A WILDLIFE SURVEY OF

HEALEY DELL LOCAL NATURE RESERVE

ROCHDALE & ROSSENDALE

A REPORT TO ROCHDALE METROPOLITAN BOROUGH COUNCIL

FEBRUARY 2005

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FEBRUARY 2005

An introduction to the Wildlife Trust for Lancashire, Manchester and North Merseyside

The Wildlife Trust is a registered charity and non-profit making organisation dedicated to protecting wildlife and natural habitats throughout Lancashire, Greater Manchester and Merseyside (north of the Mersey). It is one of 46 independent charities that together form a national partnership, The Wildlife Trusts - the largest voluntary body in the UK concerned with all aspects of wildlife. Established by volunteers in 1962, the Wildlife Trust is governed by a voluntary council elected by its 9,500+ members. On a day to day basis work is undertaken by a team of nearly 100 staff, headed by its Chief Executive, who work closely with volunteers in every area of activity. The Trust's headquarters is based at Cuerden Valley Park, a 600 acre country park south of Preston. Other staff are based at the Trust's centres in Blackburn, Bolton, Burnley, Seaforth (Liverpool), Mere Sands Wood (West Lancashire), Preston, Penwortham, Heysham and Wigan.

The Trust's mission is ...

> "*To work for a region richer in wildlife by the protection and enhancement of species and habitats, both common and rare and to work towards public recognition that a healthy environment, rich in wildlife and managed on sustainable principles, is essential for continued human existence*".

Its vision is ...

> "*To be the key voice for nature conservation within our region and to use our knowledge and expertise to help the people and organisations of Lancashire to enjoy, understand and take action to conserve Lancashire's wildlife and its habitats*".

It will achieve this through the implementation of our development plan by focusing on key areas of activity which are given below:

- **Education and Training** - NVQ training in ecology and environmental management, 17 Wildlife Watch groups, outreach work in schools, specialist Environmental Education Centre and staff, conferences, training and sharing days.
- **Land Management** - the Trust directly manages over 2,000 acres of land comprising a sample of the key habitats in the county, many of international importance for nature conservation.
- **Planning and Survey** - monitoring over 30,000 planning applications per annum, appearing at Public Inquiries, influencing Local Plan policy, consultancy and advisory work for local authorities.
- **Wildlife Sites System** - operating an acclaimed Wildlife Sites System in partnership with English Nature and Lancashire County Council.
- **Biodiversity** - contributing to the North West Biodiversity Audit and a key partner in the preparation of a Biodiversity Action Plan for Lancashire.
- **Agenda 21** - Trust staff and volunteers active throughout the county, innovative can recycling, allotments and community composting schemes.

- **Urban Conservation** - the Trust operates Urban Wildlife Projects in Blackburn, Bolton, Burnley, Liverpool, Pendle and Preston with plans to establish similar projects in other areas.
- **Liaison** - the Trust works with all 25 county, district and metropolitan councils, the environment voluntary sector, companies and community groups across Lancashire. It is involved in a wide range of initiatives and partnerships including the East Lancashire Partnership, ELWOOD, River Valley Initiatives and Lancashire Rural Futures to name a few. It also administers the Lancashire Environmental Fund (landfill tax credit scheme).
- **Volunteer Involvement** - Its network of volunteers, members and supporters permeate almost every town and village in the area. They organise events programmes, work parties, surveys, fund-raising events and keep a vigilant eye on potential threats to wildlife.
- **Fund-raising** - the Trust works in partnership with many business supporters on conservation projects, education initiatives and fund-raising events. A major membership recruitment scheme is in progress and it operates a legacy campaign.

Mr John Lamb M.Sc. is one of five regional conservation officers employed by the Trust with Mr Lamb being the conservation officer for East Lancashire. Mr Lamb graduated from Liverpool University in 1986 with a B.Sc. Honours degree in Environmental Biology. In 1987 he worked as a countryside ranger on the internationally important sand dune system of the Sefton Coast before heading south to Wye College, Kent, to study for a M.Sc. degree in Landscape Ecology, Design & Maintenance. Mr Lamb then worked for the Nature Conservancy Council as Assistant Scientific Officer and undertook a research contract for Dr George Peterken examining the ecological effects of the "Great Storm" of 16 October 1987. Mr Lamb then returned to Lancashire to take up his first post with the then Lancashire Trust for Nature Conservation, as Woodland Officer for the Central Lancashire Woodland Project surveying ancient woodlands in the Ribble Valley. He completed a Phase 2 habitat survey of sites in Burnley District and initiated an urban wildlife survey of Preston before moving to the Isle of Man to undertake a Phase 1 habitat survey for the Isle of Man government. In 1992 he took up the position of Conservation Officer with the Manx Wildlife Trust, a post he held for six years. In July 1998 John returned to his home county to take up his present position as Conservation Officer for East Lancashire with the Wildlife Trust.

The duties of Conservation Officer include the following areas of work:

- management of the Trust's nature reserves in the five districts of East Lancashire;
- representing the Trust at meetings of various partnerships and initiatives;
- providing information and advice to landmanagers, Trust members and members of the public;
- commenting on planning applications, reviews of local plans and other documents, and
- undertaking ecological survey work, normally on a consultancy basis.

1. SUMMARY

The Wildlife Trust for Lancashire, Manchester and North Merseyside ("the Trust") was contracted to survey and update the species lists for plants (including bryophytes) and birds found in the LNR over two survey seasons in 2003 and 2004.

The botanical survey (higher plants) was carried out over eleven days in September/October 2003 and April/May 2004 and recorded a total of 284 plant species, including 152 herbaceous plants, 58 trees and shrubs, 32 grasses, 21 sedges and rushes, 16 ferns and five aquatic plants. Additional species from other surveys, including those listed in the 1976 and 1987 management plans, brings the total up to an impressive 348 higher plants recorded on the site.

Ten species (3.5%) were found in all 27 areas surveyed and a further seven species were recorded in 26 of the 27 areas, hence 17 species (6%) were found in 26 or 27 of the areas. A total of 31 species (10.9%) were found in 23 or more of the 27 areas surveyed.

Sixty five species (22.9%) were found in just one of the 27 areas surveyed with a further 26 species recorded in 26 of the 27 areas, hence 91 species (32%) were found in one or two areas. A total of 153 species (53.9%) were found in five or less of the 27 areas surveyed.

At least 264 (81%) of the 325 species (not including 23 unidentified species) recorded on the site are native to the UK. The majority of the introduced species are trees and herbaceous plants (26 and 25 species respectively).

The breeding bird survey was carried out over eight days in June/July 2003 and March-June 2004 and recorded 53 bird species of which 41 were breeding on the site. Additional species listed in the 1976 management plan brings the total up to 82 birds recorded on the site and of these 26 are classified as being of national "conservation concern". The number of breeding bird species has increased from 31 in 1976 to 41.

The survey of mosses and liverworts (bryophytes) was carried out over six days in November and December 2004 and recorded 146 species including 15 mosses and 31 liverworts. The list includes 17 notable species, including three nationally scarce liverworts, one of which had not been recorded in Lancashire (Old County) before.

Changes since the management plan was produced in 1976 and 1987 include:

- an extra 107 higher plant species being recorded on the site,
- 63 higher plant species not being found in 2003/4,
- an extra 12 birds being recorded on the site, but 28 bird species not being found in 2003/4,
- the number of birds found breeding on the site increasing from 31 to 41,
- the list of mosses and liverworts being increased from 46 to 143 and the site being regarded as being of Site of Special Scientific Interest quality for its bryophytes,
- two additional mammals recorded: mink and roe deer,
- four additional butterflies recorded: brimstone, green-veined white, orange tip and peacock, and one fish recorded: three-spined stickleback.

Further survey work is required, especially of invertebrate fauna, fish, bats, fungi and lichens, in order to produce a fully comprehensive list of the flora and fauna to be found at Healey Dell.

Healey Dell is already regarded as being of regional importance for wildlife in being a County Wildlife Site in both Lancashire and Greater Manchester. The County Wildlife Sites in Lancashire are called Biological Heritage Sites and the LNR meets the selection guidelines for habitat mosaic and birds. The County Wildlife Sites in Greater Manchester are called Sites of Biological Importance. However, following this survey Healey Dell has been found to be of national importance for its mosses and liverworts in qualifying as a Site of Special Scientific Interest.

This report identifies 20 projects that could be implemented over a number of years, including habitat management, further survey work, hedgerow planting, footpath improvements, seating, signage and entrance features, creating sculptures and other environmental artwork, providing information boards and education worksheets, producing a woodland nature &/or sculpture trail leaflet.

Potential funding sources, references and sources of further information, including websites, are also presented in this report.

2. BACKGROUND AND INTRODUCTION

In April 2003, Rochdale Metropolitan Borough Council commissioned the Wildlife Trust to carry out the following at Healey Dell LNR:

Survey of flowering plants,
Survey of mosses & liverworts,
Survey of breeding birds,
Recording additional non-avian fauna, and
Producing a report identifying changes since the management plans (1976 and 1987), making management recommendations & presenting species lists and their status.

3. RESULTS AND EVALUATION

3.1 Habitats

Healey Dell is 40 hectares in size and is situated along the steep-sided valley of the River Spodden. It is part of one of the most important clough woodlands in the area, supporting semi-natural broadleaved woodland as well as areas of young broadleaved plantation.

Other habitats include heathland and grassland, scrub woodland, former mill lodges and watercourses. The disused Rochdale to Bacup railway line runs through the site and there are numerous archaeological features present on the site.

The habitat types are described and in section 2.1 of the 1987 management plan. The status of the habitats on the site were not reassessed as part of this contract, but whilst no major changes were noted in 2003/4 from the situation described in 1987, there are bound to have been some minor changes.

Healey Dell is already regarded as being of regional importance for wildlife in being a County Wildlife Site in both Lancashire and Greater Manchester. The County Wildlife Sites in Lancashire are called Biological Heritage Sites and the LNR meets the selection guidelines for its habitats (Hm3, habitat mosaic). The County Wildlife Sites in Greater Manchester are called Sites of Biological Importance.

Boundary features are present around the perimeter of and sometimes through the site, including hedgerows and dry stone walls in various states of repair and different types fencing backing onto agricultural fields and gardens. Sections of dry stone wall and hedgerow that are no longer stock proof are referred to as defunct, whereas stock proof sections are intact.

3.2 Species

Figure 1 illustrates the number and proportion of the native species in the various groups in the world that occur in the UK and in Healey Dell LNR. It can be seen that the UK is of particular importance for fungi, lichens and bryophytes, which are often overlooked in ecological surveys (just the bryophytes being surveyed as part of this

contract and report but it is recommended that surveys of fungi and lichens are carried out). In terms of native species in the UK, Healey Dell is important for its numbers of amphibians, mammals, birds, flowering plants and bryophytes (but see * below).

Fig 1. Number of native terrestrial and freshwater species in the UK compared with recent global estimates of described species in major groups excluding bacteria, viruses and algae.

Group	World species	UK species (% of world species)		Healey Dell (% of UK species)	
Flowering plants, ferns and stoneworts	>250,000	1,580	(0.6%)	264	(16.7)
Lichens	>17,000	1,500	(8.8%)	1*	(0.06)
Bryophytes	>14,000	1,000	(7.1%)	146	(14.6)
Fungi	>70,000	15,000	(21.4%)	43*	(0.29)
Invertebrates	>1,290,000	30,500	(2.4%)	82*	(0.27)
Freshwater fish	>8,500	38	(0.4%)	0*	(0)
Amphibians	>4,000	6	(0.2%)	3*	(50)
Reptiles	>6,500	6	(0.1%)	0*	(0)
Birds	9,881	390	(3.9%)	80	(20.5)
Mammals	4,327	48	(1.1%)	15*	(31.25)

* Taken from lists in the 1976 management plan for Healey Dell (list will be incomplete for lichens, fungi, invertebrates, fish and mammals).

3.2.1 Higher plant surveys

The LNR was surveyed by John Lamb on eleven occasions, i.e. 30th September, 7th, 10th, 12th and 17th October 2003, and 20th, 21st and 28th April, 11th, 13th and 18th May 2004 and recorded a total of 284 plant species, including 152 herbaceous plants, 58 trees and shrubs, 32 grasses, 21 sedges and rushes, 16 ferns and horsetails and five aquatic plants (see appendix).

The 1976 and 1987 versions of the Healey Dell Management Plans both list species for the nature reserve with 226 and 114 species (Appendix I and 2.1.4 respectively).

The section of the LNR that lies in modern Lancashire was also surveyed on the 20th August 2002 by a surveyor employed by Lancashire County Council to review the Biological Heritage Sites (BHS which represent the County Wildlife Site System for Lancashire) in Rossendale as part of the review of the Rossendale Local Plan. The 2002 survey recorded 73 plants from compartments 1, 4, 8, 11 and 15-19 and added one species to the list of plants, i.e. the grass; marsh foxtail (*Alopecurus geniculatus*).

Hence the combined list of higher plants recorded from Healey Dell LNR stands at a very impressive 348. Comparing the species lists, 226 species (64.9%) were listed as being present in 1976 with 284 (81.6%) being recorded in 2003/4. The 2003/4 survey did not record 63 of the species from the 1976/87 reports (38 vascular plants, 13 trees and shrubs, eight sedges, two grasses, one fern and one aquatic plant). The 2003/4 survey identified 107 species not listed in the 1976/87 reports. It is possible that some species have disappeared from the LNR, however, it is inevitable that some plants

will have been missed or overlooked whilst other species may persist as viable seed in the soil ready to germinate once conditions are right or the ground is disturbed. There has been an overall increase in species diversity but many of these have either been deliberately planted, have persisted after being dumped in garden waste or have spread from gardens by themselves or have been assisted by birds or mammals.

The species list includes three notable species: chickweed willowherb which is categorized as "Vulnerable" in the Provisional Lancashire Red Data List of Vascular Plants, Northern marsh-orchid and white water lily which are both categorized as "Sensitive" in the Provisional Lancashire Red Data List of Vascular Plants. None of these species, however, were recorded in 2003/4.

In the 2003/4 surveys, ten species (3.5%) were found in all 27 areas surveyed (compartments 5 and 6 were surveyed as one), i.e. sycamore, hawthorn, ash, bramble, cock's-foot, lady-fern, broad buckler-fern, rosebay willowherb and dandelion. A further seven species were recorded in 26 of the 27 areas: beech, holly, oak, common bent, wavy bittercress, broad-leaved willowherb and nettle, hence seventeen species (6%) were found in 26 or 27 of the areas. A total of 31 species (10.9%) were found in 23 or more of the 27 areas surveyed.

In the 2003/4 surveys 65 species (22.9%) were found in just one of the 27 areas surveyed (see appendix) with a further 26 species recorded in 26 of the 27 areas, hence 91 species (32%) were found in one or two areas. A total of 153 species (53.9%) were found in five or less of the 27 areas surveyed.

At least 264 (81%) of the 325 species (not including the 23 unidentified species) are native to the UK. The majority of the introduced species are trees and herbaceous plants (26 and 25 species respectively). Note that some of the native species to the UK are not considered locally indigenous to Lancashire and are known to have been planted at some stage in the past, i.e. hornbeam, beech, whitebeam and welsh poppy.

Seventy one species of trees and shrubs were found on the site, see appendix 2, half of which can be regarded as canopy-forming woodland tree species and the others shrub or hedge species. At least 26 species of tree/shrub are not native to the UK and have been introduced in the past (see status in appendix).

The native species of trees and shrubs, in particular oak and willows, support many more species of insects than introduced trees, see fig 2., as the insects tend not to be introduced with the trees and are adapted to survive in different climates than the UK.

The Postcode Plants Database (http://www.nhm.ac.uk/science/projects/fff) can be used to determine which of the species are Locally Native to the Postcode Area OL12. However, the list of trees needs to be treated with caution as several species listed are known to have been introduced from southeast England to the northwest, e.g. beech and hornbeam.

The creeping and spear thistle (but not the marsh thistle), common ragwort (but not the marsh ragwort), curled and broad-leaved docks are notifiable weeds under the Weeds Act 1956 that should be prevented from seeding onto agricultural land.

Common ragwort is poisonous to livestock, in particular horses, especially when dry such as in bales of hay but it is an excellent nectar source for insects and the foodplant of the cinnabar and burnet moths.

The majority of the notifiable weeds are excellent sources of nectar for a range of invertebrates and many of the seeds are eaten by birds. The hollow stems are also used as hibernation/over-wintering sites by invertebrates. Hence a balance is required in respect of controlling the risk of them seeding onto agricultural land and their value for wildlife. Note: the Weeds Act does not include marsh thistle or marsh ragwort.

Figure 2. Numbers of insect and mite species associated with trees and shrubs (after Kennedy and Southwood 1986).

Tree/shrub	Scientific name	No. of associated species
Willows	Salix (5 species)	450
Oak	Quercus robur & petraea	423
Birch	Betula (2 species)	334
Hawthorn	Crataegus monogyna	209
Poplars	Populus (4 species)	189
Scots Pine	Pinus sylvestris	172
Sloe	Prunus spinosa	153
Alder	Alnus glutinosa	141
Elms	Ulmus (2 species)	124
Crab apple	Malus sylvestris	118
Hazel	Corylus avellana	106
Beech	Fagus sylvatica	98
Norway Spruce*	Picea abies	70
Ash	Fraxinus excelsior	68
Mountain ash	Sorbus aucuparia	58
Lime	Tilia (2 species)	57
Hornbeam	Carpinus betulus	51
Field maple	Acer campestre	51
Sycamore*	Acer pseudoplatanus	43
European larch*	Larix decidua	38
Juniper	Juniperus communis	32
Sweet chestnut*	Castanea sativa	11
Holly	Ilex aquifolium	10
Horse chestnut*	Aesculus hippocastanum	9
Walnut*	Juglans regia	7
Yew*	Taxus baccata	6
Holm oak*	Quercus ilex	5
False acacia*	Robinia pseudoacacia	2

Note: * = Non-native trees to the UK. Some native species such as mountain ash and holly, do not have a high insect count but they are valuable in providing berries for birds and in the case of the holly being a foodplant for the holly blue butterfly.

3.2.2 Bryophytes (mosses and liverworts) surveys

Healey Dell Local Nature Reserve was surveyed by Dr Martha Newton on six occasions, i.e. the 25th, 29th and 30th November and 2nd, 3rd and 6th December 2004. The reserve was found to be an area of considerable bryological interest. With reference to the recommendations of the Joint Nature Conservation Committee (Hodgetts 1992) for the selection of Sites of Special Scientific Interest (SSSI) Healey Dell scores 195 points.

In a part of Britain where a total score of 200 would qualify a site for consideration as an SSSI in terms of its bryophytes alone, Healey Dell is clearly a highly ranked site. The JNCC recommendations are, however, in need of updating in the light of continuing field work, e.g. there is a strong case to be made for the inclusion of *Metzgeria fruticulosa* in the list of scoring species, in which case the score for the LNR would increase to 200 points.

The nationally scarce liverwort *Colura calyptrifolia*, for which this is the first record in Lancashire, is an exceedingly rare species in England as a whole. Other records are confined to only 13 10km grid-squares in England. Four are in the Lake District, five in Cornwall, and one each in Devon, Somerset, Monmouthshire, and Mid-west Yorkshire.

Healey Dell is already regarded as being of regional importance for wildlife in being a County Wildlife Site in both Lancashire and Greater Manchester. The County Wildlife Sites in Lancashire are called Biological Heritage Sites and the LNR meets the selection guidelines for habitat mosaic and birds. The County Wildlife Sites in Greater Manchester are called Sites of Biological Importance. However, following this survey Healey Dell appears to be of national importance for its mosses and liverworts in qualifying as a Site of Special Scientific Interest. Whilst it is not a priority for the government to designate all the land that qualifiers as SSSI, the importance of the site should be recognised by the LNR meeting the BHS selection guidelines for bryophytes (Br2 for the nationally scarce species and Br4 for *Cryphaea heteromalla, Orthotrichum lyellii, Polytrichum longisetum, Blasia pusilla* and *Metzgeria fruticulosa* and Br5 for its assemblage of sub-Atlantic species).

3.2.3 Bird surveys

Healey Dell was surveyed by Malcolm Hutton on seven occasions, i.e. the 22nd June, 4th July and 30th July 2003 and 30th March, 11th May, 2nd June and 16th June 2004. The surveys aimed to determine the species of bird that were breeding on the site.

The report by Birdlife International *Birds of conservation concern: 2002-2007* splits the native UK bird population into three lists, red, amber and green. The Red List contains 40 species that are of high conservation concern, i.e. whose population or range is rapidly declining, recently or historically, and those of global conservation concern. The Amber List contains 121 species that are of medium conservation concern, i.e. whose population is in moderate decline, rare breeders, internationally important and localised species, and those of unfavourable conservation status in Europe. All other regularly occurring species are on the green list (86 out of the total 247 species).

Fifty three species of bird were recorded in the nature reserve in 2003/4, see separate report, of which 41 are breeding species and of these 12 are birds of national conservation concern. Five of the species (song thrush. starling, house sparrow, bullfinch and reed bunting) are on the RED list and are of high conservation concern, and seven species (lapwing, stock dove, green woodpecker, grey wagtail, dunnock, mistle thrush and willow warbler) are on the Amber list, and are of medium conservation concern. The other bird species are on the green list.

The 1976 management plan for Healey Dell lists 70 species of bird of which 31 were recorded as breeding (nesting), 24 with occasional records, 10 frequently observed, two common winter visitors (fieldfare and redwing), one occasional winter visitor (waxwing) and two only recorded once (dabchick and long-tailed tit). Twelve birds were recorded in 2003/4, which are not on the 1976 list (10 of which were breeding: Canada goose, grey heron, sparrowhawk, stock dove, green woodpecker, dipper, dunnock, garden warbler, wood warbler and nuthatch, with two on adjacent land: ruddy shelduck and pheasant). Twenty eight birds on are the 1976 list but were not recorded in 2003/4, hence the total number of birds recorded on the site is 82.

Of the 28 bird species not recorded in 2003/4, four are on the Red List (skylark, spotted flycatcher, tree sparrow and twite), fourteen are on the Amber List (snipe, curlew, redshank, lesser black-backed gull, herring gull, cuckoo, barn owl, fieldfare, redwing, hedge sparrow, yellow wagtail, redstart, woodcock and goldcrest) with nine on the Green List and one introduced species (little owl).

Healey Dell is already regarded as being of regional importance for wildlife in being a County Wildlife Site in both Lancashire and Greater Manchester. The County Wildlife Sites in Lancashire are called Biological Heritage Sites and the LNR meets the selection guidelines for birds (Av8). The County Wildlife Sites in Greater Manchester are called Sites of Biological Importance.

3.4 Other fauna

The following non-avian fauna were noted by or reported to John Lamb during the course of the botanical surveys:

Common name	Scientific name	Date(s) seen	Compartments (where relevant)	Species group
Badger	Meles meles	18/05/04	12, 26 & 27	Mammal
Brimstone*	Gonepteryx rhamni	31/03/04		Butterfly
Roe deer	Capreolus capreolus	18/05/04	26 & 27	Mammal
Frog	Rana temporaria	20/04/04 21/04/04	2 7	Amphibian
Green-veined white	Artogeia napi	11/05/04	16	Butterfly
Grey squirrel	Sciurus carolinensis	12/10/03 18/05/04	19-23 26 & 27	Mammal
American mink	Mustela vison	07/10/03	River along 6 & 7	Mammal
Orange tip	Anthocharis cardamines	11/05/04	16	Butterfly

Peacock	Inachis io	20/04/04 11/05/04	4 16	Butterfly
Small tortoiseshell	Aglais urticae	20/04/04	1 & 2	Butterfly
Three-spined stickleback	Gasterosteus aculeatus	20/04/04	1 & 2	Fish

* reported to John Lamb by a local resident.

The 1976 management plan lists 15 mammals, three amphibians and 81 invertebrates. Of these the badger is afforded protection under the provisions of the Badger Act 1973 and was found in the LNR in 2003/4. Places used by the water vole are afforded special protection under the CROW Act 2000 but this species was not observed in 2003/4.

A few moths were disturbed during the 2003/4 survey but were not caught for identification. The number of moths on the site will exceed the number of butterfly species.

Measures can be taken to make the site more attractive both for nectar-feeding butterflies and moths but also as a breeding ground by providing the food plants on which they lay their eggs and that the caterpillars eat, see fig 3. The brown butterflies use grass species, which are abundant on the site, the orange tip and green veined white use cuckooflower, hedge garlic and hedge mustard. The red admiral, peacock and small tortoiseshell butterflies lay their eggs on nettles and the caterpillars eat the leaves hence any existing nettle beds should be retained.

Moths are attracted to plants that produce their nectar at night (because they are pollinated by night-flying insects) such as night-scented stocks, honeysuckle and evening primrose, although only honeysuckle was recorded on the site.

Other invertebrates that will undoubtedly occur at Healey Dell including hoverflies, flies, bees, spiders, crane flies, beetles, wasps, dragonflies and damselflies (which often feed well away from ponds), weevils, slugs, snails and grasshoppers etc. In common with most if not all sites if the invertebrates were surveyed in detail then the number of species would exceed that of any other species group.

Identification keys are available through the Field Studies Council and others to help schools and other groups identify the butterflies. Such a key could be included in an education pack if one was prepared for the site.

The waterbodies provides the opportunity for a number of studies including “pond” dipping in the water. Identification keys are available through the Field Studies Council and others to help schools and other groups identify the various minibeasts found in ponds and streams. Such a key could be included in an education pack if one was prepared for the site.

4. MANAGEMENT SUGGESTIONS

4.1 Habitats

Making decisions on how best to manage areas of land for nature conservation can often be difficult and involve considering several options. Inevitably whichever management regime is implemented, it will benefit some groups or species of flora and fauna but be detrimental to others at the same time. In the absence of detailed knowledge and information on all species groups from mammals, birds, fish, invertebrates, amphibians and reptiles to vascular and non-vascular plants general management principles can be applied for which there are numerous publications available. However, as surveys are carried out and the knowledge of species diversity and their status built up then habitat management is often tailored, where appropriate and practical, to benefit particular groups or notable species of animal or plant, e.g. the Red List bird species or the nationally scarce liverworts see 4.2.1 below).

For many species it is the structure of the habitat that is the most important and not necessarily the species composition, hence management should consider the structure as well as the species within the habitat.

The semi-natural woodland areas should be managed carefully to avoid changing light and humidity levels drastically over a short timescale, yet accepting change caused by natural events such as strong winds. However, windblow (trees blowing over or stems and branches snapping) would be an important issue on safety grounds in many areas within the Local Nature Reserve.

Woodland management could include light canopy thinning, clearance around specimen trees, creation of habitat piles, erection of bird nesting boxes, bat roosting boxes, control &/or removal of introduced species.

It is important for old and over-mature trees to be retained, where safe to do so, both as standing dead or dying specimens and as fallen trees. In a natural woodland up to 50% of the timber biomass can be dead, dying or in the various stages of decay and is vital to the survival of many species of birds, invertebrates and lower plants, i.e. fungi, lichens, algae, mosses and liverworts. Up to 50% of the species in a natural woodland are associated with dead or decaying wood. Whilst much of the woodland in the nature reserve is not natural, the woodland areas are still subject to many of the natural processes and these should be worked with, not against, where possible and practical. Care needs to be taken not to open up the canopy too much in one go or over a short time period as this can increase the chance and intensity of

In the young plantation areas the planting of native understorey shrubs and native woodland flora could also be considered.

It is also important to retain the open areas and edge habitats within blocks of otherwise continuous or dense woodland, but these are habitats within their own right, be they grassland, heathland, tall ruderal, marsh or aquatic vegetation and managed accordingly.

Woodland management also provides the opportunity to create woodland sculptures and the nature reserve is ideal for the creation of a sculpture trail linking a number of tree sculptures and other environmental art sculptures. Tree sculptures can be used to increase the awareness of the presence of birds and other animals that occur in the nature reserve, or spiritual carvings such as the tree of life, green man etc.

Sections of native mixed species hedgerow could be planted in selected areas, especially where this would provide corridors and connect areas of woodland together, but not at the expense of isolating or damaging other habitats.

Heathland is normally managed by burning and/or grazing but cutting is also an option. Grazing is not practical at Healey Dell because of the lack of grazing units enclosed by fencing, access issues, finding a sympathetic grazier and the numbers of people and dogs. Cutting, however, is an option. The burning of entire areas is not recommended and areas of wet heath (supporting cross-leaved heath and cottongrass) should be burnt with care if at all. It was noted that areas of heathland in compartment 3 had been burnt and this can be repeated with small areas burnt in rotation to produce a mosaic of ages of heathland vegetation.

Glades and rides, including path edges such as along the disused railway, should be managed in order to allow the plants of interest to flower and set seed, the “meadow” areas being managed by a late cut with the cuttings removed.

The areas of tall ruderal vegetation, dominated by perennial species such as nettles, thistles and willowherb, do not appear to be managed at Healey Dell and in many cases they can be left unmanaged, although butterflies prefer to lay their eggs on young nettles hence a proportion of the nettle beds can be cut down in April/May so that the regrowth is ideal for egg-laying (see figure 3).

Areas of bare ground are present along the paths and in shaded areas beneath some of the trees where only sparse vegetation persists. Bare ground can be important not only in providing opportunities for seeds to germinate but may also be used by invertebrates such as solitary bees and wasps.

4.2 Species

4.2.1 Plants

In terms of managing Healey Dell for vascular plants, the main emphasis should focus on controlling the invasive non-native species, in particular Japanese knotweed as well as preventing other species from becoming a problem, e.g. rhododendron. In certain areas it may be appropriate to reduce the proportion of non-native trees and shrubs but this should be done with care.

Healey Dell owes its bryophyte interest, not only to general diversity of habitat, but also to the presence of well represented areas of oceanic microhabitat. Topography plays a vital part in maintaining those features, but so too does tree canopy, some of which is not composed of native species. Inappropriate felling of selected species could have seriously deleterious consequences for, in particular, the nationally scarce

liverwort *Colura calyptrifolia*, which requires the maintenance of high humidity irrespective of the tree species which contribute to that effect.

C. calyptrifolia, for which this is the first record in Lancashire, is an exceedingly rare species in England as a whole. Other records are confined to only 13 10km grid-squares in England. Four are in the Lake District, five in Cornwall, and one each in Devon, Somerset, Monmouthshire, and Mid-west Yorkshire.

4.2.2 Birds

Where resources allow it is strongly advised that records of the following species are kept: kingfisher (all year), stock dove (March-June), green woodpecker (all year), grey wagtail (all year), dipper (all year), song thrush (all singing birds/territories), nuthatch (all year), bullfinch (all year) and reed bunting (all year). Hopefully this could be expanded in some years to include breeding willow warbler and mistle thrush.

It is recommended that year round bird feeding stations are provided close to the Centre and elsewhere on the site. This will encourage interaction between the public and the site's birdlife and provide a valuable seasonal resource for Red List species: starling, house sparrow, bullfinch and reed bunting, as well as many other species.

The erection of nest boxes should also be considered. The main beneficiaries of these would be blue tit and great tit. Although neither of these species is officially "of concern" presently, their reliance on insects during the nestling stage means that their eventual productivity can give a reasonable indication as to the success of other insect feeding breeders. However such an undertaking would require considerable monitoring and maintenance effort and the services of an A-licensed bird ringer to check the boxes and to monitor winter recruitment and survival as part of the package. Given the good population of great spotted woodpecker in the nature reserve the boxes would also require the addition of protective guards around the holes.

Similarly the best way to monitor tawny owls in woodlands is through the use of boxes. Again, the ringing group would need to be involved to check the boxes. On the Visitor Centre itself the positioning of sparrow and tit boxes could be considered.

Regarding habitat management there is nothing besides reasonable good practice that needs to be recommended. The open scrubby habitats need to remain that way for the benefit of the green woodpeckers, redpolls and neighbouring lapwings; the woodland edges should remain important in their own right for bullfinches and the wetter areas need to be kept pollution free and remain open (where they are presently), if they are to host the specialists: reed bunting, dipper, grey wagtail and possibly kingfisher.

For the additional 28 species of national conservation concern listed in the 1976 management plan that weren't recorded in 2003/4, further consideration needs to be given to their presence and status on the site. This includes four Red List species (skylark, spotted flycatcher, tree sparrow and twite) and 14 Amber List species:

> Snipe, curlew, redshank, lesser black-backed gull, herring gull, cuckoo, barn owl, fieldfare, redwing, hedge sparrow, yellow wagtail, redstart, woodcock and goldcrest.

It may be possible to manage the site to benefit these species and this should be considered where it would be practical and not be at the expense of other notable flora or fauna. Such management could include positioning suitable nest boxes, providing suitable bird food, changing the dates or intensity of management of open areas of grassland or heathland, controlling access to limit disturbance from the public during sensitive periods. Specialist advice should be sought in this respect.

4.2.3 Invertebrates

For breeding butterfly colonies to become established it is important to provide the relevant food plant(s), i.e. the species that the adult lays her eggs on and that the caterpillars eat, see fig 3. The brown butterflies and skippers use grasses which are abundant on the site, the orange tip and green veined white use cuckooflower, hedge garlic and hedge mustard, and the common blue uses legumes, in particular bird's-foot-trefoil. The red admiral, peacock and small tortoiseshell butterflies lay their eggs on nettles and the caterpillars eat the leaves hence existing nettle beds should be kept.

Figure 3. Butterflies of East Lancashire and their foodplants:

Butterfly	Plants on which the adult female lays her eggs
Brimstone	buckthorn and alder buckthorn trees
Comma	nettles
Common blue	bird's-foot-trefoil
Gatekeeper	grasses, mainly bents and fescues
Green-veined white	wild crucifers
Holly blue	holly in spring and ivy in summer
Large skipper	grasses
Large white	Crucifers, especially Brassicas
Meadow brown	grasses; bents, fescues and Poa's
Orange tip	cuckooflower and garlic mustard
Painted lady	thistles, mallows and nettles
Peacock	nettles
Red admiral	nettles
Small copper	common and sheep's sorrel
Small heath	grasses; bents, fescues and Poa's
Small skipper	grasses, mainly Yorkshire fog
Small tortoiseshell	nettles
Small white	Crucifers, especially Brassicas
Speckled wood	grasses; cock's-foot and Yorkshire fog
Wall	grasses; cock's-foot and Yorkshire fog

5. OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT

5.1 Project identification

A number of possible projects can be identified, including management suggestions or modifications, enhancements to benefit wildlife, improvements that could include local schools and/or community groups and opportunities for environmental education and interpretation. Some 20 projects are listed below (see also 5.2):

1. Manage the woodland areas (see 7, 8, 9, 10 and 11),
2. Survey or commission surveys of lichens, fungi, invertebrate groups, bats and fish,
3. Manage existing hedges and plant new mixed native species hedgerows along selected boundaries,
4. Manage wildflower glades and rides cutting the grass and removing it as a late “hay” crop.
5. Manage heathland areas by burning or cutting in rotational blocks on a 15-20 year cycle with intervening scrub control,
6. Manage waterbodies to enhance wildlife interest whilst maintaining recreational access,
7. Create habitat piles in the more inaccessible areas (linked to 1),
8. Make and position bird nesting and bat roosting boxes,
9. Make and position bird feeding stations,
10. Control invasive non-native species in specified areas,
11. Design and commission wood sculptures from selected tree trunks,
12. Commission other environmental art projects,
13. Create a sculpture trail route with sign/direction posts,
14. Create a nature trail route with sign/direction posts,
15. Produce a sculpture/nature trail leaflet(s),
16. Enhance pathways, where practical so that they are suitable for people with disabilities,
17. Provide benches or other seating, these could be works of art in themselves,
18. Produce interpretation boards,
19. Prepare education worksheets in consultation with local schools.
20. Monitor the populations of notable species of flora and fauna.

Issues of Health & Safety, the need for Risk Assessments and the provisions of the Disability Discrimination Act 1995 need to be addressed.

5.2 Environmental education and interpretation

In order for local residents, other regular users of the nature reserve and casual visitors to understand and appreciate the various works that are proposed, some form of onsite interpretation is required. However, a static board can only provide limited information whereas a self-guided trail leaflet or booklet can contain more details or descriptive text and illustrations.

There would be a need for interpretation of the following areas of work:

- woodland management
- tree sculptures
- ponds and wetland features
- heathland and grassland management

In many respects the nature reserve can be seen as an outdoor classroom, providing a vast diversity of potential subject matter that could be utilised and studied by local schools and college groups. It would also be possible for undergraduates or even postgraduates to carry out a project or thesis on the site.

Opportunities include:

- geology and geomorphology,
- soils types and their formation,
- local history and place names
- trees and woodlands, tree planting,
- habitat types,
- habitat creation,
- pond dipping and aquatic ecology,
- survey techniques,
- life cycles; higher and lower plants, birds, mammal and invertebrate studies,
- plant and animal names,
- origins of introduced species,
- seed collection, germination and dispersal,
- predator/prey relationships,
- habitat management and succession,
- death and decay processes,
- the water cycle,
- sculptures and environmental art,
- photography and fixed point photography,
- visitor surveys,
- bird/bat box design, construction and monitoring,
- design of interpretation and education literature etc.

5.3 Potential grant sources

A number of grants exist that will fund or contribute to the creation (by natural regeneration and/or planting) and/or the management of woodland and open spaces, which can comprise a variety of habitat types.

The principal woodland management grant is the nationally available Woodland Improvement Grant (WIG) operated by the Forestry Commission. A new grant scheme is due to be launched in England in the summer of 2005.

A variety of Lottery funding is available through the Big Lottery.

Landfill Tax Credit Schemes, in particular the Lancashire Waste Service's Lancashire Environmental Fund (LEF) that operates two level of funding; up to £7,500 and more than £7,500. LEF is administered by the Wildlife Trust at its HQ in Bamber Bridge. It may also be possible to apply for other landfill tax credit schemes, e.g. Biffaward and those operated by local companies in Rossendale and Rochdale.

A number of other environmental partnerships have also secured funding and are able to offer project grants, in particular ELWOOD (an East Lancashire Woodland Project administered by Groundwork East Lancashire and based at the East Lancashire Voluntary Sector Resource Centre in Burnley.) offers funding towards woodland management and creation, including hedgerow planting, fencing, access works, wildlife enhancements and environmental education.

Mid Pennine Arts, based in Burnley, has set up an East Lancashire Environmental Arts Network (ELEAN) and through its LAND programme can offer advice, support and funding for community projects involving the arts (sculptures, poetry, artwork, photography, sound recording, historical research, theatre and performances etc.)

In being a member of The Wildlife Trusts, the Wildlife Trust for Lancashire, Manchester and North Merseyside is able to apply to a number of funding schemes that have been secured through and are administered by the national organisation. These schemes may be available annually or can be one-off grant awards.

The charity Pond Conservation has secured funding for a Ponds for People project which offers advice and funding towards survey and management of existing ponds or for the creation of new ponds. A Northwest Community Ponds Officer is based at English Nature's offices in Wigan.

Other partner organisations such as Groundwork Rossendale (based in Rawtenstall) and the British Trust for Conservation Volunteers (based in Preston and Rochdale) can also access a variety of funding sources and can organise practical works on the ground.

In Lancashire the County Council's Local Environmental Action Fund (LEAF) that funds small projects normally up to £500 but larger applications will be considered. A similar scheme may operate in Greater Manchester.

In addition a number of charitable trusts operate project grants schemes and details for many of these can be accessed through the Funderfinder CD, copies of which are held by Groundwork, CVS and many borough councils.

Local businesses and industrial companies may contribute funding towards project work, especially in the local area, or may offer in-kind contributions such as design work, printed materials or even some staff time towards physical works on site. This could potentially take the form of a staff team-building exercise.

Many of the smaller-scale practical works could be carried out by local residents and other volunteers under supervision from Rochdale Borough Council. Volunteer time should be accounted for as it carries a significant value and counts as match funding

for many funding bodies. Some of the larger projects could be carried out by New Deal Teams.

The Friends of the LNR could organise their own fundraising events or activities and raise their own funds to implement specific projects. Examples could include bring and buy sales, garden open days/plant sales, sponsored events, guided walks/lectures, competitions, concerts etc.

5.3 Contacts and sources of further information

Organisation	Phone	email/website
British Trust for Conservation Volunteers (BTCV)	01772 257092	lancashire@btcv.org.uk
East Lancashire Partnership (ELP)	01254 300463	www.elp.org.uk
ELWOOD	01282 430433	
Forestry Commission	01768 776616	www.forestry.gov.uk
Groundwork Rossendale	01706 211421	www.groundwork.org.uk
Lancashire County Council	01772 534468	www.lancashire.gov.uk
Lancashire Environmental Fund	01772 317249	www.lancsenvfund.org.uk
Lancashire Wildlife Trust	01772 324129	www.wildlifetrust.org.uk/lancashire
Mid Pennine Arts	01282 421986	www.midpennineartsorg.uk
Ponds for People project	01942 614013	www.pondstrust.org.uk

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