

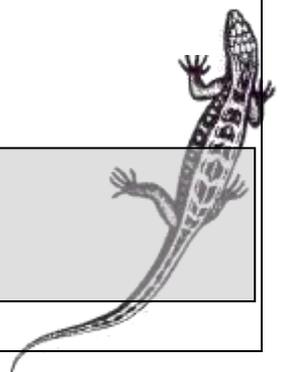
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NOTTINGHAMSHIRE HEATHLAND STRATEGY

Foreword: An Update on Progress and Future Targets



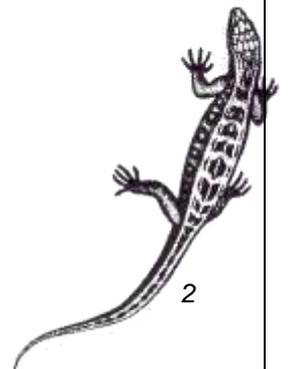
Edited by Karyn Stander
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2003



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*i*ntroduction & Background

The Nottinghamshire Heathland Strategy was and is a key document, produced to provide a framework for the conservation and restoration of Nottinghamshire's heathland habitat. Its content is the result of discussions of the Nottinghamshire Heathland Forum whose membership comprises many of the main land-owning and land management organisations in the Sherwood Natural Area.

Part 1 of the Strategy was produced in 1992 and sets out the policies and practices that provide the theory as to why the heathlands of Nottinghamshire are so important and how/why they should be enhanced.

Part 2 was also produced in 1992 identifying case studies and techniques for restoring or enhancing heaths and remains an extremely useful tool for land managers.

Part 3 produced in 1999 aimed to provide an update on project progress and methodologies.

In 2002, the Heathland Forum was renamed the Sherwood Habitats Forum, to encompass the far wider range of habitats found within Sherwood. This reflects the newly recognised need to manage and restore all habitats wherever it is possible and appropriate to do so, particularly those historically characteristic of Sherwood Forest. These are dry and wet heathland, broadleaved native woodland, wetland, acid grassland and pasture woodland.

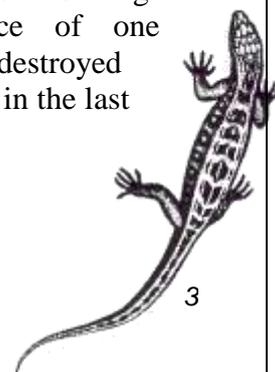
An opportunity has arisen to reprint the strategy and much of the information is still relevant. However, there has been obvious progress since first publication, with many targets met or exceeded and great achievements worthy of mention. This foreword aims to document such changes and set new targets for continued habitat restoration and re-creation throughout Sherwood for the next decade.



Heathland loss and why it is important to reverse the trend

Lowland heathland is an internationally rare and threatened habitat identified as a priority under European law. Britain supports one fifth of the world's lowland heathland, despite a decline of 75% in the national resource since 1800. In Nottinghamshire, the heathland habitat has been catastrophically reduced in area with a registered 90% decline since 1922, totalling just 250 hectares (ha) at its lowest point in the late 1980's (Glasson, 1987).

Nottinghamshire Biological & Geological Records Centre has evidence of one heathland SINC (6.4 ha) being destroyed and one being damaged (2.1 ha) in the last 10 years within the County.



Review of the Objectives & Developments 1992- 2003

Since the initial publication of the Heathland Strategy, the Nottinghamshire Lowland Heathland Inventory was published in 1995 by the RSPB and English Nature and a more detailed Heathland Register was produced in 1998 by consultants Baker, Shepherd and Gillespie, for Nottinghamshire County Council. The document is a record of sites within the County that would historically have been lowland heathland and are now at varying stages of heathland character, with the quality of some of these sites now particularly poor.

It is these heathland register sites that are targeted in the first instance for re-creation and restoration, where it is felt to be appropriate and the landowner is in agreement.

A Heathland Re-creation Plan for the County was published in 1997 and the Forestry Commission has since adopted its own National Heathland Policy.

Part 1 of the Strategy detailed a target of a further 25 ha of the County's Heathlands being brought into suitable management by 2003. This has been greatly exceeded by the various partner organisations working throughout Sherwood, resulting in restoration through appropriate tree and scrub removal and pit tip restoration. There are several large areas in the initial stages of restoration/ creation at this present time.

Work undertaken by partners to reverse former losses (1992- 2003)

Restoration and re-creation are mentioned throughout this update and separating the definition of each can be as follows:

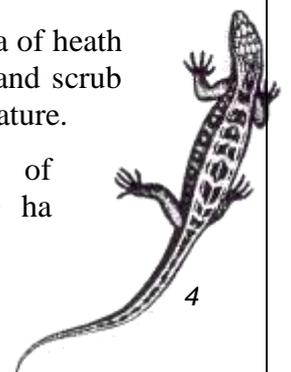
Restoration is taking a habitat of poor (landscape or ecological) quality and improving it to a more favourable status, compared to **re-creation** where the habitat used to exist, but for any number of reasons has been lost, for example forestry plantations planted onto heathland sites decades ago have resulted in the loss of the characteristic

heathland species. However, if the coniferous woodland were to be felled, it is likely that the heathland would return.

Through the Biodiversity Action Group, information has been collated which allows progress to be accurately monitored across the Sherwood area.

Heathland management has been undertaken on the following sites by a wide range of partner organisations (Estimated figures):

- Bestwood Country Park: 2 ha brought into appropriate management and 0.1 ha of new heather scrapes created.
- Birklands & Bilhaugh SSSI, Budby Forest South SSSI: Owned by Thoresby Estate and used for training by the Ministry of Defence; Management of the heathland ongoing with rotational cutting, scrub clearance and grazing over the 148 ha funded by English Nature. This is the main seed donor site for heathland re-creation schemes.
- Bulwell Forest Golf Course: Entered into Countryside Stewardship Scheme to manage 7 ha of acid grassland and produce 2 ha of heather scrapes.
- Centre Parcs: 0.5 ha of heathland created and 2 ha of heathland vegetation and bracken managed.
- Clipstone Forest: 100 ha restored to date. On the Sandstone, a further 90 ha across seven other Forestry Commission woodlands have been restored and are being brought under appropriate management. An overall target has been set for 200 ha of heathland habitats to be restored by 2006.
- Clipstone Heath SSSI: 4.5 ha of heath managed by sheep grazing and scrub control funded by English Nature.
- Clumber Estate: 34 ha of heathland restored and 60 ha bracken rolled.

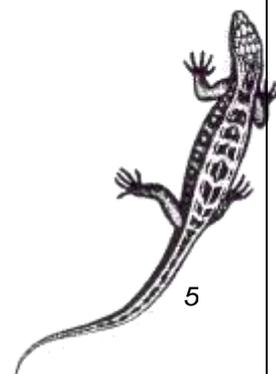


- Cockglode Wood: 2.7 ha bracken rolled.
- College Pines Golf Course: Entered into Countryside Stewardship Scheme and 6 ha of heathland re-created on ex arable land.
- Coxmoor Golf Course: Management of 16 ha of acid grassland and 0.5 ha of heather scrapes created.
- Fanny's Grove: 5.3 ha bracken rolled.
- Hollinwell Golf Course: Entered into Countryside Stewardship Scheme for management of 40 ha of acid grassland and heather and an additional 5 ha to be restored via bracken rolling, tree removal and heather scrape creation.
- Newstead Abbey: 9 ha managed through bracken rolling, grazing and planned heather scrape creation.
- Oakmere Park Golf Course: 2 ha of heather scrapes and 5 ha of acid grass heath restored on ex agricultural land.
- Oak Tree Lane Heath SSSI: 9 ha managed through heather cutting and bracken rolling, small heather scrape creation and scrub control.
- Ollerton Assarts SSSI: 0.25 ha of heathland management and 0.01 ha of new heather scrapes created.
- Rainworth Cutting: 3 ha brought into appropriate management.
- Rainworth Heath SSSI: 16 ha restored by reducing bracken and birch and increasing heather cover, by rolling, cutting and grazing respectively.
- Ravensdale, Mansfield: 1.5 ha of heather seeding and bracken rolling introduced.
- Rufford and Clipstone Collieries: Over 40 ha of restored colliery tip seeded with heather brash in 1996.
- Sherwood Forest Golf Club: 20 ha of heather dominated heath being managed by scrub and tree clearance, with heather cutting, funded by English Nature. The site is used as a seed donor.
- Sherwood Forest Country Park and NNR: 23.7 ha of heathland have been brought into appropriate management.
- Sherwood Heath LNR and SSSI: 21 ha of acid grassland and heathland managed through cutting, bracken rolling, scrub removal and heather scrape creation.
- Spalford Warren SSSI: 10 ha of 'coversand' heath restored by pine removal.
- Thoresby Estate: 4.5 ha of tree clearance from the 'Neutral ground' for heathland restoration. Bracken management on 47 ha of SSSI heathland at Buckgates, along with protection of young oaks.
- Vicar Water Country Park: 28 ha of restored colliery tip seeded with heather brash since 2000.
- Walesby Forest Scout Camp: Entered into Countryside Stewardship Scheme with 4 ha of acid grassland and heathland under management.

In addition, a number of small scale re-creation schemes totalling 4 ha have been undertaken by private landowners and on Nottinghamshire County Council roadside verges.

In total, it has been calculated that 45 ha of new heathland has been created and 730 ha restored and brought towards appropriate management since the Heathland Strategy was first printed.

Details of restoration on pit tips sites in Nottinghamshire are highlighted in the next section.



e xternal Influences in Sherwood Forest

The Decline of the Mining Industry & New Opportunities

Nottinghamshire is a County whose history and industry have been firmly linked with coal mining. In 1976, the County's 30 working collieries (16 located in Sherwood) were providing 20% of the UK's total coal production. There has been a steady closure of the pits and in 2004, just Thoresby, Rufford and Harworth sites are still working.

Since 1980, in excess of 2000 ha of former colliery land has become available for habitat re-creation. This has provided a monumental opportunity for ecological habitat restoration in the County, the largest since World War II (*Shepherd, Lattaway & Lewis, 2000*). Under British Coal ownership, woodland had been one of the main habitats chosen for restoration of the sites, with a mix of broadleaves and predominately coniferous planting. Restoration to agriculture had been a planning requirement

in the past and a frequent option. The privatised Coal Industry however, used the opportunity provided by extending the working lives of the collieries to completely revise the approved restoration schemes and submit schemes dominated by heathland and acid grassland, with wetlands where feasible, on occasions contrary to the prevailing planning climate. Changes in the Structure Plan since have made it a requirement that heathland is restored where possible and appropriate to do so.

Many of the colliery sites are in key locations, and once restored, will reduce fragmentation of the existing heathlands within Sherwood and increase the total area of this Local Biodiversity Action Plan (LBAP) habitat within the County. Work is ongoing to create connectivity and allow dispersal of species between these sites.

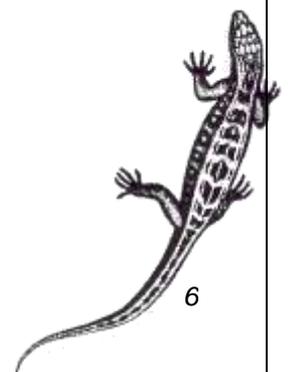
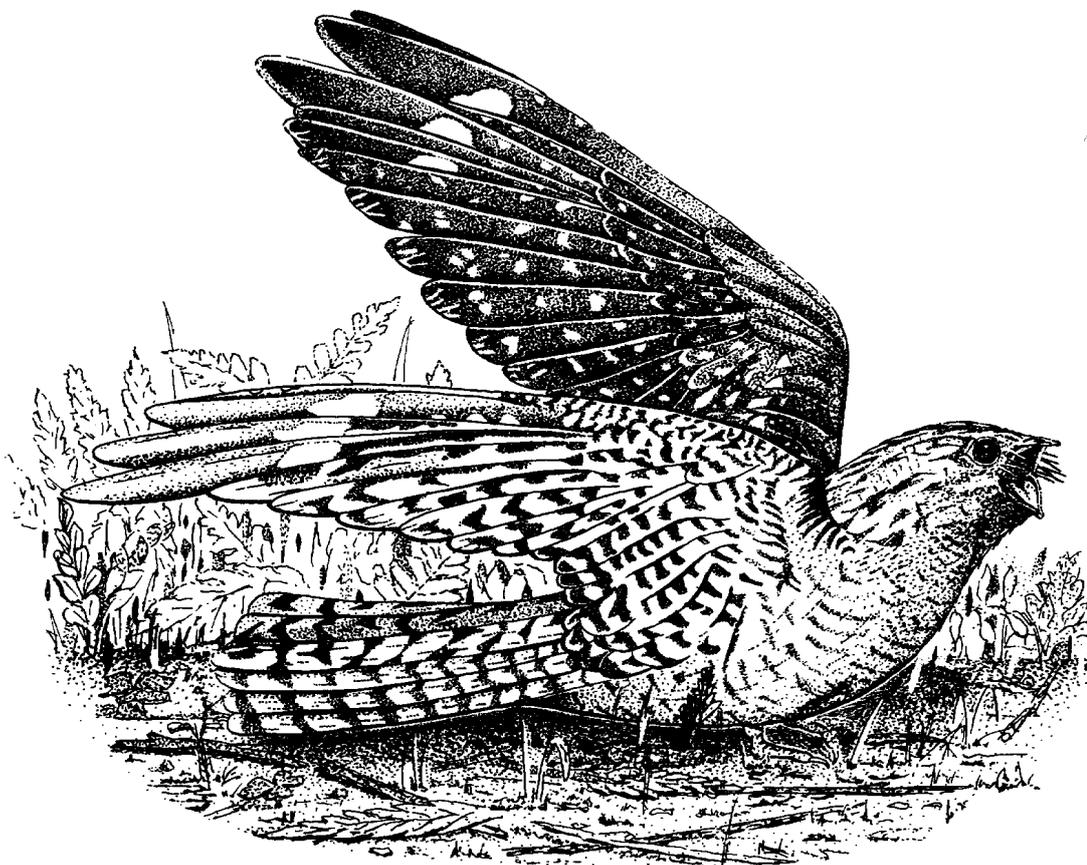


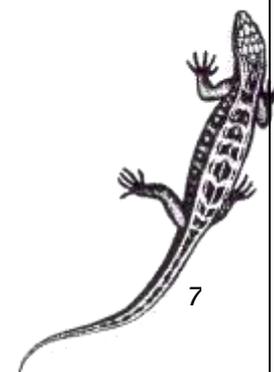
Table 1 illustrates the restoration status of colliery pit tips within Nottinghamshire.

Date Closed	Site Name	Area (ha)	Owned / Restored by	End use / Status	Restored Habitats
Pre 1984					
1966	Bestwood	20	NCC	Country Park, Agricultural Pasture	Improved pasture, wetland, coniferous plantation, unimproved grassland.
	Cinderhill		Nottingham City Council	Public open space	Woodland and grassland
	Cossall		Private	Derelict	Grassland, occasional tree planting
1984 to 1992					
1987	Newstead	100	NCC	Public open space	Plantation woodland, grassland.
1988	Mansfield / Crown	100	Private	Application granted for tip washing, work in progress. Ownership will pass to NWT.	Plantation, ruderal, wetland, industrial grassland.
1989	Blidworth	50	NCC/ FC	Forestry & public open space	Forestry, grassland, heathland
1990	Shireoaks	25	Private	Housing & public open space	Urban, improved grassland
1992 to Present Day					
	Thoresby-Cockglode	15			Broadleaved woodland
	Cotgrave	162	NCC	Forestry & public open space	Forestry, grassland
1992	Sherwood	50	NCC/ FC	Forestry, industry and public open space	Forestry, grassland
	Rufford Complex	200	UK Coal/ NCC/ Private	Golf course, heathland, forestry, pasture, unrestored shale and active tipping	Heathland, oak- birch woodland, wetland, unimproved grassland, arable, amenity grassland
	Bevercotes	125	NCC/ FC	Forestry, public open space & industry	Forestry, meadows, rough grazing, wetlands, ruderal
	Ollerton	50	NCC/ FC	Forestry & public open space	Forestry, heathland, wetland
	Manton	100	NCC/ FC	Forestry & public open space	Forestry, heathland
	Bilsthorpe	50	UK Coal/ Private	Agriculture, woodland	Broadleaf woodland, species rich grassland
	Calverton	100	FC/ CA	Awaiting restoration	Unknown
2003	Clipstone	75	Private	Proposed to be heathland, unimproved grassland, wetland, industrial	
Active Sites					
Open	Welbeck	150	UK Coal	Broadleaved woodland, acid grassland, heathland	
Open	Thoresby	150	UK Coal	Broadleaved woodland, acid grassland, heathland	
Open	Harworth	100	UK Coal	Broadleaved woodland, acid grassland, heathland, small wetlands	

Table 1 (Shepherd, Lattaway & Lewis, 2000)

KEY

- NCC Nottinghamshire County Council
- FC Forestry Commission
- CA Countryside Agency
- NWT Nottinghamshire Wildlife Trust



Changing Agricultural Systems

In recent years, the Sherwood Natural Area has been designated a Nitrate Vulnerable Zone due to its porous and free draining soil profile. This makes it illegal to apply nitrogen to the land above certain defined limits during the winter months, making it difficult to farm certain areas of land profitably or dispose of farm waste efficiently without the risk of pollution to the aquifer.

Changes in abstraction regulations for landowners removing surface and ground water have been tightened, having an effect particularly on farmers in the area. The impact has been on the type of farming operations that can be undertaken, making it even harder for landowners to manage their land for profit with old enterprises having been abandoned. Landowners are sometimes then in a position to diversify and are looking for alternative methods of managing land.



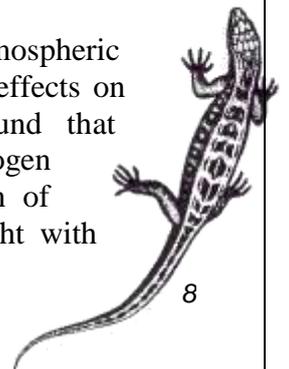
Since the production of the heathland strategies, the various agri-environment/forestry grant aid schemes have increased in popularity across the County. For example, Defra's Countryside Stewardship Scheme, the Forestry Commission's Woodland Grant Scheme, and the newly developed Sherwood Forest Trust's Sherwood Initiative Scheme, in particular. The piloting of Defra's Entry Level Scheme for agri-environment projects (Environmental Stewardship) began in 2003 and is hoped to be formalised by 2005. In addition, the Biodiversity Action Group and Sherwood Forest Trust's Sustainable Landscape Project operate grant schemes for small-scale projects to help reduce fragmentation in agricultural environments.

Climatic Considerations

Increasing temperatures caused by global warming may have negative impacts on the heathland habitat and associated fauna. Although surviving in relatively arid and low rainfall areas of the Country, heather does require moisture in order to germinate and high temperatures in the year of germination can result in high seedling mortality. Exposed soils can reach temperatures in excess of 40 C confirming the need for a shade providing nurse sward. Alternatively it may prove to be beneficial in reducing competition for heather plants from vigorous grass growth. Wetter early summer months also seem to be leading to greater bracken growth.

An increased risk of heathland fires due to increased vegetation bulk and excessive temperatures may result, although a mosaic of habitats as seen in Sherwood should help reduce the spread. Fire is a useful management tool if used at the correct time, but it can have devastating effects if occurring too frequently as a result of vandalism.

A number of studies on atmospheric deposition have monitored the effects on heathland. Analysis has found that increased rates of nitrogen deposition result in stimulation of heather shoot and canopy height with



the plant producing higher quantities of litter material. This has a negative effect on the lichens and bryophytes below the heather stand. The heather also shows an increase in brown shoots from reduced tolerance to natural stresses (Carroll *et al*, 1999).

Increasing nitrogen deposition is also showing an effect through the County, particularly causing problems with re-creation sites. Soil that should be suitably acid for seeding with heather is becoming nutrient enriched when exposed and the vigour of grasses and perennial weeds is increased at the expense of the heather seedlings.

Sulphur dioxide and nitrous oxide emission have been reduced in recent years through the use of greener technologies. However, little action has been taken to control emissions of ammonia which has the effect of causing heathlands to be increasingly colonised by grass as opposed to heather and other associated flora. International agreements are now in place to curb ammonia emissions from 2010, through UNECE Protocol to Abate Acidification, Eutrophication and Ground Level Ozone and via the National Emission Ceilings Directive (2201/91/EC).

New Targets for Heathland Re-creation in Nottinghamshire

Within the framework of the Heathland Strategy aims and principles and the formulation of the Nottinghamshire Local Biodiversity Action Plan in 1998, the following targets were set and actions proposed to reach these targets.

Target 1; Increasing the area of heathland by at least 200 hectares by 2005, 10% of which will consist of small –scale projects within priority areas identified by the Nottinghamshire Heathland Re-creation Plan.

This update has confirmed that this target has not only been achieved but has been exceeded thanks to the efforts of the Forum members. This has been the combined result of several large- scale schemes, such as the restoration of over 40 hectares of heath at Rufford and Clipstone Collieries and the restoration of over 190 hectares of degraded heath on the Forestry Commission estate. Smaller projects on farmland, golf courses and local nature reserves have also taken place.

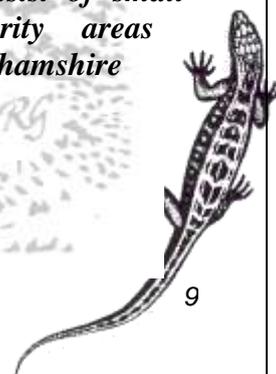
Despite this considerable achievement, the heathland resource in Nottinghamshire remains a fraction of its former extent, especially in

Sherwood. With some large projects ongoing, there is still considerable potential to restore and re-create large landscapes of heathland habitat, linking these together using smaller re-creation schemes. Sherwood has a particularly significant role to play in restoring these habitats and landscapes in the wider East Midlands Region.

Large- scale and small- scale heathland re-creation projects are considered to be of equal importance, reflecting the diverse nature of the opportunities which give rise to such projects. The advice and assistance to encourage heathland re-creation is available to a range of landholders including large land-owning estates, local authorities and farmers.

The following new target is now proposed:

Increase the area of heathland (by creation and restoration) by a further 400 hectares by 2010, 10% of which will consist of small-scale projects within priority areas identified by the Nottinghamshire Heathland Re-creation Plan.



Target 2; Bringing 80% of the County's heathland into appropriate management by 2005.

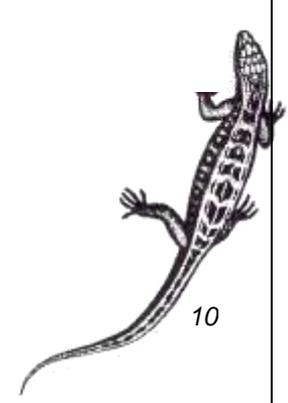
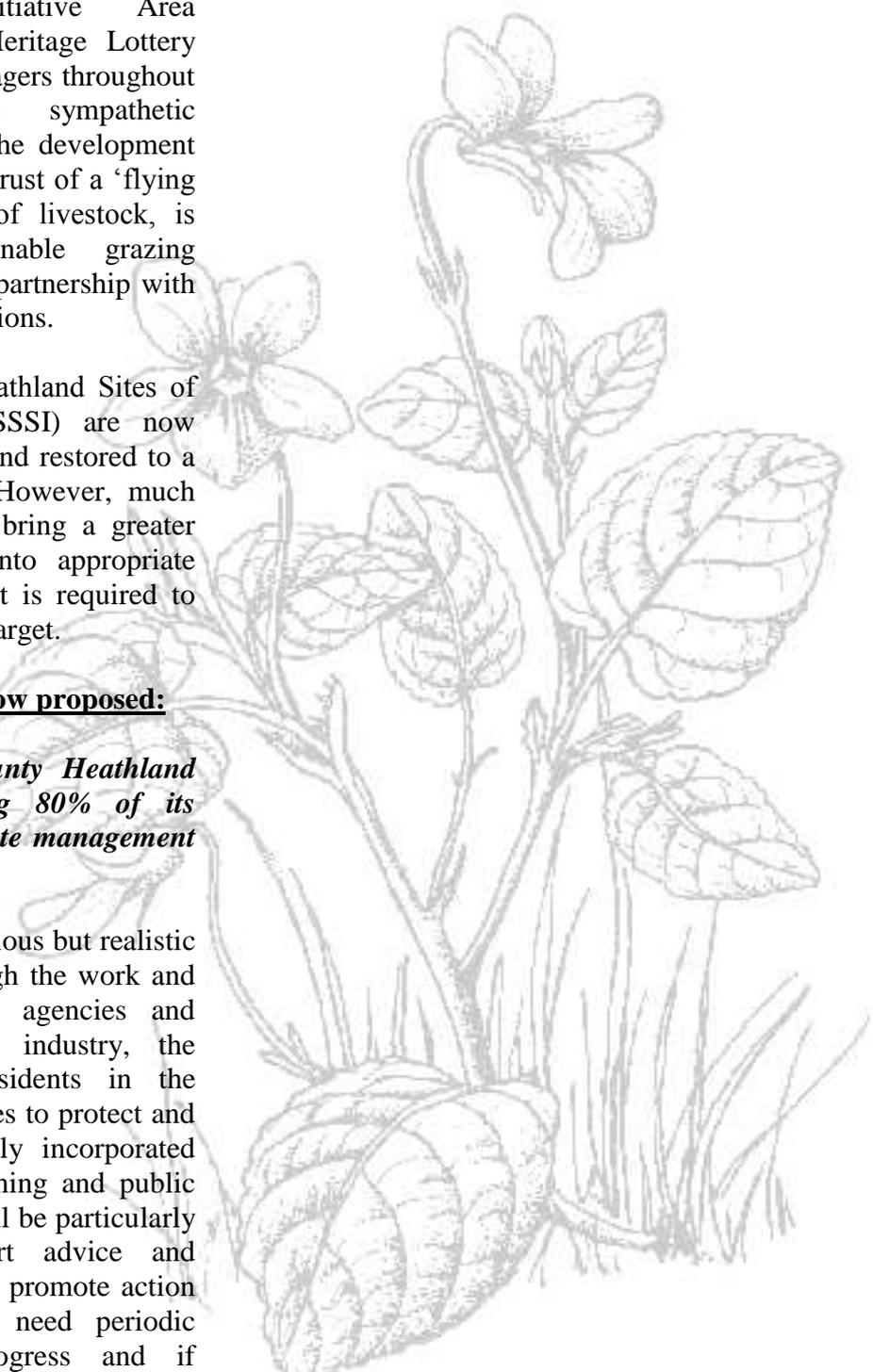
Considerable progress has been made towards delivering this ambitious target as previously highlighted in this update. For example, the successful Sherwood Initiative Area Partnership application for Heritage Lottery funding has allowed land managers throughout Sherwood to re-establish sympathetic management of heathland. The development by Nottinghamshire Wildlife Trust of a 'flying flock' of traditional breeds of livestock, is helping to restore sustainable grazing management to many sites in partnership with landowners and other organisations.

Nearly all of the County's heathland Sites of Special Scientific Interest (SSSI) are now being managed appropriately and restored to a more favourable condition. However, much work remains to be done to bring a greater number of heathland sites into appropriate management and greater effort is required to monitor progress towards this target.

The following new target is now proposed:

Review and update the County Heathland register in 2005 and bring 80% of its registered sites into appropriate management by 2010.

It is envisaged that these ambitious but realistic targets will be achieved through the work and co-operation of a range of agencies and organisations, together with industry, the farming community and residents in the County. Ensuring that measures to protect and conserve heathlands are firmly incorporated into policies, legislation, planning and public opinion will be required. It will be particularly important to provide expert advice and financial assistance in order to promote action on the ground, which will need periodic monitoring to evaluate progress and if necessary, rethink our actions.



Continuing Roles of Strategic Partners

All partners work to raise the profile of lowland heathland and the habitats of Sherwood Forest, through the Biodiversity Action Group and associated Local Biodiversity Action Plan. The following information relates to the partners on the Sherwood Habitats Steering Group:

1 **Local Authorities**

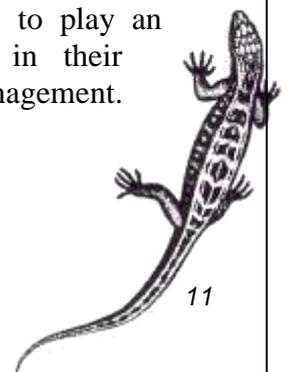
Progress has been made within Local Authorities with officers now more aware of the importance of heathland and the need to protect and enhance it through policies and mitigation measures. The new Structure Plan for the County sets out policies for heathland re-creation and recognises heathland as a habitat of worth in its own right.

Local Authorities and several partner organisations such as Nottinghamshire Wildlife Trust, work to protect heathland sites through monitoring the weekly planning lists and highlighting or objecting to developments that will degrade or destroy heathlands.

A Community Liaison Officer (CLO) has been employed since Autumn 2000 to implement the declaration of areas including heathland sites, as Local Nature Reserves (LNR's) across the Sherwood Area. This post (initially funded for three years) is a partnership between Nottinghamshire County Council, Newark &

Sherwood District Council and Mansfield District Council and is part of the Sherwood Forest Community Rangers Project. This project supports landowners and local communities to work together to protect and manage countryside sites across the Sherwood Area. The main aim of LNR's is to increase the aesthetic and wildlife value of the site through education, awareness raising activities and active involvement projects.

A CLO has also been active in the Mansfield area, promoting and supporting the development of several sites as LNR's including a heathland site in the heart of the community in Ravensdale. This post is employed by Nottinghamshire Wildlife Trust and Mansfield District Council. Both CLO posts are currently financially supported by English Nature Wildspace! Scheme and the New Opportunities Fund. Declarations such as LNR's, will help to ensure the permanent protection of heathland sites by increasing awareness of their importance and encouraging local communities to play an active role in their care and management.



2

Since the publication of the Nottinghamshire Heathland Strategy in 1992, Forest Enterprise has ensured that no further areas of heathland on the Forestry Commission's estate have been converted to forestry (Recommendation 3). A detailed restoration programme (Lowland Heathland Management Plan for Sherwood & Lincs. Forest District 1997-2002) has been revised in the format of Forest Design Plans for Nottinghamshire specifying restoration targets and a timetable for each plan area.

The initial proposal was to restore sites within Clipstone Forest (Sherwood Pines Forest Park) totalling not less than 50 ha and to manage these sites as heathland for the long term. This target was reached in 2001 while areas for restoration detailed by the design planning process were set for a further seven woodlands within the Sherwood Natural Area. At the end of 2002, the area of plantation restored to heathland habitats was 190 ha.

The successful Sherwood Initiative Area Partnership application for Heritage Lottery funding has allowed Forest Enterprise to increase its commitment to restoration, with the assurance that establishment and maintenance costs are supported and that long-term management is

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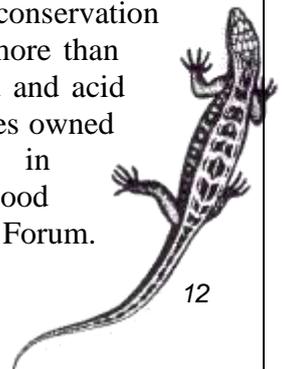
**The Wildlife
Trust**

sustainable. The current (2003) proposals detail an additional 110 ha to be restored by 2020 taking the restoration target for Nottinghamshire heathland to a total of 300 ha on the Forestry Commission's estate.

The Nottinghamshire Wildlife Trust provides advice on heathland creation and management to a range of landowners in the private and public sectors. They have also initiated the development of policy at a regional level to recognise the special importance of Sherwood Forest and its habitats and are working to promote the importance of the Nottinghamshire heathlands through the UK Lowland Heathland Habitat Action Plan Steering Group.

The Trust also works closely with the Planning Authorities and in turn with responsible applicants, to promote heathland creation and management on suitable development sites, particularly mineral sites.

The Trust owns and manages a "flying flock" of over 800 Hebridean sheep and several Longhorn and Dexter cattle which are used for conservation grazing on more than 20 heathland and acid grassland sites owned by partners in the Sherwood Habitats Forum.



The flock and shepherds are supported with finance from the Heritage Lottery Fund through the Sherwood Initiative, in addition to English Nature and a number of other sources.

The Trust also owns Rainworth Heath SSSI, which it manages through grazing and bracken rolling and which has hosted open days for the local community to raise awareness of the importance of heathland. The adjacent land at Spring Hill, which is in private ownership, may also soon be grazed by the flying flock to bring it into condition and act as a buffer to the SSSI.

4 **The National Trust**

The National Trust's Clumber Estate occupies over 1,500 ha (3,800 acres) of Sherwood and includes parkland, woodland, heathland and farmland.

Much heathland management work has been undertaken in the form of bracken rolling, heather cutting and restoration with 14 ha re-created to form an invaluable link between existing heathland within Clumber Estate and Thoresby Estate's Budby Forest South. In addition, 20 ha of pine woodland are not being replanted after felling and will be restored to heathland.

The work has resulted in an increase in woodlark numbers to ten nesting

pairs, from none for the 20 year period prior to 1998.

5 **Sherwood Forest Trust**

The Sherwood Forest Trust acts as the main vehicle for advice and guidance to landowners and managers of heathland in the Sherwood Natural Area. This is specifically delivered through the Sustainable Landscape Project with an officer employed to offer advice and raise the profile of heathlands with land-owning bodies within the area. Organisations benefiting from the project include local farmers, district councils, golf courses, forestry and mineral companies.

The Trust also co-ordinates bracken rolling and heather harvesting on behalf of a number of partners.

The project officer acts as secretary to the Sherwood Habitats Steering Group and is heavily involved in the organisation of the annual forum event.

6 **Sherwood Initiative**

In 2002, the Sherwood Forest Trust secured £5.5 million of funding from the Heritage Lottery Fund, to establish the Sherwood Initiative Programme. This scheme is enabling a landscape heritage restoration and access programme to be initiated which will allow landowners within Sherwood to

gain funding towards improving the habitats on their holding. An education, interpretation and involvement programme has also been established to raise the profile and importance of the area with local communities and visitors alike.

7

**English
Nature**

As a statutory agency, English Nature governs the management of SSSI's in agreement with the landowner. Officers provide detailed advice to ensure these important sites are managed in the most effective way. There are seven heathland SSSI's in Nottinghamshire, 11% of the County total. Monitoring and analysis of the condition of each site is also carried out by English Nature and in November 2002, parts of Sherwood Forest were designated a National Nature Reserve (NNR).

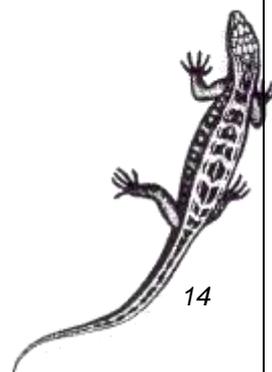
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**Ministry of
Defence
(MOD)**

The MOD is one of the largest landowners in the UK with an interest in over 260 SSSI's. In Sherwood, the MOD lease Budby Forest South (148 ha) from Thoresby Estate which provides an important and valuable heathland environment for dry training, i.e. with blank ammunition, orienteering and other exercises for regular troops, reserve forces and cadets. In providing training for troops, it is important to

provide as many different conditions as possible and the variation this site provides makes it unique in the East Midlands.

The MOD works closely with the statutory bodies and other experts to ensure the legal requirements of the site's designation are met. Advice is taken on conservation and heritage matters to ensure best environmental practices are followed to reach the site's conservation objectives.



h e a t h l a n d M a n a g e m e n t I s s u e s

Grazing as a Management Tool

Sherwood has historically been managed through grazing by deer, rabbits, hares, sheep and pigs. Local people were given rights of pannage by the King and subsequently by the Dukes, to graze their livestock and collect fallen wood in the forest. Many important rabbit warrens were kept on Sherwood heathlands with the animals confined to grazing these areas by gorse banks.

With the range of animals used, scrub was controlled and the heathland plants grazed, resulting in a reduced dominance of floral species. Within the last century, grazing of the acid grassland- heathland mosaic of Sherwood has declined dramatically leaving the existing heaths at threat from scrub encroachment and degradation through neglect. Alternative mechanical management therefore takes the form of rotational heather cutting and scrub removal. Minimal animal disturbance and changes in climate have led to a dramatic increase in bracken cover on the heathland sites. This has been controlled to some degree by mechanical intervention in the form of rolling, which will be discussed later.

Heathland grazing is now beginning to be revived within the forest with the establishment of the flying flock as previously mentioned. Nottinghamshire Wildlife Trust's shepherd moves the Hebridean sheep, Dexter and Long horn cattle around the Sherwood Habitats Forum members' heathland sites allowing scrub and grass control and the rejuvenation of heather stands. Sites that have been grazed to date through this scheme include Sherwood Forest Country Park & NNR at Edwinstowe, Vicar Water Country Park, Hollinwell Golf Course and Newstead Abbey Park.

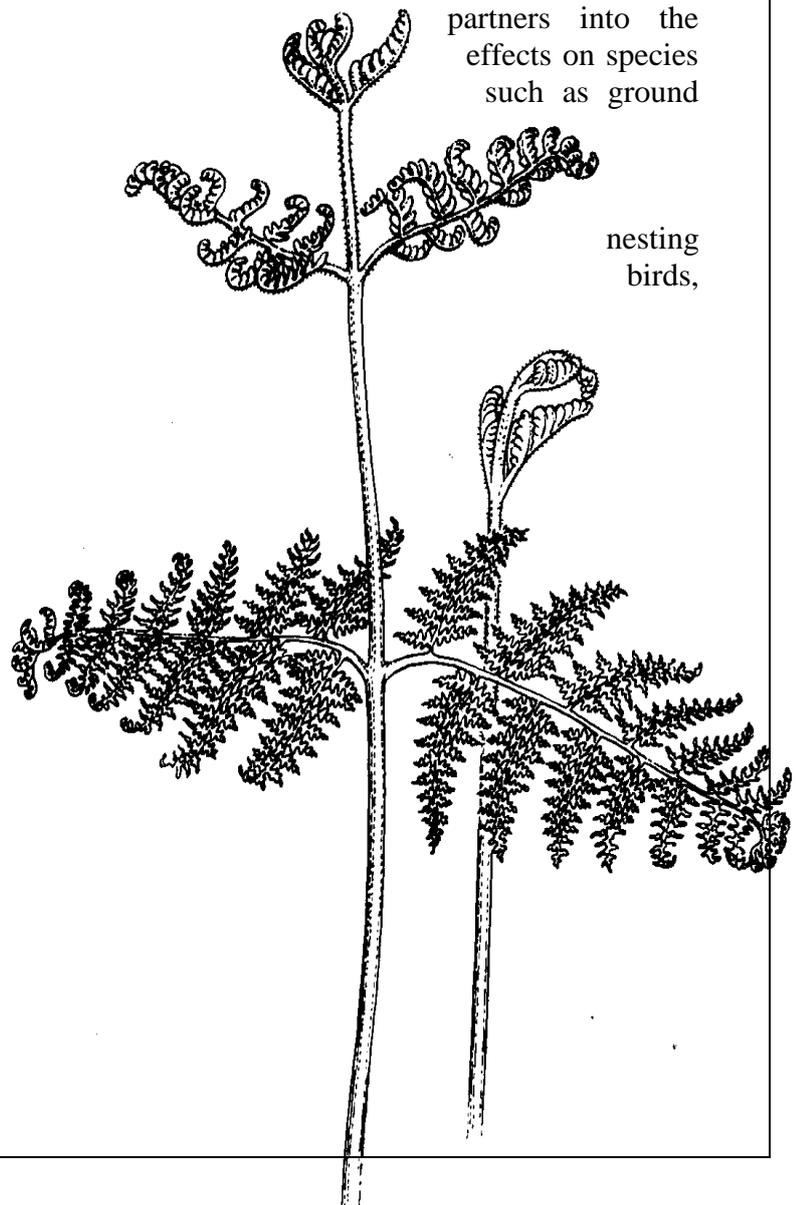
The National Trust's Clumber Estate is currently grazing approximately 300 acres of heath/ acid grassland using 300 Hebridean sheep, 7 Dexter cattle, and 6 Welsh ponies. A further 36 ha of pasture is used to supplement

the grazing. Their research has found a 65% increase in heather coverage in the last 5 years possibly attributable to the grazing regime (Originally these areas had a minimum of 25% coverage).

In the Netherlands, much research has been undertaken into grazing by different species on heathland sites. Dr Gerrit Heil from Utrecht University, found sites that had been grazed for 10 years compared to those receiving no management from cattle, supported significantly higher numbers of heath species. Thus he was able to conclude that grazing is a useful method of site restoration (*Heil, 2002*).

Care must however be taken that other species, for example, invertebrates, are not adversely effected through this form of management. Surveys and monitoring are undertaken by partners into the effects on species such as ground

nesting
birds,



butterflies and common lizards.

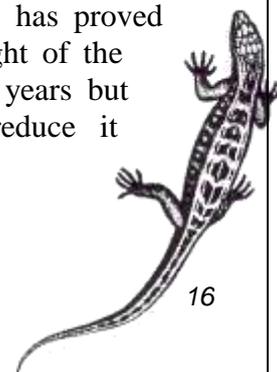
Bracken Rolling

Much research has been done on the most efficient and environmentally friendly method of achieving bracken (*Pteridium aquilinum*) control. The plant, which grows particularly abundant on the Sherwood Sands, is very invasive, spreading via rhizomes. It out competes the more favoured species such as heather, acid grasses and heath bedstraw, which so many of the important heathland fauna is dependent upon.

Spraying was the former method of control for economic reasons but for environmental, ecological and public safety reasons, a tractor pulled ridged agricultural (Otterburn) roller has been used effectively by the Sherwood Forest Trust, National Trust and Thoresby Estate in particular, to mimic the trampling effect of stock, by breaking the stems.

Carried out in mid summer at the plants maximum growth stage (this also avoids disturbance to the great majority of ground nesting birds), energy is spent on repair rather than growth. If continued for 3-4 years, the energy stored in the rhizomes becomes depleted and the bracken growth is reduced. It is recommended that the densest areas of bracken growth on the site be rolled per year with other areas left untouched to prevent excessive heather damage and disturbance to invertebrates. Monitoring is essential so that once growth begins, steps can be taken to minimise the effects and rolling can then begin again on rotation if necessary.

Trials have also been undertaken by the Sherwood Forest Trust at Sherwood Heath SSSI in the use of a mole plough. The tractor pulled mole plough is designed for pipe laying but was used at a depth of 20 cm around woodland. The aim was to sever the rhizomes and reduce spread of the plant from the woodland onto the heath. This has proved successful in reducing the height of the bracken growth in subsequent years but rolling is still required to reduce it further.



A w a r e n e s s & E d u c a t i o n

The Steering Group guides the direction of the Sherwood Habitats Forum and it is through this that much awareness raising and educational events, in particular on lowland heathland, are organised.

In September 2002, the Sherwood Habitats Steering Group hosted the 6th National Lowland Heathland Conference at the University of Nottingham. This offered a valuable opportunity to raise the profile of the often forgotten lowland heaths of the East Midlands, to 150 national and international delegates. Speakers presented papers highlighting the ongoing research into a wide range of issues affecting lowland heathland, ranging from associated flora and fauna, urban pressure, to management techniques and implications.

Speakers from the following organisations were represented; English Nature, Cannock Chase Project, Sheffield Hallam University, Nottinghamshire Biological & Geological Records Centre, Utrecht University, Bishop Burton College, Nottinghamshire Wildlife Trust, Ancient Tree Forum, Sherwood Forest Trust, Baker Shepherd & Gillespie, RSPB, Dutch Ministry of Agriculture, Nature Management & Fisheries, Forestry Commission, Lincolnshire Wildlife Trust, Hollinwell Golf Club and Tomorrow's

Heathland Heritage.

Published proceedings of the conference will be available in 2004.

Events for golf courses and landowners are held in Sherwood annually to advise on heathland management techniques. These are organised through the Sherwood Habitats Forum and Sherwood Forest Trust.

Education and interpretation for the general public, schools and landowners is being undertaken by many of the involved organisations but in particular the Sherwood Initiative who have employed two officers to undertake educational and awareness raising activities and create interpretation material, accessible to a wide audience. Nottinghamshire Wildlife Trust work with schools and the wider community to raise awareness of the importance of heathlands and involve them in practical heathland creation and management projects.

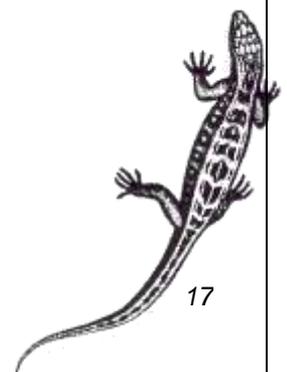
Many of the partner organisations use volunteers to undertake some form of management on their heath's and this in turn, helps to educate these groups on the ecological, historical and management importance of the site.

C o n c l u s i o n s

Partnership working has proved to be an extremely effective way of undertaking large scale restoration work on Sherwood's heathlands and provided links and connective corridors between them, which has proved so important to wildlife. The experience and advice gained by these organisations continues

to be put to good use for the benefit of the local flora and fauna, communities and visitors alike.

The Nottinghamshire Heathland Strategy still stands as a valuable advisory document from which, it is hoped, future success within Nottinghamshire and elsewhere in the UK can continue to reverse the loss of Britain's lowland heathland resource.



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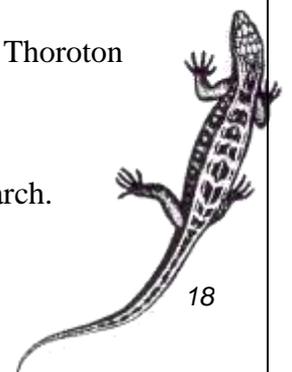
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