had moved higher up the hillside rather than scattering randomly around their release sites.

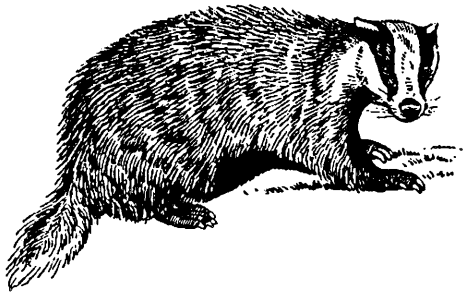
A second check of the nestboxes was made on 30 October, when Pat Morris visited the site to help with the nestbox inspection and to collect the release cages. On this occasion, 30 boxes were found to have nests and a total of 15 animals was discovered. The smaller number of nests at this time may have resulted from some boxes containing dead young being cleared on the first visit. On the second inspection, animals were weighed and sexed. Ten animals were declared to be females, three males and two were 'unclassified'. Sexing dormice is not at all easy and the preponderance of females may be an artefact. The lightest young, found abandoned in a litter of two, weighed only four and five grams respectively. One was dead and the other died during the day – the intention was to try to hand-rear it as these young almost certainly would not have gained sufficient weight to survive hibernation. Weights of other animals ranged from 11g each from a litter of two well grown, abandoned but probably weaned young, up to 24g for one of the males.

One well grown female (16g) was found torpid in a nestbox, curled in the classical hibernating position. This animal stirred during the sexing and weighing operation, which was probably a good thing. Hibernation usually takes place in hollows under moss at ground level - nestboxes are not ideal for the purpose. It is to be hoped that this individual woke up sufficiently to move to a 'sensible' overwintering site. The lower number of animals counted on the second visit may be attributed to mortality of some of the juveniles and/or to some animals already having moved from the boxes to hibernating sites. One nestbox contained a very active pigmy shrew (*Sorex minutus*).

The numbers of animals and nests found in the boxes is remarkably high given the number released. We hope it is a good omen.

Badger Watching - The Cushy Way

Mary Youngman



On Thursday 1 July eleven members of the YMG joined Charles Critchley to watch badgers at Cropton Forest in the North York Moors. Although there had been rain earlier in the day the evening was dry, pleasantly warm and calm. Not that the weather was particularly significant, for we were to watch the sett from the relative luxury of a hide. Protected from the marauding midges, this was badger watching in comfort.

Whilst we waited we were able to enjoy some grey squirrels and several birds feeding on the peanuts and other food put out for the badgers. A great spotted woodpecker and three jays were especially admired.

Suddenly the cry went up 'badger' and there was a general shuffling of bodies to get a view of the first sighting. As the light was still very good we were able to see the badger well but the appearance was all too brief. This set the trend for the rest of the evening, good views but the badgers seemed rather nervous. Perhaps their unease was due to our scent lingering in the still evening air. We were treated to several more sightings during our visit, one large individual gave a particularly good showing and several well grown cubs made brief sorties into view. Despite Charles' declaration that the watching had not been up to the usual standard for this sett, I believe that most members went home well satisfied.

Mammal Recording

Michael Thompson

Sometime ago the Yorkshire Mammal Group obtained the *Look Out For Mammals* database from The Mammal Society, with the idea that the Group took on the mammal recording for North Yorkshire. After an initially successful start, the scheme has now lapsed. Becky Turner (née Smurthwaite) got the scheme going using a computer at her work in Teeside. Unfortunately, due to pressure of work, she has been unable to continue with this. We thank Becky for all her efforts.

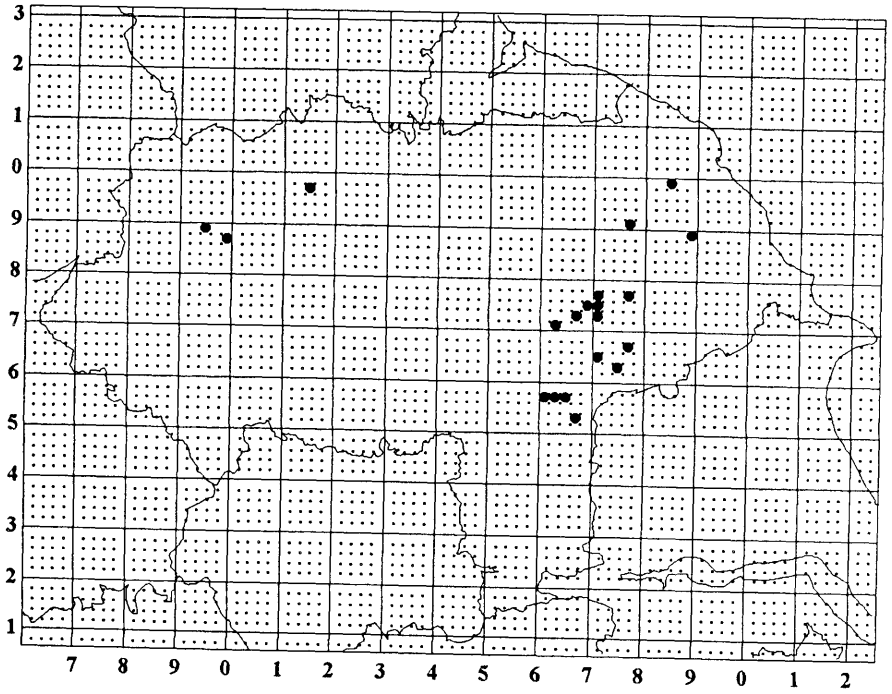
Over the years various recording schemes, set up for the membership of the YMG, have come and gone but none has been sustainable. The Mammal Society's database called Biobase was supplied to me for my personal mammal records. As a consequence I have been asked by the YMG Committee to take on the mammal recording for the Group. I intend to make a start soon, and would ask the membership to supply me with their current records as soon as possible. What I would like to do is to have a completed set of records for North Yorkshire within the next three years, after which I could print out some distribution maps.

The records will, in future, be passed on to The Mammal Society's recording scheme at their headquarters in London. In 1993, the Conservation Committee of the Yorkshire Wildlife Trust (YWT) floated the idea that there should be a biological data centre for North and East Yorkshire. Together with various statutory bodies, such as the respective County Councils, interested District Councils, the two North Yorkshire National Parks Authorities and English Nature, the YWT became part of a steering committee to see if such a centre was feasible. I have represented the YWT on the committee from its inception. Now, many meetings later, we have been able to launch the North and East Yorkshire Ecological Data Trust (NEYEDT), of which I am a founder Trustee. The Trust, which has charitable status, has at the moment three Trustees; Jeff Lunn, of English Nature, acts as its Secretary, and Jack Lavin its Consultant. It will soon be in the position to employ a Director, and currently is arranging office accommodation with the St. William's Foundation in York. NEYEDT will form one of the 15 or more regional data centres being set up throughout Britain. The local records centres will be linked to the National Biodiversity Network. Thus, not only will the YMG's records go to London, but also

will be available locally for wildlife interests, planners and other people who make decisions about our environment.

A very preliminary distribution map for the fox (*Vulpes vulpes*) in N. Yorkshire based, so far, solely on Michael Thompson's own records.

Fox



Editor's note: For this mapping scheme to be successful we obviously need as many records from members as possible. Please forward your records to Michael Thompson on the appropriate YMG form as soon as possible. If you do not have copies of the form or the instructions for filling it in, please get in touch with Michael or Geoff Oxford (contact details on page 45).

Mammals in the Morning

Roma Oxford

On the morning of Sunday 4 July, at York Cemetery, the Yorkshire Mammal Group pulled out all stops for our contribution to National Mammal Week. The event was designed to illustrate the numerous ways in which the presence of wild mammals can be detected. In fact, there were probably more tell-tale signs of British mammals in one location than have ever been seen before. There were paw-prints in puddles, nibbled nuts and cones, snagged badger hairs, a fresh dung pit and droppings from all manner of mammals. They had all been 'planted' much earlier as part of a demonstration to show how to identify mammals from their tracks and other signs. Another organised activity included opening 40 Longworth traps, set the evening before in what appeared to be an ideal habitat for small mammals. Twenty expectant children and their parents arrived at 10am hoping to see voles, mice and shrews and must have been very disappointed as our total catch was NOTHING! The numerous local cats were possibly to blame. However, a quiz based on a collection of mammal skulls kept many children guessing. The difference between carnivores and herbivores was illustrated most clearly by, among others, a deer skull and a borrowed tiger skull, the latter being voted the most 'cool' object on display. An introduction to the nightly lives of hedgehogs, bats and field mice was made possible by having rescued live specimens present. The children also learned how to make plaster casts from mammal footprints. However the most fascinating activity of all was clearly the dissection of owl pellets followed by mounting the teased-out bones onto black card. If lunch-time hunger had not intervened, everyone would have stayed all afternoon too. The YMG organisers and participants deserve congratulation for a most successful event. All agreed it was hard work, but nonetheless, an event that could be run again on future occasions.

More about Mammals

John Ray

More about Mammals was a regional Mammal Society symposium. organised by the Yorkshire Mammal Group in the Department of Biology, University of York on Saturday 24 October, 1998.

The day was well attended by more than 130 people and was chaired by Professor Stephen Harris, who opened the meeting by reiterating the aims of the Mammal Society: to create awareness of, survey, promote studies of, advocate conservation of, educate about and monitor British mammals.

The programme included a variety of topics by speakers who gave their time freely to contribute towards a most informative day. What follows are short notes on the contents of, and messages emerging from, the eight contributions.

Dean Waters – *Daubenton's Bats on the River Wharfe*

There had been little hard evidence of what governed the population structure and range of this species. Echolocations were recorded and identified back in the laboratory. Habitat category factors recorded included presence or absence of riverside trees and water state (smooth flowing, ripples etc). Some bats were harp-trapped and radio telemetry, along consistent transects at set times, was used to monitor the movements of individuals e.g. Declan, Eddie and Fergal! As well as males, two main roosts of breeding females were found in Wharfedale. The northern roost fed 2km. further downstream during the summer as the river dried. The bats required surface water over which to hunt. The recommended management plan was to promote smooth flowing water, sympathetic restoration of bridges and enhancement of riparian woodland.

Johnny Birks – *Status of the Pine Marten in England and Wales*

The aim of the study was to establish whether there were any viable populations left to conserve. Pine marten ranges vary from 0.1km^2 in Ireland to 30km^2 in Scotland. They are omnivorous, and more likely in areas where they are less vulnerable to predatory foxes. From mainly third party sightings it was concluded that despite legal protection since 1988 pine martens are virtually extinct in England and Wales but that Ireland and Scotland have healthy populations.

Gordon Woodroffe – *Water Voles – A Conservation Dilemma*

Of those sites which had water voles in 1900, 70% are now empty. Pristine water vole habitat, e.g. steep bank angle, high percentage of grass and minimal disturbance, also suits mink. The two populations are inversely proportional, with mink increasing. In a study area of seven rivers, water voles were caught at only 10 core sites; some 400 trap nights at 15 peripheral sites yielded none, nor, as one might have expected, were any found at 14 unsuitable sites. Frequent surveying is required. Gordon concluded by suggesting that perhaps rivers were not now the best habitat: some colonies have been found in reed beds and even gardens!

Pat Morris – *Rehabilitation of Sick Hedgehogs – Can They Cope after Release?*

A large number of hedgehogs are rescued each year, e.g. traffic and strimmer casualties. Hedgehogs have to weigh at least 450g to endure hibernation, an adult can weigh between 500–1500g; young rehabs are usually taken into care in autumn and released in spring. On average only a third remained alive after a month, and had lost 30% of their body weight. Young rehabs appeared to be less efficient at foraging so a qualified answer to the question appears to be 'No'. However, rehabilitation still saves many lives.

Jeremy Searle – *The Common Shrew – Its Behavioural Ecology and Evolution*

There are believed to be five main sources of colonisation of northern Eurasia at the end of the last glaciation. There are now 50 different forms of common shrew recognized, distinguished by number and shape of their chromosomes, from the west of the U.K. to Lake Baikal in Siberia. They prefer damper conditions, e.g. alder, than the French shrew, which prefers oak habitat. Common shrews have a simple life cycle, but more complex mating strategies. Males born in March tend to have short home ranges and

father on average 2.9 offspring; those born in April tend to have longer ranges and sire on average 1.6 offspring. Females are promiscuous, mating frequently during their very short oestrus (20 copulations in three hours) which reduces the risk from mating with a brother. DNA analysis showed one litter had been fathered by six different males, although three fathers was the average.

Ruth Temple – *Brown Hare Survey*

Classed as vulnerable or rapidly declining, one aim of the 'Biodiversity Action Plan' is to double the number of hares in Britain by 2010. From game bag data of a century ago, numbers are now much reduced. Sites where hares were seen dropped significantly from the 60s to the 80s. However, random 1km^2 surveys (conducted around noon, when brown hares are likely to be in their forms) in 1991-93 and in 1997-99 indicate similar population sizes. Modern agricultural practices have had an adverse impact. Increased silage cutting (up to three times a year) coincides with young lying in forms awaiting a twice daily feed by their mothers. Leverets cannot avoid the cutting machines. Field edge and hedgerow reductions exacerbate this. White clover grown to tolerate lower temperatures and high levels of nutrients, have higher levels of phyto-oestrogens, which are converted into active oestrogens in the females. High levels of oestrogen cause ovarian abnormalities and induce sterility. Winter cereal crops have increased; these are woody and indigestible, necessitating wider foraging during the breeding season.

Piran White – *Roads – Cause of Fragmentation in Badger Populations*

Road traffic accidents are the biggest cause of badger deaths in Britain accounting for 70,000+ cubs alone per year. For badgers, roads are a barrier to movement and a source of mortality and disturbance. Data were derived from nearly 8000km^2 in the SW of England and from the DoT and MAFF (1984, post gassing). Land class was not found to be significant, but different classes of road were. Motorways, A and B roads have an approximately equal risk of death to badgers, six times greater than the risk on C roads. Nevertheless, because there are more C roads than others, they account for a high actual number of deaths. The efficacy of badger tunnels was put in doubt by the data.

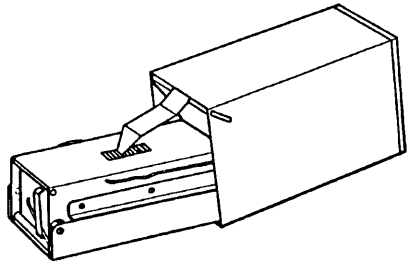
Paul Bright – *Dormice in Northern England*

Their physiology (lack of caecum in the gut) dictates that dormice must eat the most nutritious parts of plants, tree flowers and tree fruit. Hence they

are more likely to be found where there is a high density of trees and shrubs, particularly under-canopy shrubs in woodland. Dormice exist in S and W Lakeland and at one 7km^2 site in Northumberland, which enjoys a sheltered micro-climate. Again, human practices have adversely affected populations. Coppicing of the under-storey is now confined to S England, meaning more canopy forming trees (and less under-canopy shrubs) elsewhere. Towards northern England, the frequency and size of ancient woodland and the woodland diversity decreases; hedgerows, important dispersal corridors between woodlands, also decrease. Climate changes have also had an effect. Whereas shorter winters aid survival by allowing females to breed earlier, leading to bigger young able to better endure the next winter, a stable cold winter is better than an unstable warm one. Under the latter conditions dormice wake more often and use more energy, and are thus weakened. A re-introduction in 200 acre woodland in Huntingdonshire has been successful. Similar success in N England would have to be preceded by the restoration of suitable habitat.

Thirty Years of Small Mammal Trapping Studies in Yorkshire: The Yorkshire Mammal Group's Landmark Contribution to Science

Colin Howes
Museum and Art Gallery, Doncaster



Introduction

In the process of collating data for the Mammal Society's *Look Out For Mammals* national computer data base, a staggering 86 literature references were located which referred to small mammal trapping projects within the Yorkshire region (Howes 1998). Since some of these works in themselves represented the culmination of a considerable investment of peoples time, effort and expertise, collectively they formed a colossal corpus of biological information.

The study also revealed that over 80% of the papers resulted from the Yorkshire Mammal Group's (YMG) field studies, mostly published in the YMG's own journal, *Imprint*. Launched in 1983 through the vision and enthusiasm of the late Barrie Smith, this lively and constantly improving magazine has provided an invaluable repository for local survey and project results.

In compiling this bibliography and indexed catalogue of survey sites, the following review focuses a spotlight of acknowledgement on the Herculean contribution the YMG has made both in recording Yorkshire's mammal fauna and in providing raw data on the biology and ecology of small mammals in general.

History of humane live trapping

The invention of the 'Longworth Live Trap' (Chitty and Kempson, 1949) and the development of field methods and techniques associated with its use in the field (Delany, 1974), revolutionised small mammal studies, enabling specimens to be examined, marked, released back into the population and re-trapped. This opened up the way to investigations of territoriality, home range, seasonal movement, dispersal, weight variation and a range of breeding cycle and demographic studies. For the first time small mammal studies were given the possibilities and 'glamour' of bird ringing.

The acquisition of a set of traps by the York based YMG signalled the advent of a highly productive and continuing era of activity by this small group of dedicated and highly skilled enthusiasts. The first published report of this activity was Dennis Aspinall and Michael Thompson's (1973) analysis of a year-long study (9984 trap nights) at Howsham Wood by the Derwent. Subsequent long tern studies include those of the Forestry Commission plantation at Blackwoods, Wheldrake from 1971 to 1985, the results being reviewed in Sharp (1985) and Sharp and Wilson (1987), the plantation and hedgerow habitats at Hopewell House Farm, Knaresborough from 1980 to 1988 (Frazer, 1988) and at the experimental agroforestry plots at Leeds University Farm, Tadcaster from 1991 to 1996, the results from which still await analysis.

The majority of recording surveys undertaken by the group are however single weekend trapping sessions often at Yorkshire Wildlife Trust nature reserves or similar sites.

Relative importance and influence of YMG field studies

Table 1 shows the relative importance of local, regional and national literature and some unpublished theses in providing information on Yorkshire small mammal trapping studies, revealing that 78 papers, (90% of the resource) had been contributed by local publications, 52 (60%) of which were YMG studies published in *Imprint*.

Perhaps researchers who routinely depend on the main-stream national scientific literature are proceeding in a state of ignorance. Since the vast majority of work goes on at local level, researchers need to search out and utilise this rich resource.

The YMG's co-operation with other natural history societies from the late 1970s, notably at Harrogate, Scarborough and Sheffield, spread the expertise and triggered independent bouts of field work and series of publications.

Although significant numbers of trapping records were available up to the early 1980s to be used in the 'Atlas of Yorkshire Mammals' (Howes 1983) and *Yorkshire Mammals* (Delany 1985), much of the current bibliography post-dates these landmark publications, indicating that a new review of the biology and ecology small mammals in Yorkshire may be justifiable - how about it ?

Bibliography and index of study sites

The following numbered bibliography (see Appendix 1) is presented here to facilitate access to this published resource and to encourage the use and analysis of this substantial body of information.

Table 2 gives an alphabetical index to 28 small mammal trapping localities in Watsonian Yorkshire and in providing the reference numbers to the bibliography, forms a key to research and information on each site.

Acknowledgements

Although a large number of individuals have been involved in the trapping sessions over the years, the main players featuring in the literature are the following :- Dennis Aspinall, Ken Burden, Ron Deaton, Caroline Frazer (née Sharp), Kate Fuller, Ann Hanson, Angie Hibbert, Geoff Oxford, Michael Thompson, Jack Whitehead and Dave Woodings.

Thanks are due to Ann Hanson and Michael J. A. Thompson for commenting on the references in *Imprint.*

General references

Chitty, D. & Kempson, D.A. (1949) Prebaiting small mammals and a new design of live trap. *Ecology*, **30**: 536-542

Delany, M. J. (1974) *The Ecology of Small Mammals*. Institute of Biology's Studies in Biology No. 51. Arnold, London.

Delany, M. J. (1985) *Yorkshire Mammals*. University of Bradford.

Howes, C. A. (1983) An atlas of Yorkshire mammals. *Naturalist*, **108**: 41-82

Howes, C. A. (1998) A history and bibliography of small mammal trapping studies in Watsonian Yorkshire. *Naturalist*, **123**: 149-157

Table 1. Sources of Yorkshire mammal trapping studies based on an analysis of 86 literature references

Sources	No. of citations
Imprint	52
Sorby Record	8
The Naturalist	7
Journal of Zoology	4
Hull Natural History Society	5
Harrogate Naturalists' Society	2
Unpublished Theses and Dissertations	2
Yorkshire Mammals (Delany 1985)	2
Knaresborough Ringing Station	1
Scarborough Field Naturalists' Society	1
Acta Thereologica	1
Aspects of Applied Biology	1

Table 2. Alphabetical index to mammal trapping localities with bibliographic reference numbers.

Trapping Localities	Grid Refs.	Bibliography Nos.
Ashberry Pastures	(SE/5685)	19,29
Askham Bog	(SE/5748)	49
Blackwoods	(SE/6646)	33,35
Chafer Wood	(SE/8983)	21,52
Clifton Moor	(SE/5853)	15
Cropton Forest	(SE/7-9-)	39
Ellerburn Bank	(SE/8494)	54
Filey Dams	(TA/1080)	22,34,38,43,53
Foss Island	(SE/6051)	30
Garbutt Wood	(SE/5083)	28
Gouthwaite Reservoir	(SE/1270)	3
High Batts Nat. Res.	(SE/3075)	6,37,41,47,51
Hob Moor	(SE/5850)	13
Holgate Beck	(SE/5851)	12
Hopewell House Farm	(SE/3758)	5,7,27,31,32,44,48
Howsham Wood	(SE/7463)	1
Humber Wildfowl Refuge	(SE/8-2-)	17
Jeffrey Bog	(SE/7566)	11
Leeds University Farm	(SE/4-4-)	8,10,16,18,20,23,24
Lindholme Moor	(SE/7-0-)	25
Moorlands, Skelton	(SE/5758)	9
Poppleton	(SE/5554)	46
Rawcliffe Meadows	(SE/5754)	14
Rievaulx Abbey	(SE/5784)	42
Scotton Banks	(SE/3258)	4
Skipwith Common	(SE/6537)	40
Willow Garth	(SE/5124)	2,45,50
Wharnecliff Wood	(SK/3-9-)	36
Regions		
East Yorkshire (Vice County 61)		1,17,22,34,33,35,38, 40,43,53
Harrogate/Knaresborough/Ripon region		3,4,5,6,7,27,31,32,37, 41,42,44,48,51
North York Moors & Forestry		19,21,28,29,39,52,54.
South Yorkshire		25,36
York area		9,11,12,13,14,15,27, 30,35,46,49

Appendix 1 – Bibliography

(1) Aspinall, D.L. & Thompson, M. J. A. (1973) Small mammals of Howsham Wood. *Naturalist*, **98**: 83-86

(2) Burden, K. (1987) Willow Garth trap. 24-26.4.1987. *Imprint*, **9**: 18-20

(3) Counter, J., Damper, B. & Deaton, R. H. (1983) A Yorkshire first. [Small mammal trapping at Gouthwaite Reservoir 8-9.10.1983]. *Imprint*, **2**: 6

(4) Counter, J., Damper, B. & Deaton, R. H. (1983)To prebait or not to prebait, that is the question! [Small mammal trapping on roadside verges near Harrogate and on the Nidd banks, Scotton]. *Imprint*, **2**: 7

(5) Deaton, R. (1987) Field Studies Report 1987 - Hopewell House Farm, Knaresborough, North Yorkshire 13-15.3.1987. *Imprint*, **9**: 17

(6) Elleker, H. (1987) Field Studies Report 1987 - High Batts Reserve, Ripon 1.2.1987. *Imprint*, **9**: 16

(7) Frazer, C. (1988) Field Studies Report 1988 - Hopewell House Farm Study. *Imprint*, **11**: 2-11

(8) Fuller, K. (1991) Long term study of the agroforestry site at Leeds University farm near Tadcaster [initial trap 24.4.1991]. *Imprint*, **17**: 6-8

(9) Fuller, K. (1991) York Environment Week Trap 25.5.1991 – Moorlands Nature Reserve near York. *Imprint*, **17**: 9

(10) Fuller, K. (1992) Long term study of the agroforestry site at Leeds University farm near Tadcaster [second trap 13-14.10.1991]. *Imprint*, **18**: 6-10

(11) Fuller, K. (1992) Jeffrey Bog near Kirkham Priory 13-14.10.1991. *Imprint*, **18**: 10-11

(12) Fuller, K. (1992) York Green-sites Survey 23.2.1992 - Holgate Beck Corridor. [bottle & drinks can survey]. *Imprint*, **19**: 4

(13) Fuller, K. (1992) York Green-sites Survey 23.2.1992 - Hob Moor. [bottle & drinks can survey]. *Imprint*, **19**: 4

(14) Fuller, K. (1992) York Green-sites Survey 23.2.1992 - Rawcliffe Meadows. [Bottle & drinks can survey]. *Imprint*, **19**: 4

(15) Fuller, K. (1992)York Green-sites Survey 23.2.1992 - Clifton Moor. [bottle & drinks can survey]. *Imprint*, **19**: 4

(16) Fuller, K. (1992) Long term study of the agroforestry site at Leeds University farm near Tadcaster [third trap 8-10.5.1992; fourth trap 18-20.7.1992]. *Imprint*, **19**: 5-8

(17) Hanson, A. (1993) The Humber Wildfowl Refuge 6-7.3.1993. *Imprint*, **20**: 11-12

(18) Hanson, A. (1993) Long term study of the agroforestry site at Leeds University farm near Tadcaster [fifth trap 23-25.10.1992; sixth trap 16-18.4.1993; seventh trap 9-11.7.1993]. *Imprint*, **20**: 12-23

(19) Hanson, A. (1994) Return to Ashberry Pastures - The Dennis Aspinall Memorial Trap 11-12.9.1993. *Imprint*, **21**: 12-13

(20) Hanson, A. (1994) Leeds University farm agroforestry project [eighth trap 15-17.10.1993; ninth trap 15-17.4.1994]. *Imprint*, **21**: 13-19

(21) Hanson, A. (1995) Chafer Wood: The Dennis Aspinall Memorial Trap 10-11.9.1994. *Imprint*, **22**: 9-12

(22) Hanson, A. (1995) Filey Dams: The Dennis Aspinall Memorial Trap 19-20.8.1995. *Imprint*, **22**: 13-18

(23) Hanson, A. (1995) Leeds University farm agroforestry project [tenth trap 7-9.9.1994; eleventh trap 21-23.4.1995]. *Imprint*, **22**: 19-24

(24) Hanson, A. (1996) Leeds University farm agroforestry project [twelfth trap 3-5.11.1995; thirteenth trap 19-21.4.1996]. *Imprint*, **23**: 9-17

(25) Hanson, A. (1997) Lindholme Island, Hatfield Moor - The Dennis Aspinall Memorial Trap 13-15.9.1996. *Imprint*, **24**: 8-15

(26) Hanson, A. (1997) The small mammals of a suburban park [West Bank Park, Acomb 4-5.10.1996]. *Imprint*, **24**: 15-16

(27) Hibbert, A. W. (1986) Small mammal records from Hopewell Farm in March 1986. *Imprint*, **7**: 14-15

(28) Oxford, G. (1992) The Denis Aspinall Memorial trap: Garbutt Wood 28-29.9.1991. *Imprint*, **18**: 5

(29) Oxford, G. (1993) The mice of Ashberry Pastures 12-13.9.1992. *Imprint*, **20**: 9-10

(30) Oxford, G. (1993) Foss Islands Reserve, York 17-18.10.1992. *Imprint*, **20**: 10-11

(31) Sharp, C. (1984) Hopewell House Farm, Knaresborough: A report on the Demonstration Farms Project 1980-1984. *Imprint*, **3**: 3-9

(32) Sharp, C. (1985) Field Studies Advisor's Report 1984: Hopewell House Farm. *Imprint*, **5**: 3-4

(33) Sharp, C. (1985) Blackwoods: A weighty problem. *Imprint*, **6**: 3-5

(34) Sharp, C. (1985) Water shrews at Filey. *Imprint*, **6**: 12-13

(35) Sharp, C. & Wilson, K. A. (1987) Small mammal use of a managed secondary succession. [Blackwoods, Wheldrake] *Imprint*, **9**: 4-9

(36) Thompson. M. J. A. (1987) Field Studies Report 1986 - Wharnecliff Wood, Sheffield 25-27.4.1986. *Imprint*, **8**: 6

(37) Thompson. M. J. A. (1987) Field Studies Report 1986 - High Batts Nature Reserve, Ripon 25.5.1986. *Imprint*, **8**: 6

(38) Thompson. M. J. A. (1987) Field Studies Report 1986 - Filey Dams 15.6.1986. *Imprint*, **8**: 7

(39) Thompson. M. J. A. (1987) Field Studies Report 1986 - Cropton Forest 10-12.10.1986. *Imprint*, **8**: 7-8
(40) Thompson. M. J. A. (1987) Field Studies Report 1986 - Skipwith Common 22-23.11.1986. *Imprint*, **8**: 8-9
(41) Thompson. M. J. A. (1988) Field Studies Report 1987 - High Batts, Ripon 10-12.7.1987 *Imprint*, **10**: 2
(42) Thompson. M. J. A. (1988) Field Studies Report 1987 - Rievaulx Abbey 25-26.7.1987. *Imprint*, **10**: 2-3
(43) Thompson. M. J. A. (1988) Field Studies Report 1987 - Filey Dams 9.8.1987. *Imprint*, **10**: 3
(44) Thompson. M. J. A. (1988) Field Studies Report 1987 - Hopewell House Farm, Knaresborough 18-20.9.1987. *Imprint*, **10**: 3
(45) Thompson. M. J. A. (1988) Field Studies Report 1987 - Willow Garth, Knottingley 17-18.10 1987. *Imprint*, **10**: 4
(46) Thompson. M. J. A. (1988) Field Studies Report 1987 - Poppleton Church Graveyard -.11.1987. *Imprint*, **10**: 4
(47) Thompson. M. J. A. (1988) Field Studies Report 1988 - High Batts Nature Reserve. 20-21.2.1988. *Imprint*, **11**: 14-15
(48) Thompson. M. J. A. (1988) Field Studies Report 1988 - Hopewell House Farm, Knaresborough 26-27.3.1988. *Imprint*, **11**: 15-16
(49) Thompson. M. J. A. (1988) Field Studies Report 1988 - Askham Bog YWT Nature Reserve 16.4.1988. *Imprint*, **11**: 16
(50) Thompson. M. J. A. (1989) Field Studies Report 1988 - Willow Garth, Knottingley 21-22.5.1988. *Imprint*, **12**: 11-12
(51) Thompson. M. J. A. (1989) Field Studies Report 1988 - High Batts, Ripon 30-31.7.1988. *Imprint*, **12**: 12
(52) Whitehead, J. (1990) Chafer Wood Trap 9-10.9. 1989. *Imprint*, **14**: 10-11
(53) Whitehead, J. (1993) Fieldwork Report 1992 - Trap at Filey Dams 22-23.8.1992. *Imprint*, **20**: 7-8
(54) Woodings, D. (1978) Small mammal trapping at Ellerburn bank nature reserve. Scarborough Field Naturalists' Society Annual Report for 1977: 75-77

Rat goes Nuts

John Drewett

With Bishop Dike at the bottom of the garden, I have both Water Voles and Brown Rats close at hand. The voles can sometimes be watched in the dike early and late in the day, but do not venture far afield. However, it is not that unusual for the occasional rat to wander around the garden.

Until the 1998/9 winter, this has been no more than a passing curiosity. Then, the ingenuity of what I assume to be one particular rat made it necessary to find another way of feeding the garden birds.

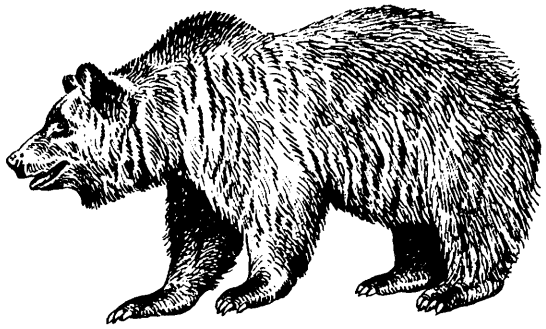
There is general agreement locally that Brown Rats have become more common in the Selby district over the past couple of years. This is assumed to be partly a result of the run of mild winters. They have certainly appeared more frequently in the garden, but have just as quickly returned to the dike.

Over the winter, a rat was appearing on an almost daily basis on the lawn during the day, at first for just a few minutes at a time. It soon discovered the fragments of peanuts dropped by birds feeding at the nut basket hanging from the fence and could be watched through the patio door cleaning up the scraps. However, within a few days it had perfected the technique of climbing the fence, then hanging upside down from the nut basket like a rather large blue tit. Disturbing it sent the animal scurrying back to the dike for a few minutes only to return again almost immediately.

As the neighbours had already expressed alarm at once seeing a rat in their garden, I decided action was needed when this particular animal took to spending most of the day either hanging from the feeder or sitting boldly on top of the fence in full view of their kitchen window! The only practical solution was to remove the nut basket and replace it with one attached to the window by suction. Climbing glass has obviously proved too much of a challenge and the rather plump rat was last seen miserably heading back to the dike.

Discovering Bieszczady

Phil Hemmings
Environment Agency



Brown bear
*(*Ursus arctos*)*

Following a number of years corresponding with Wojciech Smietana, who has spent the last twelve years studying wolves (*Canis lupus*), brown bear (*Ursus arctos*), lynx (*Lynx lynx*) and their prey in the Carpathian Mountains, I finally managed to find time to spend two weeks in his company and help in his research. I left England on 1 August and arrived at Krakow some three hours later. Following a night in Krakow we left early the next day for Bieszczady National Park (271km^2). The park is part of the International Biosphere Reserve 'East Carpathians' (1538km^2) set up in 1993 in the territories of Poland, Slovakia and Ukraine.

Wojciech has performed a number of studies on changes in wolf numbers, wolf diet and the influence of snow cover on wolf and red deer (*Cervus elephas*) relationships in the National Park. The park lends itself to research as all the mammals one would expect to see are there such as roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*), bison (*Bison bonasus*), elk (*Alces alces*), beaver (*Castor fiber*) and otter (*Lutra lutra*).

Accommodation was in the building used for ecological research and entailed a personal room with bunk bed and shared kitchen, toilet, shower and lounge facilities. Meals consisted of bread, cheese, sausage and jam for breakfast and supper, and soup, meat and vegetables and cake for lunch. A number of evenings were spent sitting beside a campfire cooking sausage

or goat helped down by copious quantities of Polish lager at 54p per half-litre (New Labour please note!).

Our first few mornings were spent walking along trails or through the forests of spruce (*Picea excelsa*) and beech (*Fagus silvatica*), looking for scats or footprints. This required a special permit as tourists were only allowed on certain signposted paths. Consequently, we rarely met other people apart from foresters or charcoal burners tending their ovens. The charcoal trade has recently assumed greater importance as the war in Yugoslavia has meant most of the western business has moved to Polish firms.

Many of the ridges were around 1000m (the highest top being 1346m) and with temperatures around 30°C this took some time to adjust to. However, we found a number of wolf tracks and bear scats on our first two days. Wojciech has amassed 800 scats during his study and he showed me how to treat our 'finds' back at his laboratory. First they were placed in his clay oven to dry for two days, then washed with water and detergent to eliminate parasites, sieved, dried again and finally we were left with hairs, bone, dew claws etc of the prey animal. Red deer and roe deer hairs were difficult to differentiate even under a microscope but if dew claws were present the task was made easier.

On the third day we set a snare with a radio collar for any passing wolves before our daily trek. Wojciech has developed a collar that allows it to self-attach with the help of some fishing line once a wolf passes through the snare. Bears break the line before getting attached and smaller animals can retreat without getting attached also.

The fourth day entailed waking up at 3.00hr to count deer numbers and assess ages, make-up of the herd, etc. By 8.00hr we found some bison tracks and decided to follow them into the forest. We stopped at regular intervals to howl, hoping for a response, but either the wolves were too far away to reply or near a den in which case response is rare. There are five packs in the Bieszczady mountains but no pack is fully contained within the National Park, and the average summer population is five to six per pack. Due to the high density of prey animals the average territory size is estimated at 85km^2. Their main prey is red deer (*circa* 75%), roe deer (15%) with wild boar (10%), although boar only make up this proportion in winter when they are easier to kill. Some sheep were killed the previous year but the Polish government has started a scheme whereby they pay for the purchase of Tatra mountain sheepdogs and their first year of feeding and vet bills and then they are given to local farmers. Wojciech trains the

dogs. We visited a local farmer who was delighted with his dog – the previous year he had lost 12 sheep to wolves but this year not one.

Day five was another early start but with the bonus of finding a beaver lodge with otter prints nearby. The location of the lodge was on the Ukraine side of the border but a bit of fence climbing solved this small problem! Fortunately the border patrols must have had a lie-in that day as none were encountered and we were soon safely back on the Polish side. That evening, we checked the snare again and Wjciech showed me a bear den in a hollow spruce trunk he had located the previous winter. The circumference was 4.5m and inside it was 2.5m high. We also found a lot of scats left by fox and pine marten that evening.

After a lovely supper of goat in red wine I was informed we were leaving at 23.00hr that evening to track a lynx that had a radio-collar attached. The Lynx left its den at 23.30hr and crossed the river coming in our direction. We parked our truck on a forest road and waited to see where it would go. By 1.00hr the signal was so loud it appeared as though the lynx was on top of the roof but even with a night scope we could not see it. After a few hours we drove up the road to get another bearing and the lynx could not have been more than 30m away from where we had been - so close yet so far!

Sunday was a welcome day off so why I went for a six hour walk I am not quite sure – although the stunning views might have had something to do with it. The next four days were spent in much the same way as the previous week – early starts, later starts – except that Wojciech trusted me enough to go solo one day as we could cover twice the area. We still howled without reply and found more tracks of bear and wolf as well as one bear scat that was still warm and contained many blueberries. Then on Friday morning at 4.00hr as we set off to count deer we turned the corner of the road about 50m from the centre and there was a lone wolf in the centre of the track. We watched it for three seconds before it loped off into the cover of the forest. It might not sound long but those three seconds finally allowed me to fulfil a dream of seeing a wolf in the wild and despite not being able to get my camera or video recorder out, the image will never leave me.

It was a tired person who reached the airport on the Sunday but hopefully I will be going back next year in the winter to snowtrack the wolves and other animals. Who knows – I may see more next time or even hear them howl!

Editor's note: At the time of writing Phil was based in York working for the Environment Agency mapping water vole distributions on some of Yorkshire's rivers.

Fur Coats are not Fun!

Gordon L. Woodroffe

As Professor Mark Williamson points out in his book *Biological Invasions* (1996), the tens rule is a useful yardstick to deduce the frequency of invasive species becoming pests. This rule suggests that roughly 10% of introduced invaders, living outside captivity in any sense, establish feral populations and, of these, 10% go on to become pests. So where do American mink (*Mustela vison*) fit in?

Mink were first imported to fur farms in the UK in 1929 and escapes were soon reported from many places in England and Scotland. The earliest confirmed reports of escaped mink breeding in the wild came from Lancashire in the late 1940s. However, it was not until 1957, in Devon, that breeding in the wild was officially confirmed. There were at least 110,000 wild mink estimated to be in Britain in 1995 (Harris, Morris, Wray & Yalden, 1995).

Much of the early research into feral mink was carried out at Exeter University where the emphasis was to find out if there was a serious overlap in the diets of mink and otter (*Lutra lutra*). This did not appear to be the case. Mink had a far more catholic diet compared to otters, which were largely fish specialists. Although it was recognised that mink might be harmful to some seabird populations they were not considered to be the threat some people were predicting.

In recent years, however, it has been shown quite conclusively that mink pose a serious threat to water voles and are capable of causing local extinctions. Radio-tracking studies of water voles in the North York Moors National Park, carried out in 1986-1990, showed that as mink colonised areas, water vole populations soon disappeared. More recently it has been shown that this pattern is repeatable, for example as mink colonised parts of

the River Thames water vole populations became extinct. The decline of the water vole across its range in Britain is now well established and the role feral American mink play in the process is now undisputed. Even in pristine habitats in Scotland the number of sites occupied by water voles in an area is strongly related to the level of mink predation. The co-existence of mink and water voles is also often cited but in some cases where this occurs, such as on the River Itchen, water vole populations are very high, there is good habitat and mink are controlled throughout the year.

The continuing decline of water vole is obviously a complex issue but mink are undoubtedly a major factor. Because mink populations are sustained by a wide variety of alternative prey, they have a devastating effect on water voles, and provide a particularly clear example of the role such generalist predators have in determining species' distributions.

Clive Craik of the Centre for Coastal and Marine Sciences has also observed that native colonial ground-nesting birds in north west Scotland are unable to breed successfully in the presence of this new predator (Craik 1999). Mink control has been necessary in an attempt to try to save some of these colonies. There is now evidence that mink have reached north Uist (Everett 1999) and potentially pose a serious threat to its seabird populations.

While American mink continue to prosper, the European mink (*Mustela lutreola*) is not doing nearly as well. Sidovorich, Kruuk & Macdonald (1999) have been studying the body sizes of European mink, polecat (*M. putorius*) and American mink in north-eastern Belarus over a 10 year period, at and after the arrival of American mink. On arrival, American mink males were larger than males of European mink and polecat, and American mink females were also larger than females of the other two species. However after colonisation, the mean body size of the American mink decreased, whilst that of the resident male and female European mink and female polecat increased. As the authors point out, the body size data suggest that European mink, and to a lesser extent polecat, are responding to direct aggression from American mink (rather than competing for resources), with the smaller European mink individuals more likely to disappear first. The authors gathered direct evidence for aggressive behaviour from observations made during radio-tracking. All inter-specific interactions were aggressive – significantly more so than intra-specific encounters. These aggressive acts caused the European mink to flee with several leaving the study area. If the American mink is causing the demise of the already endangered European mink, only selective and rigorous removal of the introduced species is likely to remedy this.

The American mink seems to provide a good example of the roughly one in a hundred introduced species that has not only established but has gone on to become a pest. Hardly good news for a wide number of indigenous species in the UK and elsewhere.

References

Craik, C. (1999) Mink and seabirds in west Scotland. *Mammal News* **119**:12

Everett, S. (199) Conservation news. *British Wildlife* 11 **1**:71

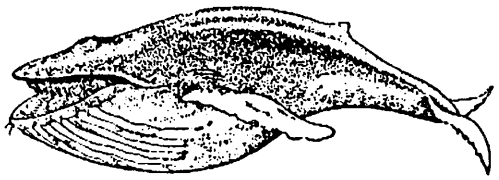
Harris, S., Morris, P., Wray, S. & Yalden, D. (1995) *A review of British mammals: population estimates and conservation status of British mammals other than cetaceans.* JNCC., Peterborough

Sidorovich, V., Kruuk, H. & Macdonald, D. W. (1999) Body size and interactions between European and American mink (*Mustela lutreola* and *M. vison*) in Eastern Europe. *Journal of Zoology* **248**: 521-527

Williamson, M. (1996) *Biological Invasions.* Chapman & Hall, London

Mammals of the Galapagos

Michael Thompson



Humpback whale (*Megaptera novaeangliae*)

Situated out in the Pacific Ocean, some 960km from mainland Ecuador to the east, are the volcanic islands of the Galapagos. The archipelago consists of thirteen large islands, of which the largest is Isabella, and as many as forty named islets. The total land area is about 8000km^2. Made up of entirely volcanic rock, the islands, of which 97% are now an Ecuadorian National Park and a World Heritage Site, support a unique flora and fauna. Many species are endemic to the area. Volcanic activity is still present and the islands are continuing to evolve, some disappearing and others forming; the last eruptions occurring in 1991.

The Galapagos islands sit on a tectonic plate which, according to geologists, is drifting eastwards towards the South American mainland at 7cm per year. I, along with several others, spent 14 days on a motorised schooner, the *Cachalote*, exploring the Galapagos in April, 1999.

Although the islands have a rich aquatic mammalian fauna, nurtured by the fish-carrying, cold Antarctic waters of the Humboldt current, there are only six species of land-based mammals. This sparsity is considered to be a result of the low probability of colonists making the crossing from the mainland on raft materials. The six species consist of two species of bat which arrived by flight, two species of rice rats which arrived by rafting and the sea lion and fur seal which swam there. There are no major mammalian predators on the islands, which, so it is thought, accounts for why the rest of the fauna, especially the birds, are so approachable. However, several alien mammal species, introduced by humans, especially mariners of former times, have done considerable damage to the endemic species.

Goats, introduced as a ready source of food for passing ships, have long since gone feral and have, over a considerable length of time, inflicted much damage to the local vegetation. The National Park's policy now is to eliminate the goat as soon as possible, and to date two or three of the main islands are goat-free. Vegetation on these islands is gradually recovering as are the animals that depend on it. On a hillside above one of our anchorages off Isabella, we could see armed Park wardens chasing after a small herd of goats in order to shoot them. The European black rat, *Rattus rattus,* arrived with shipping and is now well established, and responsible for the elimination in many areas of the rice rats. Other domestic mammals gone feral are pigs, cats, dog and burros, a donkey-like species, and are present on most of the islands. We heard, but did not see, burros on Santa Maria. The brown rat, *Rattus norvegicus,* arrived in the 1970s and is spreading rapidly, bringing with it all the problems we experience here in Britain.

Of the rice rats and bats, I saw none during the visit, although I was ashore early one evening at Puerto Ayora on Santa Cruz Island. I deliberately looked out for bats. However, at nearly every place we landed there were sea lions, often in good numbers. The Galapagos sea lion *Zalophus californianus wollebacki* is a subspecies of the Californian sea lion. The El Niño of 1997 greatly reduced the number of sea lions, but, according to our Ecuadorian guide, Mauricio, they were now recovering. The climatic changes of El Niño warmed the seas around the Galapagos and, by doing so, reduced the number of fish species available on which the sea lions depend for food. On my first day I saw a female hauled out on some

volcanic rocks suckling a youngster. Often groups of females would be basking in the sun on sandy beaches accompanied by a bull. Bulls could be dangerous on land, and we were encouraged to keep an eye on them. I learnt to snorkel and experienced swimming on the surface with sea lions all about me. It was a wonderful experience, never to be forgotten. These beautiful creatures are extremely agile in the water and the youngsters so playful.

The other sea lion to be found on the Galapagos is the fur seal *Arctocephalus galapagoensis*. They are not as numerous as the sea lion and are gradually recovering from generations of being hunted for their fur. They were called the fur seal, as this was a more acceptable name for the furriers, but in fact they are a true sea lion, using both their fore and hind flippers for propulsion on land. Smaller than the sea lion, the fur seal has a beautiful thick, brown pelage that insulates it from the cold water conditions. Hauled up on sheltered rocky shelves during the day, these mammals hunt squid by night. I was first shown and then approached one on the island of Santiago. It was a male with large, black, rather sad looking eyes. Subsequently, when circling Daphne Major island, our guide pointed out several others.

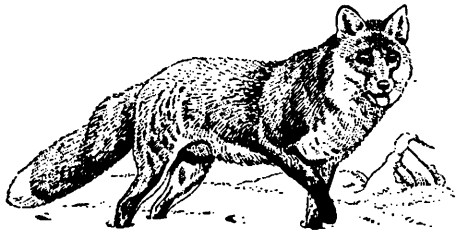
The only other mammals I saw on this extraordinary journey was a large school of bottle-nosed dolphins, *Tursiops truncatus*. One late afternoon, when travelling north just off the coast of Isabelle island, the schooner became surrounded by at least a hundred of these cetaceans. They stayed with the boat for at least half an hour, often racing ahead of the bows or jumping clean out of the water. What a display! Then, on the following evening, we caught up with two 30 tonne humpback whales, *Megaptera novaeangliae,* surfacing and revealing their dorsal fins. All afternoon, ahead of the boat, they had been blowing a water spray from their nostrils, indicating that they were around. Unfortunately, I was looking the other way, when one of them breached and came almost all out of the water. The excitement aboard was almost palpable!

So ended a most exciting and unusual journey, full of mammalian interest.

Notes on the Diets of Foxes (*Vulpes vulpes*) on Lindholme Moor, Doncaster

Colin Howes
Museum and Art Gallery, Doncaster

Introduction and site description



Red fox (*Vulpes vulpes*)

The Lindholme Moor area (SE/7006) represents the central core of Hatfield Moor SSSI and forms a key floral and faunal refugium of peatland and heathland habitat within the Humber-head Levels region. The dominant vegetation of dense birch (*Betula pendula*) scrub, heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), the two cotton grasses (*Eriophorum angustifolium* and *E. vaginatum*) and a population of native Scots pine (*Pinus sylvestris*), is surrounded (horizon to horizon) by a vast region of what was lowland mire but is now substantially de-vegetated 'peat-fields', drained and 'open cast' for horticultural peat.

The uncut peatland element of Lindholme is under the ownership of the Lyon family of Lindholme Hall and Lindholme Grange who are enthusiastically concerned with maintaining this unique historic landscape and ecological refugium. Some years ago the late Jack Lyon entered into a Section 39 conservation management agreement (Wildlife & Countryside Act 1981) with the Local Authority. It is under this agreement that the recording, monitoring and conservation management work proceeds.

Although now perched above the level of the surrounding commercial 'peat fields', current conservation management is attempting to keep Lindholme Moor as wet as possible to facilitate the survival of the unique communities of mire and wet heath invertebrates. In the longer term these organisms will potentially be able to re-colonise surrounding peat workings when they are

worked out, re-flooded and handed over by the commercial operator to English Nature.

In addition to the areas of waterlogged peat, a large proportion of Lindholme is in effect a glacial moraine which rises slightly above the peat and contributes a sandy heathland element to the site. Drier areas, particularly adjacent to cultivated fields, support numerous rabbit warrens and the uncut heath grassland is populated by large numbers of field voles (*Microtus agrestis*).

Fox diet study: methods

The frequency of tracks, droppings, earths and sightings of foxes on the Lindholme area of Hatfield Moor suggested that they were likely to play a significant role in the vertebrate predator-prey relationships on this peatland and on the adjacent areas of arable and acid grassland.

With a view to investigating the food ecology of the local fox population and to learn something of the small mammals occurring on this specialist habitat some 30 batches of fox droppings were collected during visits on the 1, 3 and 5 April, 1992.

The droppings were soaked and dismantled individually and any identifiable contents were listed. The following table quantifies the numbers of droppings (diets) and the % of the batch of 30 droppings in which particular prey items were identified.

Although always interesting and full of the unexpected, fox diet studies are beset by problems. Foxes damage their prey by chewing; large prey items may be eaten over a number of days, the remains appearing in a succession of different droppings; gluts of prey are sometimes 'cashed' and consumed later (even out of season); and fragments of incomplete prey can be scavenged. Also, compared with owls which produce pristine skeletal remains in their pellets, the digestive process in foxes is relatively aggressive and is far more complete. Only the more robust bone fragments survive and one is reliant on the painstaking process of microscopically identifying hair fibres and feather fragments.

The consequence of all this is that the following table does not represent the number of prey items taken but the number of droppings in which the various prey types were identifiable. Also, the percentages do not reflect the relative amounts of each prey taken but merely represent the proportion of the 30 droppings containing identifiable evidence.

Results and discussion (see Table 1)

Lagomorphs: Although both brown hare (*Lepus europaeus*) and rabbit (*Oryctolagus cuniculus*) are present on and around the study area, rabbits are more likely to be represented in the diet since the sandy moraine adjacent to the peat moor contained numerous well populated warrens. The remains of rabbit kills are regularly encountered and in snowy conditions tracks show that foxes routinely patrol the warrens and rabbit-frequented areas.

Table 1. Prey identified in 30 fox droppings collected on Lindholme Moor in April 1992.

Prey type	No. of droppings (diets)
Lagomorph	29 (96.6%)
Galliform	9 (30%)
Columbidae	5 (16.5%)
Hen's egg	3 (10%)
Wheat grains	3 (10%)
Small rodent	1 (3.3%)
Burying beetle	1 (3.3%)
Silver paper	1 (3.3%)

Small rodent: This was identified from a single incisor. Too small for water vole (*Arvicola terrestris*) and brown rat (*Rattus norvegicus*), it was probably from a field vole (*Microtus agrestis*) or wood mouse (*Apodemus sylvaticus*) both of which are commonly taken by local long-eared owls (*Asio otus*). Curiously a 200 trap night small mammal survey carried out from the 13 to 15 September, 1996, at the end of at least five years of drought, revealed a considerable population of wood mice but failed to detect any other species (Hanson, 1997).

Hen's egg: These fragments of thin, brittle shell, still attached to the underlying membrane, were identified on the basis of their unpatterned creamy white colour, their thickness and chalky texture. A duck or even a pheasant egg shell would probably have been thicker and with a smoother, more waxy texture.

Galliforms: Since Hatfield Moor was managed as a pheasant shoot during the early 1990s it is likely that some of these birds were pheasants (*Phasianus colchicus*), possibly unretrieved from the large areas of very dense birch scrub after a shoot. According to feather remains, at least one bird was certainly a pheasant. Five droppings containing white feathers consistent with them being from domestic (battery-type) chickens (*Gallus domesticus*). A likely source were the mounds of broiler house debris routinely dumped at the perimeter of the Lindholme Prison farm on the western edge of Hatfield Moors.

Columbiforms: During the winter months the tall birches on the edge of the moraine are used as a roosting site by wood pigeons (*Columba palumbus*) which fly in from arable land on the adjacent Hatfield Chase. Although completely safe from fox predation, these high roosts were regularly shot for purposes of crop protection. It is likely that foxes were scavenging on unretrieved corpses after pigeon shoots.

Wheat grains: Batches of wheat grains were probably undigested food from the crops of unretrieved shot game birds.

Burying beetle: The remains of *Nicrophorus vespillo*, one of the sexton beetles, indicated that at least some vertebrate items were either scavenged or retrieved from food caches.

Contrary to initial expectations, it seemed that according to this small sample of diets, the fox population inhabiting this lowland mire site had no significant dietary interest in the mire ecology. Judging from the frequency and bulk of rabbit remains, foxes seemed to be surviving largely on the productivity of the rabbit warrens on the dryer sandy areas on the southern edge of Lindholme Moor. The products of the local pheasant and pigeon shoot were clearly of seasonal importance and the fox population itself is periodically reduced (by shooting) by the game rearing interests. There was also evidence of scavenging, probably on broiler house waste dumped on adjacent arable land.

The use of food resources associated with the arable agricultural industry and game shoots closely parallels fox diet studies on Thorne Moors National Nature Reserve and SSSI (SE/71). Though in contrast to Lindholme (much drier in 1992 than at present) foxes on Thorne Moors exploited wetland vertebrates such as Black-headed Gulls (*Larus ridibundus*), coot (*Fulica atra*), duck (Anatidae), and water voles (*Arvicola terrestris*) (Howes, 1979 and in prep.).

References

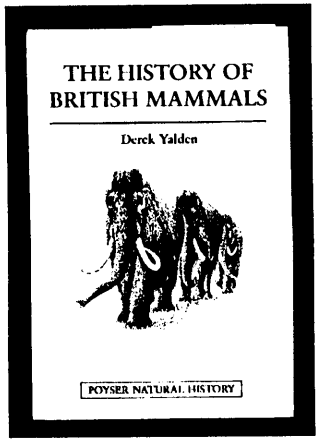
Hanson, A. (1997) Lindholme Island, Hatfield Moor - The Dennis Aspinall Memorial Trap 13-15.9.1996. *Imprint*, **24**: 8-15

Howes, C. A. (1979) A review of the food and mortality of water voles in Yorkshire. *Naturalist*, 104: 71-74

Howes, C. A. (in prep.) A study the seasonal diets of foxes (*Vulpes vulpes*) on Thorne Moors National Nature Reserve.

Book Review

Geoff Oxford



The History of British Mammals. Derek Yalden. Poyser Natural History, London. 1999. Pp.305. Price £29.95, hardback. ISBN 0 85661 110 7.

This is truly a scholarly tome that will surely act as the baseline for work on the history of British mammals for many years to come. To have written such a book requires in an author a deep knowledge of very disparate academic fields including palaeontology, archaeology, history and biogeography among others. Increasingly, books covering multi-diciplinary areas are either edited works with chapters by narrowly focused experts or books jointly written by a veritable team of people. The days when one person can do the job single-handed are numbered and, in my view, this is a sad reflection of the blinkered, tunnel vision encouraged by modern career structures and funding strategies in research institutes the world over. However, let us rejoice that we live in a world in which there are still a few 'real' academics like Derek Yalden left.

This book has its (published) origin rooted in a *Mammal Review* article from 1982 (**12**: 1-57), updated with a chapter in the third edition of the *Handbook of British Mammals* (Corbet & Harris, 1991). The volume comprises nine chapters (plus a brief Introduction), the first five of which

follow the history of these islands and their changing mammalian faunas in chronological order. Most of the book concentrates on the last 15,000 years, the period most relevant to an understanding of how our present mammal assemblage came to be, but deeper palaeontology gets a brief mention. The last four chapters consider, respectively, the effects of hunting on the demise of certain species, the impact of introductions ('Restoring the Balance'), the history and origins of island races and an analysis of the expansions and contractions of ranges of species in the twentieth century. Throughout the book, data are thoroughly and critically analysed and some long-standing sacred cows put to rest. For example, received wisdom had the land bridge between England and France breached as late as 5000 b.p. whereas Yalden argues, with evidence, that Britain was almost certainly an island by 7000 b.p. This has important implications for the composition of the British fauna during a period when mammals were spreading northwards again after the glacial retreat.

The sheer amount of information packed into what is a relatively slim book is astonishing. Indeed, there were times when I thought the wealth of detail distracted from the general message. For example, in several places there are long tables showing every record of occurrence for a particular species from earliest times; these could well have been consigned to an appendix. The text is illustrated by superb pencil drawings by Priscilla Barrett while others are by the author. The quality of the latter range from excellent to awful. Some of the maps look rather homespun (e.g. p.86) and (unlabelled) lines of latitude on others seem to be included for the sole purpose of giving the illustrated mammals something to balance on (e.g. p.224). But these are really very minor niggles for this is a wonderful, authoritative and fascinating book that should appeal to a very wide audience.

Editor's note: A shorter version of this review first appeared in *Mammal News* No. 118, p.15 (1999).

Yorkshire Mammal Group Programme, 2000

January 6th. ***The Ecology of Roe Deer in Yorkshire.*** Alister Ward (Environment Department, University of York).

February 3rd. ***Small Mammal Movement across a Golf Course.*** Alex Lewis (Environment Department, University of York).

March 2nd. ***A Practical Evening*** – Learn how to analyse the contents of owl pellets and discarded bottle/cans.

April 6th. ***The Tale of the Spanish Rabbit.*** Deborah Petterson (School of Biology, University of Leeds)

May 4th. ***Stoats and Weasels - Two UK Predators.*** Wayne Green (Wildbreaks Centre, Devon).

June 1st. ***Evening Field Trip*** (details to follow). During the summer months there will be other field study events, including those by the North Yorkshire Bat Group.

October 5th. ***Water Vole Status and Distribution in West Yorkshire.*** Wendy Adams (University of East London).

November 9th. ***The Return of Dormice to Cheshire.*** Sue Tatman (Cheshire Wildlife Trust).

December 7th. AGM. followed by ***Seal Monitoring Around the World.*** Jean Banwell (YMG)

Indoor meetings are held in the Common Room of the Department of Biology, University of York and start at 7.30pm. All are welcome.

For further details contact: Denise Ray on 01759 371167

Yorkshire Mammal Group Committee Members, 2000

CHAIR
Ann Hanson
'Red Loam', Occupation Lane
Bramham Crossroads, Nr. Tadcaster
W. Yorks. LS24 9NW
Tel: (01132) 811286

SECRETARY
Denise Ray
Barn House, North Farm
Scoreby, York YO4 1NP
Tel: (01759) 371167

TREASURER
Robert Masheder
'Red Loam', Occupation Lane
Bramham Crossroads, Nr. Tadcaster
W. Yorks. LS24 9NW
Tel: (01132) 811286

FIELD STUDIES OFFICER
Post to be filled.

PUBLICITY OFFICER
Cara Morgan
Department of Biology, University of York,
York YO10 5YW
Tel: (01904) 434383 (daytime)

IMPRINT EDITOR
Geoff Oxford
519 Huntington Road
Huntington, York YO32 9PY
Tel: (01904) 760422

MAMMAL RECORDER
Michael Thompson
'Burwood', Railway Street
Slingsby, N. Yorks. YO6 7AN
Tel: (01653) 628620

COMMITTEE MEMBERS

John Drewett (Bat Group representative)
64 Pinfold Garth, Sherburn-in-Elmet
Leeds, LS25 6LE
Tel: (01977) 681898

Roma Oxford
519 Huntington Road
Huntington, York YO32 9PY
Tel: (01904) 760422
