



Habitat Restoration Project Sherwood Forest

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**Habitat Restoration Project:
Sherwood Forest**

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Preface

This report summarises the work of the Habitat Restoration Project in Nottinghamshire from 1997 to 2000 - the *Sherwood Forest Project*. The comments made and conclusions reached are based on the actual experience of the Project but would not necessarily be repeated in other places during other time frames. Common themes and contrasting approaches across the four Forest trial areas will be established when comparisons are made between the *Sherwood Forest Project* and the other project areas. Consequently the views expressed here are not necessarily those of English Nature but will make a useful contribution to developing that view.

Rachel Thomas

April 2000

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Gordon Hewston
Catherine Scott

April 2000

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Executive summary

In April 1996, English Nature initiated the Habitat Restoration Project to trial methods of creating new habitats and ensure that the management of our countryside takes greater account of its effects on wild plants and animals. One of four trial projects was located in the Dukeries area of historic Sherwood Forest, Nottinghamshire, and managed by the Sherwood Forest Trust.

The Sherwood trial area comprises a series of ownership types, including: commercial leisure and mineral industries, farmers, the Forestry Commission, local authorities, Ministry of Defence, private estates and voluntary conservation bodies. Land uses include: agriculture, industrial after-use, leisure, military, multi-purpose forestry and private forestry.

The project was delivered by a Project Officer, employed by the Sherwood Forest Trust with guidance from a steering group consisting of landowners, government agencies, voluntary organisations and local authorities. Strong existing partnerships already existed and several organisations were active in the trial area, including the Nottinghamshire Heathland Forum.

A vision map was developed to identify the priority habitats for each land parcel and to develop targets based on the national Biodiversity Action Plan (BAP) targets.

In total, 197 ha of habitats were restored, and 277 ha were created in the trial area. All targets for restoration were met and exceeded with the exception of broadleaved woodland and wetlands. All creation targets were met and exceeded with over five times the heathland creation target achieved. Work in biodiversity 'hotspots' elsewhere in the Natural Area yielded an additional 131 ha of restoration and 112 ha of creation.

The proportional area of priority habitat in the trial area was increased from 26% to 28% over the lifetime of the project. The proportion of the trial area covered by heathland and acid grassland increased from 4% to 6%, with corresponding increases in the number of habitat parcels. While mean patch sizes remained fairly constant, there was a shift in the distribution of heathland parcel sizes, which tended to become larger. The impact on wildlife populations of these changes will be measured through a ten year monitoring programme.

By far the largest contribution to habitat area work (heathland woodland and wetland) was made on land used for leisure. A good fit with business aims was found in the leisure sector once cultural constraints were broken down. The amount of habitat work carried out by commercial (leisure and minerals) managers was greater than any other management type while the contribution of private estates, the Forestry Commission and voluntary conservation organisations was also significant. Work in the agricultural sector was biased heavily towards linear habitats (field margins and hedgerows). The relatively low activity in this sector is a reflection of the number and intensity of constraints experienced.

A number of different constraints were identified, including: cultural constraints, lack of technical knowledge and confidence, practical constraints, confusion over the diversity of funding schemes and sources of advice, lack of reversibility, and funding constraints. Each of these constraints were found to impact on individual landowners to a different extent, resulting in a unique 'constraints mix'.

Various methods of reducing the impact of these constraints were developed, while ongoing relationship building was vital in identifying relevant constraints for each holding and targeting activity and promotion.

2. Key lessons derived from the trial

2.1 Evaluation

This chapter comprises a summary evaluation of the project brief, delivery and outputs and sets out learning points for use in the delivery of BAP targets locally and nationally.

2.1.1 Overall objectives

The project was successful in meeting nine of the 12 habitat restoration and creation targets set and exceeded most of these. The proportional area of priority habitat in the trial area was increased from 26% to 28% over the lifetime of the project. The proportion of the trial area covered by heathland and acid grassland increased from 4% to 6%, with corresponding increases in the number of habitat parcels. The project was successful in meeting and exceeding national BAP targets for Sherwood. The impact of the changes in the fragmentation of habitats will be measured over the ten year monitoring programme.

2.1.2 Host organisation

The Sherwood Forest Trust provided an ideal structure for project delivery. The board members are drawn from landowners and partnership organisations with excellent contacts amongst other key land managers and partners. The Trust has a good image with landowners and retains its 'neutrality' through a non-intervention policy in planning issues. The Trust provided a strong existing partnership to work through from the start of project delivery.

2.1.3 Steering group

The steering group provided valuable input in the first phase of the project helping to introduce the Project Officer to the issues, partners and key landowners. The group continued to provide useful guidance throughout the project, particularly over the production of the vision map and report. The steering group met quarterly for the first year and every six months thereafter.

2.1.4 Vision

The production of the vision and the vision map was a useful exercise in setting priorities for the project. It was also welcomed by other advisory organisations in helping to prioritise habitats in any particular area. The map laid out priorities for the whole trial area, helping to show each landowner the rationale for the project. The fact that priorities were identified for every holding helped to reduce any sense of "victimisation" felt by individual land managers.

2.1.5 Targets

The targets were set using national BAP targets for the Natural Area provided by English Nature. These were extrapolated for the trial area then adjusted upward to better reflect the more ambitious Sherwood Forest Trust targets. The project outcomes far exceeded these targets, suggesting that national BAP targets for Sherwood could be far more ambitious.

2.1.6 Management types within the trial area

The contribution made by commercial leisure and industry companies, private estates and the Forestry Commission was significant. Contributions were also made by farmers, local authorities and voluntary conservation organisations (VCOs) but the relatively large area of influence of commercial companies, private estates and the Forestry Commission has played a significant part in the project's success. The Forestry Commission's role is particularly notable considering its inability to access funding from the Countryside Stewardship Scheme or woodland grants.

2.1.7 Land uses within the trial area

The highly significant contribution made by the leisure sector is notable. This is largely due to the close fit of wildlife management and leisure aims and can reasonably be expected to be reproduced elsewhere in the lowlands of England. The potential for habitat creation on land used for leisure is significant, especially on new golf courses. The lack of advisors dedicated to the leisure sector as a whole and golf courses in particular is surprising given the huge opportunities presented.

The potential for habitat creation through industrial after-use is large and well recognised. The role of development control is vital to this process. Multi-purpose forestry also provides significant opportunities for habitat creation. The outcomes of this trial show that private forestry and agriculture are subject to greater constraints in contributing to BAP targets.

2.1.8 Use of constraints mix approach

Perceived constraints to habitat restoration include: cultural constraints, lack of technical knowledge practical constraints, confusion over the diversity and applicability of funding schemes and sources of advice, lack of reversibility and lack of financial incentive. The major constraints and importance of each (the 'constraints mix') differed widely between individual managers. The recognition of this led to the development of a range of methods to reduce constraints, tailored to meet the needs of each land manager.

The use of the constraints mix approach assisted the process of relationship building, prioritising and targeting visits, targeting promotion and ultimately developing the range of tools used to enable habitat restoration works. While an analysis of the constraints mix, management type and land use would draw some very broad conclusions, the value of this approach was that it recognises that each land manager, from whatever sector faced a different suite of constraints of varying magnitude. It is only through relationship building that these constraints can be identified and gradually removed.

2.1.9 Removing cultural constraints

The structure of the Sherwood Forest Trust proved to be valuable in reducing cultural constraints. As a new partnership body with strong landowner representation, the Trust was largely seen as positive or at least neutral in its relationships with landowners. Its policy of non-involvement in the planning process was useful in maintaining this 'neutrality'.

Relationship building and targeted, small-scale demonstration events were useful tools but there was no substitute for winning the support of opinion leaders within land use sectors. These methods are also useful in improving confidence in grant schemes and habitat restoration techniques.

2.1.10 Improving technical knowledge and confidence

Demonstration events were used extensively and were found to be most effective when targeted at specific land uses, and similar land management types. One-to-one visits were also invaluable but were resource intensive.

‘Start up’ grants for introductory habitat restoration schemes proved useful although they were relatively time consuming to manage when compared to the Countryside Stewardship Scheme (CSS). However, of the 15 holdings receiving this support, 12 carried out further habitat work during the lifetime of the project. Five of these holdings later entered into Countryside Stewardship with two further holdings likely to enter in 2000 and one likely to apply for Woodland Grant Scheme (WGS). The ‘start up’ grants are an excellent tool in establishing and cementing relationships. Part of their value was that individual schemes can be negotiated by the Project Officer, reducing the level of bureaucracy and allowing more meaningful contact with land managers.

2.1.11 Removing practical and financial constraints

The methods of practical and funding support in addition to CSS and WGS proved successful in reducing the range of constraints. The small amount of habitat work done with purely advisory and CSS or WGS support (about 10%) gives an indication of the impact of the lack of technical knowledge, confidence, practical and funding constraints on landowners, with regard to non-linear habitats. Conversely, 88% of the linear habitat work was done without any additional support, indicating that these constraints have a far lower impact for these habitats.

The Countryside Stewardship Scheme has proven to be very useful in delivering a range of habitat targets across a range of land use sectors. However, a notable exception to this is the lack of non-linear habitat creation on agricultural land. This reflects the impact of constraints on farmers, including the greater incentives for agricultural production currently available.

While financial constraints impact on landowners of all sectors, they are felt most by the agricultural industry, where habitat restoration on a large scale requires removal of land from commercial production. This constraint appears to be of little impact for industrial after-use and some elements of the leisure sector.

£102,000 of additional funds for habitat restoration works were raised by the project. Sources were: landfill tax, other charitable bodies, public donations and corporate sponsorship.

One funding constraint that could be resolved relatively easily was the lack of recognition under the Countryside Stewardship Scheme for the extra value of hedgerow trees in an area like Sherwood, where veteran trees are internationally important. The project was relatively unsuccessful in planting new hedgerow trees which could provide the next generation of veterans.

2.1.12 Confusion over ELMS and advisory services

This constraint was reduced through: integrated promotional literature; development of a networking group for advisors; jointly held demonstration events and projects. Communication between advisors has been improved and further developments are ongoing.

2.1.13 Lack of reversibility in habitat restoration

This was a major constraint for the agricultural industry where CAP reform and evolving ELMS, create an environment that rewards flexible land management. No effective means of removing this constraint were developed during the project.

2.1.14 Targeting effort

The process of targeting effort was greatly aided by the analysis of the likelihood of land managers undertaking habitat restoration (see para 5.3.2). This project targeted Group 2 managers consisting of land managers with a low level of awareness, knowledge and experience of ELMS, habitat restoration and advisory services; a latent or unformed interest in wildlife, countryside sport or habitats; or a good fit between core business aims and habitat restoration. The Project officer worked with them on 'start up' schemes and ELMS until knowledge and experience was developed. At this point, contact was handed to paid advisors, enabling succession.

This approach is attractive in that it allows the Project Officer to continually develop new schemes and contacts with landowners. It was successful with the agricultural sector, mainly because both ADAS and FWAG have well-regarded advisors active in the county. However, it was less effective when dealing with the leisure sector as there was no such high profile sources of advice specifically available. In practice, a number of projects undertaken by the leisure sector are still reliant on the project for advice and ongoing support.

2.2 Local succession

The Habitat Restoration Project has been welcomed in Sherwood and has a close fit with the aims of the Sherwood Forest Trust and partnership. Methods of working developed through the Project will be continued by an expanded project on a Natural Area scale, but focused on areas identified for their combined existing biodiversity and opportunity. These areas have been identified through the Nottinghamshire Heathland Re-creation Plan (Nottinghamshire County Council, 1997), national BAP targets and local BAP targets. The project will:

- Be delivered by a Project Officer employed by the strong partnership of the Sherwood Forest Trust.
- Target Group 2 managers, and refer Group 1 managers to paid advisors.
- Continue to develop joint working with other advisors and promote their services in the target areas.
- Use the constraints mix approach to help prioritise work and target promotion.

- Emphasise relationship building with land managers.
- Focus on training land managers through events.
- Continue to operate small ‘start up’ grants.
- Continue to provide practical support.
- Work with all sectors, particularly leisure.

The Sherwood Forest Trust will also seek to deliver habitat creation through large scale projects delivered through partnerships with public, private and voluntary sector landowners.

2.3 Implications for delivery of BAP targets

The project identified the following implications for the delivery of BAP targets.

- All land management types should be involved, especially; private estates, commercial industry and leisure, the Forestry Commission and local authorities.
- Effort should be targeted at all land uses, especially industrial after use and leisure.
- Current ELMS funding has proven sufficient in Sherwood, other than for the agricultural sector, to deliver BAP targets.
- National and regional lobbying is still required to help remove the constraints on the agricultural sector.
- At the project delivery level, a number of methods to reduce the range of constraints are required. These will vary depending on local situations and levels of current activity but should include practical support as well as advice.
- Strong local partnerships with local landowners and other advisory organisations are highly beneficial.
- Relationship building with landowners is a key activity in identifying constraints and targeting activity at the land holding level.

3. Background to the trial

In April 1996, English Nature initiated the Habitat Restoration Project to trial methods of creating new habitats and ensuring that the management of our countryside takes greater account of its effects on wild plants and animals.

Restoring wildlife habitats, re-creating those previously lost and creating wildlife-friendly corridors and stepping stones to aid movement between existing habitats is high on the national and international political agenda. The European Commission's Habitats Directive and UK Government's Biodiversity Action Plan (UK Biodiversity Group 1995) provide the policy framework and set targets for increasing the variety and abundance of wildlife, the biodiversity, of countryside in lowland England.

Four trial areas, each of approximately 100 km², were chosen to represent a range of landscapes typical of lowland England. Trial areas were selected in Sherwood, Blackmore Vale in Dorset, the Alde Estuary in Suffolk, and the Ouse Valley near Milton Keynes, Buckinghamshire. The Sherwood and Dorset trials were established in 1997, a year after the Ouse and the Alde trials, all scheduled to run for 3 years (Map 1).

Within each trial area landowners and other countryside organisations were encouraged to become involved through a steering group and practical work. The findings of the project will be disseminated to help in project development elsewhere and to inform English Nature's work in influencing policies and procedures at the national and local levels.

4. The project locally

The Sherwood trial was hosted by the Sherwood Forest Trust, a charity established by a partnership of government agencies, local authorities, landowners and voluntary conservation organisations. The Trust was set up in 1996 to act as a focus for the restoration of traditional landscapes and habitats in the Sherwood Natural Area.

4.1 Physical conditions

4.1.1 Location

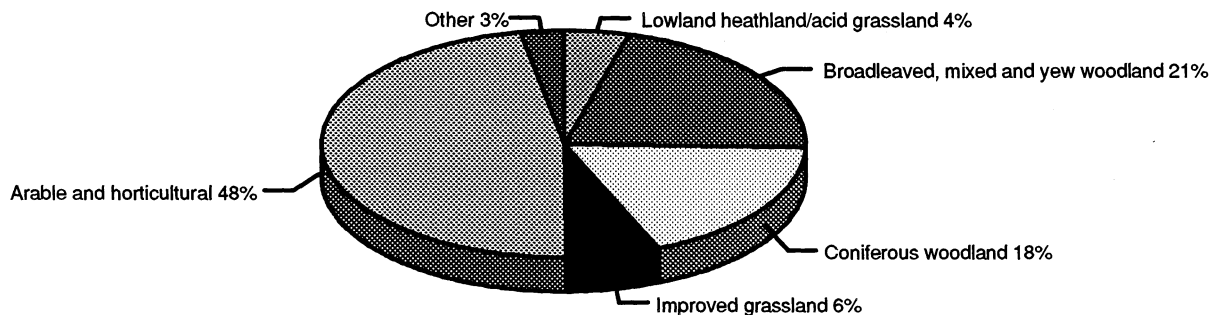
The Sherwood Natural Area stretches from the south of Nottingham to north of Worksop in Nottinghamshire (Map 2). The trial area is centred on the Dukeries, in the north of Sherwood Natural Area, so known because of the predominance of large estates owned by the aristocracy. The trial area consists of 102km² extending from Clumber Park in the north to Clipstone Forest in the south. The mining villages of Ollerton and Warsop form the boundaries to the east and west respectively. Three rivers cross the trial area from west to east, the Poulter, Maun and Meden while Rainworth Water runs up the southern and eastern edge to join with the Maun. These rivers have created a series of valleys surrounded by gently rolling hills which characterise the landscape.

4.1.2 Geology, soils and climate

The underlying geology consists of Sherwood sandstone giving rise to thin, freely draining, acidic soils. The area lies in the rain shadow of the Pennine ridge with a low annual rainfall of about 600mm. The dry climate and freely draining soil result in frequently occurring drought conditions and can lead to a build up of dry vegetation litter in semi-natural habitats. The trial area ranges from 25m to 85m above sea level.

4.2 Main habitats

A field survey, based on standard Phase 1 methodology (Nature Conservancy Council, 1990), was carried out in by EMEC in August 1997. Data from the survey was converted to BAP broad and key habitat types (Maps 3 & 4) and is summarised below:



“Other” habitat types are:

Neutral grassland	0.6%	Standing open water	1.1%
Reedbed	0.1%	Rivers and streams	0.3%
Lowland calcareous grassland	0.01%	Inland rock (spoil)	0.5%

Figure 1: Extent of habitat types in the trial area at project initiation

4.3 Main nature conservation features and designations

Several of the habitat types within the trial area are important on a national (SSSI) or international (cSAC) scale. Four Sites of Special Scientific Interest, notified under the Wildlife and Countryside Act 1981, as amended; are partly, or wholly, within the trial area (Map 7). One of these, Birklands and Bilhaugh, is also a candidate Special Area of Conservation (cSAC) under the EC Habitats Directive (1992). The site has been listed as an example of "old acidophilous oak woods with *Quercus robur* (pedunculate oak) on sandy plains" which is a habitat on Annex I of the Directive.

4.4 Land use

The royal hunting forest of the Robin Hood legends (12th century) is thought to have been around 26,000 hectares in area, consisting predominantly of heathland with a maximum of 10,000 ha of oak woodland (Rackham, 1986). Today forest habitats survive as a scatter of ancient wood-pasture and heathland fragments - a mere 2,000 hectares - adrift in a landscape of intensive agriculture, built development and closed coal mines. Much of this loss has been sustained this century with 90% of the heathland resource disappearing since 1922.

Current land use sectors active in the trial area include:

- **Agriculture:** mainly intensive arable (root crops including potatoes, sugar beet and carrots) and, more recently, free-range pigs.
- **Built development:** the historic village of Edwinstowe is the only sizeable settlement in the trial area
- **Industrial after-use:** this is predominantly coal mine tips. Two working coal mines, owned by RJB Mining Ltd, remain. The associated spoil tips are also classified as industry and are owned or managed by RJB, local authorities or the Sherwood Trust.
- **Leisure:** solely leisure holdings include country parks, a holiday village, a scout camp, a golf course and a farm park. Private estates and farmers also own land used solely for informal leisure or sport.
- **Military:** the Ministry of Defence use a significant area of heathland at Budby South Forest and an area of plantation for training purposes.
- **Multi-purpose forestry:** for timber, wildlife, visual amenity and recreation as practised by the Forestry Commission. Timber production is profitable in Sherwood compared to other areas in England.
- **Private forestry:** consisting mainly of Corsican and Scots pine with some broadleaved plantations of oak and sweet chestnut.

4.5 Land ownership

4.5.1 Categorisation of ownership/management

The system for categorising ownership is based on the balance of control within decisions made over habitat restoration works. In many leisure and forestry leases, the terms are such that the tenant has a great deal of decision-making control over habitat restoration and creation. For these sectors, the tenant is described as the land manager. A large area used for military training is influenced both by the MOD tenants and the private estate owners and both are included as managers. Agricultural tenancies often require the tenant to consult the owner before taking land out of agriculture, leaving the tenant with decreased decision-making ability. To reflect this, farm managers have been divided into owners and tenants. Other owners and managers of small holdings with limited potential for habitat restoration are excluded from this analysis and the scope of this report. Significant management types:

- **Commercial:** this type is predominantly involved in the leisure sector, including a golf course, holiday village, a scout camp but also includes the mineral industry.
- **Farmer owner:** practising agriculture, occasionally with some areas of land used managed as game cover or other amenity uses.
- **Farmer tenant:** as farmer owner.
- **Forestry Commission:** practising multi-purpose forestry.
- **Local Authority:** practising mineral restoration and leisure land uses.
- **Ministry of Defence (MOD).**
- **Private estate:** practising private forestry, agriculture and leisure land uses. This category is also the significant manager for some work on land used for military training.
- **Voluntary conservation organisation:** including the National Trust and the Sherwood Forest Trust

Table 1. The relationship between management types and land use

	Commercial	Farmer - owner	Farmer - tenant	Forestry Commission	Local Authority	MOD	Private Estate	Voluntary Conservation Organisation
Agriculture		X	X				X	
Industrial after-use	X				X			X
Leisure	X	X	X		X		X	X
Military						X	X	
Multi-purpose forestry				X				
Private forestry				X			X	

4.6 Partnership organisations and activity

There were several organisations active by working with landowners in the county at the time of the project's inception. These included: Farming and Wildlife Advisory Group (FWAG), ADAS Consulting Ltd, Forestry Commission (formerly Forestry Authority), Farming and Rural Conservation Agency (FRCA) and the Environment Agency. A Heathland Forum of landowners was held annually to disseminate good management practice. Specialist equipment for heather management, seed collection and bracken control had been developed and acquired by the Heathland Forum. The Sherwood Forest Trust had recently been set up

to restore and re-create the traditional landscapes and habitats of Sherwood Forest for the benefit of the public through education, direct action and work with partners.

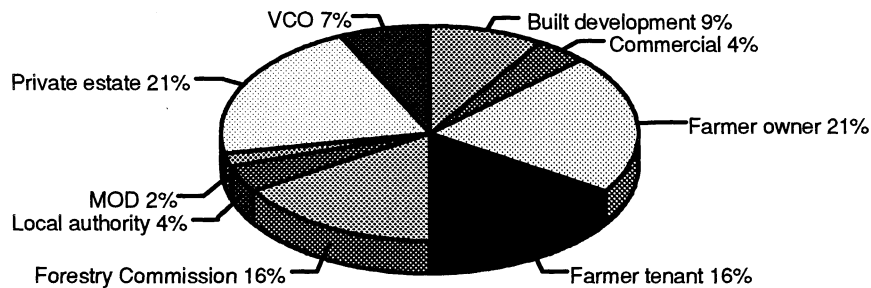


Figure 2: Extent of land management types

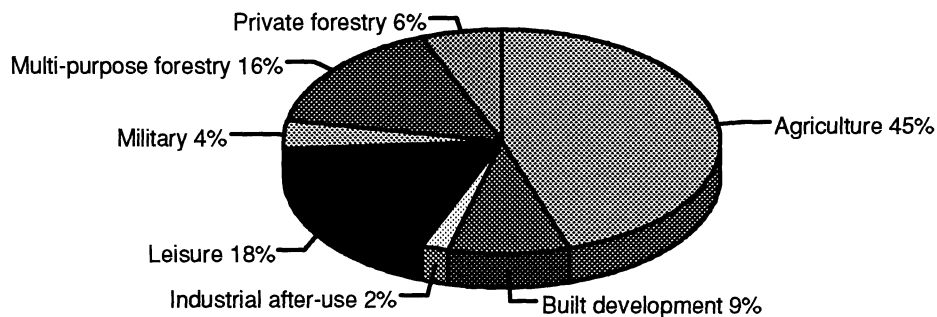


Figure 3: Extent of land use sectors

5. Project brief and vision

5.1 Project outline

5.1.1 Steering group

Local direction for the Project was provided by a steering group comprising the Trustees of the Sherwood Forest Trust and representatives of FRCA and the Environment Agency. The Trustees of the Sherwood Forest Trust comprise officers and members nominated by Bassetlaw District Council, Country Landowners Association, English Nature, Forestry Commission, National Farmers' Union, Newark and Sherwood District Council, Nottinghamshire County Council and Nottinghamshire Wildlife Trust. The group met every

six months to provide guidance and direction to the project alongside representatives from the Project team from English Nature, Peterborough.

5.1.2 Project officer

The Project was delivered by a dedicated officer, employed by the Sherwood Forest Trust. The Project Officer's time was divided equally between work within the trial area and biodiversity 'hotspots' in the remainder of the Natural Area as guided by the Heathland Re-creation Plan (NCC 1997). Employment of the Project Officer was delayed by three months until July 1997 resulting in a reduced Project timescale.

5.1.3 Project summary

A Phase 1 survey of the trial area was carried out in the first three months to establish a baseline for monitoring and assist in development of a vision. The Project Officer was then charged with: production of a vision map and report to establish wildlife and spatial habitat priorities (Hewston, Horton and Hall, 1998); conducting a Landowner Attitude Survey; promoting habitat restoration and ELMS; providing advice for landowners; organising demonstration events and monitoring take up of ELMS in the trial area. Habitat and species monitoring strategies were developed with implementation managed locally.

5.2 The vision map

A vision map was created for the trial area (Map 5), designed to show interested land managers how their land fitted into the ecology of Sherwood as a whole. The map, published as a leaflet, emphasized the need for a reduction in fragmentation of existing habitats and identified areas where habitat restoration and creation would benefit wildlife most. Existing areas of wildlife habitat were also shown. Rare or commonly recognizable species chosen as 'flagships' were identified to help engender appreciation for habitats. This map was shown and discussed with each landowner within the trial area and sent out to help guide the work of partners.

5.2.1 Background to derivation of vision

Target habitats, characteristic of the trial area, were identified and defined using the following information:

- the objectives of the Sherwood Forest Trust, comprising targets for the restoration and re-creation of woodland and heathland;
- the Nottinghamshire Heathland Re-creation Plan (NCC 1997) which includes a strategic map of spatial heathland priorities;
- topography and soil types;
- past and present distribution of semi-natural habitats and farmland;
- the UK Biodiversity Action Plan (UK Biodiversity Group 1995) and EC Habitats Directive, which identify national and international priority habitats and species;

- the Sherwood Natural Area Profile (Windrum 1997), which identified those habitats and species of high priority locally;
- local knowledge and advice supplied by members of the Steering Group;

5.2.2 Target habitats

The target habitats were presented as simplified habitat types identified as:

- Heathland, comprising a mosaic of lowland heath and acid grassland;
- Broadleaved woodland, wood-pasture and parkland;
- Wetland habitats, comprising eutrophic standing and open water, rivers and streams, reed beds, wet pasture (lowland hay meadows) and wet woodlands;
- Farmland habitats, comprising cereal field margins, hedgerows, small woodlands, avenues and hedgerow trees;
- Coniferous plantation.

5.2.3 Quantitative targets

The vision set quantitative targets based on: national BAP targets broken down into Natural Areas by English Nature; Natural Area Objectives, Nottinghamshire Heathland Strategy targets and Sherwood Forest Trust Objectives for the Natural Area as a whole. These targets were adjusted down for the smaller area of the trial area and re-adjusted to reflect perceived achievability (targets were increased for heathland and broadleaved woodland). The targets are set out in Table 2.

5.3 Landowner attitude survey

Initially planned for the first month of the project, the delayed start resulted in the landowner attitude survey being conducted informally throughout the first two years. The survey was conducted through face to face visits and consisted of a range of questions designed to establish the following: understanding and appreciation of wildlife habitats; awareness and experience of ELMS; awareness and experience of dealing with advisory services; opinion of the quality and relevance of ELMS and advisory services in the context of each land holding. The delayed timescale and an evolving questionnaire mean that a meaningful analysis is hard to achieve. However, the survey provided a very useful structure for first visits and provided the knowledge necessary to target future contact. From the findings, a series of key constraints to habitat restoration were identified. These constraints are discussed in section 7.

5.4 Funding options for restoration

The following schemes were available to fund restoration projects within the trial area (Hewston, Horton and Hall, 1998).

Ministry of Agriculture Fisheries and Food (MAFF)

- Countryside Stewardship Scheme (CSS)
- Non-rotational and rotational set-aside
- Nitrate Sensitive Area (NSA) (this scheme was discontinued in 1999)
- Farm Woodland Premium Scheme (FWPS)
- Organic Aid Scheme

Forestry Commission

- Woodland Grant Scheme (WGS) (an enhanced level of payment was available under the Commission's Sherwood Initiative)

English Nature (EN)

- Wildlife Enhancement Scheme (WES)

Habitat Restoration Project funds (HRP)

- a small budget contributed by English Nature and Nottinghamshire County Council

In addition to the incentive schemes, the following were also considered options to assist in the implementation of the project:

- FWAG Landwise and Whole Farm plans
- assistance from the Environment Agency (EA)
- owners/managers own funds (LM)
- assistance from Local Authorities (LA)

5.5 Monitoring programme

The monitoring programme was designed by the English Nature Project Managers for use in all four trial areas. It will:

- Assess the success of individual site based creation and restoration projects in terms of their ability to replicate target BAP habitats as distinguished by their National Vegetation Classification communities.
- Demonstrate the effectiveness of habitat restoration at a landscape scale in reversing habitat fragmentation and as a mechanism to sustain viable populations of target and other species of flora and fauna in a working countryside.

The monitoring programme consists of appraisal and validation monitoring of habitat restoration sites alongside bat, bird and butterfly monitoring and will run for 10 years from 1999 (Burch *et al* 1999). Further information on monitoring methodology is available from the English Nature Grantham team and the Sherwood Forest Trust.

6. Outputs achieved

6.1 Outputs against targets

Table 2 summarises original targets and the area of restoration/creation achieved while Map 6 shows the distribution of this work across the trial area.

Table 2: Outputs achieved against project targets

Habitat	Area/length of existing habitat	Area/length of restored/created habitat	Percentage of existing habitat restored/increased in area through creation	Original Target
Heathland	399 ha	136 ha restored	34%	Restore 30 ha
		158 ha created	40%	Create 30 ha
Parkland and wood-pasture	279 ha	47 ha restored	17%	Restore 1 ha
		15 ha created	5%	Create 0.7 ha
Broadleaved and mixed woodland	1656	14 ha restored	0.9%	Restore 30 ha
		52 ha created	3%	Create 20 ha
Lowland pasture	635 ha	0 ha restored	0%	No target
		45 ha created	7%	No target
Open water / wetland (includes rivers, streams, reedbed and marshy grassland)	149 ha	0 ha restored	0%	No target for open water No target for rivers and streams Restore 1 ha of reedbed Restore 1 ha of wet pasture
		7 ha open water / reedbed / marshy grassland created	5%	No target for open water No target for rivers and streams Create 0.5 ha of reedbed Create 0.5 ha of wet pasture
Hedgerows	240.6 km	23.2 km restored	10%	No targets set
		5.6 km created	2.4%	No targets set
Field margins	0 km	14.9 km created	NA	Create 2 km of 2m margins and 2 km of 6m margins

All targets for restoration were met and exceeded with the exception of the broadleaved woodland restoration and wetland restoration targets. Over four times the target figure for heathland restoration was achieved and over five times the target figure for heathland creation.

Schemes of totaling 131 ha of heathland and woodland restoration and 112 ha of heathland and woodland creation were initiating and managed solely by the Project Officers in other target areas within the Natural Area.

6.2 Changes in fragmentation

Table 3: Changes in the fragmentation of habitats

Fragmentation measure	At start of project %	After restoration work %
Priority habitat as % of trial area	25.9	28.3
Heathland as a % of trial area	3.9	5.6
Lowland wood-pasture and parkland as a % of trial area	2.8	2.9
Broadleaved, mixed and yew woodland as a % of trial area	19.0	19.6
Number of individual priority habitat parcels		
Overall (priority habitats)	753	772
Heathland	73	102
Lowland wood-pasture and parkland	34	39
Mean patch size (ha)		
Overall (priority habitats)	5.8	5.6
Heathland	5.5	5.5
Lowland wood-pasture and parkland	8.2	7.6
Broadleaved, mixed and yew woodland	3.0	no data
Nearest neighbour: minimum distance (m) : maximum distance (m)		
Overall (priority habitats)	no data	no data
Heathland	30:2020	30:2010
Lowland wood-pasture and parkland	60:2210	20:2580
Broadleaved, mixed and yew woodland	no data	no data
Median inter-patch distance (m)		
Overall (priority habitats)	299	385
Heathland	310	350
Lowland wood-pasture and parkland	365	365
Broadleaved, mixed and yew woodland	no data	no data
Proportions of parcels in the following class sizes 0-1ha : 1-3ha : 3-5 ha : 5-10 ha : 10+ ha		
Overall (priority habitats)	49%:26%:10%:9%:6%	48%:27%:10%:9%:6%
Heathland	64%:14%:10%:5%:7%	48%:25%:11%:8%:9%
Lowland wood-pasture and parkland	71%:18%:3%:3%:6%	67%:21%:3%:3%:8%
Broadleaved, mixed and yew woodland	46%:28%:11%:10%:5%	47%:28%:10%:9%:6%

Broadleaved, mixed woodland and wood-pasture figures relate to areas of habitat between rides while figures for heathland were calculated under the assumption that rides and paths are part of the habitat mosaic.

Key changes

- The proportional area of priority habitat in the trial area was increased from 25.9% to 28.3% over the lifetime of the project.
- The proportion of the trial area covered by heathland and acid grassland increased from 3.9% to 5.6%, with corresponding increases in the number of habitat parcels.
- Mean patch sizes remained fairly constant for all habitats except for parkland and wood pasture which fell. This reflects the number of small scale schemes such as avenues and occasional tree planting classified under this habitat. These schemes also contributed to the minimum distance between parkland falling from 60m to 20m.

- The maximum distance between heathland parcels was reduced slightly, while the median distance was increased from 299 metres to 385 metres. This can be explained by the creation of a small number of large heathland parcels, at some distance from nearest recorded heathland.
- While the distribution of parcel size for overall priority habitats did not change significantly, there was an encouraging shift in the distribution of heathland parcel sizes. The proportion of total heathland parcels of less than 1 ha fell from 64% to 48% while the proportion over 10ha increased from 7% to 9%.

The effects on wildlife populations of these fragmentation changes are not quantifiable at present. The monitoring regime outlined in chapter 4 will explore the impacts over a ten year period.

6.3 Analysis of work by management type

Table 4 summarises the area of work in each habitat by land management/ownership type.

Table 4: Work carried out by management types

	Commercial	Farmer - owner	Farmer - tenant	Forestry Commission	Local Authority	Private estate	Voluntary conservation organisation
Heathland restoration	48.3 ha				16.9 ha	70.7 ha	
Heathland creation	57.8 ha	3.2 ha	6.5 ha	51.0 ha		38.1 ha	0.6 ha
Parkland and wood-pasture restoration						46.6 ha	
Parkland and wood-pasture creation		1.8 ha			1.4 ha	12.0 ha	
Woodland restoration	8.3 ha	3.1 ha			3.0 ha		
Woodland creation	34.9 ha	1.8 ha		5.4 ha	0.9 ha		9.4 ha
Lowland pasture restoration							
Lowland pasture creation	3.1 ha						41.6 ha
Open water/wetland restoration							
Open water/wetland creation	1.7 ha	0.2 ha	4.2 ha			1.2 ha	
Field margin creation		11.8 km	3.1 km				
Hedgerow restoration	1.1 km	15.3 km	6.8 km				
Hedgerow creation	0.7 km	3.1 km	1.8 km				
Total area/length restored and created	154.1 ha 1.8 km	10.1 ha 30.2 km	10.7 ha 11.7 km	56.4 ha	22.2 ha	168.6 ha	51.6 ha
Proportion of land managed committed during the trial	38.1%	0.5%	0.7%	3.5%	5.5%	7.9 %	7.3%

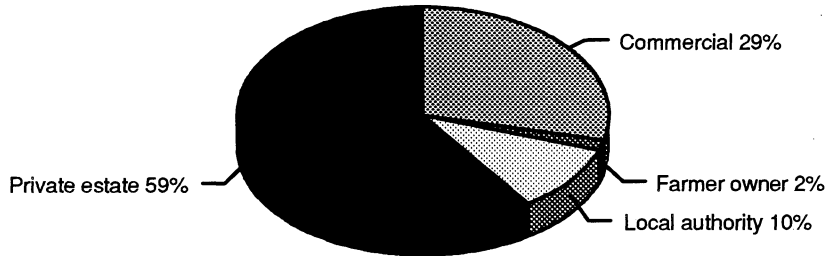


Figure 4a: Habitat area restored by management type

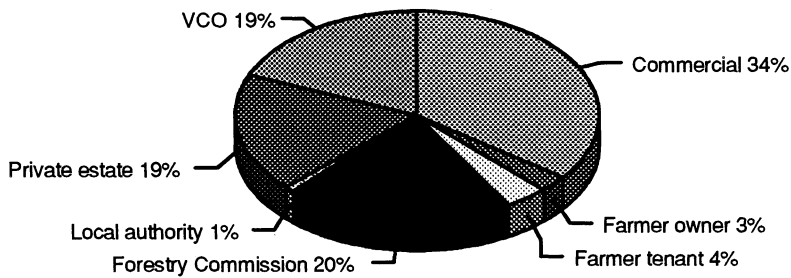


Figure 4b: Habitat area created by management type

These figures reflect the variable fit of habitat restoration with core business aims. The commercial sector (encompassing privately owned leisure and minerals sites) committed over a third of its land holding to habitat work during the trial. The high commitment of commercial managers is also due to the high priority placed on this sector of land managers by the project after it was clearly identified as an under-serviced management sector.

The large amount of restoration work undertaken by private estates reflects a shift in business priorities with increasing priority placed on leisure land uses and an increase in the availability of WES payments occurring during the project.

Of the three management types undertaking most work (commercial, private estates and Forestry Commission) there are interesting variations in the balance of restoration to creation. The Forestry Commission carried out mainly creation of habitats unlike private estates and

commercial land managers where the balance was more even. These trends reflect the increasing emphasis placed on biodiversity by the Forestry Commission.

The low proportion of area committed by farming managers reflects the greater number and intensity of constraints experienced by this management sector. However, the vast majority of linear habitat work was carried out by farmers, an indication of appreciation for traditional farm hedgerow habitats and good financial incentives for field margins. This may also partly be explained by the balance of Countryside Stewardship payments which favours field margins and hedgerow work. The greater number and intensity of constraints experienced by farmers is also reflected in the number of land managers actively seeking advice from the project or carrying out restoration work (50% of farm managers compared to 100% of all other management types). However, the range and number of schemes undertaken by farm managers reflects an appreciation of wildlife, sporting interests and a desire to improve their environment where constraints allow.

6.4 Analysis of work by land use

Table 5 summarises the extent of work carried out on each habitat by land use type.

Table 5: Work carried out on holdings in different land uses

	Farming	Industrial after-use	Leisure	Military	Multi-purpose forestry	Private forestry
Heathland restoration			66.9 ha	68.9ha		
Heathland creation	12.3 ha	11.8 ha	84.4 ha		49.0	
Parkland and wood pasture restoration			46.6 ha			
Parkland and wood pasture creation			15.0 ha			
Woodland restoration	3.1 ha	8.3 ha	3.0 ha			
Woodland creation	1.3 ha	43.5 ha	2.2 ha		5.4ha	
Lowland pasture restoration						
Lowland pasture creation	0.9 ha		43.8 ha			
Open water/wetland restoration						
Open water/wetland creation	4.3 ha	1.2ha	1.8 ha			
Field margin creation	14.9 km					
Hedgerow restoration	22.1 km		1.1 km			
Hedgerow creation	4.9 km		0.7 km			
Total area and length restored / created	21.9 ha 41.9 km	64.8 ha	263.7 ha 1.8 km	68.9 ha	54.4 ha	
Proportion of total area committed during trial	0.5%	32.1 %	14.5 %	17.1 %	3.4%	0%

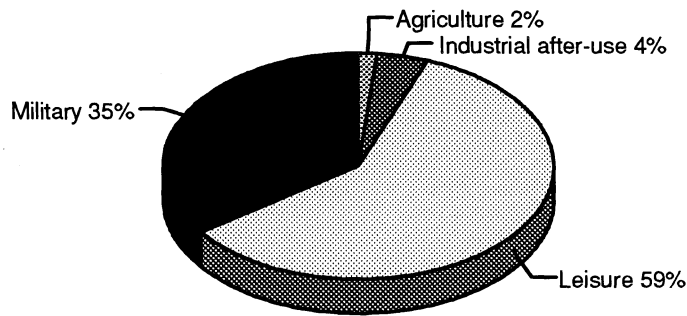


Figure 5a: Habitat area restored by land use

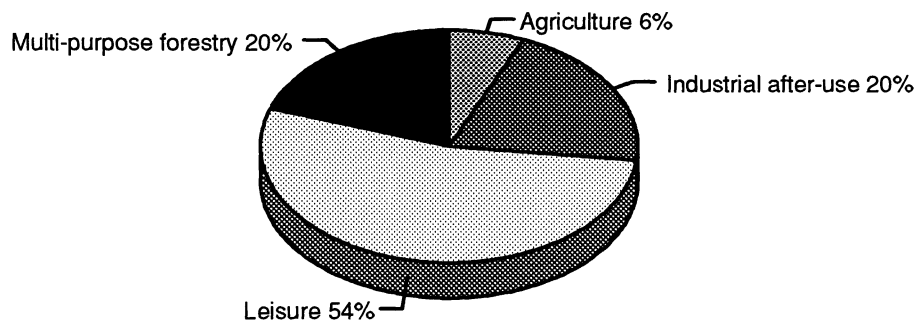


Figure 5b: Habitat area created by land use

These figures strongly reflect the importance of leisure as a land use for nature conservation in Sherwood. Leisure in this trial area consists of formal and informal recreation for private or public use, including; a golf course, private use by estates, and informal leisure in country parks and a holiday village. The good fit with business aims and large areas of land available are contributing factors to the sizeable contribution made. This is mirrored by the Project Officer's work elsewhere in the Sherwood Natural Area, which has yielded 131 ha of restoration and 112 ha of creation; with 81% of restoration and 84% of creation carried out on golf courses.

The potential contribution to BAP targets by the mineral industry, military and forestry is also highlighted by these figures.

6.5 Funding sources

Table 6 shows the area of work for each habitat funded through different mechanisms.

Table 6: Funding sources used for habitat restoration

	CSS	HRP	WGS	LM	Sponsor	WES	LA
Heathland restoration	49.0 ha			6.2 ha	16.7 ha	64.6 ha	
Heathland creation	90.5 ha	13.0 ha		60.6 ha	2.0 ha		
Parkland restoration						46.6 ha	
Parkland creation	12.8 ha			2.2 ha			2.6 ha
Woodland restoration				6.1 ha	8.3 ha		
Woodland creation	0.9 ha	0.1 ha	23.9 ha	5.4 ha	9.4 ha		0.9 ha
Lowland pasture restoration							
Lowland pasture creation	44.7 ha						
Open water / wetland restoration							
Open water / wetland creation*	5.4 ha	1.9 ha					
Field margin creation	14.9 km						
Hedgerow restoration	11.0 km	6.4 km					5.8 km
Hedgerow creation	5.1 km			0.2 km			0.2 km
Total	203.3 ha 31.0 km	15.0 ha 6.4 km	23.9 ha	80.5 ha 0.2 km	36.4 ha	111.2 ha	3.5 ha 6.0 km

CSS: Countryside Stewardship Scheme

LA: Local Authority funds

Sponsor: public donations, landfill tax, charities

WGS: Woodland Grant Scheme

HRP: Habitat Restoration Project 'start up' grants

LM: Funded by land manager

WES: Wildlife Enhancement Scheme

* Environment Agency funds were also used for three scrape creation projects

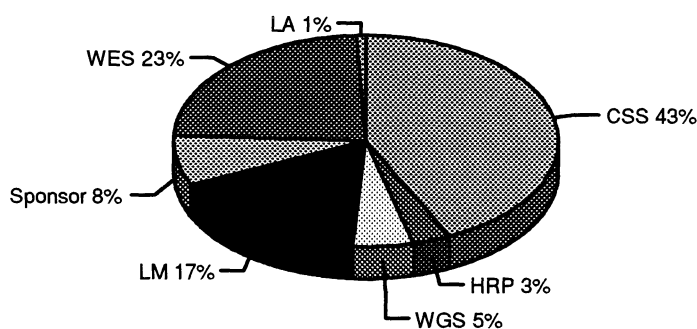


Figure 6. Funding sources used

These figures highlight the value of Stewardship as a scheme in encouraging a wide range of habitat restoration and creation work. In addition, the contribution of additional sources (such as public donations, landfill tax, corporate sponsorship and grant-making trusts) was significant. The amount of work funded by land managers themselves is also significant, although about three-quarters of the 81 ha of self-funded work was carried out by the Forestry Commission.

6.6 Funding sources by management type

Table 7 shows the differential take up of different funding mechanisms by land management/ownership type.

Table 7: Funding sources used for different management types

Management type	CSS	HRP	WGS	LM	Sponsor	WES	LA
Commercial	*94.2 ha 1.8 km	7.8 ha	12.8 ha	12.8 ha	8.3 ha		
Farmer owner	3.8 ha 20.3 km	3.5 ha 4.3 km	1.7 ha	3.1 ha 0.2 km			2.6 ha 2.8km
Farmer tenant	10.6 ha 6.8 km	3.5 ha					3.2 km
Forestry Commission				54.2 ha			
Local authority	16.7 ha		9.4 ha	6.0 ha	16.7 ha		0.9 ha
Private estate	37.2 ha			4.4 ha		111.1 ha	
VCO	40.8 ha				11.4 ha		
Total	203.3 ha 28.9 km	15.0 ha 4.3 km	23.9 ha	80.5 ha 0.2 km	36.4 ha	111.1 ha	3.5 ha 6.0 km

* all commercial landowners receiving CSS funding were leisure sector managers rather than minerals industry

This table highlights the value of Countryside Stewardship as a funding mechanism for all land management types. In other work in the Natural Area, the Countryside Stewardship Scheme proved invaluable in providing the incentive necessary to break down cultural constraints experienced by the golfing sector in particular. Once cultural constraints were removed and the benefits of created or restored habitats experienced, future management and creation costs are likely to be provided by the managers themselves.

6.7 Hedgerow creation and restoration

Table 8 illustrates the length of work undertaken on different types of hedgerows.

Table 8: Hedgerow creation and restoration

Hedgerow creation / restoration	Length (m)
Species-rich, intact: created	5624
Species-rich, intact: restored	1105
Species-poor, intact: restored to species-rich, intact	3285
Species-poor, defunct: restored to species-rich, intact	15939
Species-poor, intact: restored	914
Species-poor, defunct: restored to species-poor, intact	1648
Species-poor, intact: restored to species-rich, with trees	352

Under Rackham's (1986) categorisation of the Britain into 'planned' and 'ancient' countryside, Sherwood is classified as 'planned'. This type of landscape is characterised by species-poor (often only hawthorn) hedges forming rectilinear fields. The hedges in Sherwood are predominantly hawthorn and often defunct, suffering, as they have recently, from drought and sometimes neglect in a largely arable area. Sherwood's hedges are lacking in hedgerow trees, although there are areas of mature and sometimes veteran oaks forming field, Parish and holding boundaries. These trees are especially valuable in an area, where the veteran oaks of Birklands and Bilhaugh cSAC are of international importance.

The figures presented, while showing a large amount of hedge restoration are disappointing in terms of the planting of hedgerow and boundary trees to provide the next generation of veteran oaks. This is mainly due to the resulting loss in crop yield where canopies cast shade. While Countryside Stewardship provides payments for tree planting, there is no distinction between hedges with trees and those without, under the revenue payments for management. An enhanced payment for management of hedgerows with trees (or a reduced payment for hedges without) would provide more incentive for farm managers to plant the next generation of veteran trees.

7. Discussion – project delivery

This chapter outlines the strategies, techniques and tools developed throughout the lifetime of the project.

7.1 Perceived constraints to habitat restoration

Perceived constraints to habitat restoration were identified through the landowner attitude survey, advice from members of the Steering Group and other partners, ongoing relationships and observations. These include:

- **cultural constraints:** lack of awareness or appreciation of wildlife and habitats; and perceived conflict of interest with core business aims; and previous poor relationships with the conservation community
- **lack of technical knowledge** in habitat restoration and confidence in implementation
- **practical constraints;** lack of local seed and other materials, specialist machinery, time and labour
- **confusion over the diversity and applicability of funding schemes and sources of advice**
- **lack of reversibility** related to the long term commitment necessary for habitat restoration
- **lack of financial incentive** or adequate funding

7.1.1 Identifying the constraints mix

Although it was possible to draw broad conclusions over the constraints that were prevalent for different land use sectors and management types, the major constraints and importance of each (the 'constraints mix') differed widely between individual managers. It was often only possible to identify the key constraints for an individual land manager through a face to face visit (or a series of visits).

Once an individual manager's constraints mix was identified, methods of removing constraints and exploiting opportunities were developed throughout the life of the project. The ability to remove key constraints became an important factor in prioritising future involvement. Follow up activity was also made more effective through: more focused contact; targeted information and marketing; and provision of targeted demonstration events.

7.2 Working with landowners

7.2.1 Removing cultural constraints

Previous poor relationships between land managers and the conservation community can be a major constraint to habitat restoration. Conflicting interests exposed in the past can result in communication barriers that take years to break down. The Sherwood Forest Trust was set up as a neutral, partnership body with a fresh image for land managers. The Trust works through persuasion, education and direct action and has a very clear policy of avoiding involvement in planning issues or contentious lobbying to help maintain relationships with land managers.

Methods used to reduce the impact of cultural constraints during the project included: circulation of leaflets and information packs; quarterly demonstration events and relationship building through one-to-one contact. In some cases there was a genuine conflict of interest with core business aims for certain types of habitat restoration eg. large areas of heathland creation on productive farmland.

In general, leisure managers were very aware of the benefits of habitat restoration to the core business aims, especially country parks and the holiday village. Elsewhere in the Natural Area, there was an initial perceived conflict of interest within several golf clubs, especially amongst the members. This has been broken down in several cases by the enthusiasm of the course management and members themselves with support from the Project Officer.

Information circulated by post was generally found to be an inefficient means of raising awareness and identifying opportunities. The most effective means of awareness raising within the farming and golf industries was found to be word of mouth. Targeting influential community members (opinion leaders) and judicious use of demonstration events provided valuable ways of breaking down cultural constraints.

7.2.2 Improving technical knowledge and confidence

The levels of knowledge and confidence were found to vary widely amongst different land managers. Any shortfall in technical knowledge was partially addressed through demonstration events, targeted to management types, land uses and levels of existing

knowledge. The programme of events held included demonstrations holding special interest for farmers, golf clubs, country park managers, foresters, small-holders and schools. Training was most effective when events were small scale and informal. One-to-one meetings and visits to demonstration sites proved invaluable despite the obvious resource implications. Specialist advice from members of the steering group, other advisors and specialists was also facilitated where appropriate.

Land managers' confidence in sources of advice, ELMS and practical restoration work was also encouraged through hands on guidance through grant applications and introductory 'start up' projects funded through the project working budget. The 'start up' projects proved especially useful in introducing land managers to heathland creation. Fifteen holdings were part funded for twenty small scale projects including heathland creation, wetland creation, small woodland planting and hedgerow restoration and creation. At the time of writing, five of those holdings have gone on to enter the Countryside Stewardship Scheme, while two further holdings are likely to enter in 2000. Another holding is likely to enter the Woodland Grant Scheme while a total of twelve land managers are undertaking further habitat restoration works.

7.2.3 Removing practical constraints

Practical constraints such as a lack of: specialist machinery, local seed and stock, time and labour have been addressed elsewhere in the country through land management projects. In Sherwood, a successful network of heathland owners (Nottinghamshire Heathland Forum) already existed before the project was initiated. Methods of heather management and seed collection had been developed alongside use of a specialist roller for bracken control. The project helped to develop and implement systems for operation of the Forum and utilisation of equipment and expanded the Forum network to include new land use sectors including several golf courses, other leisure providers and a small number of farmers. By these means, heather management and bracken control operations were available for all land managers in the trial area. A source of local heather seed was also available for re-creation projects. The need for local tree and shrub stock was identified as a priority and is currently being progressed through other local partnerships. A clearing saw was purchased using project funds and is extensively used by land managers in the restoration of heathland.

Time and labour constraints for land managers can be solved through the use of contractors or volunteers. This has a number of advantages and disadvantages: contractors are often more expensive, introducing a financial constraint; work done by the land manager is often better managed in the future due to an enhanced sense of 'ownership'; however, the quality of contractors' work is often known and can be predicted. Volunteers often require a large time input and quality of work is highly variable.

Time constraints can also be eased through the production of easy to use, costed management and work plans tailored to fit with existing operations to guide managers through habitat restoration and management. FWAG Landwise Plans were especially useful for farmers wishing to carry out a number of works (usually funded by the Countryside Stewardship Scheme), while traditional habitat management plan structures were streamlined for use in the leisure industry. Comprehensive whole farm or management plans were not used until a certain level of enthusiasm, experience and commitment was displayed by the land manager to avoid any loss of confidence through over-ambition.

The effectiveness of the practical measures to reduce the impacts of these constraints can be measured in terms of outcomes. Of the projects where advice and assistance with Countryside Stewardship or Forestry Commission grant applications were the only form of support, 49ha of habitats were re-created or restored while 35.75km of linear habitats were created or restored. 425ha of habitats and 4.91km of linear habitats were created or restored with practical support comprising all or part of the following tools: specialist machinery hire, local seed brokerage, volunteer or contractor labour referral, start up funding, Wildlife Enhancement Scheme funding, additional funding from: corporate sponsorship, landfill tax and private donations.

7.2.4 The desire for ‘reversibility’

This is a major constraint for the agricultural industry where business aims require maximum utilisation of land. The agricultural industry operates in a frequently changing financial environment due to a range of factors including; price fluctuations, ever-changing currency values, CAP reform and evolving ELMS. This fluid environment can engender short-term thinking and a requirement to maintain flexible land management. This was obviously a major constraint for most non-linear habitat creation schemes, including heathland and woodland creation, which require indefinite timescales. Current funding mechanisms do not provide the financial return or long term guarantees to enable removal of land from productive agriculture.

The desire for reversibility was reflected in a greater uptake of the high payments and reversibility of field margins under the Stewardship Scheme in Sherwood. Habitat creation on farm holdings was generally limited to problematical areas of land such as unproductive or frequently flooded fields and field corners.

7.2.5 Removing financial constraints

The ‘financial’ constraint is felt most by the agricultural industry, where habitat restoration on a large scale requires removal of land from commercial production. Current funding levels under Stewardship were found to be only attractive enough to remove low productivity areas from agriculture. Other underperforming agricultural areas (such as a restored pit tip sown with unharvested linseed) were not entered into habitat restoration because of the opportunity cost of lost subsidies.

Financial constraints appear to have been less of a constraint for the commercial sector, where business aims either rely on the quality of habitats and landscape (for holiday villages and golf courses); or habitat restoration costs are relatively insignificant (for mineral companies with a statutory requirement to carry out some form of after use restoration).

A lack of funding for desired habitat restoration work is a common occurrence in the local authority, military, forestry, agricultural and often the voluntary sectors. This constraint could be reduced through lobbying on a local and national scale by conservation organisations, activities that are beyond the scope of this project. However, sources of additional funds to facilitate habitat restoration works and changes in management practice or ownership were developed by this Project. Examples of additional funds raised for schemes within the trial area include:

- Corporate sponsorship for heathland and woodland restoration and publicity materials.

- Landfill tax, private and corporate donations were provided by a consortium of local Rotary Clubs to fund the creation of new woodland.
- Private donations, made by individuals from the locality and around the world for woodland creation through the Sherwood Forest Trust's Adopt an Oak Scheme (publicised locally and via the Internet).

In total £102,000 was raised by the project to help fund habitat restoration works.

The value of an internationally recognisable name such as Sherwood Forest is a vital asset for fundraising. Fundraising activities were ongoing at the time of writing through development of a bid for lottery funds for large-scale habitat restoration works.

7.3 Working with partners

7.3.1 Removing confusion over elms and advisory services

The range of ELMS available during the project was extensive, and administered through a number of organisations. The need for clear audit trails and financial control necessitates sophisticated systems of grant provision and monitoring. Application packs for Forestry Commission woodland grants and MAFF Countryside Stewardship were revised during the life of the project. The new packs were designed to be more user friendly and succeeded to a certain extent. However, applying for grants can still be daunting to the inexperienced and there is no substitute for personal advice for the first time applicant.

Promotion of the main grants schemes (Countryside Stewardship, woodland grants and the project small grants scheme) was integrated within a short introductory leaflet. This leaflet also included short summaries of the advisory services available and promoted the Sherwood Forest Trust as the source of first contact ('a one-stop-shop').

Advice provision in the Sherwood area was fragmented due partially to the number of organisations involved and different areas of operation and specialism. A contributing factor was a shortfall in officers providing full-time advice to land managers, putting unnecessary pressure on officer time and restricting networking opportunities.

In some cases, competition for customers occurred, especially amongst semi-commercial organisations. While competition is not necessarily a negative force, in some cases land managers were confused or were reluctant to commit to advice in case 'better offers' could be found elsewhere. While these effects will never be completely eradicated much was improved by greater networking opportunities provided through the Project's initiation of an Advisors' Liaison Group comprising practitioners from: FWAG, ADAS Farm Conservation, County Council Countryside Management, District Councils, English Nature, Environment Agency, Forestry Commission, FRCA, Nottinghamshire Wildlife Trust and Sherwood Forest Trust. Meeting quarterly this has proved useful in: information sharing; networking; identifying specialist sources of advice, reliable contractors and lead advisors for land use sectors or habitats; joint promotion through leaflets and events and joint management of restoration projects. Further advances in provision of coherent and consistent advice are ongoing and likely to consist of codes of practice, further joint promotion and more sophisticated identification of lead advisors for land use and habitat type.

Perhaps the most effective means of engendering better joint working is to share restoration project development and management and assist in relationship building with land managers as much as possible. This Project actively promoted joint working and developed several schemes which were managed jointly or solely by each of the Advisors' Liaison Group members.

7.3.2 Targeting effort

The process of targeting effort was aided by the following analysis of the likelihood of land managers undertaking habitat restoration:

Group 1 consisting of land managers with some or all of the following: an appreciation of wildlife and habitats, sporting interests; experience of habitat restoration and ELMS; a relatively high level of awareness and knowledge of advisory services and technical habitat work; a good fit between core business aims and habitat restoration.

Group 2 consisting of land managers with: a low level of awareness, knowledge and experience of ELMS, habitat restoration and advisory services; a latent or unformed interest in wildlife, countryside sport or habitats; or a good fit between core business aims and habitat restoration.

Group 3 consisting of land managers with: no interest in wildlife, countryside sport or habitats; and a poor fit between business aims and habitat restoration.

Managers willing to pay for advice generally sit in Group 1 and are best serviced by FWAG, ADAS and other consultancies. The role developed by this Project was to facilitate increased activity by paid or specialist advisors' in the trial area by identifying Group 1 managers and facilitating contact. This released the Project Officer to target Group 2 through promotion, relationship building and increasing expertise. The approach taken involved working with land managers over a variable length of time, developing and funding 'start up' schemes where necessary and providing hands on 'guidance' through restoration work or ELMS applications. Once knowledge, experience and confidence was built to an appropriate level, land managers were generally willing to pay for advice and 'moved' to Group 1. At this point a commercial or semi-commercial advisor was introduced to deliver future advice. In this way the activity levels of paid or specialist countryside advisors were increased in the trial area, and the Project Officer's time was freed to develop new relationships amongst Group 2 managers.

Through targeting promotional activity and visits at Group 2, the interest of several managers in Groups 1 and 3 was engendered, resulting in positive approaches for information. Group 2 also contains the largest amount of managers in the trial area with roughly 70% in Group 2; 10% in Group 1 and 20% in Group 3 at the start of the project. As the project developed and land managers' knowledge and experience increased, the numbers within Group 1 increased accordingly from around 10% at the start of the project to 40%. The number of land managers in Group 3 decreased to around 10% reflecting the numbers who sought introductory information from the project.

This approach is highly effective in allowing the Project Officer to continually develop new schemes and contacts with landowners. It also provided ongoing succession from reliance on the Project, which reduced the impact on landowner confidence resulting from project closure.

Targeting also provided benefits to the paid advisors in the area by undertaking contact development on their behalf.

This approach proved highly effective with the agricultural sector as both ADAS and FWAG have well-regarded advisors active in the county. However, it was less effective when dealing with the leisure sector as there was no such high profile sources of advice specifically available. In practice, a number of projects undertaken by the leisure sector are still reliant on the project for advice and ongoing support.

New golf courses especially provide huge opportunities for habitat creation and are only currently served by the Sports Turf Research Institute, who's ecologist is not only charged with covering the whole country but is largely focused on courses with existing habitats. Other bodies involved in habitat work on golf courses include the European Golf Ecology Unit and the English Golf Union. However, both bodies offer general guidance with no capacity for individual advice. This was identified as a large gap in the market of habitat creation advice in Sherwood.

This targeting approach is also less effective in the provision of practical support such as access to specialist machinery, local seed and labour. Many land managers who are enthusiastic and skilled in habitat restoration still face many practical constraints. The ongoing provision of practical support will be necessary beyond project closure in Sherwood.

7.4 Working with communities

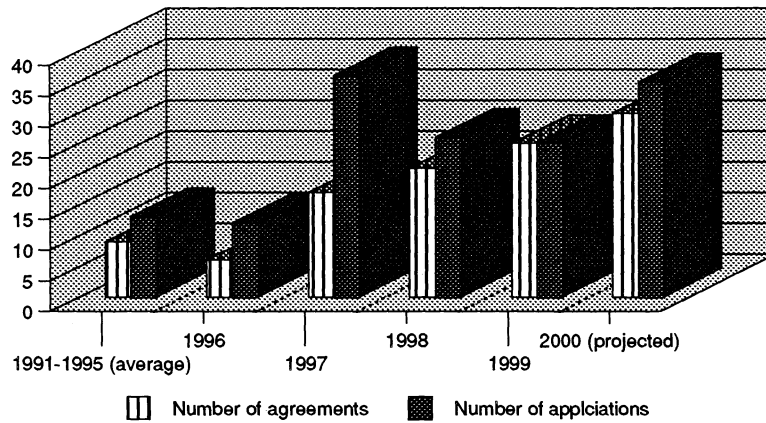
Working with community groups is often very time consuming but can provide significant benefits in reducing cultural, practical and financial constraints. New wetland, woodland and heathland sites were created with the assistance of community groups. Significant funding was provided by Rotary for habitat restoration on a coal tip as well as practical assistance in planting trees and raising awareness through high levels of publicity. Opinion formers within Edwinstowe were instrumental in securing the land for a wetland project, using contacts unavailable to the Project Officer. Further practical work for the project has been provided through the village conservation group which has attracted a high level of publicity. The same group is becoming instrumental in identifying new areas of land for habitat restoration and applying significant influence on land managers.



8. References

- BURCH, MITCHLEY, BUCKLEY & WATT. 1999. Habitat Restoration Monitoring: Development of monitoring methodologies. *English Nature Research Reports*, No. 284. Peterborough: English Nature.
- HEWSTON, HORTON & HALL. 1998. *Opportunities for Renewing Sherwood's Wildlife*. Peterborough: English Nature.
- UK BIODIVERSITY GROUP. 1995. *Biodiversity: The UK Steering Group Report*. London: HMSO.
- NATURE CONSERVANCY COUNCIL. 1990. *Handbook for Phase 1 habitat survey – a technique for environmental audit*. Peterborough: JNCC.
- NOTTINGHAMSHIRE COUNTY COUNCIL. 1997. *Nottinghamshire Heathland Recreation Plan*.
- NOTTINGHAMSHIRE COUNTY COUNCIL. 1998. *Action for Wildlife; a Biodiversity Action Plan for Nottinghamshire*.
- RACKHAM. 1986. *The History of the Countryside*. London: Dent.
- WINDRUM. 1997. *Sherwood Natural Area Profile*. Grantham: English Nature.

Appendix 1. Countryside Stewardship Agreements in Nottinghamshire (1991-2000)



Appendix 2. Priority species within the trial area

(From Natural Area Profile (Windrum 1997))

Habitat	Species	International importance	National importance	Local importance	Characteristic species
Heathland	Higher plants				
	cross-leaved heath			✓	
	hoary ling		✓		✓
	hare's tail cotton			✓	
	sedge			✓	
	petty whin			✓	
	dwarf gorse			✓	
	bilberry		✓		
stag's horn clubmoss					
	Bryophytes				
	<i>Cladonia</i> spp			✓	
	Invertebrates				
	green tiger beetle			✓	
	small chocolate-tip moth		✓		
	moth		✓		
	Portland moth			✓	
	glow worm				
	Reptiles				
	common lizard			✓	
	adder			✓	
	slow worm			✓	
	Birds				
	nightjar		✓		
	woodlark		✓		
	great grey shrike			✓	

Appendix 3. Targets habitats and significant species

Heathland: lowland heath / acid grassland mosaic

ling and hoary ling <i>L + F</i>	petty whin <i>L</i>	western gorse <i>L</i>
skylark <i>N + F</i>	woodlark <i>N</i>	nightjar <i>N</i>
grey partridge <i>N + F</i>	common lizard <i>L + F</i>	green tiger beetle <i>L</i>
hazel leaf beetle <i>N</i>		

Wood-pasture and parkland

veteran oaks (English and sessile) <i>I + F</i>	ling heather <i>L + F</i>	Natterer's bat <i>N</i>
green woodpecker <i>N</i>	long-eared owl <i>N</i>	nightjar <i>N</i>
false scorpions <i>N</i>	redstart <i>N</i>	dead-wood beetles ?
	spiders <i>N</i>	

Broadleaved woodland: oak-birch woodland on acidic, sandy soils

English and sessile oaks <i>F</i>	bluebell <i>N</i>	noctule bat <i>N</i>
wood warbler <i>N</i>	bullfinch <i>N</i>	purple hairstreak butterfly <i>L</i>

Wetland habitats: eutrophic standing and open water, rivers and streams, reed beds, wet pasture (lowland hay meadow) and wet woodlands

short-leaved water starwort <i>L</i>	yellow iris <i>F</i>	marsh marigold <i>F</i>
tussock sedge	common reed <i>F</i>	European otter <i>N + F</i>
water vole <i>N</i>	gadwall <i>N</i>	pochard <i>N</i>
teal <i>N</i>	kingfisher <i>N + F</i>	heron <i>L + F</i>
brown trout <i>L + F</i>	brook lamprey <i>N</i>	

Farmland habitats: cereal field margins, ancient and / or species rich hedgerows

pipistrelle bat <i>N</i>	yellowhammer <i>N + F</i>	linnet <i>N</i>
grey partridge <i>N + F</i>	tree sparrow <i>N</i>	song thrush <i>N + F</i>
turtle dove <i>N</i>	skylark <i>N + F</i>	bullfinch <i>N + F</i>

N: UK BAP long list

L: LBAP listed species (Characteristic or declining local populations)

F: 'Flagship' species chosen for projected public appeal

Appendix 4. The value of practical support and additional sources of funds

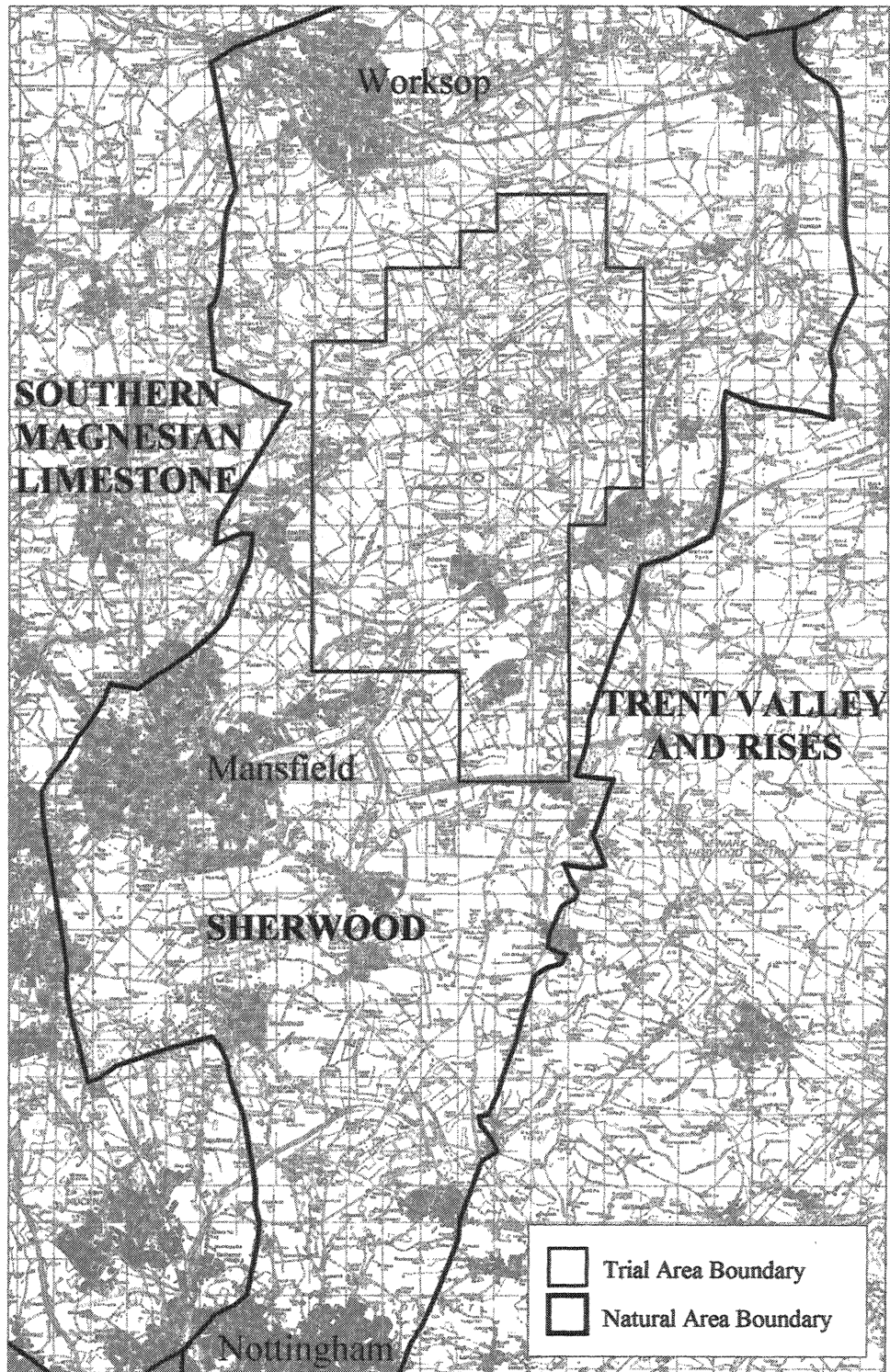
	Work done with advice and grants assistance only	Work done with advice and practical support (including funding additional to CSS and WGS)
Heathland restoration	2 ha (1%)	134 ha (98%)
Heathland creation	21 ha (13%)	137 ha (100%)
Parkland restoration	0	47 ha (100%)
Parkland creation	13 ha (13%)	2 ha (87%)
Woodland restoration	3 ha (2%)	11 ha (98%)
Woodland creation	2 ha (4%)	50 ha (98%)
Lowland pasture restoration	0	0
Lowland pasture creation	45 ha (100%)	0
Open water / wetland restoration	0	0
Open water / wetland creation	4 ha (57%)	3 ha (43%)
Field margin creation	14850m	0 ha
Hedgerow restoration	18.5 km	4.5 km
Hedgerow creation	4.2 km	14 km

Renewing Sherwood's Wildlife

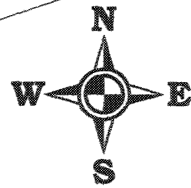
Map 1

Location of Trial Areas

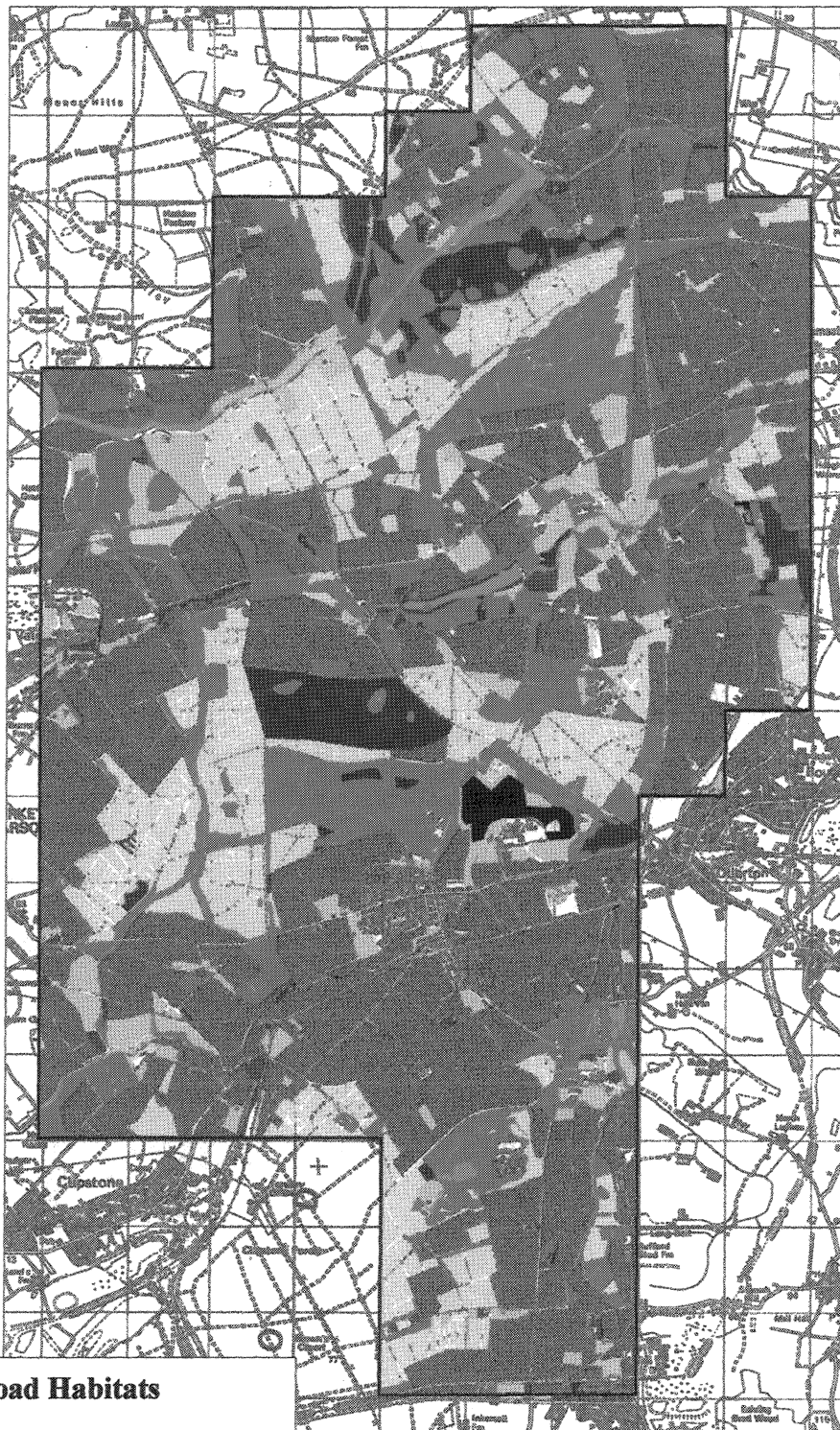




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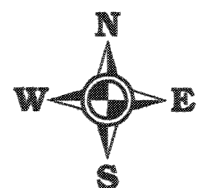
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BAP Broad Habitats

- Broadleaved, mixed and yew woodland
- Coniferous woodland
- Arable and horticultural
- Improved grassland
- Neutral grassland
- Calcareous grassland
- Acid grassland
- Fen, marsh and swamp
- Standing open water and canals
- Rivers and streams
- Inland rock

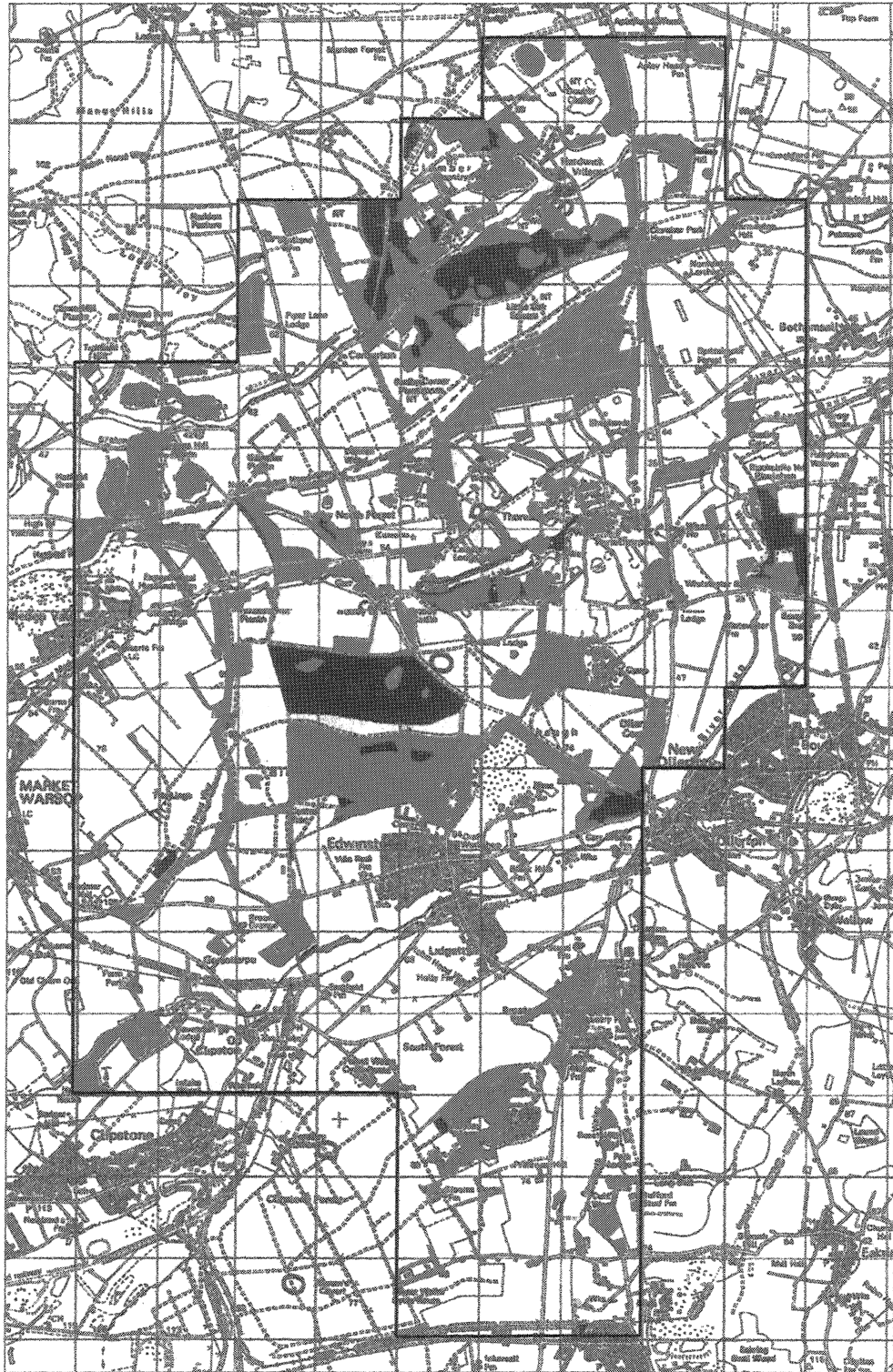
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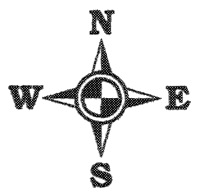
Distribution of BAP Priority Habitats with Broadleaved, mixed and yew woodland



BAP Priority Habitats

- Broadleaved, mixed and yew woodland
- Lowland wood pasture and parkland
- Coastal and floodplain grazing marsh
- Lowland calcareous grassland
- Acid grassland/heath
- Reedbeds

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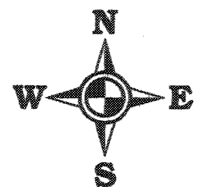
Existing features suitable for Restoration Management

- Broadleaved woodland, wood pasture and parkland
- Coniferous plantation
- Heathland and acid grassland
- Open water

Zones in which habitat creation will benefit most

- Restoring heathland habitats *
- Restoring woodland and parkland habitats **
- Restoring farmland habitats
- Restoring wetland habitats

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Key - Opportunities for Habitat Restoration in Sherwood

If you are looking for ways to help wildlife on your land, the following options should be considered:

Existing features suitable for habitat management

-  Broadleaved woodland, wood pasture and parkland
-  Coniferous plantation
-  Heathland and acid grassland
-  Open water

Opportunities for Habitat Creation

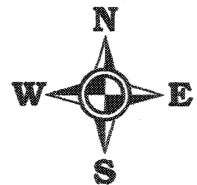
-  Restoring and extending ancient wood pasture, parkland with veteran trees and planting the next generation of veteran trees
-  Creating linking habitats in farmland and coniferous plantation - creating woodland strips; small farm woodlands; hedgerow restoration; planting hedgerow trees and avenues
-  Creating heathland links in coniferous plantation and on farmland - re-creating blocks and strips of heathland or acid grassland
-  Restoring wetland habitats - re-creating riverside pastures, meadows, reedbeds and carr woodland; field margins



Size of dot does not reflect area of work undertaken

- Woodland restoration/creation
- Grassland restoration/creation
- Heathland/acid grassland restoration/creation
- Pond/standing water restoration/creation
- Fen, marsh and swamp creation
- ★ Arable field margin creation
- ★ Hedgerow restoration/creation

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Renewing Sherwood's Wildlife

Map 7

Location of Designated Areas



-  Site of Special Scientific Interest (SSSI)
-  SSSI and Special Area of Conservation (SAC)
-  Sites of Interest for Nature Conservation (SINC)
-  Local Nature Reserve (LNR)

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