PROTECTING OUR NATIVE ANIMALS AND THEIR HABITATS

Mammals Trust UK

The State of Britain's Mammals 2004

The Third of the Annual Updates following the publication of *Britain's Mammals: The Challenge for Conservation* for the launch of Mammals Trust UK in 2001.

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WILD CRU
WILDLIFE CONSERVATION RESEARCH UNIT

Summary

1. Once again, we highlight problems facing what are arguably Britain's two most threatened mammals: the water vole and the red squirrel. With a combination of mink control and habitat management (for example under the National Key Sites project), there may yet be hope for the water vole, but the red squirrel's precarious situation continues to worsen, and its eventual extinction in mainland England, Wales and southern Scotland seems inevitable.
   - Invading grey squirrels, and associated outbreaks of parapoxvirus, seriously threaten Merseyside's red squirrels, one of the largest populations left in England. Over the past decade greys have also spread through Cumbria, threatening unique red squirrel populations there.
   - A new analysis suggests that mink predation has simply hastened the 'tail-end' of a centuries-long decline in water vole populations resulting from competition with livestock.
2. This year we focus on two very different BAP species: the otter and the pipistrelle bats. A third species, the Scottish wildcat, is probably on the brink of extinction in the UK, yet is not a priority for the UK BAP process; its BAP status should be upgraded urgently.
   - **Otters**: Many organisations have worked hard, and largely successfully, to restore British otter populations. The Fourth National Otter Survey for England (2000-2002) found signs of otters at 34% of 3327 sites surveyed, a five-fold increase since the first survey in 1977-1979. 18 of 20 actions in the otter SAP have been enacted.
   - **Pipistrelle bats**: Habitat degradation, particularly intensive agriculture, is the main threat facing the pipistrelle bats. Thanks to extensive research, the ongoing National Bat Monitoring Programme, and publication of accessible literature, the species' needs and status are relatively well known. All 12 actions in the SAP have been enacted.
   - **Scottish wildcats**: Critically endangered, having interbred extensively with feral domestic cats, the Scottish Wildcat's legal protection is jeopardised by uncertainty over their definition and identification. Diagnostic features need to be clarified. A Code of Practice for Wildcat Conservation should urgently be devised and promoted to all stake-holders if Scottish populations are to be restored. This should involve selective removal of domestic cat genes, and staunching their flow into wild-living populations, and may involve a zoned approach to identify and prioritise Special Areas of Wildcat Conservation.
3. The Tracking Mammals Partnership, a joint initiative by some 23 organisations, has a full-time co-ordinator for a programme that ranges from established monitoring schemes that have collected data for many years, to pilot schemes testing methods and assessing results.
   - A new atlas and comprehensive status review highlights the importance of UK waters for whales and dolphins. Cetaceans represent a particular challenge for monitoring, and Small Cetaceans in the European Atlantic and North Sea (SCANS-II), a repeat of the major international survey conducted in 1994 (SCANS-I), is planned for 2005 to estimate the abundance of small cetaceans in shelf waters of the Atlantic margin, the North Sea and adjacent waters.
4. Managing mammals will never be without welfare costs, and measuring these costs has always been difficult. Advances in molecular biology offer great scope for improving the measurement of welfare, and in reducing the welfare impacts of some management techniques. Wild animal welfare has frequently been in the news over the past year, with three issues in particular making headlines:
   - The Hunting Bill set to prevent hunting with dogs, was rejected by the Lords, and then ran out of parliamentary time. For now hunting with dogs continues to be legal in England and Wales.
   - Badger culling was suspended when preliminary analysis of results from the 'Krebs' trial showed a 27% increase in the number of cases of bovine TB occurring in reactive culling areas, compared to the related survey-only areas where no badger culling took place.
   - The Uist's introduced hedgehogs, which threaten internationally important populations of breeding waders, have also generated controversy. In 2003, Scottish Natural Heritage culled 66 out of an estimated 90 hedgehogs on North Uist, and plan to continue culling in 2004, despite widespread calls for trial relocations to the mainland.
5. Agri-environment schemes could aid mammal conservation over large areas, but there is a lack of robust studies evaluating their effectiveness for biodiversity. Long-awaited reform of the Common Agricultural Policy, linking subsidies to compliance with specific environmental standards, also holds promise of improving farmland habitat for the many mammals that live there.
   - A project to restore water voles to West Sussex, partly through managing farmland under the Countryside Stewardship Scheme, has demonstrated the potential of sustainable farming practices to benefit biodiversity on a landscape scale.
6. MTUK continues to develop and expand its activities. Three years after its launch, we are beginning to see the results of MTUK funded research making a direct practical contribution to mammal conservation in the UK. Increasingly successful fundraising activities have meant that we have been able to support even more work during the last year. However, there has been a parallel increase in the number of excellent applications to the fund. This has presented the Advisory Group with some difficult decisions to make. All recent MTUK funded projects are listed on page 18.

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Preface

THE NATURAL WORLD is in continual flux, and conservationists have always faced a moving target. In recent years, however, the task of managing change has grown to a gargantuan challenge. Global climate change, international policy instruments and a rampant extinction crisis are all set in the framework of a more consumptive, growing human population, and ever-more demanding political processes. Yet, and in a way that is both enthralling and daunting, the grand and sometimes incomprehensible forces abut against the tiny detail of adaptation within the intricacy of ecological processes. Thus, amongst British mammals, in these pages we report on the impacts of agro-economic forces on the foraging flights of bats, and the habitats of water voles; in the context of invasive species – by definition a man-made phenomenon – we highlight how the still unknown mechanisms underlying liaisons between feral cats and the descendants of their wild ancestors threaten to genetically dilute the Scottish wildcat into oblivion, and how the intra-guild animosities between otters and invasive American mink may be disadvantaging the latter to the benefit of the benighted water vole. Big forces operate through small changes to bequeath large, often unexpected and unwelcome, consequences. This is the bigger picture of which the conservation of British mammals is a part, and to which this year Mammals Trust UK has grown in importance.

Globally, there is no longer serious dissent from two once-contested views. Climate change and massive biodiversity loss are upon us, and both present change that must be managed. 2004 saw the publication in *Nature* of an analysis suggesting that 15–37% of a sample of 1,103 land plants and animals would eventually become extinct as a result of climate changes expected by 2050[a]. These are not distant threats – we report here on data suggesting that through a chain operating through rainfall and frost to earthworms and their predators, climate change is affecting badger numbers in lowland England – so far (although this may be changing) it has benefited them, but that may have had consequences for agricultural livelihoods; we report also on troubling developments in attempts to solve the bovine tuberculosis problem. These, too, shout the message that tackling big problems can require understanding small details – in this case, how the attempts to control the transmission of bTB affect (perhaps perversely) the intricacies of badger behaviour. Indeed, tuberculosis being a stress-related disease, and the survivors of control programmes arguably being candidates for stress, also reminds us that the science of animal welfare is an important topic for consideration in terms of both the subjects and the practices of conservation biology, and we report on developments in that arena too.

There are welcome signs that policy thinkers have realised the scale of the biodiversity challenge, and its relevance to every citizen. English Nature launched their *State of Nature Report on English Lowlands*. Similar messages were shared with Defra's two 2002 reports entitled, respectively, *Working with the grain of nature - A biodiversity strategy for England*, and *Directing the flow – priorities for future water flow*. Also relevant to British mammals is the Biodiversity Research Advisory Group initiative focusing on invasive species, also covered by Defra's *Review of Non-native Species Policy*. What general lessons can be gleaned from these initiatives? First, there is a widespread realisation that conservation needs to shift in scale, not abandoning its earlier site-based preoccupations, but adding to them understanding and actions at a landscape scale. This must stimulate a new sort of conservation science to provide the necessary underpinning knowledge (we report on one such project on the Chichester Plain). Second, conservation cannot escape the need to be integrated with wider societal needs and, to hold its place in the priority list, must engage the wider public. We report here on cetacean numbers, and it is noteworthy that levels of cetacean bycatch are one of the Government's indicators of the health of the Coasts and Seas. In terms of public investment, it is heartening that over the past two years, English Nature's Wildspace! grant scheme has awarded nearly £7 million of National Lottery money, while in terms of public engagement many schemes harness volunteer effort to survey mammal numbers. Less happily, we see little evidence of biodiversity as an important factor driving planning decisions, and this, as one of the priorities we nominated in our 2001 report, remains an unfulfilled priority.

Generations of schoolchildren have won and lost money betting on the length of the Headmaster's speech day address, as have politicians on the timing of the Chancellor's budget speech. Since this is now the fourth such Preface we have drafted, those who have read its predecessors might lay bets on how far through it we would get before lamenting, yet again, the absence of a national mammal monitoring network in the UK. Without such a national scheme it remains impossible to judge the urgency of various problems (whether pest or asset) or the effectiveness of their remedies. It may be tedious to mention it again, but despite the worthy efforts of the Tracking Mammals Partnership, and a landmark report on cetaceans (both reported here), the fact remains that there is still a long way to go, before there is a fully functional national mammal monitoring network in the UK, covering all species and providing the sort of quality information we have come to expect from the bird world. As the aforementioned Headmaster might wearily say to Government – could do better!

David Macdonald and Fran Tattersall

Acknowledgements

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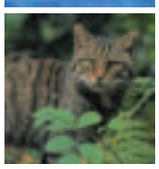


BAP Species Update: Water Voles and Red Squirrels

IN PREVIOUS YEARS, we have highlighted the problems faced by what are arguably Britain's two most threatened mammals, the water vole and the red squirrel. Once widespread, the water vole is now absent from much of its former range in many English and Welsh waterways, thanks to predation from introduced American mink, combined with habitat fragmentation and destruction. Strenuous efforts are underway to halt the species' decline, with numerous projects around the UK. In 2001 we reported on two such projects, The National Key Sites project, and the Chichester Plain Project; these are updated on page 5 and on page 16. It seems that with a combination of mink control and habitat management, there may yet be hope for the water vole – but both strategies need careful scientific underpinning.

In bleak contrast, the red squirrel's already precarious situation continues to worsen, and without large-scale grey squirrel control and/or the development of a means of vaccination against squirrel parapoxvirus (SPPV)[1] their eventual extinction in mainland England, Wales and southern Scotland seems inevitable. Particularly disturbing is the fact that their Merseyside and Cumbrian strongholds are seriously threatened. Also, in northern England, a recent report[2] highlights the potential vulnerability of the important red squirrel population in Kielder Forest to incursions by greys. As a result, Forest Enterprise has agreed to manage the whole of the main block of Kielder Forest, as well as Kidland and Usway Forests, for red squirrels.

'Priority' woodland sites for management to benefit red squirrel conservation in north and central Scotland have been identified and ranked[8]. Criteria used to identify the 127 sites included grey squirrel absence, area, tree species composition, surrounding woodland cover, defensibility from grey invasion, and landowner support. Woodland to the north of the Central Belt offers better opportunities for red squirrel conservation than more southerly woodlands, which are under severe threat from encroaching greys. Monitoring and control of grey squirrels need to focus on the Dee and Don valleys in particular.

Erratum: In our 2003 report we wrote that there had been no action to create 2000ha of conifer reserves in Wales. In fact, Forest Enterprise designated the whole of Clocaenog Forest in North Wales as a red squirrel reserve in 1997, an area of 6400ha.

Northern England's Threatened Red Squirrels

An invasion of grey squirrels and associated outbreaks of parapoxvirus seriously threaten the Merseyside red squirrel population, one of the largest remaining in England. Although there are no long-term standardised monitoring data from this area, there are worrying indicators. Standardised visual surveys, (19 1km transects walked three times), carried out throughout Merseyside by volunteers for Lancashire Wildlife Trust in the autumn and spring 2002 and 2003, showed declines on all transects in both seasons. These were not statistically significant, but sample sizes were small. In 2002 there were 76, and in 2003, 342 verified sightings of grey squirrels, mainly from Ormskirk, Aughton, Formby and Southport. Outbreaks of parapoxvirus in 1995 in the Rufford and Ormskirk areas of West Lancashire wiped out the local red squirrel populations. In February 2003 three red squirrels close to the strong coastal red squirrel population were confirmed to have contracted parapoxvirus; a further six were confirmed in November 2003.

In Cumbria, too, greys have spread through the region over the past decade. This is particularly serious because the population has a unique genotype. Most red squirrels in Britain possess colour characteristics associated with continental European subspecies[3], and have a recent continental (often Scandinavian) European ancestry[4]. Only populations in Cumbria showed coat characteristics of the original description of *Sciurus vulgaris leucourus*, although some of these have become more like the European sub-species since 1980, when changes in the wooded landscape connected populations from the north-east of England and the Borders with those in Cumbria. European red squirrels have been widely released into Britain during the last 150 years. The rapid spread of the Scandinavian haplotype since 1966 suggests that these squirrels may have an adaptive advantage in the non-native spruce dominated conifer plantations of northern England.

The Merseyside red squirrel population is seriously threatened by invading greys. This map shows 1km squares in which grey squirrels were reported in 2002/3. Grey dots indicate grey squirrel sightings: large dots = 10+ squirrels; medium dots = 4 –10; small dots = 1- 3. Red area indicates current red squirrel distribution. Source: Lancashire Wildlife Trust.

For references please see notes on page 19.

Key Sites for Water Voles

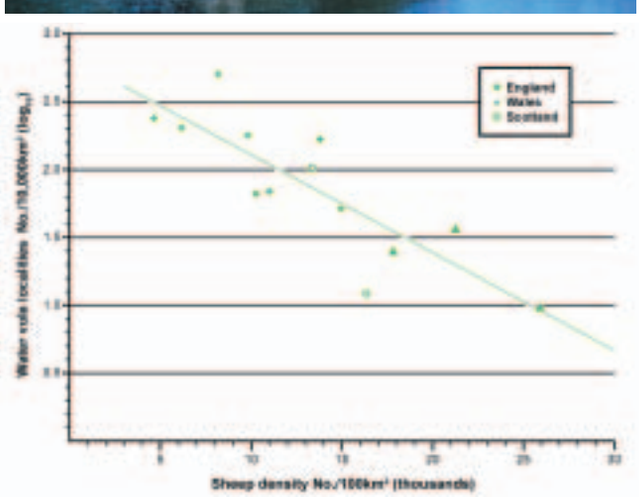
Researchers at Royal Holloway, University of London, radio-tracked 70 water voles at three reedbed sites, and monitored overwinter mortality[5]. Although 64% of voles died over winter, predation rates in the dense reedbed centres were considerably lower than in main water channels, where predatory American mink were most active. Reedbeds provide some protection from mink, creating a refuge for water voles, from which they may be able to colonise surrounding areas and help maintain nearby populations. A recent study by a Scottish research team has elegantly demonstrated that, by spring, one fifth of female and a third of male water voles have left their natal population, dispersing an average of 1.8 km (but as much as 5.2 km) between populations[6].

Fourteen reedbed and extensive grazing marsh sites (which may also offer protection), have now become National Key Sites (NKS) for water voles, and more are planned. The NKS concept focuses conservation effort on specific refuge sites. Site owners have agreed to habitat management that favours water voles, and banks have been created in reedbeds. Sites are monitored twice yearly, using trained volunteers, and early indications are that numbers have increased. Although nearly three

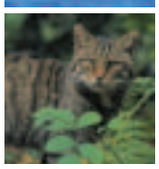
quarters of sites around NKSs lack good quality habitat for water voles, there is great scope for habitat restoration. The project continues with the goal of achieving some recovery in this wider landscape, termed National Key Areas, within three years. Future work will also assess the long-term value of grazing marshes and reedbeds as refuges from mink in the absence of control.

Water Vole Survey Update

A comprehensive analysis[7] of the results of the two National Water Vole Surveys in 1989-1990 and 1996-1998, together with historical data, has arrived at some startling new conclusions. Competition with livestock, particularly sheep, since Iron Age times had caused the loss of over 99% of the water vole population by 1900 and the extinction of the fossorial form from mainland Britain. Large changes in sheep numbers and distribution in the 1930s to 1950s caused marked declines in the water vole populations of upland northern and western areas, resulting in a predominantly south-eastern distribution by the late 20th century. The species' once-continuous distribution is now broken into discrete patches; in between are large areas devoid of voles including southern Wales, south-west and north-west England, the Lowlands of Scotland, parts of Sussex and the East Midlands. The 'tail-end' of the vole's decline has been hastened by predation from American mink. Mink, particularly breeding females, appear to target water vole colonies, moving on once their prey can no longer sustain them. However, water voles may be altering their behaviour by spending less time in their burrows, where they are vulnerable to predation by female mink.



There is a highly significant correlation ($p<0.001$) between sheep density in 1938 and the log of the density of occupied water vole localities recorded in the literature from 1900 to 1985 in 13 regions of Britain. Source: Jefferies, 2003.



BAP Species: Otter

NEARLY HALF A CENTURY after their precipitous decline otters have returned to many parts of the UK. Sea loch and coastal colonies in Scotland, always a stronghold, comprise one of the largest populations in Europe. Although many organochlorine pesticides have now been banned, pollution remains a potential threat, both directly and indirectly. Poor quality water and in-stream habitat can result in insufficient prey, while in many areas impoverished river banks provide inadequate shelter for resting and breeding. Other threats are road deaths and drowning in eel traps.

The otter is one of the most popular and charismatic of British mammals, so it is perhaps not surprising that many organisations have worked hard – and largely successfully – to reverse the decline in its fortunes. Actions include:

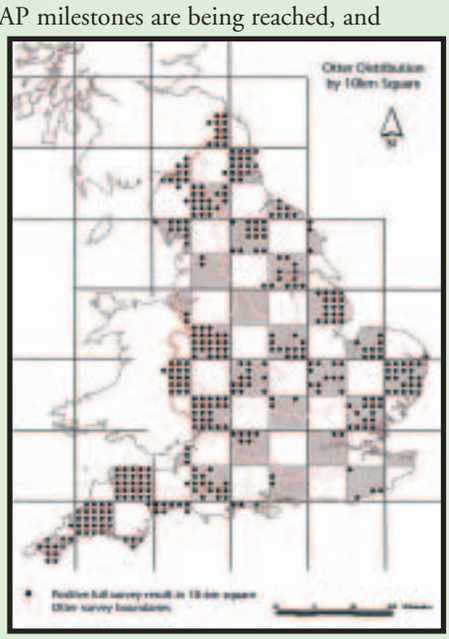
- Four national surveys conducted since 1977, substantially complemented by local surveys by Wildlife Trusts and other organisations.
- Research on the implications of pollutant contamination in fish and ecosystems, particularly heavy metals, organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs).
- Practical conservation such as creating log piles or artificial holts, with advice from Wildlife Trusts and the Environment Agency, and an agri-environment scheme aimed at improving riverine habitat.
- A programme of otter post-mortem and tissue analysis undertaken by the Environment Agency with support from the Wildlife Trusts and others.
- Research into the impacts of roadkill on otters, and the production of best practice advice, and implementation of mitigation schemes for both existing roads and new road projects.
- Promotion and expansion of otter-sensitive woodland management by the Forestry Commission and Forest Enterprise, through preparation and implementation of their Forest and Water Guidelines.
- Improvements in water quality as a result of water company investment[9].
- Some 22 candidate Special Areas of Conservation (six in Wales, 12 in Scotland, one in Northern Ireland, three in England) in which the otter is a primary feature for site selection; otters occur at a further 50 cSACs.

The Species Action Plan aims to maintain and expand existing otter populations, and by 2010, restore breeding otters to all catchments and coastal areas where they have been recorded since 1960. Additional actions, not in the SAP, that could usefully be considered as otters become increasingly abundant and widespread, include working with fisheries organisations to develop otter-proof fencing, refuge areas for fish and river restoration techniques that encompass all species rather than focusing on improving fishing.

The Fourth National Otter Survey for England (2000-2002)

The Fourth National Otter Survey for England (2000-2002)[10] found signs of otters at 34% of 3327 sites surveyed, a five-fold increase in the otter's distribution since the first survey in 1977-1979, when just 5.8% of 2940 sites had otter signs. Each of the 12 survey regions and catchments in England showed an increase, and the leading edge of the recovering population continues to expand. The largest increase in positive signs since the 1991-1994 survey was in the Trent River network, where 24.4% of sites showed evidence of otters, compared with 5% nine years previously. The Thames and Anglian Regions have particularly benefited from the reintroduction of otters into local rivers, while the Trent Catchment's substantial rise (222%) has been due almost entirely to natural recolonisation.

The survey report's author considers even the present level of monitoring to be insufficient to determine whether the SAP milestones are being reached, and recommends full coverage in the next (2007-2009) survey, rather than alternating 50 km squares. Surveys have also been completed for Wales and Northern Ireland, and reports are due this year. In Scotland a survey will be completed in 2005.

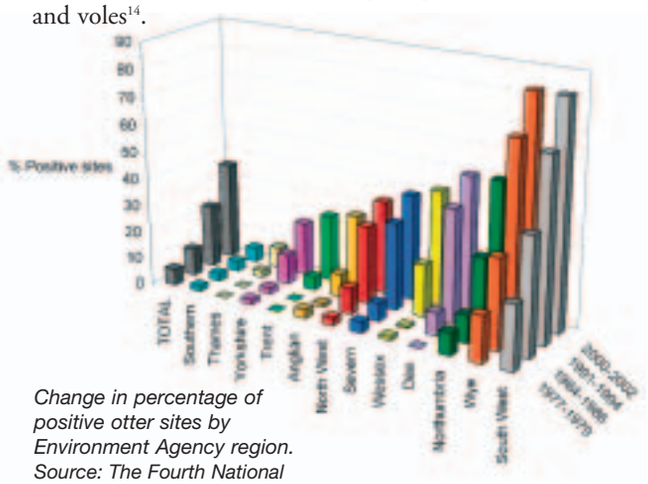


2002-2004 distribution of otters in England by 10 km square. Source: The Fourth Otter Survey for England.

Competition Between Otters and Mink

Some 65% of the American mink population in Britain was lost between 1989-90 and 1996-98[11]. Inter-specific competition between mink and otters – both semi-aquatic mustelids – may explain the decline. A series of field experiments has demonstrated that, as otter densities increase, mink populations decline and change their behaviour. In a 1353 km^2 area in England, the arrival of otters was associated with a significant and rapid reduction in mink density[12].However, over the same time period, mink occupancy remained stable in a similar, otter-free, area of 2464 km^2. Otters also have an effect on the foraging behaviour of mink and hence their diet. In the absence of otters, mink favour a relatively high proportion of aquatic prey. As the density of otters increases, mink are forced to shift their diet towards terrestrial prey[13], but where such prey are scarce, mink enter into direct conflict with the otter, often abandoning the area or being killed.

However, otter and mink can coexist for longer in habitats where mink can find alternative prey, particularly rabbits and voles[14].



Change in percentage of positive otter sites by Environment Agency region. Source: The Fourth National Otter Survey for England.

The Otter SAP

ELEMENTS OF the actions will be ongoing indefinitely, but have been completed in the sense that an effective mechanism for action is in place, and the action is up-to-date.

ACTION	Planned	Ongoing	Completed
Seek to secure agreement on JNCC's UK Framework for Otter Conservation 1995-2000.			●
Seek to ensure that management agreements and incentive schemes (e.g. ESAs, Countryside Stewardship and Tir Cymen) take account of the requirements of otters in occupied areas.		●	●
Seek to determine by 2000 Statutory Water Quality Objectives for standing and running waters in Britain that will sustain otters.			
Review the protection afforded to otters by current legislation and investigate the usefulness and appropriateness of licensing to control release of otters.		●	
Identify and resolve problems with existing legislation. Seek to clarify the definition of 'trap' in the Wildlife and Countryside Act 1981 and resolve inconsistencies over the use of otter guards over fish traps.		●	
Seek to include action for otters in Catchment Management Plans for all rivers containing otter populations by 2005, including "otter havens" in relevant areas.		●	●
Continue to secure appropriate management of riparian habitats and catchments in woodlands to maintain or enhance otter populations.		●	
Produce catchment based local habitat management plans identifying key areas for restoration and enhancement.		●	
Seek to establish an "Otter Forum" to co-ordinate conservation, information exchange, publicity and research.			●
Ensure otter releases are carried out only under the guidelines set out in the Framework for Otter Conservation.		●	
Attempt to limit accidental killing or injury (for example by provision of road underpasses, and dyke net guards), particularly on key catchments.		●	●
Ensure the provision of information on otter requirements and conservation to key groups, to include land owners, through the publication of posters and guidelines.		●	●
Collate information on prey productivity, biomass and pollution in occupied and likely recolonisation areas.		●	
Develop a standard methodology to analyse the level of pollution accumulation in otters.		●	●
Investigate the effects of disturbance on otter populations.			
Develop and implement methods to estimate otter numbers and permit population modelling.		●	
Monitor populations and distribution of otters throughout the UK, including local survey to monitor the expansion of fringe populations.		●	●
Pass information gathered during survey and monitoring of this species to JNCC in order that it can be incorporated in a national database and contribute to the maintenance of an up-to-date Red List.			
Develop a methodology for identifying otter breeding areas and produce guidelines for the protection and creation of breeding habitat.		●	●
Use this popular species to publicise the importance of water quality and riparian habitats to biodiversity.		●	

Monitoring Britain's Mammals

MONITORING BRITAIN'S MAMMALS is a vital part of ensuring their continued survival and good management[15]. Last year we reported on the launch of the Tracking Mammals Partnership[16] (TMP), a joint initiative by some 23 organisations involved in mammal conservation. The TMP was formally launched in July 2003 and now has a full-time co-ordinator, jointly funded by JNCC and PTES. The partnership aims to provide information on the changing status of all UK mammals by improving collaboration between organisations and by overseeing and guiding the development of the surveillance and monitoring programme.

The programme ranges from established monitoring schemes that have collected data for many years, to pilot schemes testing methods and assessing results. Three separate surveys are currently underway in gardens and urban areas, an environment about which relatively little is known at present.

As yet, no surveys actively share 1km or 10km sampling squares – hopefully this will become a more prominent feature as the Partnership evolves. The first full report of the work being carried out by the TMP will be produced later this year.

The second Polecat distribution survey began in January 2004 and will run for 3 years. The survey is run by the Vincent Wildlife Trust with The Mammal Society, and is looking for bodies and/or photos of polecat carcasses. The aim is to produce a new 10km square distribution map to track any changes since the last survey finished in 1997.

Projects Under the Tracking Mammals Partnership Umbrella

Project title	Run by	Main funders:
The National Dormouse Monitoring Programme	Royal Holloway, University of London (RHUL), People's Trust for Endangered Species (PTES)	PTES, English Nature
The National Bat Monitoring Programme	Bat Conservation Trust	Joint Nature Conservation Committee (JNCC), Environment Agency (EA)
Mammal Monitoring through the BTO Breeding Bird Survey	British Trust for Ornithology (BTO)	BTO, JNCC, Royal Society for the Protection of Birds (RSPB)
The National Game Bag Census	The Game Conservancy Trust (GCT)	GCT
The English House Condition Survey	Department for Transport, Local Government and the Regions (DTLR); analysis of commensal rodent data by Central Science Laboratory (CSL)	Commensal rodent element: Department for the Environment, Food & Rural Affairs (Defra)
Fourth Otter Survey of England	EA, The Wildlife Trusts	EA, English Nature (EN), Water UK, Biffaward, local water companies
Fourth Otter Survey of Scotland	Scottish Natural Heritage (SNH)	SNH
Fourth Otter Survey of Wales	Environment Agency, The Wildlife Trusts	Environment Agency, Countryside Council for Wales, The Wildlife Trusts
Second Otter Survey of N. Ireland	Aquatic and Terrestrial Environmental Consultants	The Environment & Heritage Service Northern Ireland
Mammals on Roads	PTES, RHUL	PTES and JNCC
Winter Mammal Monitoring Project	BTO, The Mammal Society	Defra
DNA Library	Forensic Science Service (FSS) and the University of Bristol	FSS, JNCC, the Environment and Heritage Service (EHS), the Veterinary Laboratories Agency (VLA) and the University of Bristol
Living with Mammals	PTES and RHUL	PTES, survey participants
Garden BirdWatch	BTO	BTO, CJ WildBird Foods Ltd, survey participants
Mammals in your garden	The Mammal Society	The Mammal Society
Research project on monitoring Bechstein's bats	University of Sussex, Natural History Museum, Forest Enterprise	Mammals Trust UK (MTUK)
Mammal Monitoring in Wytham Woods	WildCRU, Earthwatch Institute	WildCRU, Earthwatch Institute, PTES
Deer Collisions research	Deer Initiative	Highways Agency, Scottish Executive, the Woodland Trust, the National Forest Company, the Deer Study & Resource Centre

Deer on Roads

OVER 30,000 DEER are estimated to be involved in vehicle collisions annually in the UK. As well as posing a serious risk to human life, such accidents are a major welfare issue, as many deer require humane dispatch at the roadside (often following a long delay until appropriate help arrives), or run off to die later from internal bleeding and other injuries. A systematic means of monitoring and collating such accident records as they occur has not hitherto been available, but now a new database, the National Register of Deer/Vehicle Collisions[17], is being set up by the Deer Initiative to begin to do just that. During 2003 alone, the project received nearly 4000 detailed records of deer collisions with vehicles, including eight human fatalities. Information collated will be used to assess the true scale and distribution of this problem, identify current and future black-spots, and formulate improved roadside measures aimed at reducing road traffic accidents involving deer and other species.

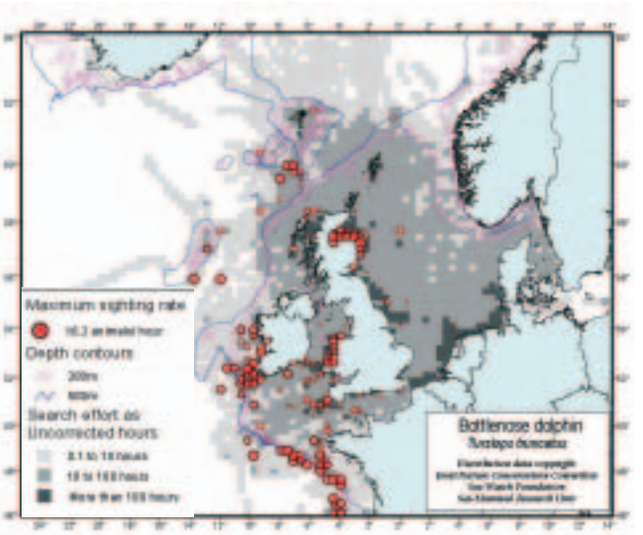
Cetacean Monitoring

AT PRESENT The Tracking Mammals Partnership does not cover marine mammals, although they are an important and threatened component of the UK's mammal fauna. Cetaceans present a particular challenge for monitoring – they are elusive, inaccessible and difficult to identify. Nevertheless, there have been significant recent improvements in monitoring methods and in our understanding of their distribution[18].

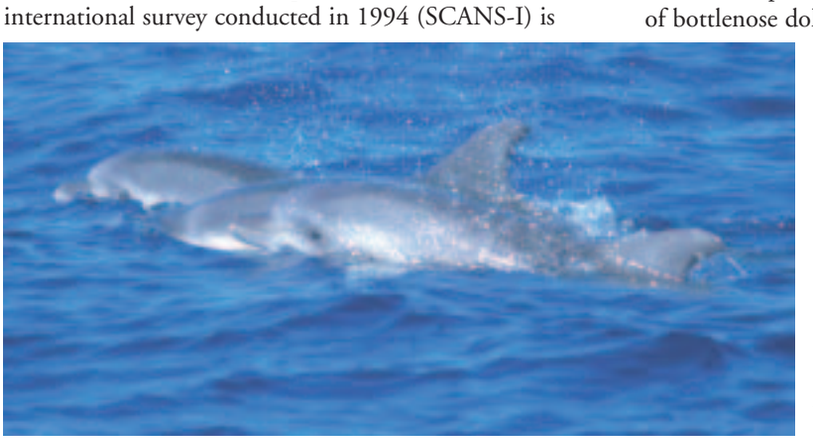
A new atlas[19], together with a comprehensive review of the status of UK cetaceans[20], highlights the importance of waters around the UK and north-west Europe for whales and dolphins. It shows, for example, that UK waters hold the majority of harbour porpoises in Europe and that Scotland's waters are the main home of the white-beaked dolphin off Europe. The atlas, the first of its kind for this area, is based on sightings made by hundreds of observers over the past 25 years, and takes observer effort into account.

Information on the abundance of most species remains scant. In 2000, the 3rd Meeting of Parties to the Agreement on Small Cetaceans in the Baltic and North Seas (ASCOBANS, to which the UK is a Party), set a small cetacean bycatch target of less than 1.7% of the population, but required more accurate abundance estimates. Small Cetaceans in the European Atlantic and North Sea (SCANS-II), a repeat of the major international survey conducted in 1994 (SCANS-I) is therefore planned for 2005 to estimate the abundance of small cetacean populations, particularly harbour porpoise and common dolphin, inhabiting shelf waters of the Atlantic margin, the North Sea and adjacent waters.

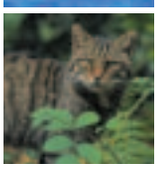
Distribution of the bottlenose dolphin. Source: Atlas of cetacean distribution in North West European Waters, 2003.



Information on cetacean distribution is crucial to identifying appropriate boundaries for protected marine areas, and for managing these areas adequately. The Moray Firth cSAC protects the only known 'resident' population of bottlenose dolphins remaining in the North Sea. Using data collected between 1990 and 2000, together with combined passive acoustic and visual surveys in 2001, changes in the distribution of dolphins and other cetaceans in the inner Moray Firth were recently re-assessed in response to plans to replace a sub-sea oil pipeline running through the cSAC. Throughout the decade over which monitoring data were collected, dolphin sightings concentrated around three deep, narrow channels in the inner Moray Firth, emphasising the importance of management plans for key areas such as these small deep areas. Dolphins were not detected outside the area of the cSAC, but porpoises were widely sighted throughout the Moray Firth.



August 2003 saw the second National Whale and Dolphin Watch[21], run by Sea Watch Foundation, which aims to provide a snapshot of the numbers and species of whales, dolphins and porpoises seen around the British Isles. About a thousand participants, at some 200 sites, recorded 321 sightings of 9 species, predominantly harbour porpoise and bottlenose dolphin, but also including northern bottlenose whale, and a fin whale.



The Scottish Wildcat

SCOTTISH WILDCATS WERE once found throughout Britain, but a recently published Action Plan[22] suggests they are being pushed towards the brink of extinction, having hybridised extensively with feral domestic cats.

British law is not adequate to ensure the conservation of Scottish wildcats, and this must be urgently addressed. The problem has two facets: first, protection of individual wildcat specimens, which is the clear purpose of the Wildlife & Countryside Act; and second, conservation of viable wildcat populations. Existing legislation – even if diligently applied – may be inadequate to achieve this. Since the failure of a 1990 court case cast doubt on the capacity of expert witnesses to agree on the identification of wildcats, there has been concern over the effectiveness of the protective legislation. The difficulty has been in having confidence in definitions of the differences between feral cats, hybrids and wildcats. This threatens to thwart legal protection of wildcats; at worst it could allow illegal killing of a protected species, and accelerate introgression. Conflict is also a serious threat to Scottish wildcats, as wild-living cats are controlled on shooting estates in Scotland. Other potential threats include diseases transmitted by domestic cats, habitat fragmentation, and exposure to toxic chemicals.

Wild-living cats that, to a greater or lesser extent, possess pristine (that is, pre-Iron Age) wildcat features (genetic, morphological and ecological) probably now exist only in northern Scotland. Contention over the definition of a wildcat makes interpretation of survey data and population estimates difficult. Estimates of 'wildcat' numbers in Scotland have varied between 1,000 and 4,000, but at worst, fewer than 400 cats with classical wildcat pelage may survive. Nevertheless, studies conducted over the last decade suggest the existence of wild-living cats that can either be accepted as pristine wildcats, or at least contain sufficient 'wildcat' characteristics to be worthy of serious conservation effort.

In the UK BAP the wildcat is considered a 'species of conservation concern'. The Scottish wildcat should urgently be given the additional protection offered by inclusion as a 'Priority Species' in the UK BAP, with its own Species Action Plan.

Defining the Scottish Wildcat

The wildcat has supposedly been fully protected in the UK since 1988, when it went onto Schedule 5 of the Wildlife and Countryside Act 1981. In 1992 the then Joint Nature Conservancy Council recommended that 'wildcat hybrid (of wildcat appearance)' be added to Schedule 5, but this was not approved. Current legislation thus assumes not only the existence of some form of 'pure' wildcat, but also that this can be distinguished from domestic cats and hybrids. The inadequacy of this approach was highlighted when in 1990 a prosecution for the illegal killing of three wildcats failed after the expert witness claimed he could not identify the deceased animals as wildcats beyond reasonable doubt[23]. Amending the Wildlife and Countryside Act to include a workable definition of the Scottish wildcat on which expert witnesses can agree is clearly a priority, but has not proven straightforward. Indeed, it raises interesting questions in biology and logic, since domestic cats not only hybridise with wildcats, but only recently descended from them.

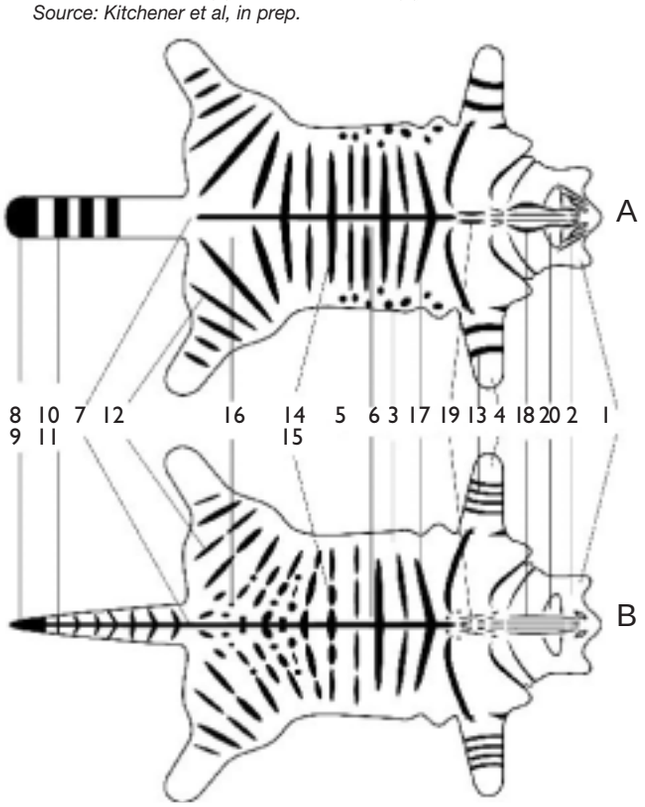
Although the exact process of introgression remains unclear, wild-living cats in Scotland probably comprise a continuum of types from wildcat to domestic cat, with various hybrids in between. Difficulties in defining Scottish wildcats are compounded by the fact that the museum holotype specimen was collected in 1904, at least 2,000 years after wildcats and

domestic cats could first interbreed in the British Isles. Specimens of this vintage are generally the 'benchmark' for defining a classical wildcat, but a logical problem is that the diagnostic features that typified the pre-Iron Age wildcat are obviously unknown. Various studies have identified that a proportion of wild-living cats have characteristics that are furthest-from-domestic cats and so it might be reasonable to accept that they are thus closest-to-wildcats, but one difficulty is that a different proportion fits this description depending on which parameters are used (e.g. skull morphology, limb bone size, gut length, genetics, pelage). However, a recent study involving a collaboration between the National Museum of Scotland and the WildCRU at Oxford has suggested a system that involves quantitative scoring of pelage features, and thereby identifying a subset of specimens that have what is termed strict classical pelage and also are furthest-from-domestic on all other counts too – these pelage characteristics thus provide a basis on which expert witnesses can agree for distinguishing wildcats under the law.

Although the characteristics of classical pelage provide a scientifically defensible criterion for securing wildcats individual protection under the law, this may not be sufficient to ensure the conservation of their populations. This is because the numbers of specimens qualifying for protection may already be so few, and so scattered, and prone to non-selective control, as to be non-viable. If so, then many cats that do not possess strict classical wildcat pelage may nonetheless possess wildcat genes that merit protection.

The Action Plan therefore calls for a two-tier system whereby individual specimens secure protection on the basis of classical pelage, but whereby the viability of their wider populations is secured through a series of management actions, perhaps including geographical zonation, that are clearly set out in a Code of Practice for Wildcat Conservation. Under this code, local protection would be extended to cats other than those meeting the criterion of classical pelage – for example, any striped tabby cat with a bushy tail and a black tip would be given the benefit of the doubt and treated as protected. This is the only realistic way of ensuring the conservation of wildcats in the field under conditions of visibility that would not permit a detailed examination.

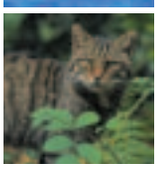
Pelage characteristics useful to diagnose a free-ranging tabby cat as a Scottish 'wildcat' (A) or feral domestic (B).
Source: Kitchener et al, in prep.



How can the Wildcat be Adequately Protected?

There needs to be a clear roadmap to recovering viable, secure populations of wildcats in Scotland. Actions and legislative changes that should form part of this roadmap include the following:

- Agreement that classical pelage defines the wildcat under the Wildlife and Countryside Act.
- Addition of the Scottish wildcat (with its clarified definition and diagnostic characters) to the list of Priority Biodiversity Action Plan species.
- Identification of Special Areas of Wildcat Conservation (SAWCs) in Scotland. The designation of such areas, and the actions associated with their management would be described in an evolving Code of Practice for Wildcat Conservation championed by SNH and involving all other stakeholders (including those concerned with responsible cat ownership, game management and biodiversity conservation).
- Within these SAWCs, a code of practice ruling out any lethal cat control except well-managed, selective removal of cats that do not meet specified criteria, should be promoted.
- A public information campaign about the predicament of the wildcat needs to be undertaken. This could include working with veterinarians to provide a proactive and perhaps locally subsidised neutering and inoculation service for cat owners where the risk of new hybridisation is highest, and an information leaflet for cat owners explaining responsible ownership. Feeding of stray cat colonies should be discouraged.
- Working with game managers to evaluate the reality of the threat posed by wildcats, and how it can be mitigated by non-lethal control methods, and promotion of selective methods of controlling wild-living cats that focus on obvious hybrids and feral domestics while sparing wildcats (furthest-from-domestic).
- A regular monitoring programme to assess the effectiveness of conservation actions.
- Although reintroduction would be premature, the recently initiated stud book should be encouraged, specimens being selected according to strict criteria, and plans laid against the likelihood that reintroductions will become a priority.



Wildlife Welfare

THERE ARE VERY OBVIOUS welfare aspects to almost all control and recreational interactions between people and wild mammals, from poisoning moles to stalking deer. Measuring and then minimising these welfare impacts is an exciting challenge, bringing together a spectrum of research and legislative interests. Managing mammals will never be without welfare costs, and the emerging science of wild animal welfare is poised to make a valuable contribution to wildlife conservation.

Measuring welfare in animals, especially in wild mammals, has always been challenging, but advances in molecular biology offer enormous scope for innovations. Indeed, one new technique sheds further light on the stress experienced by live-trapped and transported mammals such as badgers[24]. Traditionally, amongst the more quantitative approaches to welfare, has been the assay of stress hormones, such as cortisol, in the blood. Recently, it has become feasible to measure the levels of cortisol in droppings[25]. New non-invasive – and therefore welfare-friendly – techniques are revolutionising fieldwork on wild mammals. Perhaps the greatest of these is the rapidly burgeoning capacity to census populations through sampling DNA in droppings[26].

Mammal conservationists have to evaluate carefully the impact of their interventions on their subjects (not least because a stressful intervention may distort results). For example, small mammals are routinely live-trapped in studies around the world, but a recent study[27] revealed that some methods of handling live-trapped wood mice and bank voles resulted in weight loss (albeit small amounts) among the captives – a finding that reminds field mammalogists of remaining alert to ways of minimising the stress caused by their own interventions.

Over the past year some of the public consultations carried out by Defra that have touched on wildlife welfare issues include the use of snares and traps (under Section 11 of the Wildlife and Countryside Act 1981, and Section 8 of the Pests Act 1954); a review of Defra's procedures for badger licensing in England under the Protection of Badgers Act 1992; and a review of strategies for managing wild deer in England.

Hunting with Dogs

The government's original Hunting Bill proposed banning stag hunting and hare coursing, but allowed licensed fox hunting. However, in 2003, MPs voted for the Bill to be amended to ban all hunting with dogs in England and Wales. The House of Lords rejected that in an October 2003 vote, and there was insufficient parliamentary time for the Bill to return to the Commons before the end of the parliamentary year. The Bill was not reintroduced in the Queen's Speech at the opening of Parliament in November 2003, but could be introduced in a Private Members' Bill or by the government. If the Bill is reintroduced in the same form as it left the Commons, with a total ban on hunting, and is again voted down by the Lords, the government could take the very exceptional step of over-ruling the Lords using the Parliament Act of 1949.

At the start of the 2003/4 parliamentary session, Labour Peer, Lord Donoughue, introduced a Bill to the House of Lords, seeking to amend the Wild Mammals (Protection) Act 1996. Liberal Democrat MP, Lembit Öpik, introduced an almost identical Bill to the House of Commons as a Private Members' Bill. Both Bills propose legislation to create an offence of "intentionally causing undue suffering to any wild mammal" and also remove the current exceptions in the 1996 Act for lawful hunting, shooting, coursing and pest control.

One part of the debate surrounding hunting foxes with dogs in the UK is whether it is more or less humane than shooting. Research commissioned by the All Party Parliamentary Middle Way Group[28] attempted to address the humaneness of shooting foxes. The research used coloured cut-out fox silhouettes as targets to assess the penetration, kill rate, and wounding rate of 51 different shooting regimes, including different shot sizes, and user competencies. Fox wounding rates increased significantly when No. 6 shot in shotguns was used, due to poor penetration, but the use of BB shot minimized wounding rates. Experienced shooters using correctly zeroed rifles achieved a high kill rate. Studies that strive to provide quantitative information to replace hearsay in such controversial debates are surely to be welcomed, but it remains the case that scientific comparison of different levels of suffering in wild animals is extremely difficult.

Reactive Badger Culling Increases Bovine TB in Cattle

The incidence of bTB in cattle has increased substantially in parts of Britain in the past twenty years, seriously damaging the livelihoods of many farmers. Badgers are known to be a reservoir of bTB, and between 1975 and 1997 over 20,000 badgers were culled as part of British bTB control policy.

In 1998 the government initiated a large-scale field trial, the Randomised Badger Culling Trial (the so-called 'Krebs Trial'[29]), to test experimentally the efficacy of badger culling to reduce the incidence of bTB in cattle.

Three experimental treatments were used:

(i) proactive culling, which reduced badger densities to very low levels across entire trial areas;

(ii) reactive culling, which removed only those badgers geographically close to recent bTB outbreaks on particular premises; and

(iii) no culling (survey only).

The experiment, like the culling regimes that preceded it, has been controversial, with concern among animal welfare and conservation groups about the scale of the badger cull.

On 4 November 2003, however, the Animal Health Minister announced the early suspension of culling in reactive treatment areas. Analysis of data collected to date showed a 27% increase in the number of cases of bTB occurring in reactive culling areas compared to the related survey-only areas where no badger culling took place[30]. It is now essential to explain this result.

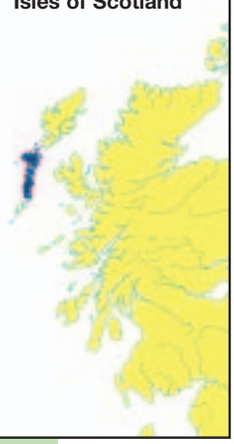
Probably several factors are at work, of which one with a biological mechanism is the so-called 'perturbation hypothesis', that suggests that culling may affect the transmission of disease amongst surviving badgers by disrupting their social organisation and increasing stress[31].

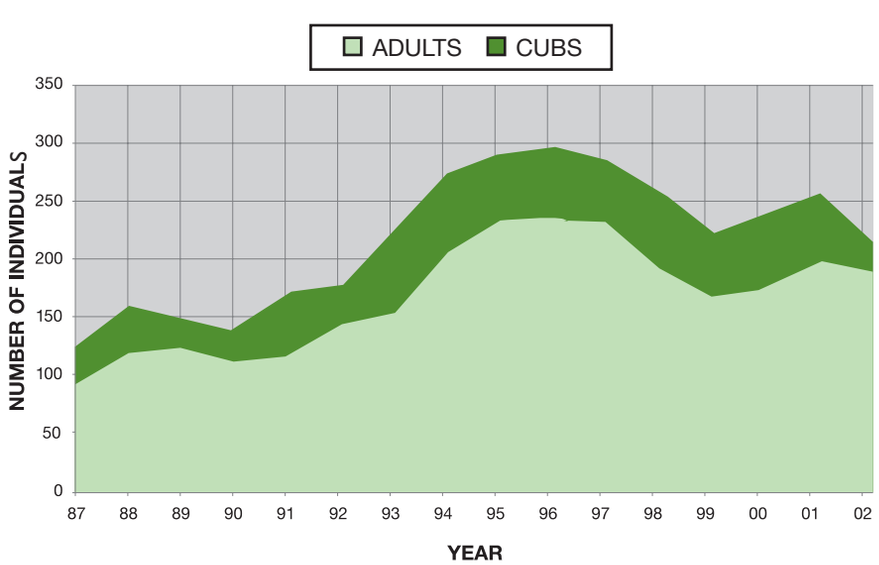
Hedgehogs on the Uists

In 1995, the UK hedgehog population was estimated at 1.5 million animals, but there is evidence that they have declined by up to 50% in some areas since then (P. Bright, National Hedgehog Survey 2001). Hedgehogs are not native to the Hebridean Islands, where, in 1974, four individuals were released on South Uist. They have since spread throughout South Uist and Benbecula, as far north as Carinish in North Uist, and the population has risen to at least 5000 individuals[32]. However, the omnivorous hedgehogs raid birds' nests for eggs, and this is having a serious impact on the Uists' internationally important populations of breeding dunlin, ringed plover, redshank, snipe, lapwing and oystercatcher. Surveys carried out in 1995 and 2000 found that wader numbers had almost halved since the mid-1980s and plans were drawn up to remove the hedgehogs.

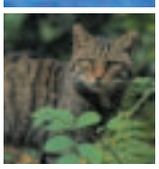
A 2002 report by the RSPB/SNH Uist Wader Project concluded that overall levels of suffering would be lower if hedgehogs were removed by culling by lethal injection, rather than by translocation or by taking wild hedgehogs into permanent captivity. In 2003, therefore, following their non-acceptance of a plan to carry out a trial relocation put forward by a group of welfare and conservation organisations, SNH began a removal campaign, culling 66 out of an estimated 90 hedgehogs on North Uist, provoking an outcry from animal protection groups and the general public. Feelings ran so high that several members of the original group caught 150 hedgehogs from South Uist and Benbecula and relocated them to the mainland, where their fate remains unclear. In the summer and autumn of 2003 a further attempt was made to plan a trial relocation, but the only protocol that was acceptable to SNH was too costly for the wildlife charities to fund, and SNH declined to contribute. SNH will, therefore, continue to cull hedgehogs on North Uist in 2004, and plans to expand the programme first into Benbecula and then into South Uist, where the populations are higher. According to an online poll at www.mtuk.org, 90% of respondents are against a cull of hedgehogs on the Uists while only 10% are in favour. However, a report by the Scottish Economic Policy Network[33] showed 78% of participants, albeit a very small sample interested in conservation, and from a University background, favoured humane culling, with only 18.8% supporting a relocation.

The Uists in the Western Isles of Scotland





Population changes in the badgers of Wytham Woods, 1987-2002
Extended spells of dry weather in 2003 again caused serious problems for badgers, which were unable to find enough of their staple food, earthworms. In Wytham Woods, where some 50 setts have been monitored by Oxford scientists for 28 years[34], dry conditions in the spring of 2002 and 2003 resulted in the lowest number of surviving cubs ever recorded – just 12 in 2003 and 15 in 2002. An average year might produce 45 cubs. In Wytham, all cubs sampled during May each year are infected with the coccidian gut parasite Eimeria melis, which leads to diarrhoea and consequent fluid loss. Cubs are thus particularly susceptible to dehydration in dry springs.



BAP Species: Pipistrelle Bats

THE PIPISTRELLE BATS SAP covers two species: the common pipistrelle, *Pipistrellus pipistrellus*, and the soprano pipistrelle, *Pipistrellus pygmaeus*, only distinguished in the late 1990s. Pipistrelle bats are one of the most abundant British mammals, with an estimated (joint) population of two million in 1995 spread throughout mainland Britain. Nevertheless, their populations may have fallen by 70% between 1978 and 1993, and it is not possible to say whether one species has declined more than the other. Few colonies of more than 1,000 are now known, although these were not unusual before 1960. Habitat degradation, particularly intensive agriculture, is the main threat facing the pipistrelle bats.

The pipistrelle bats SAP aims to maintain the existing geographical range of both species, and to maintain and restore population sizes to pre-1970 numbers. Of 12 actions proposed in the BAP, all have been enacted. Important actions include:

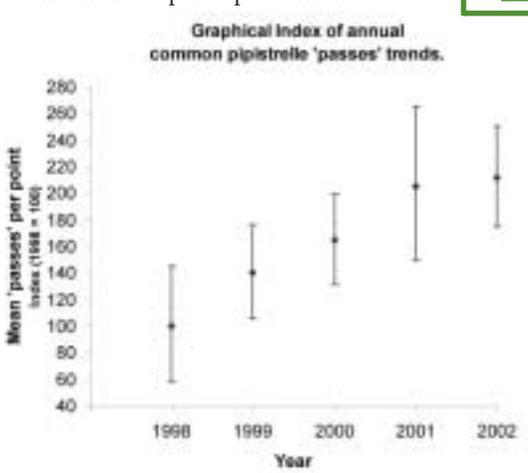
- Extensive research on all aspects of pipistrelle bat biology and conservation.
- The ongoing National Bat Monitoring Programme.
- Publication of accessible literature such as 'HabitatManagement for Bats'[35] and 'The Bat Workers' Manual'[36].

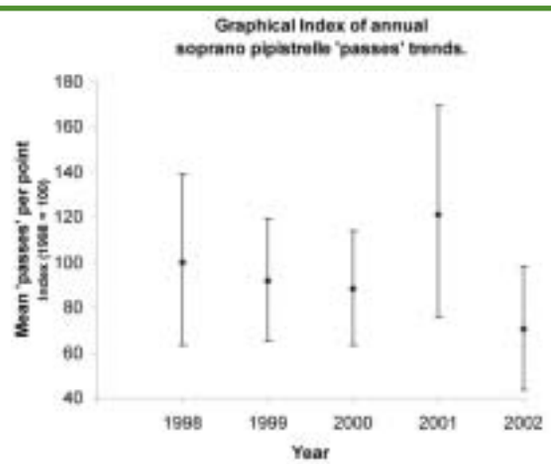
The conservation of pipistrelles has been greatly aided by the development of a strong legal and policy framework for all bats, including full protection under the Wildlife and Countryside Act, and a large network of licensed bat workers who monitor bats, locate and protect sites important to bats, deal with planning issues, rehabilitate injured bats, provide conservation advice and are enormously important in public relations. This is particularly important for pipistrelles, as they often inhabit buildings.

Monitoring Pipistrelle Bats

The Bat Conservation Trust's National Bat Monitoring Programme has been monitoring pipistrelle bat colonies since 1998, and has also carried out field surveys of bat 'passes' heard on a bat detector. Although the data are still insufficient for statistical analysis of long-term trends, a recent analysis[37] shows a consistent increase in numbers of common pipistrelle passes heard but no consistent changes in numbers of soprano passes heard. Longer runs of data are needed to verify whether these trends are real and sustained. The NBMP is grateful to over 400 volunteers throughout the UK who have participated in these difficult field surveys.

Note: The FMD outbreak in 2001 reduced the numbers of field surveys and hence the wide confidence limits for 2001.



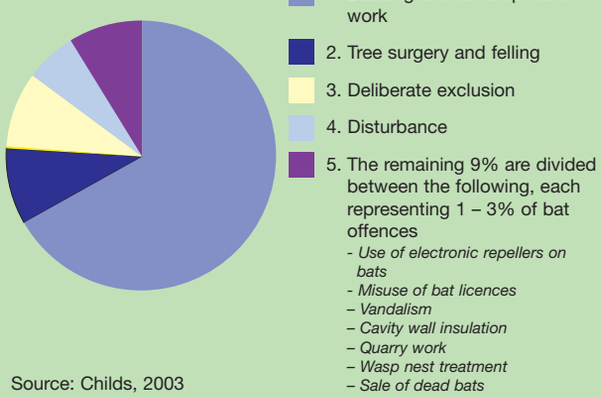


Bats and the Law

Crimes against bats are extensive and widespread according to a report by BCT and the RSPB[38]. A two-year project ending in March 2003 detected 144 bat offences across the UK, more than two-thirds of which were committed by the building trade. Bat roosts were damaged or destroyed in 80% of cases, affecting whole colonies, and implying that these offences probably have a serious impact on bat conservation. Of the 144 cases, 129 were passed to the police, of which 71 resulted in police action, mainly advice and verbal or written warnings. There were eight prosecutions, of which six were successful, with fines totalling £2600.

There is an urgent need to educate the building industry and the planning process to ensure greater compliance with the legislation, and there should be a requirement that advice given by statutory conservation organisations must be followed. Although the inclusion of an offence of 'reckless' damage in the Countryside and Rights of Way Act 2000 has improved protection in England and Wales, equivalent amendments are still needed in Scotland and Northern Ireland, and the 1994 Habitat Regulations should be updated. The report also calls for greater cooperation between police, statutory nature conservation organisations and the Bat Conservation Trust.

The 144 bat offences recorded in the two years of the project can be broken down as follows:



Source: Childs, 2003

Bats on Organic Farms

Agricultural intensification is considered to be a major reason for declining populations of pipistrelle and other bats in the UK and Europe, but until recently there has been little hard evidence. Now a Bristol University study[39] has tested the hypothesis that farming methods have been a factor in bat population declines by comparing bat activity and species richness on 24 matched pairs of organic and conventional farms in southern England and Wales. Bat passes detected on a bat detector and recorded directly onto a laptop computer were identified to species using an artificial neural network. Greater and lesser horseshoe bats were only recorded on organic farms. Pipistrelles, particularly common pipistrelles, were the dominant species, together comprising more than 70% of all passes for both farm types. Bat activity (number of passes recorded on a bat detector in 10 minutes at 3 sample points per habitat) and foraging activity (feeding buzzes) were significantly higher on organic farms than on conventional farms. Some 61% more passes were recorded on organic farms than on conventional farms, and 84% more feeding buzzes were recorded. The activity of both Daubenton's and Brandt's bats was significantly higher on organic farms than on conventional farms, even when only passes over water features were considered. The differences in bat activity between farm types may reflect features such as taller hedgerows and better water quality on organic farms. Higher foraging activity also suggests that habitat quality in terms of prey availability is greater on organic farms. Less intensive farming benefits bats, and as the number of organic enterprises increases it may help to reverse declines in bat populations.

The Pipistrelle Bats SAP

ELEMENTS OF the actions will be ongoing indefinitely, but have been completed in the sense that an effective mechanism for action is in place, and the action is up-to-date.

ACTION	Planned	Ongoing	Completed
Encourage water quality levels which will help support populations of aquatic insects on which pipistrelles feed.		●	
Ensure the needs of this species are considered in incentive schemes designed to encourage the management of habitat suitable for this species.		●	
Encourage favourable management of land adjacent to known roost sites to support foraging by juvenile pipistrelles.		●	
Maintain current licensing procedures and training schemes as appropriate.		●	●
Assess the effect of current management and protection policies and amend as necessary to ensure maintenance of healthy populations.		●	●
Ensure landowners are aware of the presence and legal status of pipistrelle bats and that advice is available on appropriate methods of management for conservation of their roosts and foraging habitats.		●	●
Undertake research to clarify the taxonomic status of pipistrelle bats in the UK.			●
Continue to research the habitat requirements and ecology of the species to help develop appropriate management advice.		●	●
Develop and implement a systematic survey technique to clarify the conservation status of the species in the UK. This should include monitoring of summer maternity roosts and the extent and effect of reproductive isolation of summer colonies used for monitoring.			●
Encourage research on the ecology and conservation of pipistrelles on an international level.		●	
Pass information gathered during survey and monitoring of this species to JNCC in order that it can be incorporated into a national database and contribute to the maintenance of an up-to-date Red List.		●	
Maintain programmes of carefully supervised roost visiting, general education and publicity.		●	●

Landscape-Scale Conservation

AGRICULTURAL LAND OF one sort or another covers 17.9 million hectares, just under three-quarters of the UK, and is home to at least 40 of our 54 wild terrestrial mammals[40]. Conceptually simple changes in management of this land, such as the provision of field margins and buffer zones, provide potentially significant opportunities to conserve many species over a large area. For example, a broad aim of most agri-environment schemes is to seek to promote more extensive, lower-input agriculture, reversing many of the recent changes that are perceived as being damaging to wildlife. Of the 112 SAPs produced in 1995, over one third specifically refer to agri-environment schemes as mechanisms for achieving targets. The two largest schemes of recent years, Environmentally Sensitive Areas and Countryside Stewardship Scheme, have promoted lower-input farming practices on over 7% (0.71 million hectares) of the agricultural land in England. Mammals such as brown hares, water voles and pipistrelle bats, are particularly likely to benefit from the broad habitat management measures in place over this area. Other species which are likely to benefit from specifically targeted management at selected sites include the greater horseshoe bat, and there is potential for at least some benefits for all ten BAP priority terrestrial mammal species[41]. Long-awaited reform of the Common Agricultural Policy, linking subsidies to compliance with specific environmental standards also holds the promise of improving farmland habitat for the many mammals that live there. However, there is a lack of robust studies evaluating the effectiveness of agri-environment schemes in the UK and in Europe as a whole[42].

By contrast, highly intensive agriculture using herbicide-tolerant GM crops would seem to have a negative impact on biodiversity. 2003 saw the publication of the results of the farm-scale evaluations of three herbicide-tolerant GM crops (maize, beet and spring oilseed rape), the largest GM crop trial ever undertaken anywhere in the world[43]. There were more insects in and around the conventional beet and rape crops, which contained more weeds, and more weed seeds. However, there were more weeds (but not more insects) in and around GM maize crops, because farmers used a different type of herbicide at a later time of year. The use of GM crops where the herbicide regime results in fewer weed and invertebrate species could have serious consequences on many mammals, from wood mice to bats, and we would urge caution in their widespread introduction to UK farmland.

The three rivers of Pagham harbour draining the farmland of the coastal plain. Source: West Sussex County Council.

Restoring Water Voles and Other Biodiversity to the Wider Countryside

In 2000, only 100 water voles were recorded in West Sussex. The main problems for water voles in the area resulted from intensive farming, heavy engineering work on watercourses for flood defence and land drainage, and mink predation. The fear that water voles would soon become extinct in Sussex prompted the formation of The Chichester Coastal Plain Sustainable Farming Partnership, involving a team coordinated by Oxford University's WildCRU, and including Farming and Wildlife Advisory Group, the Environment Agency (EA), local landowners, West Sussex County Council and Sussex Wildlife Trust. As well as safeguarding water voles at a landscape scale, an important aim of the three-year project was to establish a demonstration area of best practice for sustainable farming and biodiversity[44]. The effectiveness of various types of habitat enhancement and restoration measures was examined through comparative experiments and monitoring the abundance of key indicator species.

The project considered the whole landscape of the Chichester coastal plain in terms of land-use and river catchment management[45]. Through whole-farm conservation plans, linked habitat corridors were created across and between neighbouring farms totalling 8400 ha, of which

Species Translocation Policy

A policy on species translocation was published in 2003 by the JNCC[47]. The policy defines translocation as "...the transfer by human agency of any organism(s) from one place to another. Conservation translocations can help to restore populations of declining and threatened species...".

The policies and procedures laid out in the document are largely based on the 1995 *IUCN Guidelines for Re-introductions* and provide the framework for deciding when translocations should be used for conservation. It notes that ranges of species alter naturally over time and that intervening against such natural changes is generally inappropriate and ineffective. Species that have occurred in Britain in historic times but are now extinct in the wild, and translocation of native species beyond their current or recent range are to be treated as the introduction of a non-native species. Section 14 of the Wildlife and Countryside Act, 1981 applies to these species, so that release into the wild of any animal "of a kind not ordinarily resident in or a regular visitor to Great Britain in a wild state" is illegal and can only be carried out under licence, following an appropriate risk assessment process.

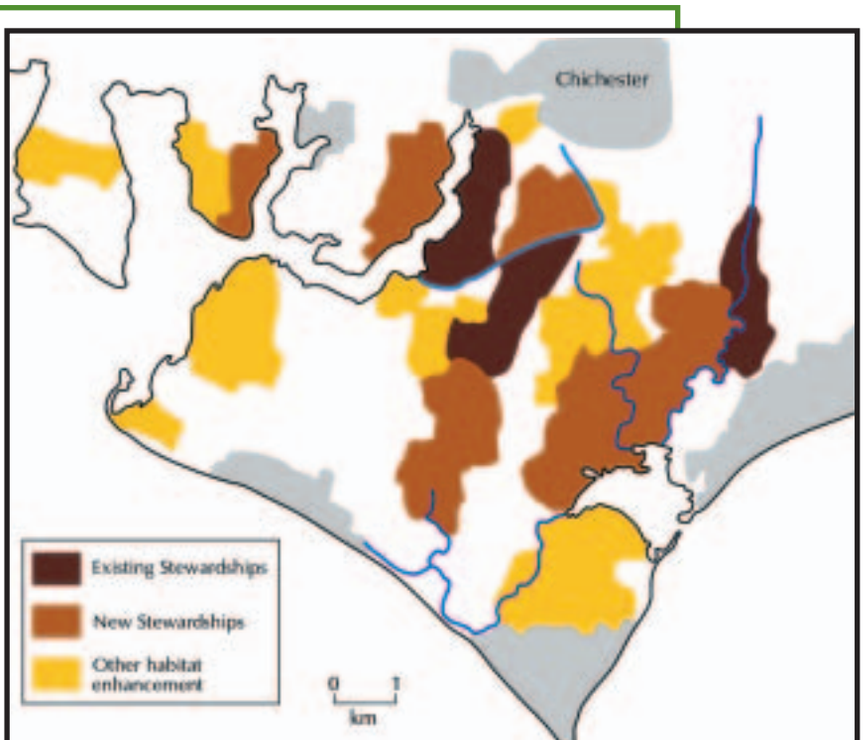
There is a need for additional guidelines to deal more fully with relocation of species threatened by development. Importantly, the document stresses that species relocation is not an acceptable alternative to in-situ-conservation, but where a development has been given planning approval, relocation should be considered as a means of partially compensating for the loss of the populations affected. Systematic recording of species translocations for conservation purposes is required and existing recording schemes and the National Biodiversity Network should be used to collect and disseminate the resulting data and information.

Following a working group review of non-native species policy published in March 2003[48], in December 2003 DEFRA launched a consultation[49] to develop a detailed strategy for dealing with non-native species. The consultation exercise, which closed in April 2004, covered organisational structures, prevention methods, monitoring and detection, and management and control of non-native species.

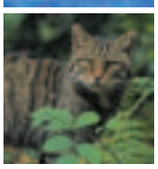
Plans to reintroduce the pine marten to Southern England have been on hold pending the publication of the JNCC's policy document on species translocation. However, despite the pine marten being one of Britain's rarest mammals, it is not a priority species in the UK BAP and so the issue has unfortunately not been addressed in the document. Conservationists are therefore calling for the conservation status of the pine marten to be upgraded as a matter of urgency.

4556 ha were entered into the Countryside Stewardship Scheme as a direct result of the project. In just three years, the landscape acquired 61 km of grassy margins, 28 new ditch ponds and 27 restored farm ponds. Seven kilometres of fencing now prevents cattle from poaching riverbanks, and ditches and rifes are being maintained more sensitively by the EA based on local flood risk. Along 57 km of watercourse the EA now cut only mid-channel vegetation or bank vegetation on one side, providing year-round food and cover for water voles. This approach has been extended to other Sussex catchments, influencing thousands of kilometres in the county. These measures, combined with two years of mink control, have been highly effective in halting the decline of the water vole in Sussex. In fact, the initiative has seen an increase in water vole populations from 100 to 348 individuals, more than a 300 per cent rise. There were also measured increases in hares, skylarks and butterflies.

The project has been hailed as exemplary and now it is being used as a template for new initiatives with similar issues, starting with the Upper Thames and Pett Levels, East Sussex. The practical approaches piloted in the project have been incorporated into guidance packs[46] intended for use by landowners and conservation advisors and practitioners, and therefore the influence of this successful project will extend nation-wide.



Farms in the Chichester Coastal plain project.
Source: Strachan & Holmes-Ling, 2003



MTUK Third Annual Update, April 2004

THIS IS THE THIRD in what we hope will become a series of annual updates on the state of Britain's mammals. Professor David Macdonald and Dr Fran Tattersall have, once again, consulted with colleagues far and wide in its preparation. In inviting them to write it, we emphasised that we wished them to feel free to concentrate on those issues they felt were most topical, to give us their personal interpretation of the content and to give direction and focus to future work which MTUK and others might undertake.

MTUK has had a very successful year. Excitingly, the results of some of our earlier projects have been published and acted upon. The results of the red squirrel modelling work at Newcastle University were immediately taken on board by the Forestry Commission, and, as a result, large swathes of woodland in Cumbria will now be managed for this imperilled species. The pilot Living with Mammals Survey, launched in the spring of 2003 and carried out between the beginning of April and the end of June, gave some very encouraging results. 90% of volunteers saw at least one mammal, and 24 species (or groups of species) in total were recorded, including some species of conservation concern. The Mammals on Roads survey continued into its third year and the results are expected soon.

At the January 2004 meeting of the Advisory Group, grants to the value of almost £100,000 were made. Ten main grants were awarded and, in addition, seven recent graduates were awarded internships to the value of £3000 each. We are particularly delighted that one MTUK intern will be working at Queen's University, Belfast, our first project in Northern Ireland. In February 2004 we held a very successful conference in Nottingham (hosted by Center Parcs) on conflict between man and mammals. Our February conference is now a firm fixture in our calendar. Planning for next year is already underway.

MTUK Student Projects

- David Tosh from Queen's University Belfast will be looking into the conservation status of pine martens in Northern Ireland.
- Stephanie Murphy from the University of Sussex will be examining the response of Bechstein's bat to a new lure consisting of synthesised social calls.
- Miriam Pugh from the University of Leeds will be looking at how the installation of bat grills at underground sites affects the bats' swarming behaviour.
- Catherine Head from Royal Holloway, University of London will be looking at which landscape features influence the distribution of mink in and around the National Key Sites for Water Voles.
- Jamie Urquhart from the University of Aberdeen will be assessing the reasons for the different impacts that stoat and American mink predation have on water voles.
- Bonnie Griffin from the University of Aberdeen will be looking at the ecology and behaviour of Daubenton's bats in relation to the epidemiology of European bat lyssavirus 2.
- Rebecca Fell from WildCRU, University of Oxford will be looking at the survival of badger cubs and their social integration into the group into which they were born.

New MTUK Projects Funded in 2004

- **Squirrel parapoxvirus risk assessment and the development of a monitoring and disease contingency plan in Kielder Forest.** John Gurnell, Queen Mary, University of London will be following up earlier MTUK funded work on forest design and management by devising contingency plans for red squirrels and invasive greys and outbreaks of parapoxvirus, should they become necessary in future.
- **Identification of potential woodland habitats in southern England for conservation management of Bechstein's bats.** Little is known about this very rare bat and no conservation measures are currently in place for the species. Dr Hill from Sussex University and other colleagues have got together to put together a coordinated plan from scratch, which breaks up quite neatly into a number of components. We hope to get the first of these off the ground in the next few months.
- **Reversing the water vole decline: habitat restoration and National Key Sites.** There are currently 14 Key Sites for water voles throughout England and Wales and MTUK has awarded Dr Paul Bright of RHUL a grant to enable him to expand the programme. The grant will enable project workers to talk to landowners and farmers around Key Sites and help them restore the habitat to encourage water voles to disperse.
- **Water vole restoration to the wider countryside.** Following his very successful work on the Chichester Plain mentioned on p16, Rob Strachan of WildCRU faces a new challenge in the Upper Thames Tributaries, where water vole populations are fragmented and extremely fragile.
- **Polecats and American mink; the return of a native predator.** Very little is known about the interactions between polecat and mink. Polecats are recovering nationwide, but into a niche now largely occupied by American mink. Is the presence of mink harmful to polecats? Professor David Macdonald aims to find out.
- **Wiltshire Water Vole Recovery Project.** Mark Satinet from the Wiltshire Wildlife Trust has received funding again this year to research the efficacy of strategically controlling mink on a catchment area basis. The results of this project will feed into the theoretical work on mink modelling being carried out by Professor Macdonald's team at WildCRU.
- **Ecological differences in cryptic bat species and their importance in bat conservation.** Lena Berge at the University of Bristol is looking at whether two morphologically similar bats, Brandt's bat and the whiskered bat have similar foraging activities. This is a very important issue which has implications for future management.
- **Scottish Bat Officer 2004.** MTUK will continue to support the postholder through BCT. Anne Youngman is stimulating a lot of interest in bats and their conservation in Scotland and, ideally, we would like this post to continue well into the future, funds permitting.
- **Purpose built rehab/care facility for hedgehogs.** Lynne Garner from the Herts Hogline will be constructing more facilities to care for sick and injured hedgehogs.
- **Sawley Water Meadows.** MTUK will fund the fencing of 400m of riverbank to allow bankside vegetation to increase and to encourage resting up by otters.

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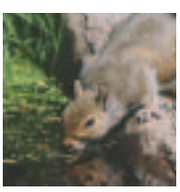

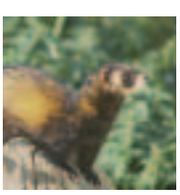
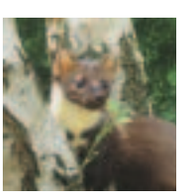

Mammals Trust UK

Mammals Trust UK is dedicated to working in partnership with voluntary organisations, wildlife experts, government and industry to conserve wild mammals and their habitats throughout the British Isles.

Our Aims

- To raise funds for research and practical conservation based on sound scientific understanding.
- To increase public awareness, bring together all with an interest in mammal conservation and share knowledge.
- To create opportunities for people to participate actively in mammal monitoring and conservation projects across the UK.
- To manage key conservation sites to protect them for the future and to create opportunities for education, recreation and enjoyment of our natural heritage.

Fundraising and grant making

Mammals Trust UK raises funds from a variety of sources, including individual supporters, trusts and industry. An Advisory Group advises on conservation policy issues and the work to be funded and comprises representatives of the following organisations: The People's Trust for Endangered Species, The Bat Conservation Trust, The Mammal Society, The National Federation of Badger Groups, The British Hedgehog Preservation Society, The Wildlife Trusts, English Nature, Scottish Natural Heritage, The Countryside Council for Wales, The Environment and Heritage Service, Northern Ireland, and the Joint Nature Conservation Committee. They are joined by Professor Paul Racey, Regius Professor of Natural History at the University of Aberdeen, Professor David Macdonald, Director of the Wildlife Conservation Research Unit at the University of Oxford and Dr Pat Morris of Royal Holloway, University of London.

Mammals Trust UK is administered as a restricted fund of the People's Trust for Endangered Species (PTES), registered charity no. 274206. Chairman Professor John Beddington, Chief Executive Dr Valerie Keeble

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PROTECTING OUR NATIVE ANIMALS AND THEIR HABITATS
Mammals Trust UK

The Wildlife Conservation Research Unit

The WildCRU's mission is to undertake original research on aspects of fundamental biology relevant to solving practical problems of wildlife conservation and environmental management.

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Copies of *Britain's Mammals: the Challenge for Conservation* and further copies of this publication can be obtained by contacting Mammals Trust UK at the address and phone number above.