THE STATE OF NATURE IN SHERWOOD REPORT 2015



Produced by the Sherwood Habitats Strategy Group
1st Edition – May 2016

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Cover photo – Sherwood Forest NNR (©Nick Crouch)

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FOREWORD

This report, the State of Nature in Sherwood Report 2015, is the result of discussions at the Sherwood Habitats Strategy Group over the last two years, and forms an important part of the process in reviewing the partnership's collective efforts in delivering the goals set out in the 'Purple Vision' (Sherwood Habitats Steering Group 2005).

It is also an important milestone for nature conservation in Sherwood, as it collates baseline data in a single document for the first time since the Victorian era, a heyday for the field naturalist and data collecting. In establishing a baseline, we set a mark against which we can keep track of the extent of habitats and the status of species in Sherwood over time, and highlight those that are doing well and those that are declining and therefore require our attention.

Baseline data is also essential for helping us to set SMART (Specific, Measurable, Achievable, Realistic and Timed) targets for our ambitions to improve the status of Sherwood's special habitats and species, allowing us to check that our, often all too limited, resources are delivering successfully.

There is an impressive amount of information in the report which is testament to the dedication of (largely volunteer) recorders going out into the field to survey sites. This is a report that everyone can contribute to in the future by helping with surveys and sending in records.

Over time this report will be updated to provide a 'health check' of Sherwood's habitats and species, and as recording and knowledge of species' distributions improves, it can hopefully include distribution maps and indications of trends.

This report would not have happened without the recorders and records mentioned above, nor without the contributions of a number working in Sherwood and the efforts of Nick Crouch, author, in bringing data together from a wide range of sources. As Chairman of the Sherwood Habitats Strategy Group I thank them all for their efforts.

Carl Cornish, Chair of the Sherwood Habitats Strategy Group
May 2016



Acid grassland (©Nick Crouch)

INTRODUCTION

This report has been produced by the Sherwood Habitats Strategy Group (SHSG), a partnership of organisations whose aim is to facilitate the delivery of the Nottinghamshire Heathland Strategy and the biodiversity and landscape elements of the Vision for Sherwood. The remit of the SHSG covers the Sherwood Natural Character Area, and the group seeks to ensure the long term future of Sherwood's habitats - their protection, conservation, enhancement, sustainable management and significant expansion. The SHSG is also a technical advisory group to the Sherwood Forest Regional Park Board.

The report's purpose is to establish a 2015 baseline for the State of Nature in Sherwood, which can then be used to monitor the status of Sherwood's key habitats and species in future years; to help identify conservation priorities; and to target conservation activities in the context of scarce resources. It is envisaged that the report will also be used to raise the profile of nature in Sherwood more widely with decision makers and members of the public.

For the purposes of this report, Sherwood is defined as the Sherwood Natural Character Area (NCA). This important area falls entirely within Nottinghamshire, and occupies around 53,456ha of land up the western side of the county, extending from Beeston in the south to Langold and Oldcotes in the north, and including the urban areas of Mansfield, Worksop, Retford and Ollerton, and large parts of Greater Nottingham (Figure 1). Within the Sherwood NCA sits an area known as The Dukeries, formed by the largely contiguous parkland estates of Welbeck, Worksop, Thoresby and Clumber. Whilst not a ducal seat, Rufford is also normally considered to be part of the Dukeries.

Sherwood has a distinctive natural character, born from its underlying sandstone geology. The key semi-natural habitats of Sherwood are Lowland Heathland, Lowland Dry Acid Grassland, Mixed Deciduous Woodland (oak-birch woodland), and Wood Pasture and Parkland. Other land uses, primarily arable farmland and coniferous forestry are also prevalent, dominating large areas of the NCA.

Huge areas of semi-natural habitat – primarily heathland and acid grassland – have been lost from Sherwood over the last few centuries, ploughed up for farmland, planted with conifer trees or consumed by expanding towns. However, Sherwood continues to support some very important areas of habitat, and recent efforts have seen the loss of these halted, and in some cases reversed. But much work remains to be done, to ensure that existing areas of habitat are brought under favourable management, and that opportunities are taken to expand and re-link the isolated fragments that remain. To this end, a range of plans and strategies exist, including:

- The Nottinghamshire Heathland Strategy (Stander 2003)
- A Vision of the Future for Sherwood Forest (Sherwood Habitats Strategy Group 2005)
- Natural Character Area Profile: 49 Sherwood (Natural England 2012)
- Climate Change in Sherwood (Natural England 2013)
- Sherwood Biodiversity Opportunity Map (Nottinghamshire Biodiversity Action Group, in prep.)
- The Local Biodiversity Action Plan for Nottinghamshire (Taylor 1998)
- Futurescapes – Sherwood Forest (Royal Society for the Protection of Birds 2014)
- Creating a Living Landscape for Nottinghamshire (Nottinghamshire Wildlife Trust, undated)
- Humber Basin River Management Plan (Environment Agency 2015)

Figure 1. The Sherwood Natural Character Area within the county of Nottinghamshire



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Information about Sherwood's special species is harder to come by, and producing accurate population estimates, trends, and in some cases distributions, is difficult or impossible. A recent resurgence in recording, especially of invertebrates by a small number of dedicated individuals, has led to the discovery or rediscovery of a number of notable species. However, much remains to be learnt, even for some of Sherwood's more obvious and well-studied species groups.

It is intended that this report will be updated every 3 years, in order that the state of Sherwood's nature can be monitored. It is envisaged that the report will be used to help set targets for action on species and habitats in Sherwood, and to inform the annual work plan of the SHSG. It will also identify where there are gaps in our data which need to be filled.



Clipstone Forest (© Nick Crouch)

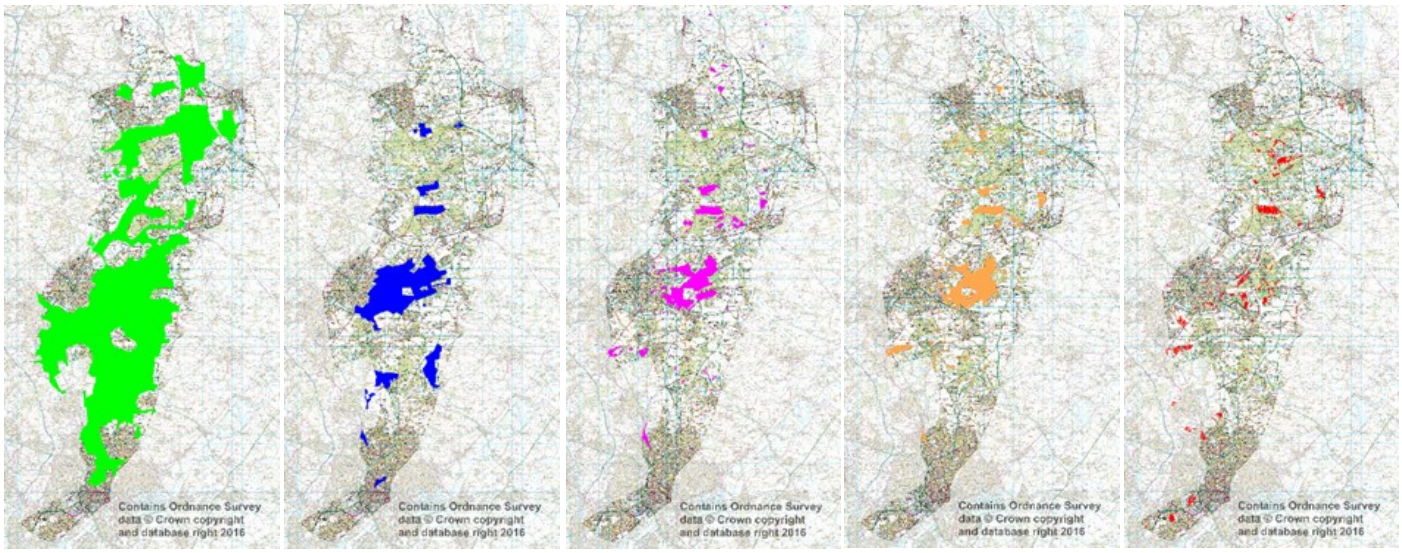
HISTORICAL CONTEXT

It is well known that significant areas of semi-natural habitat have been lost from Sherwood over the preceding centuries, as a result of agricultural intensification, urbanisation and the planting of coniferous forestry. However, quantifying these losses is, for the main part, impossible, due to a lack of baseline information from previous eras. The exception is heathland/acid grassland, where historic mapping does allow for the extent of this habitat to be broadly quantified (Table 1) and mapped for several moments in time, back to 1774 (Figure 2). However, it must be noted that historic map sources (and hence the data derived from them) must be treated with a degree of caution, due to problems with accuracy and interpretation; nevertheless, such maps do allow for broad changes in the extent and distribution of to be illustrated and examined.

Table 1. Changes in heathland extent in Sherwood

Period	Extent of heathland (hectares)
1774 (from Chapman's Map)	c. 23,560ha
1835 (Sanderson's Map)	c. 4490ha
1885 (OS 6 Inch Series 1)	c. 2395ha
1920 (OS 6 Inch Series 2r)	c. 3180ha
Local Biodiversity Action Plan (LBAP) mapping (2013)	c. 905ha

Figure 2. Changes in heathland coverage in Sherwood



L-R: 1774; 1835; 1885; 1920; 2013

Meaningful historic information concerning the status of species in Sherwood is also hard to come by. However, as an example, examination of historic accounts of butterflies gives an indication of how things have changed: Sherwood previously hosted no fewer than six species of Fritillary; High Brown, Silver-washed, Dark-green, Pearl-bordered, Small Pearl-bordered and Marsh, but these were all lost by the late 1930's. Similarly, Wood White, Purple Emperor, Silver-studded Blue and Grayling were also previously recorded in Sherwood, but are now extinct. Whilst some of these species may always have been rare or scarce, other were clearly not, and Carr (1916) highlights the current or previous status of various species, with reference to previous works by Sterland and Brameld:

- Silver-washed Fritillary: '*Much rarer now than formerly. It used to be not at all uncommon in Sherwood Forest, according to Sterland, but Brameld speaks of it as rare*'

- High Brown Fritillary: '*Still fairly frequent in some parts of Sherwood Forest*'
- Dark-green Fritillary: '*Scarce. Frequent in Sherwood Forest (Sterland); formerly common there, now much less so (Brameld)*'
- Pearl-bordered Fritillary: '*Very common in Sherwood Forest (Brameld)*'
- Small Pearl-bordered Fritillary: '*Common at Clumber (Brameld)*'
- Silver-studded Blue: '*Common in Sherwood Forest (Brameld)*'

However, by way of contrast, a number of species which were rare or scarce during Carr's time are now common and widespread, most notably Comma, Speckled Wood, Holly Blue and Essex Skipper, whilst Brown Argus did not occur in Nottinghamshire at all at that time.



Silver-washed Fritillary - unrecorded in Sherwood Forest since Carr's time but recorded with increasing frequency within Nottinghamshire and may yet recolonise Sherwood (©Nick Crouch)

Much of Sherwood is covered by a range of nature conservation designations, from international to local, and providing differing levels of protection.

Headlines

- Accounting for overlaps between different designation types, approximately 7,700ha, or 14.5%, of Sherwood is covered by a nature conservation designation of one sort or another.
- There is one SAC in Sherwood, covering 271.8ha or 0.5% of the NCA
- There is one NNR in Sherwood, covering 423.6ha or 0.8% of the NCA
- There are 14 SSSIs wholly or partially within Sherwood, covering 1758ha or 3.3% of the NCA;
- Of those SSSIs wholly within Sherwood, 96.8% by area are categorised as being in 'target condition'
- There are 244 LWSs wholly or substantially within Sherwood, covering 7802.2ha or 14.6% of the NCA
- Of these LWSs, 96 (39% by number) are considered to be in 'positive conservation management'
- There are 18 LNRs wholly within Sherwood (with a further three partially), covering 205ha or 0.4% of the NCA

Special Areas of Conservation

Special Areas of Conservation (SACs) are internationally important sites subject to strict protection, designated under the EC Habitats Directive for the conservation of habitats and species listed in Annexes I and II, respectively, of the Directive. Sherwood (and Nottinghamshire) hosts a single SAC, which coincides with parts of the Birklands and Bilhaugh SSSI (see Table 2).

Table 2. SAC details

SAC name	Area (ha)	% of NCA
Birklands & Bilhaugh	271.8ha	0.5%

Data source: JNCC website: http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0012740

The habitat at the site is categorised as 'old acidophilous oak woods with *Quercus robur* on sandy plains', and is one of just four examples of this habitat type selected for SAC designation in Britain. It is described as "the most northerly site selected for old acidophilous oak woods and is notable for its rich invertebrate fauna, particularly spiders, and for a diverse fungal assemblage, including *Grifoa suphurea* and *Fistulina hepatica*. Both native oak species, *Quercus petraea* and *Quercus robur*, are present, with a mixture of age-classes, so there is good potential for maintaining the structure and function of the woodland system and a continuity of dead-wood habitats."

Management of the site is split across a number of organisations – Nottinghamshire County Council, Forest Enterprise (managing different parts of the Birklands section) and the Thoresby Estate (responsible for the area known as Buckgates).

Conservation Objectives for this site have been produced by Natural England, and are available at: http://publications.naturalengland.org.uk/publication/5179475394297856

A Site Improvement Plan has also recently been produced for the SAC, providing an overview of current and predicted issues affecting the site, and outlines the priority measures required to improve the condition of the site. This document can be obtained at: http://publications.naturalengland.org.uk/publication/6727956374224896



Longhorn cattle grazing in Sherwood as part of conservation management (©Nick Crouch)

National Nature Reserves

National Nature Reserves (NNRs) are legally designated sites of national importance, protecting the best examples of a particular habitat. They must be managed appropriately to retain their special status, and whilst their main purpose is the conservation of their important habitats and species, they also provide opportunities for the



Sherwood Forest NNR (©Nick Crouch)

public to enjoy and engage with nature.

One NNR is designated in Sherwood (and Nottinghamshire), coinciding with the Birklands section of the Birklands and Bilhaugh SAC, but also including the large open heath to the north, known as Budby South Forest (or Budby Heath).

Table 3. NNR details

NNR name	Area (ha)	% of NCA
Sherwood Forest	423.6ha	0.8%

Data source: Gov.uk website: https://www.gov.uk/government/publications/nottinghamshires-national-nature-reserves/nottinghamshires-national-nature-reserve

Whilst the southern part of the NNR (coinciding with the Birklands section of the Birklands and Bilhaugh SAC) remains under the management of Nottinghamshire County Council, Budby South Forest came under the management of the RSPB in early 2015, having previously been used as a military training area by the Defence Training Estate.

Sites of Special Scientific Interest

Sites of Special Scientific Interest (SSSIs) are nationally important, legally protected sites, which are identified and designated by Natural England and represent the finest sites for wildlife and natural features in Britain.

There are 14 SSSIs at least partly within Sherwood, covering a combined area of nearly 1,758ha or 3.3% of the NCA (see Table 4), of which 10 fall wholly within the NCA. All SSSI's in Sherwood are designated solely for their biological interest; there are no geological or mixed interest SSSIs.

Natural England are responsible for assessing the condition of SSSIs, assigning compartments within each SSSI to one of five categories. The condition of each SSSI wholly within Sherwood is shown in Table 5 (with the fifth condition category, 'Destroyed', omitted as no areas of SSSI in the NCA are categorised as such). Table 6 shows SSSI condition broken down by SSSI notification features.

Table 4. SSSI details – area (all SSSIs wholly or partially in Sherwood NCA)

SSSI name	Total area (ha)	Area within Sherwood NCA (ha)
Clumber Park	525.66	525.66
Welbeck Lake	101.67	101.67
Thoresby Lake	58.01	58.01
Birklands & Bilhaugh	505.78	505.78
Birklands West & Ollerton Corner	414.00	414.00
Clipstone Heath	4.30	4.30
Sherwood Forest Golf Course	62.56	62.56
Strawberry Hills Heath	31.52	31.52
Rainworth Heath	13.77	13.77
Rainworth Lakes	14.16	14.16
Hills & Holes and Sookholme Brook	30.20	15.70
Wellow Park	135.50	7.10
Attenborough Gravel Pits	226.60	1.60
Gamston & Eaton Woods & Roadside Verges	57.20	1.30
Totals	**2180.93**	**1757.13**

Data source: Natural England Designated Sites View website: https://designatedsites.naturalengland.org.uk/

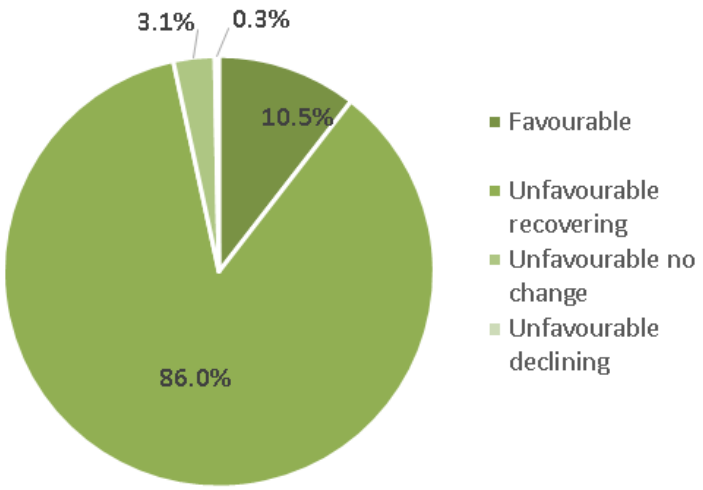
Table 5. SSSI details – condition by site (SSSIs wholly within Sherwood NCA)

SSSI name	Favourable (ha)	Unfavourable Recovering (ha)	Unfavourable No change (ha)	Unfavourable Declining (ha)	Total (ha)
Clumber Park	44.38	481.28	0	0	**525.66**
Welbeck Lake	91.94	9.73	0	0	**101.67**
Thoresby Lake	45.88	6.57	0	5.55	**58.00**
Birklands & Bilhaugh	0	489.95	15.83	0	**505.78**
Birklands West & Ollerton Corner	0	390.46	23.54	0	**414.00**
Clipstone Heath	0	4.30	0	0	**4.30**
Sherwood Forest Golf Course	0	62.56	0	0	**62.56**
Strawberry Hills Heath	0	31.52	0	0	**31.52**
Rainworth Heath	0	13.77	0	0	**13.77**
Rainworth Lakes	0	0	14.16	0	**14.16**
Total	**182.20**	**1490.14**	**53.53**	**5.55**	**1731.42**

Data source: Natural England Designated Sites View website: https://designatedsites.naturalengland.org.uk/

The percentage of SSSI (by area) falling within each of the condition categories is shown in Figure 3. Together, the figures for Favourable and Unfavourable Recovering condition provide a figure for 'Target Condition'; the government set a target for 95% of SSSIs to be in Target Condition by 2010. In Nottinghamshire, this figure is currently 96.59%.

Figure 3. SSSI condition by area



Data source: Natural England Designated Sites View website: https://designatedsites.naturalengland.org.uk/

Table 6. SSSI details – condition by designation feature

SSSI feature	Favourable (ha)	Unfavourable recovering (ha)	Unfavourable no change (ha)	Unfavourable declining (ha)	Not assessed (ha)	Total (ha)
Aggregations of breeding birds						
Grey Heron *Ardea cinerea*					9.73	9.73
Assemblages of breeding birds						
Lowland Open Waters & their Margins					54.32	54.32
Mixed: Lowland Open Water, Woodland	91.94				9.73	101.67
Woodland	6.86	8.38			5.99	21.23
Invertebrate Assemblage						
Grassland And Scrub Matrix		214.78				214.78
Scrub-heath and Moorland		165.75				165.75
Unshaded Early Successional Mosaic		165.75				165.75
Wood Decay	170.56	96.58				267.15
Wood Decay: Bark And Sapwood Decay	121.24	651.00	12.53		204.92	989.69
Wood Decay: Fungal Fruiting Bodies	54.41	670.27	12.53		173.18	910.40
Wood Decay: Heartwood Decay	121.24	603.45	12.53		173.18	910.40
Habitats						
Lowland Dry Acid Grassland (U1b,c,d,f)					5.69	5.69
Lowland Dry Acid Grassland (U1e)		60.89			33.70	94.60
Lowland Dry Acid Grassland (U4)		73.02			33.70	106.72
Lowland Dry Heath		472.03			25.24	520.80
Lowland Mixed Deciduous Woodland	6.37	184.99	12.53			203.89
Lowland Neutral Grassland					5.69	5.69
Lowland Wet Heath		13.77				13.77
Lowland Wood-pasture and Parkland		267.15	3.29			270.44
Valley Fen (Lowland)		7.16				7.16
Waterfringe Fen (Lowland)	45.88		14.16		52.18	112.22
Wet Woodland					5.99	5.99

Data source: Natural England – East Midlands Team

Local Nature Reserves

Local Nature Reserves (LNRs), designated by local authorities, are sites which support wildlife or geological features that are of special interest locally, and which offer people opportunities to study or learn about nature, or simply to enjoy it.

There are 18 LNRs wholly and a further three LNRs partially within Sherwood, extending to 205.0ha (solely within Sherwood) or 0.4% of the NCA area (see Table 7).

Table 7. LNR details

LNR name	Total area (ha)	Area within Sherwood NCA (ha)	Designating authority
Alexandrina Plantation	3.6	3.6	Broxtowe Borough Council
Beeston Sidings	5.5	5.5	Nottingham City Council
Cocklode & Rotary Woods	14.8	14.8	Nottinghamshire County Council
Hermitage	1.8	1.8	Mansfield District Council
Hucknall Road Linear Walkway	8.2	5.2	Nottingham City Council
King George's Park	3.2	3.2	Broxtowe Borough Council
Kings Mill Reservoir	27.5	27.5	Ashfield District Council
Maun Valley Park	16.4	16.4	Mansfield District Council
Oakham	5.5	5.5	Mansfield District Council
Oaktree Heath	10.1	10.1	Mansfield District Council
Quarry Lane	4.7	4.7	Mansfield District Council
Rainworth Water	18.0	18.0	Nottinghamshire County Council
Ravensdale	9.6	9.6	Mansfield District Council
Retford Cemetery	12.7	5.5	Bassetlaw District Council
Rufford Country Park	5.0	5.0	Nottinghamshire County Council
Sandy Banks	5.7	5.7	Nottingham City Council
Sandy Lane Public Open Space	9.3	9.3	Broxtowe Borough Council
Sherwood Heath	23.3	23.3	Newark & Sherwood District Council
Southwell Trail	27.1	14.0	Nottinghamshire County Council
Sunrise Hill	1.5	1.5	Nottingham City Council
Tippings Wood	30.2	30.2	Nottinghamshire County Council
The Bottoms	10.9	10.9	Mansfield District Council
The Carrs	5.8	5.8	Mansfield District Council
Vicar Water Country Park	82.0	82.0	Newark & Sherwood District Council
Wollaton Park	141.0	134.7	Nottingham City Council
Total	**483.4**	**453.7**	

Data source: Nottinghamshire County Council - Conservation Team



Oaktree Heath LNR © (Chris Jackson)

Local Wildlife Sites

Local Wildlife Sites (LWSs), previously known as Sites of Importance for Nature Conservation (SINCs), are sites that are identified as being of at least county-level importance for their wildlife. They are a local, non-statutory designation, used throughout the UK under various names, principally in relation to land use planning and development.

There are a total of 244 LWSs (including candidate sites) wholly or substantially (>25% by area) within Sherwood. Their total area extends to some 7802.2ha (this figure includes those parts of LWSs which overlap and fall outside the Sherwood NCA boundary) or 14.6% of the NCA area. Of these, 96, or 39% (by number) are known to be in positive conservation management, as defined by Single Data List 160 (2014-15 figure)

Data source: Nottinghamshire Biological and Geological Records Centre and Nottinghamshire County Council (Conservation Team).

HABITATS

Our most important habitats are so-called 'habitats of principal importance for conservation of biological diversity in England' by virtue of Section 41 of the Natural Environment and Rural Communities Act, a term that is often shortened to 'habitats of principal importance', 'Section 41 habitats', or simply 'priority habitats'. This means that they are recognised as being of national conservation importance, and are the subject of national strategies for their protection, enhancement and expansion. These habitats, and a number of habitats of more local conservation concern, are also covered by the Nottinghamshire Local Biodiversity Action Plan (LBAP).

Headlines

- 65% of the Sherwood NCA is farmland (although this includes some semi-natural grassland)
- 16% of the NCA is urban land (which includes some areas of semi-natural habitat)
- 10% of the NCA is planted coniferous woodland
- 10% of the NCA is broad-leaved woodland (of which an unknown proportion is oak-birch woodland that is characteristic of the NCA)
- 1.6% of the NCA is Ancient Woodland
- 2% of the NCA is heathland/acid grassland
- 2.5% of the NCA is other habitats of ecological importance (excluding wood pasture and parkland which overlap to a large degree with other habitats)
- None of Sherwood's major watercourses rivers are categorised as having 'Good' status under WFD.

Key habitats

A number of habitats are particularly characteristic of Sherwood, and are considered to be particular priorities for conservation action in the NCA. These are listed in Table 8, along with an indication of their extent (where known).



Heathland at Budby South Forest (©Nick Crouch)

Table 8. Priority Habitats by area

Priority Habitat	Total extent in NCA (ha) (year)	% of NCA	Area in favourable condition (ha)	Notes
Lowland Heathland	904 [a]	2	Unknown	A combined figure from 2013 which requires further refinement; distinguishing between acid grassland and heathland is an ongoing issue when trying to map the extent of this habitat in Sherwood. A figure of 993 ha is provided by Natural England ([b]).
Lowland Dry Acid Grassland				
Broadleaved woodland	5087 [b]	10	Unknown	Includes all broad-leaved woodland
[Lowland Mixed Deciduous Woodland]	3767 [b]	7	Unknown	Covers the Broad Habitat "Broadleaved mixed and yew woodland"
[Oak-birch Woodland]	No data	No data	Unknown	LBAP habitat
[Wet Woodland]	No data	No data	Unknown	LBAP habitat
[Ancient Woodland – all]	875.8 [c]	1.6	Unknown	
[Ancient Semi-Natural Woodland]	424.5 [c]	0.8	Unknown	
[Planted Ancient Woodland Sites]	451.2 [c]	0.8	Unknown	
Wood Pasture	496.8 [d]	0.9	Unknown	A provisional figure, covering Birklands & Bilhaugh SAC and units 1 & 2 of Birklands West & Ollerton Corner SSSI; includes habitat also counted as Lowland Mixed Deciduous Woodland
Parkland	827.4 [a]	1.5	Unknown	Includes habitat counted under other definitions (i.e. woodland, grassland, heathland and waterbodies)

Data sources: [a] Notts BAG / NBGRC LBAP habitat mapping (in prep.); and [b] Natural England (2012)



Species-rich acid grassland road verges in Clumber Park (©Nick Crouch)

Other habitats

A range of other habitats are also present in Sherwood, listed in Table 9, although are generally of lower importance or are less prevalent than the habitats listed above; nevertheless, they make an important contribution to the area's biodiversity.

Table 9. Other Priority Habitats by area

Habitat	Total extent (ha) / no.	% of NCA	Area in favourable condition (ha)	Notes
Eutrophic Standing Waters (lakes)	188.9 [a] (17 no.)	Add	Unknown	Includes all permanent waterbodies over 2ha in size
Ponds (waterbodies <2ha in size)	745 no. [a]	n/a	Unknown	A provisional figure based on Ordnance Survey mapping and aerial photography; this figure is for all ponds and does not distinguish between those of LBAP/S41-quality ponds and those that are not.
Wetland (fen, marsh and swamp)	24 [b]	<1	Unknown	
Reedbed	3.3 [a]	<0.1	Unknown	
Lowland Neutral Grassland	22 [b]	<1	Unknown	
Lowland Calcareous Grassland	12.7 [a]	<0.1	Unknown	
Floodplain Grazing Marsh	4.0 [a]	<0.1	Unknown	
Open Mosaic Habitat on Previously Developed Land	84.9 [a]	0.2	Unknown	
Mixed or other woodland	1386 [b]	3	Unknown	Woodland not categorised as 'Broadleaved'
Planted Coniferous Woodland	5110 [b]	10	Unknown	
Urban areas	8796 [b]	16	n/a	

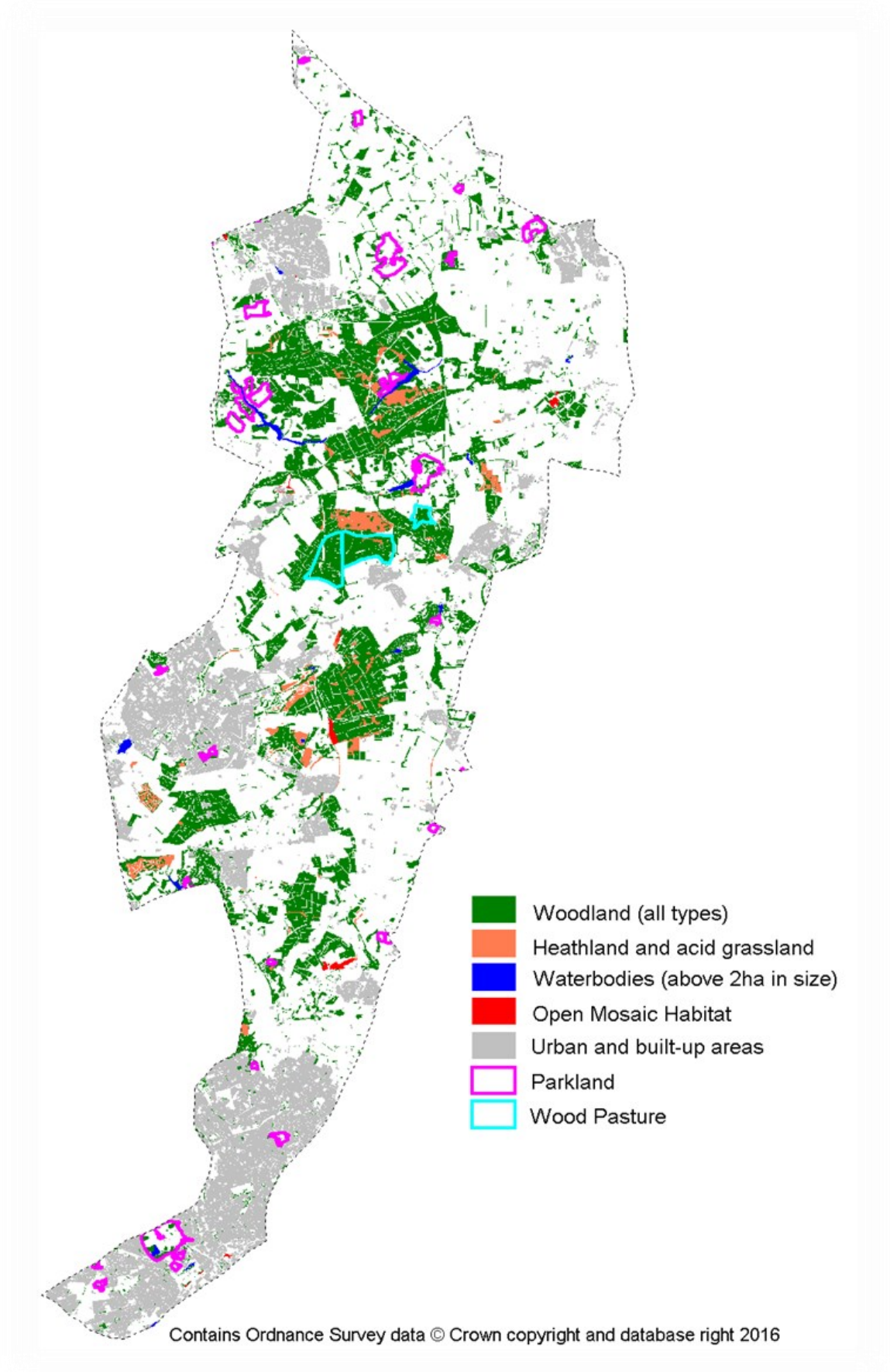
Data sources: [a] Notts BAG / NBGRC LBAP habitat mapping (in prep.); and [b] Natural England (2012)



The lake at Rufford Country Park (©Nick Crouch)

The distribution of habitats in Sherwood is not even, with the main woodland and heathland areas in particular being concentrated at a small number of sites running up the middle of the NCA – see Figure 4.

Figure 4. Distribution of selected habitats in Sherwood



Data source: Nottinghamshire Biodiversity Action Group

Rivers

Detailed below are the main rivers in the Sherwood area, summarised in terms of their Water Framework Directive (WFD) status (see also Table 10). It should be noted that in some cases, only small parts of the WFD waterbodies referred to actually run through Sherwood (see Figure 5). Further details about the WFD can be found at: http://evidence.environment-agency.gov.uk/FCERM/en/SC060065/About.aspx

River Ryton and tributaries

Previously split into two WFD waterbodies, the River Ryton is now one WFD waterbody. It is at Moderate status, failing for phytobenthos and phosphate. Reasons for failures include diffuse source pollution caused by drainage (urban and transport) and point source pollution caused by the sewage industry.

There are a number of large WFD tributaries of the River Ryton, including; Owlands Wood Dyke (Moderate status); Hodsock Brook (Good status); Oldcotes Dyke (Moderate status); and the Anston Brook (Moderate status).

River Poulter and tributaries

The River Poulter is split into two WFD waterbodies. The upper reach is at Moderate status, failing on zinc, whilst the lower reach is also at Moderate status, failing for phosphate and flow. The reasons for these failures are diffuse source pollution (urban and transport run off), point source pollution from the sewage and water industry and groundwater abstraction.

The Millwood Brook is a major tributary of the River Poulter, and is at Moderate status under WFD.

River Meden and tributaries

The River Meden is split into two WFD waterbodies. Both are classed at Moderate, the lower reach having improved on the 2009 baseline data (which classified it as Poor). The lower reaches are currently failing on phosphate only due to diffuse source pollution from drainage from the urban/transport sector and also point source pollution from the sewage industry. The upper reaches, which are not within the Sherwood NCA, are failing for fish, invertebrates and phosphates, with the former linked to habitat and barriers, and both linked to poor water quality (phosphate). The reasons for failure include diffuse source pollution from arable and agriculture and urban and transport drainage, point source pollution from the sewage industry.

The Sookholme Brook is a tributary of the River Meden and is a WFD waterbody at Poor status.

Rainworth Water and tributaries

Rainworth Water is split into two WFD waterbodies. The upper reach is at Moderate status (an improvement on Poor status in 2009), currently failing for fish, invertebrates, macrophytes, phytobenthos, phosphates and flow. The lower reach is at Poor status (the same as in 2009), failing for invertebrates, phytobenthos, macrophytes, pH, phosphate and flow. The reasons for these failures include; physical modifications (barriers to fish passage and land drainage); point source issues (sewer discharges, unsewered discharges); diffuse source (drainage, mixed agricultural inputs, urban runoff and transport); and hydrology (water industry abstractions and over abstracted groundwater supplies).

Rainworth Water also has a major tributary; the Gallow Hole Dyke which is at Poor status under WFD.



The Rainworth Water at Rainworth Water Local Nature Reserve (©Nick Crouch)

River Maun and tributaries

The River Maun is split into three WFD waterbodies, all of which are classed as Moderate. The upper reach is failing for fish, invertebrates, ammonia, phosphate and mitigation measures; the middle section failing for phosphate, fish and mitigation measures (an improvement on 2009 data); and the lower reach is failing for phytobenthos, phosphate, mitigation measures and flow (also an improvement on 2009 data). Reasons for these failures include physical modification (barriers, flood defences and land drainage modifications), point source pollution from the sewage industry and diffuse source pollution through drainage (urban and transport) and mixed farm infrastructure.

Vicar Water and Bevercotes Beck are both key tributaries of the River Maun, and both are WFD waterbodies at Poor status.

River Idle and tributaries

Due to the River Idle being extensively modified it has been classified as a Heavily Modified Waterbody under WFD. It is split into three WFD waterbodies, all of which are at Moderate status (an improvement from the 2009 baseline data which classified all as Poor). Failures for these waterbodies include phosphate, macrophytes, flow and mitigation measures. Reasons for failure include diffuse and point source pollution from mixed drainage, urban and transport run off, agricultural land management and sewage discharges.

The Ranskill Brook tributary is a WFD waterbody at Good status.

River Leen and tributaries

The River Leen is split into two WFD waterbodies, the uppermost part and the lower reaches only are within Sherwood's NCA; the lower reach is classified as a Heavily Modified Waterbody. The upper reach is at Moderate status, failing on macrophytes, whilst the lower reach is also at Moderate status, failing for fish, macrophytes and mitigation measures. The reasons for these failures are attributed to physical modification predominantly due to flood defence schemes, diffuse pollution from sewage discharges and urban/road transport runoff and also point source pollution from intermittent sewage discharges.

The River Leen has several tributaries, some are classed as the River Leen under WFD, but there are two which are WFD waterbodies in their own right; the Baker Lane Brook at Moderate status and the Day Brook also at Moderate status. The other non-WFD tributaries include the Tottle Brook, Farleys Brook and the Hempshill Brook.

Dover Beck and tributaries

The Dover Beck is one WFD waterbody, at Moderate status – an improvement on its 2009 Poor classification; only the upper reach is within the Sherwood NCA. It is failing for invertebrates, macrophytes and phosphate. Reasons for these failures include groundwater abstractions, point source pollution from the sewage and water industry and diffuse source pollution from mixed agriculture and urban/transport run off.

The Dover Beck has several tributaries, but none are classified under WFD. These include the Woodborough Beck, Oxton Dumble and the Grimesmoor Dyke.

Chesterfield Canal

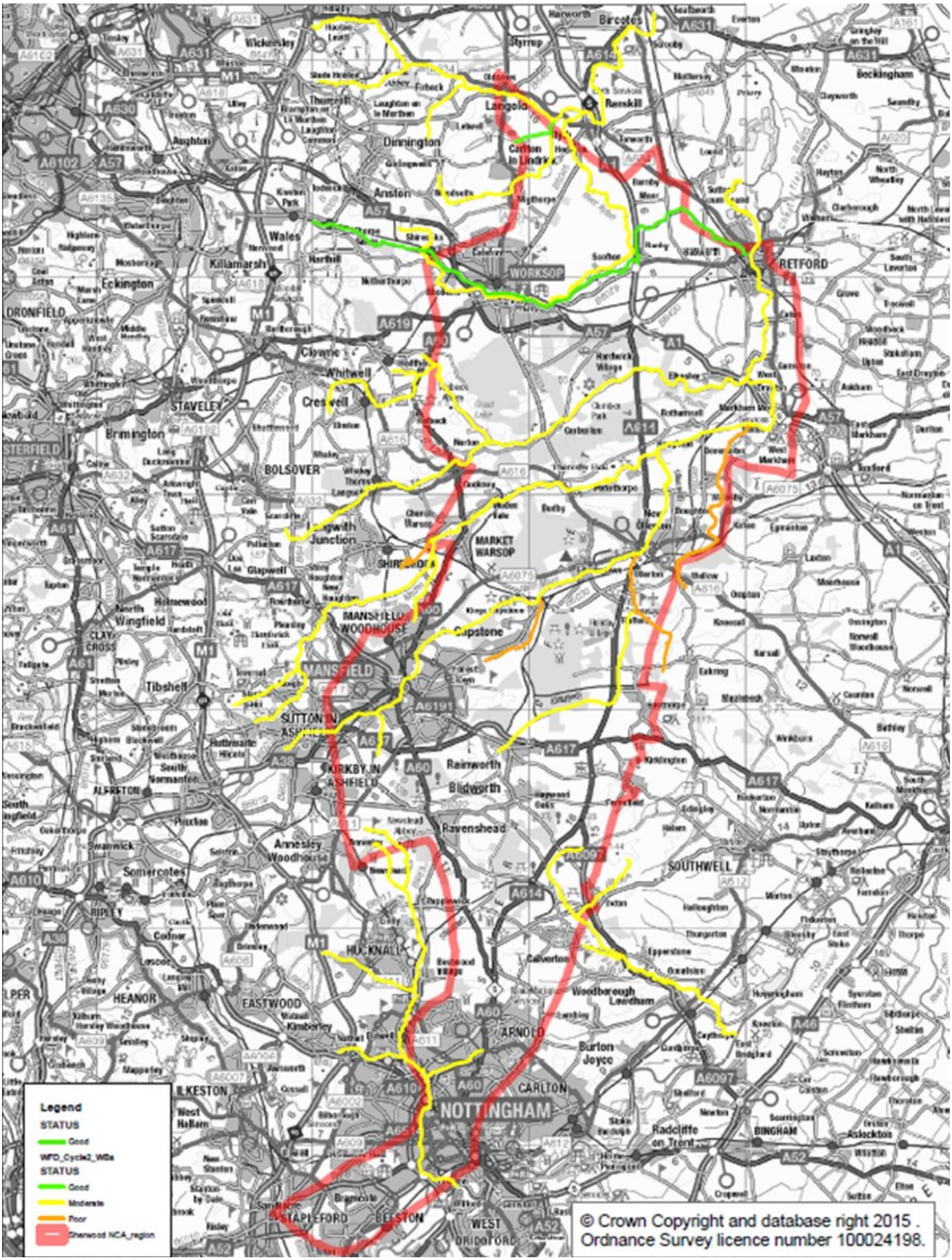
The Chesterfield Canal is split into two WFD waterbodies, both classified at Good status.

Table 10. Rivers by WFD status

River	WFD status of upper reach	WFD status of middle reach	WFD status of lower reach
Ryton	-	Moderate	-
Meden	Moderate	-	Moderate
Maun	Moderate	Moderate	Moderate
Poulter	Moderate	-	Moderate
Idle	Moderate	Moderate	Moderate
Chesterfield Canal	Good	-	Good
Rainworth Water	Moderate	-	Poor
Leen	Moderate	-	Moderate
Dover Beck	-	Moderate	-

Data source: Environment Agency (2015)

Figure 5. Map showing the WFD status of Sherwood's watercourses



Data source: Environment Agency

Farmland

Arable farmland is a significant land-use across much of Sherwood, along with areas of pasture used for sheep grazing. The light, sandy soils are particularly important for the growing of root vegetables, and the rearing of outdoor pigs. The vast majority of farmland falls within the Agricultural Land Classification Grades 3a and 3b, with some Grade 2 also occurring (Table 11).

Table 11. Extent of farmland by ALC grade

Agricultural Land Classification (ALC) Grade	Extent in Sherwood (ha)	% of NCA
1	0	0%
2	4209	7.9%
3a & 3b	30415	56.9%
4	1	0%
5	0	0%
Total	34625	64.8%

Data source: Natural England (2012)

Like habitats, our most important species are identified as 'species of principal importance for conservation of biological diversity in England' under Section 41 of the Natural Environment and Rural Communities Act - often shortened to 'species of principal importance', 'S41' species, or simply 'priority species'. This means that they are recognised as being of national conservation importance, and are the subject of national strategies for their protection and recovery. These species, and a number of more local conservation concern, are also covered by the Nottinghamshire Local Biodiversity Action Plan (LBAP).

A list of all Section 41 species known to occur in Sherwood is provided in Appendix 1. A number of non-Section 41 species are also considered to be particularly characteristic of Sherwood. In the following species accounts, the conservation status of each species is included, where such a status exists; an explanation of these can be found at: http://jncc.defra.gov.uk/page-3425.

Headlines

- The Sherwood NCA is known to support 121 species listed on Section 41 of the NERC Act (although 47 of these are 'research only' priorities)
- The status of Sherwood's notable bird species is variable, with some stable (such as Nightjar and Honey-buzzard), others having increased in recent times (e.g. Woodlark and Goshawk), and several declining or of uncertain status (e.g. Hawfinch, Lesser Spotted Woodpecker, Tree Pipit, Spotted Flycatcher, Turtle Dove and Willow Tit)
- Amongst Sherwood reptiles, Adder is thought to have become recently extinct
- A number of notable invertebrates have been discovered or rediscovered in Sherwood in recent years, including Hazel Pot Beetle, Black Oil Beetle, Welsh Clearwing, Midas Tree-weaver and the cranefly *Ctenophora ornate*
- Sherwood supports a number of rare and notable species of fungi and lichens, although these groups are particularly under-recorded.
- Ancient trees are a particular feature of parts of the NCA
- Invasive non-native species occur widely through the NCA, particularly in association with urban areas, with Rhododendron, Japanese Knotweed and Himalayan Balsam the most prevalent.

Birds

Nightjar *Caprimulgus europaeus* (Annex 1, S41, Amber list). Described in The Victorian History of the County of Nottinghamshire (Page 1907) as '*plentiful during the summer months in the forest but not nearly so numerous as formerly, when… a dozen [were) on the wing at once flying about the road between Harlow and Thieves Woods*'. Whitaker (1907) adds little detail to the knowledge of Nightjar's status in Sherwood at the time.

Dobbs (1975) considered the Nightjar to be uncommon and estimated a population of about 60 pairs; he also considered that the population had "held its own" after recovering from a decline from 1900 to the 1930s. A national BTO survey was undertaken in 1981 and 67 churring males were recorded (Cowley in Dobbs (ed) 1981). More recently, SCARABBS (Statutory Conservation Agencies and RSPB Annual Breeding Birds Scheme) surveys in Nottinghamshire recorded 73 churring males in 1992 and 66 churring males in 2004 (a 7 % decrease from 1992) (Conway *et al.* 2007).

The last two national bird atlas surveys (1988-91 and 2007-11) found that nightjar numbers remained stable in survey squares (recorded in six tetrads in 1988-91 and nine in 2007-11). Not all tetrads in Nottinghamshire were surveyed for the 1988-91 atlas so comparison with 2007-11 is of a sample. All tetrads in the county were surveyed for the 2007-11 so there is a fuller picture of distribution (Nottinghamshire Birdwatchers unpublished atlas data).



Nightjar (©John & Eileen Smith)

Birklands Ringing Group surveys 2000-15 show that the population is stable in the areas they cover, with minor annual fluctuations in numbers of pairs breeding, with disturbance (both from human and animal) and weather conditions early in the season being factors which effect territory occupancy, particularly by females. Nest productivity is high with 61% of nests producing at least one fledged young (n=817 nests) (Birklands Ringing Group, unpublished data). A 10 year data set from Clipstone Forest (Lowe, Rogers & Durrant 2014) shows relatively stable numbers, but fewer birds using the more disturbed northern section (Table 12).

Table 12. Breeding nightjar numbers in Clipstone Forest 2001-10

Year	Breeding pairs			Unpaired males total
	North Section	South Section	Total	
2001	7	10	17	3
2002	6	10	16	2
2003	7	11	18	4
2004	5	8	13	6
2005	4	10	14	3
2006	7	13	20	2
2007	7	12	19	2
2008	2	10	12	2
2009	3	11	14	3
2010	2	9	11	7
mean	5	10.4	15.4	3.4

Data source: Lowe, Rogers & Durrant (2014)

Woodlark *Lullula arborea* (Annex 1, S41, Green list). Described in the Victorian History of Nottinghamshire (Page 1907) as '*a very rare bird, but found occasionally in the forest where the late Mr Sterland some years back took its eggs; it has been seen several times at Newstead*'.

Dobbs (1975) states that the Woodlark was present at about 30 sites in 1950 but started to decline from 1960s onwards and had become extinct as a breeding species by 1969; the account for Woodlark in the Nottinghamshire Birdwatchers' Annual Report for 1969 reads; '*No reports for the year. Careful searches, Dukeries, on Atlas Survey work drew a blank*.' Dobbs speculates that the decline was caused by a loss of habitat and rabbits, affected by myxomatosis, to keep the habitat quality required. Woodlark then remained absent as a breeding species until 1974 when it re-colonised as a rare breeder (one to four pairs) up to the mid-1990s (Reece 2009). There was then a population increase (Table 13).

A further SCARABBS survey in 2006 confirmed this ongoing population increase, with 106 territories recorded (a 218.2 % increase from 1997) (Conway *et al*. 2009); the next SCARABBS survey is due in 2018. Woodlark also showed a significant increase between the two atlas periods (zero tetrads occupied in 1988-91[2] and 12 in 2009-11). The 1988-91 figure is in the sample of tetrads surveyed - low numbers were breeding in the county (Nottinghamshire Birdwatchers' Annual Reports).

Table 13. Woodlark territories in Nottinghamshire 1985 to 1997

	1985	**1986**	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	**1997**
Pairs	1	1	1	4	3	1	0	0	3	6	7	12	28
Singing males	0	0	0	0	1	3	2	4	0	2	2	0	5
Total	1	1	1	4	4	4	2	4	3	8	9	12	33

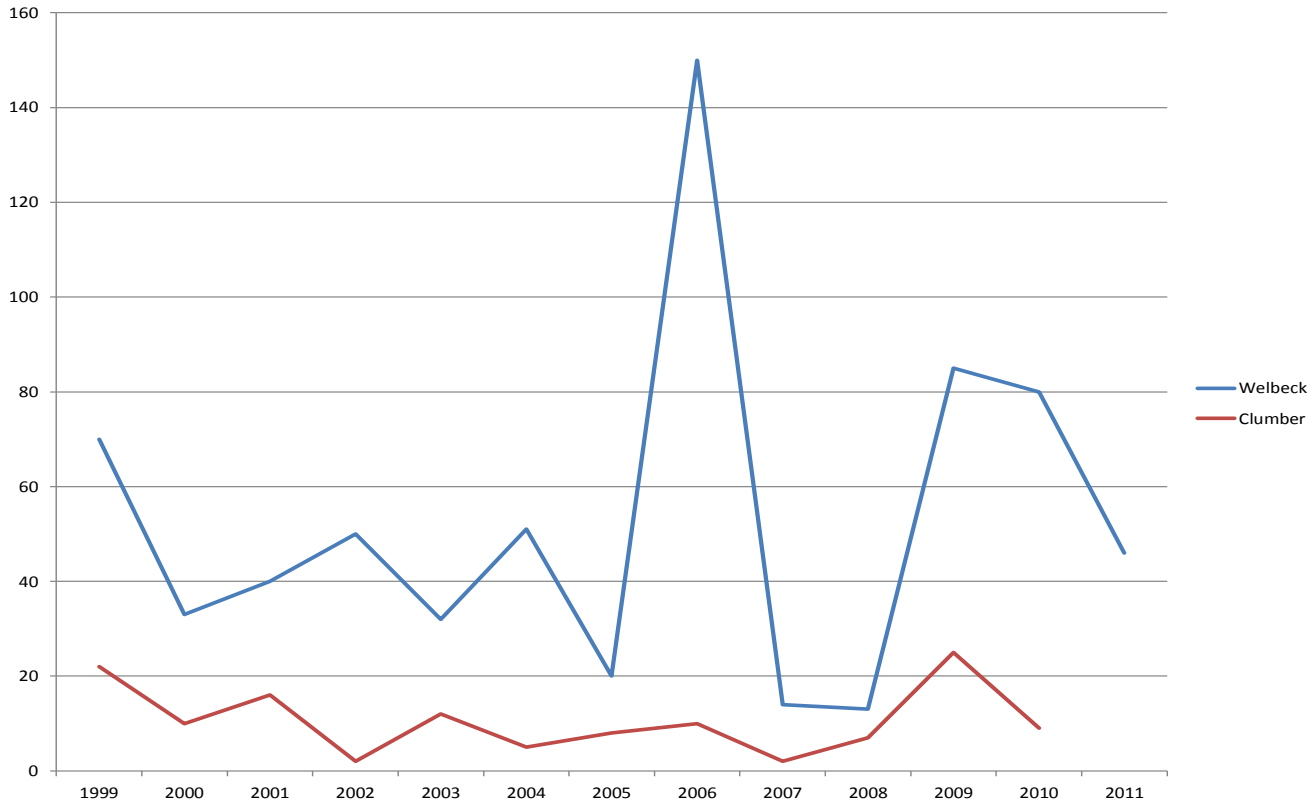
Data source: Szczur in Ellis *et al.* (ed) (1997)
Note: years in bold were covered by SCARABBS surveys

Hawfinch *Coccothraustes coccothraustes* (S41, Red list). Hawfinch was considered to be rare during the middle of the 19th century (Sterland 1869) but was considered to be fairly common by 1906 (Whitaker 1907). By the 1970s the county population was estimated to be 60 pairs (Dobbs 1975) with Sherwood the stronghold with 30 pairs. Sherwood Forest is now the main area for the species in Nottinghamshire with Clumber Park, Rufford Abbey CP and Welbeck Estate key sites; however, there are no recent records from sites in the northern part of the NCA that formerly had birds in 1980s and 1990s – Babworth, Osberton Estate, Carlton-in-Lindrick and Langold.

At Welbeck Estate there have been regular winter counts since 1999 (Roy Frost, pers. comm). Here, Hawfinches are uncommon in November and semi-regular in December, with numbers building up in January to peak in February/March. The peak count has ranged from 13 (2008) to 150 (2006) and the mean peak count is 52.6 over a 13 year period. Small numbers breed at Welbeck and the population there is considered to be stable. Clumber Park is another traditional wintering site for Hawfinch and in the period 1999 to 2010 peak counts ranged from 2 to 25; the highest count was 25 in 2009 and the mean peak count is 10.7 over a 12 year period (data from Nottinghamshire Birdwatchers' Annual Reports). In recent winters the Lime Tree Avenue at Rufford Abbey CP has been a regular site for a small number of Hawfinches (usually less than 10 birds) (data from Nottinghamshire Birdwatchers' Annual Reports). See Figure 6.

Still much is not known about the Hawfinches in Sherwood – the origin of wintering birds is unknown (i.e. whether they are resident birds or winter immigrants), and the size and distribution of the breeding population is also unknown. Breeding information is scant as this species can be difficult to find during the breeding season. Birklands Ringing Group has located pairs and nests in recent years but unfortunately all nests located have failed while at the egg stage due to predation by Grey Squirrel, although a pair with two newly fledged young was recorded during 2015 (Birklands Ringing Group, unpublished data).

Figure 6. Annual wintering numbers of Hawfinch at Welbeck and Clumber 1999-2011



Data source: Nottinghamshire Birdwatchers' Annual Reports.

Lesser Spotted Woodpecker *Dendrocopos minor* (S41, Red list). Described in The Victorian History of the County of Nottinghamshire (Page 1907) as '*by no means common, but it is harder to see than either [Green or Great Spotted Woodpeckers]*'. This species has always been well spread throughout the forest with sites holding pairs for a few seasons before the site is vacated and no longer occupied (Birklands Ringing Group, unpublished data).

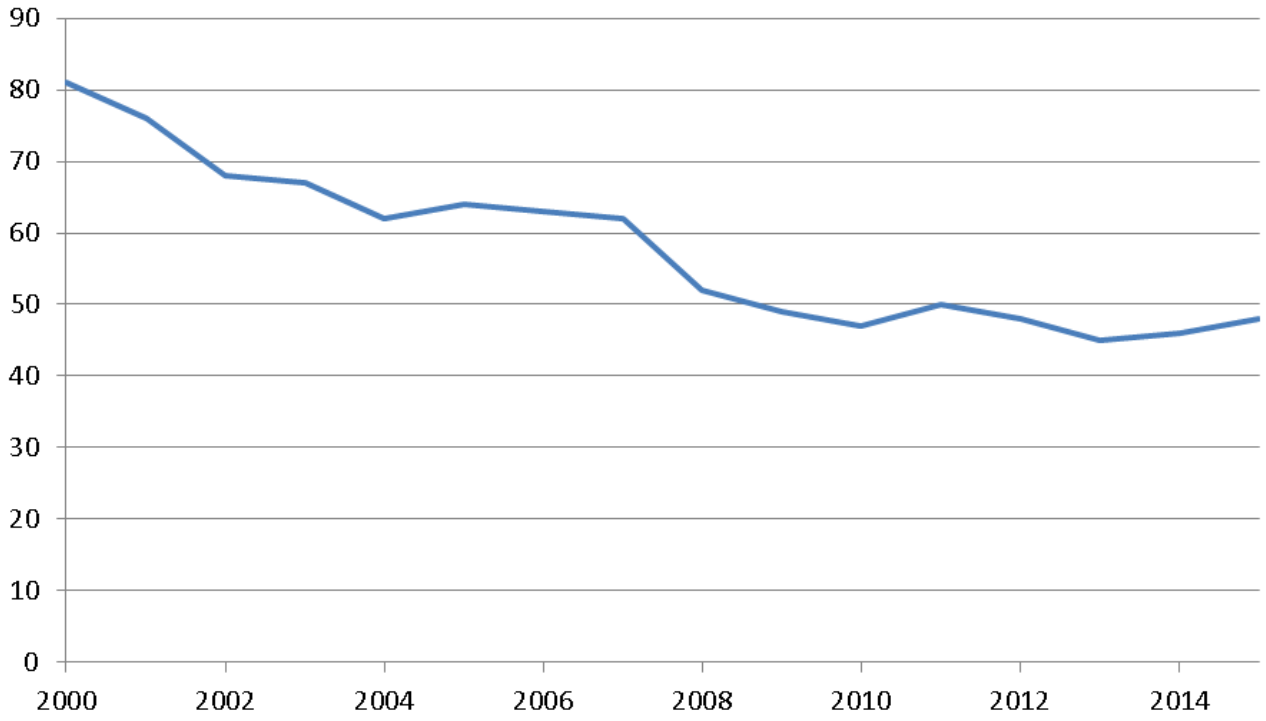
An exception is the area around its stronghold in Sherwood Forest centred on the Sherwood Forest NNR. In recent years the population here has remained stable with 3 or 4 pairs (Birklands Ringing Group, unpublished data). Elsewhere, Rufford Country Park, Clumber Park, Thoresby and Welbeck Estates and Wollaton Park all hold pairs, but little is known of the population density or breeding success.

Tree Pipit *Anthus trivialis* (S41, Red list). The Tree Pipit is a long distance migrant that has been undergoing a large decline and it has been contracting its range in the UK with a general bias to a more upland distribution in the north and west. It occurs fairly widely in Sherwood in suitable habitat and the National Atlas data shows that Sherwood is a still a hotspot for Tree Pipit; however, it is under-recorded making it difficult to assess the trend in breeding numbers.

A county-wide survey in 1999 found 394 territories, with 389 territories in the Sherwood Forest NCA (Szczur 2000). Within Sherwood Forest NCA, 54.8% occurred in clear fells and young plantations, 36.2% in heathland, 7.2% in open woodland and 1.8% in rough grassland habitat. Territory density on heathland was 25 territories per km^2 and higher on young conifer plantations at 34 per km^2, with a preference for young plantations (one to two years after planting). The most important sites were Clipstone Forest (59 territories), Budby South Forest (44), Clumber Park (43), Harlow and Thieves Woods (26), Duncan Wood and Gibraltar Plantation (19) and Papplewick Plantations (16). This demonstrates the species' heavy reliance on suitable clear fell areas in the NCA.

Since the year 2000, Birklands Ringing Group has been monitoring the number of singing males holding territories on a number of sites within Sherwood, breaking each site into smaller compartments. This allows a count to be made of the number of males singing during all visits allowing an accurate number of males present within the larger site to be assessed. From these figures it can be seen that Tree Pipit numbers have been slowly declining, despite the habitat appearing to be under good management regimes (Figure 7). More widely, Birklands Ringing Group recorded 100 pairs across Budby South Forest, Birklands (including the Sherwood Forest Country Park site) and Clipstone Forest/Sherwood Pines in 2015 (Birklands Ringing Group, unpublished data).

Figure 7. Number of Tree Pipit territories in Clipstone Forest 2000-2015



Data source: Birklands Ringing Group

Cuckoo *Cuculus canorus* (S41, Red list). The population of Cuckoo returning to Sherwood seems to fluctuate year on year, but there is no data available to provide an accurate population estimate. Recently, four males have been GPS tagged with their location up-dated daily on the British Trust for Ornithology website. In Sherwood Cuckoos tend to use Tree Pipit as their preferred host, followed by Dunnock; Reed Warbler were once uncommon breeders in Sherwood but in recent years their numbers have increased significantly but so far no eggs have been found in nest of this species (n=178 nests) (Birklands Ringing Group, unpublished data).

Spotted Flycatcher *Muscicapa striata* (S41, Red list). A countywide survey in 2004 found a total of 124 Spotted Flycatcher territories in 59 locations in Nottinghamshire (Hall 2005); the species was found to be sparsely spread across the Sherwood NCA. The scale of the species' decline is illustrated by data from Clumber Park, a site which was estimated as having 30 to 40 pairs in 1975, but with only four territories in 2004. The bird's stronghold is Birklands, including Sherwood Forest NNR; numbers here have decreased but appear to be stable albeit in low numbers (Birklands Ringing Group, unpublished data).

Sherwood Pines/Clipstone Forest has never held high numbers of this species. The main sites for it are in Center Parcs, particularly on the main entrance drive with the area holding about three pairs; the entrance to Clipstone Forest off the A614 which often holds two pairs; there are other pairs scattered throughout the forest but it never has more than eight pairs in total (Birklands Ringing Group, unpublished data).

Marsh Tit *Poecile palustris* (S41, Red list). The earlier status of Marsh Tit is difficult to ascertain as the almost identical Willow Tit (in terms of plumage) was not separated as a distinct species in the UK until the early 20th century. Dobbs (1975) stated it was a fairly common resident but considered that Willow Tit was more numerous in the Sherwood NCA than Marsh Tit.

The species is considered to be common in suitable habitat, especially in Clumber Park, Sherwood Forest NNR and Rufford Abbey CP, but much less so in most of Birklands and Sherwood Pines/Clipstone Forest, as indicated by BRG's ringing totals which show that four times more Willow Tit were trapped by the group between 1968 – 2015 (Birklands Ringing Group, unpublished data).

Marsh Tit is now expanding its range to include most of Birklands and Sherwood Pines/Clipstone Forest as these area's dense plantations of pine trees are felled, and it can now be found on most feeding stations within this area with 29 pairs recorded in 2015 by Birklands Ringing Group (Birklands Ringing Group, unpublished data).

Woodcock *Scolopax rusticola* (S41, Red list). Birklands Ringing Group, in conjunction with The Game and Wildlife Conservation Trust and Nottingham University, has been trapping and fixing GPS tags to male Woodcock. The preliminary results of this work has shown that males rode (display) on average only one in three evenings, so counts carried out of roding birds could be underestimating the actual number of breeding males present on a site by up to a third, which if proven in subsequent years underlines the importance of Sherwood Forest for this species. In 2015, a total of 29-33 roding males were estimated in areas covered by Birklands Ringing Group (Birklands, Sherwood Forest NNR, Clipstone Forest/Sherwood Pines and Annesley) (Birklands Ringing Group, unpublished data).

Turtle Dove *Streptopelia turtur* (S41, Red list). This species has declined enormously in Sherwood, mirroring the national picture for this species, which has undergone a severe decline of over 90% in the last 25 years (see Eaton *et al.* 2015). Birds with nests were regularly found on the edge of arable land, in farm yards and within the pit villages that dot Sherwood; the last strongholds for breeding birds are now along mineral and the Robin Hood railway lines, in the thicket stage conifer plantations within Sherwood Pines/Clipstone Forest and in Severn Trent Water's sewage works at Shirebrook, Rainworth and Warsop, with 9 pairs recorded in 2015 by Birklands Ringing Group (Birklands Ringing Group, unpublished data).

Willow Tit *Poecile montanus* (S41, Red list). Nationally, Willow tit is the resident bird species which has suffered the greatest decline in numbers and range. It was once widespread in Sherwood but now in decline (Andy Lowe, pers. comm.). As an example, there used to be up to six territories at Welbeck Estate in the early 2000s but none now (Roy Frost pers. comm.). Its main strongholds in Sherwood are now areas with damp scrub such as sewage works, especially along Rainworth Water, and brownfield sites - colliery spoil tips and disused mineral railway lines. As a result of its decline, Willow tit is now monitored by the Rare Breeding Birds Panel, but coverage from Sherwood NCA is incomplete; 13 pairs were recorded in 2015 by Birklands Ringing Group (Birklands Ringing Group, unpublished data).

Redstart *Phoenicurus phoenicurus* (Amber list). Redstarts in Sherwood are on the edge of the species' distribution in the UK after declines and range contraction from lowland areas (Balmer *et al*. 2013). The species is currently known to breed at only three sites – Birklands (Sherwood Forest NNR and land to the west), Budby South Forest and Clumber Park. There were 27 territories in 2013 and 31 in 2015 (Birklands Ringing Group, unpublished data), the highest numbers since 2002 when there were 32 to 37 territories (Reece (Ed) 2015).

Away from the current core area there are a few records for breeding Redstart, but they appear to be no longer found in Sherwood Pines/Clipstone Forest despite there being apparently suitable habitat available, and the species' status in Clumber Park is uncertain.

Whilst there has always been plenty of potential nest sites at certain sites within Sherwood, the population appeared to be in decline because of deterioration in habitat quality. The recent upturn in numbers coincides with woodland management improving the habitat, with the halo-ing of the old stag oaks (removal of saplings / conifers from around the oaks) and grazing by longhorn cattle creating the open understory that Redstarts require for feeding habitat.

Historically the Redstart was more widespread in Sherwood Forest. Dobbs (1975) stated that the Redstart was fairly common, albeit local, and his map shows breeding Redstarts throughout much of the Sherwood NCA for the period 1942 to 1970; but that there had been declines since 1969.

Table 14. Breeding Redstarts in Sherwood

Decade	Sites	Estimated number of pairs
1950-59	15	96
1960-69	32	94
1970-79	15	81
1980-89	9	65
1990-99	4	14

Data source: Reece (2009)



Redstart (©John Smith)

Goshawk *Accipiter gentilis* (S41, Green list). This species is doing very well within Sherwood and pairs are monitored by Birklands Ringing Group. Breeding pairs in Sherwood average 3.3 fledged young per nesting attempt; this is unusually high number when compared to sites such as Thetford Forest where pairs average 1.8 fledged young per nesting attempt. Goshawk is a species covered by the Rare Breeding Bird Panel and since 2006 the numbers reported for Nottinghamshire have increased from a mean total number of pairs of four for the period 2006-9 to just over six for the period 2010-13 (Holling and Rare Breeding Birds Panel 2012, 2013, 2014 and 2015).

Honey-buzzard *Pernis apivorus* (Annex 1, Amber list). The Honey-buzzard is a rare breeding bird in the UK, on the edge of its range and the recent five year mean is 43 breeding pairs (Holling and the Rare Birds Breeding Panel 2015). The species is monitored by the Rare Breeding Birds Panel and national coverage and reporting is considered to be high. However, it can be a difficult bird to find during the breeding season.

One to two pairs bred in Sherwood in most years from the 1960s to 2001 (Reece 2009). Irons (1980) studied the breeding of the Honey-buzzard in Nottinghamshire from 1971 to 1979, during which time birds summered every year in the Dukeries and nests were found in six of the nine years with successful breeding in four years. Before the 2011 Rare Breeding Bird Panel Report, details of Honey-buzzard breeding were not given on a county basis - county data since 2011 is provided below (Table 15).

Table 15. Breeding Honey-buzzards in Nottinghamshire 2011-2013

Year	Breeding
2011	2 probable pairs
2012	1 pair bred + 1 territory
2013	1 pair bred + 1 possible pair

Data source: Rare Breeding Birds Panel reports (Holling and the Rare Birds Breeding Panel 2013, 2014 & 2015)

Mammals

Red Deer *Cervus elaphus*. Recorded in 29 1km squares since 2000, (20 1km squares since 2010); these figures include the parkland herd at Wollaton Park, which accounts for 3 1km squares. Most records come from the Birklands, Thoresby Estate and Clipstone Forest/Rufford Colliery area, with records also coming from Clumber Park and the Newstead area.

Leisler's Bat *Nyctalus leisleri*. Recorded in 29 1km squares since 2000 (9 1km squares since 2010). Most records are clustered in the northern part of the NCA, around Birklands and Bilhaugh, Thoresby and Welbeck Estates, Clumber Park and Elkesley Woods. Other records occur around the fringes of Mansfield and at Newstead.

[Data provided by Michael Walker, county mammal recorder]

Herpetofauna

Adder *Vipera berus* (S41). In the Victorian History of Nottinghamshire (Page 1907), this species is described as '*formerly common in Sherwood Forest according to Sterland, but now rare. Mr J Whitaker reports it occasionally about Rainworth; one [was] killed there on the carriageway in 1900… also specimens captured at Oxton and Newstead Park… a very fine example [was] captured in Sherwood Forest near Edwinstowe in Nov. 1904*'. Since 1980, Adders have been recorded in three distinct locations within a large site in Sherwood, and on an adjoining site. The last record came from 2005, and there have been no confirmed records of Adders in Sherwood (or indeed, Nottinghamshire) since then.

Slow-worm *Anguis fragilis* (S41). In the Victorian History of Nottinghamshire (Page 1907), it is stated that this species was '*at one time frequent in Sherwood Forest, according to Sterland. Not often seen now…*'. Since 2000, Slow-worms have been recorded at nine sites in



Red Deer (©Jon Hawkins)

Sherwood NCA, of which two are gardens in urban areas.

Common Lizard *Zootoca vivipara* (S41). This species has been recorded in 55 1km squares in the Sherwood NCA since 2000. The majority of these come from the Clipstone Forest/Rufford Colliery area, Sherwood Forest NNR, and Clumber Park and surrounds.



Common Lizard (©Amy Lewis)

[Data provided by Sheila Wright and John Osborne, county herpetofauna recorders]

Moths

Forester *Adscita statices* (S41, Nationally Local, Notts Grade 2). Since 1990, recorded at 4 sites: Clumber Park (last record 2014), Sherwood Heath (last record 2012), Calverton Pit Top (2010) and Budby South Forest (2010).

Scarce Vapourer *Orgyia recens* (S41, RDB, Notts Grade 1). Since 1990, recorded at 1 site: Clumber Park (last record 2000).

The Anomalous *Stilbia anomala* (S41, Nationally Local, Notts Grade 2). Since 1990, recorded at 4 sites: Budby South Forest (last record 2009), Center Parcs (last record 2004), Clipstone Forest (last record 2001) and Newstead Abbey Park (1999).

Yellow-legged Clearwing *Synanthedon vespiformis* (Nationally Notable Nb, Notts Grade 1). Since 1990, recorded at 7 sites: Sherwood Forest Country Park (last record 2012), Clumber Park (last record 2011), Budby South Forest (last record 2010), Oxton Bogs (last record 2010), Buck Gates (2009), Clipstone Old Quarter (2009) and Newstead Abbey Park (last record 1992).

Large Red-belted Clearwing *Synanthedon culiciformis* (Nationally Notable Nb, Notts Grade 1). Since 1990, recorded at 4 sites: Budby South Forest (last record 2013), Sherwood Forest Country Park (last record 2010), Birklands (last record 1998), Oak Tree Heath (last record 1998).

Welsh Clearwing *Synanthedon scoliaeformis* (RDB, Notts Grade 1) . First found in Sherwood in 2008, at Sherwood Forest Country Park; the only other English site this species occurs at is Cannock Chase in Staffordshire. The species is present throughout the NNR, and has also been recorded in Clipstone Old Quarter (last record 2009), Budby South Forest (last record 2009) and Sherwood Heath (last record 2013). Surveys in appropriate habitat my find it to be present at additional sites. More details at: http://www.eakringbirds.com/eakringbirds6/mothimageswelshclearwing.htm



Welsh Clearwing (©Trevor & Dilys Pendleton)

Frosted Green *Polyploca ridens* (Nationally Local, Notts Grade 2). Since 1990, recorded at 7 sites: Birklands, Centre Tree (last record 2014), Ollerton Shooting Range (last record 2012), Sherwood Forest Country Park (2011), Budby South Forest (last record 2011), Clipstone Old Quarter (last record 2011), Buck Gates (last record 2005), Ollerton (last record 1994).

Orange Underwing *Archiearis parthenias* (Nationally Local, Notts Grade 2). Since 1990, recorded at 11 sites: Budby Pumping Station (last record 2014), Budby South Forest (last record 2015), Sansom Wood (last record 2012), Sherwood Forest Country Park (last record 2015), Clumber Park (last record 2011), Clipstone Forest (last record 2010), Clipstone Old Quarter (last record 2014), Foxcovert Plantation (last record 1997), Swinecote Lane (last recorded 2015), Strawberry Hill

Heath (last recorded 2014) and Blidworth Bottoms (last recorded 2014).

Pauper Pug *Eupithecia egenaria* (RDB, Notts Grade 1). Since 1990, recorded at 2 sites: Clumber Park (last record 2007) and Center Parcs (last record 2006).

Ling Pug *Eupithecia absinthiata* (Nationally Local, Notts Grade 2). Since 1990, recorded at 4 sites: Sherwood Forest County Park (last record 2012), Clipstone Old Quarter (last record 2012), Budby South Forest (last record 2012), Clipstone Forest (2004).

Small Seraphim *Pterapherapteryx sexalata* (Nationally Local, Notts Grade 2). Since 1990, recorded at 1 site: Clumber Park (last record 2011).

Small Brindled Beauty *Apocheima hispidaria* (Nationally Local, Notts Grade 2). Since 1990, recorded at 2 sites: Buck Gates (last record 2005) and Proteus Square (last record 2002).

Great Oak Beauty *Hypomecis roboraria* (Nationally Notable Nb, Notts Grade 1). Since 1990, recorded at 10 sites: Carburton Border (last record 2015), Budby Pumping Station (last record 2014), Budby South Forest (last record 2013), Clipstone Old Quarter (last record 2011), Clumber Park (last record 2011), Sherwood Forest Country Park (last record 2009), Ollerton Shooting Range (last record 2008), Newstead Abbey Park – Abbeywood House (last record 1999), Buck gates (last recorded 1997), Center Parcs (last record 1992).

Annulet *Gnophos obscurata* (Nationally Local, Notts Grade 2). Since 1990, recorded at 1 site: Budby South Forest (last record 1994).

Grass Wave *Perconia strigillaria* (Nationally Local, Notts Grade 2). Since 1990, recorded at 9 sites: Budby Pumping Station (last record 2014), Clipstone Old Quarter (2013), Budby South Forest (last record 2013), Sherwood Forest Country Park (last record 2010), Clumber Park (last record 2009), Center Parcs (last record 2008), Clipstone Forest (last record 2005), Newstead Abbey Park – Abbeywood House (last record 1998), Rainworth Heath (last record 1994).

Broad-bordered Bee Hawk-moth *Hemaris fuciformis* (Nationally Notable Nb, Notts Grade 1). Since 1990, recorded at 2 sites: Clumber Park (last record 2014), Newstead Abbey Park – Abbeywood House (last record 1995).

Alder Kitten *Furcula bicuspis* (Nationally Local, Notts Grade 2). Since 1990, recorded at 8 sites: Birklands, Centre Tree (last record 2014), Ravenshead (last record 2015), Clipstone Old Quarter (last record 2013), Sherwood Forest Country Park (last record 2011), Budby South Forest (2011), Clumber Park (last record 2007), Proteus Square (last record 2002), Newstead Abbey Park – Abbeywood House (last record 2000).



Alder Kitten (©Sheila Wright)

Scarce Prominent *Odontosia carmelita* (Nationally Local, Notts Grade 2). Since 1990, recorded at 9 sites: Birklands – Centre Tree (last record 2014), Center Parcs (last record 2014), Clipstone Old Quarter (last record 2011), Sherwood Forest Country Park (last record 2011), Budby South Forest (last record 2010), Thieves Wood (last record 2010), Clumber Park (last record 2010), Ravenshead (last record 2010), Ollerton Shooting Range (last record 2008), Bilhaugh (last record 2004), Buck Gates (last record 2004), Ollerton (last record 2002), Newstead Abbey Park – Abbeywood House (last record 2000).

Small Chocolate-tip *Clostera pigra* (Nationally Notable Nb, Notts Grade 1). Since 1990, recorded at 1 site: Budby South Forest (last record 1992).

Muslin Footman *Nudaria mundana* (Nationally Local, Notts Grade 2). Since 1990, recorded at 2 sites: Thieves Wood (last record 2009) and Newstead Abbey Park – Abbeywood House (last record 1997).

Clouded Buff *Diacrisia sannio* (Nationally Local, Notts Grade 2). Since 1990, recorded at 7 sites: Carburton Border (last record 2015), Budby South Forest (last record 2013), Sherwood Forest Country Park (last record 2012), Budby South Forest (last record 2011), Clumber Park (last record 2010), Sherwood Heath (last record 2008), Rainworth Heath (last record 2002).

Barred Chestnut *Diarsia dahlii* (Nationally Local, Notts Grade 2). Since 1990, recorded at 7 sites: Newstead Abbey Park (last record 2012), Ollerton Shooting Range (last record 2011), Sherwood Forest Country Park (last

record 2010), Clipstone Old Quarter (last record 2010), Clipstone Forest (last record 2004), Center Parcs (last record 2004), Newstead Abbey Park – Abbeywood House (last record 1997).

Square-spotted Clay *Xestia rhomboidea* (Nationally Notable Nb, Notts Grade 1). Since 1990, recorded at 1 site: Newstead Abbey Park – Abbeywood House (last record 1996).

Beautiful Brocade *Lacanobia contigua* (Nationally Local, Notts Grade 2). Since 1990, recorded at 11 sites: Carburton Border (last record 2015), Sherwood Forest Country Park (last record 2012), Budby South Forest (last record 2011), Clumber Park (last record 2011), Clipstone Old Quarter (last record 2010), Ollerton Shooting Range (last record 2007), Clumber Park (last record 2006), Sherwood Heath (last record 2006), Rainworth Heath (last record 2005), Mansfield – Eakring Road (last record 1996), Center Parcs (last record 1992).

Angle-striped Sallow *Enargia paleacea* (Nationally Notable Nb, Notts Grade 2). Since 1990, recorded at 18 sites: Carburton Border (last record 2015), Clipstone Old Quarter (last record 2013), Budby South Forest (last record 2013), Ravenshead (last record 2015), Sherwood Forest Country Park (last record 2012), Clumber Park (last record 2012), Mansfield – Thieves Wood Lane (last record 2012), Ollerton Shooting Range (last record 2011), Center Parcs (last record 2010), Newstead Abbey Park (last record 2009), Rainworth Heath (last record 2009), Hollinwell Golf Course (last record 2007), Sherwood Heath (last record 2005), Wollaton Park (last record 2005), Clipstone Forest (last record 2004), Newstead Abbey Park – Abbeywood House (last record 2000), Buck Gates (1998), Mansfield – Eakring Road (last record 1996).

Beautiful Snout *Hypena crassalis* (Nationally Local, Notts Grade 2). Since 1990, recorded at 1 site: Thieves Wood (last record 2011).

[Data provided by Dr. Sheila Wright, county moth recorder]

Spiders and relatives

Mastigusa macrophthalma (RDB3). Last recorded in 2002 (Pendleton & Pendleton 2014a); considered to be 'quite abundant' in parts of Sherwood Forest (Alexander 2013).

Meta bourneti. First recorded in Sherwood in 1978, in ducts beneath the Sherwood Forest Visitor Centre; the species continues to persist at this site (Pendleton & Pendleton 2014a). More details at: http://www.eakringbirds.com/eakringbirds3/arachnidsmetabourneti.htm

Zora silvestris (RDB2). This spider was first recorded in Sherwood NNR in 1978, and the only confirmed UK records since 1992 have been from this site. Recently, the species has been recorded in the Sherwood Forest Country Park section of Sherwood Forest NNR in 2002, 2003, 2010, 2011 and 2012, and was also found on Budby South Forest in 2010 (Pendleton & Pendleton 2014a). More details at: http://www.eakringbirds.com/eakringbirds3/arachnidszorasilvestris.htm

Zora nemoralis (Notable/Nb). Recorded once, in 2002 at Sherwood Forest Country Park (Pendleton & Pendleton 2014a).

Philodromus praedatus (Notable/Nb). Recorded at Buckgates in 2002, this crab spider may possibly have been overlooked in the past because of its similarity to the common *P. aereolus*; also recorded in 2012 on Budby South Forest (Pendleton & Pendleton 2014a).

Midas Tree-weaver *Midia midas* (S41, RDB2). Recorded in Sherwood Forest NNR in 1912, and in 1978 (Pendleton & Pendleton 2014a). Targeted surveys in 2014 recorded a single female, confirming the continued presence of this species at the site, which is one of just five nationally where the species occurs.



Surveying for Midas Tree-weaver in Sherwood Forest NNR (©Nick Crouch)

A pseudoscorpion *Allochernes wideri* (RDBK). First recorded in 1906, and most recently recorded in 2013 (Pendleton & Pendleton 2014c).

A pseudoscorpion *Dendrochernes cyrneus* (RDB3). First recorded in 1905 (Pendleton & Pendleton 2014c); Sherwood Forest is considered to be a national stronghold for this species, where it was last recorded in 2009 (Alexander, 2013).

A pseudoscorpion *Lamprochernes savignvi* (Notable/ Nb). Recorded in the Sherwood Forest Country Park section of Sherwood Forest NNR in 2002 (Pendleton & Pendleton 2014c).

Beetles

Cryptocephalus querceti (RDB2). Although not an obvious saproxylic beetle, this leaf beetle is associated with ancient oak trees, and has been recorded in Clipstone Old Quarter in 1998, 2010, and 2011 (Pendleton & Pendleton 2014b, Pendleton & Pendleton 2015). Elsewhere in Britain, it is known from the New Forest, Windsor Forest and a handful of other small, isolated sites (Alexander 2011).

Hazel Pot Beetle *Cryptocephalus coryli* (S41, RDB1). A leaf beetle rediscovered in Sherwood Forest NNR in 2008 after an absence of nearly 70 years, and recorded annually since; in 2013, a single male was discovered in Clumber Park (Pendleton & Pendleton 2014b). More details at: http://www.eakringbirds.com/eakringbirds6/cryptocephaluscoryli.htm

Ampedus cardinalis (RDB2). A saproxylic beetle first record published in 1916, and most recently recorded in 2010 (Pendleton & Pendleton 2014b); additionally known nationally from two main population centres in the South-East and three further small isolated sites (Alexander 2011).

Corticaria longicollis (RDBI). A saproxylic beetle first record published in 1916, and most recently recorded in 1998 (Pendleton & Pendleton 2014b); otherwise known only from Speyside in Scotland (Alexander 2011).

Corticeus unicolor (RDB3). A saproxylic beetle first recorded in 1933, and most recently recorded in 2013 (Pendleton & Pendleton 2014b); this species occurs from Sherwood Forest north into South Yorkshire, and one additional location where it is considered to be probably extinct (Alexander 2011).

Micridium halidaii (RDB1). A saproxylic beetle first recorded in 1867 and most recently recorded in 1985 (Pendleton & Pendleton 2014b); known from one other Midlands site and two sites in the South-East (Alexander 2011).



Hazel Pot Beetle (©Trevor & Dilys Pendleton)

Oxylaemus cylindricus (RDB1 Ex). A saproxylic beetle, with a published record in 1916 (Pendleton & Pendleton 2014b), but not recorded since; also known previously from the New Forest area, and rediscovered at a new site in the South-East in 2009 (Alexander 2011).

Prionychus melanarius (RDB2). A saproxylic beetle first recorded in 1908, and most recently recorded in 2011 (Pendleton & Pendleton 2014b); known from three further main population centres nationally (Alexander 2011).

Teredus cylindricus (RDB1). A saproxylic beetle first recorded in 1884, and most recently recorded in 2013 (Pendleton & Pendleton 2014b); elsewhere, known only from Windsor Great Park and Forest (Alexander 2011).

Black Oil Beetle *Meloe proscarabaeus* (S41). Discovered in Sherwood Forest NNR on Budby South Forest, in 2011, and subsequently in Newstead Park in 2013 (Pendleton & Pendleton 2014b). More details at: http://www.eakringbirds.com/eakringbirds4/meloeproscarabaeussurveys.htm



Black Oil Beetle (©Nick Crouch)

Mab's Lantern *Philorhizus quadrisignatus* (S41, RDB1). A ground beetle recorded in Sherwood Forest NNR in 1978, but not previously or subsequently (Pendleton & Pendleton 2014b).

Note: The ancient semi-natural woodlands of Birklands and Bilhaugh are widely recognised as having national and European importance for the conservation of saproxylic invertebrates, especially beetles. The saproxylic beetle list currently stands at 316 species, although this includes introduced conifer associates and other recent arrivals. The other major saproxylic invertebrate group, the Diptera, have hardly been studied at Sherwood and are a major gap in knowledge. The saproxylic beetle species listed above are the key species which characterise the special interest of Sherwood Forest for saproxylic invertebrates; there are many other Red Data Book species known but they are all also known from more than four major sites and generally are known from a selection of smaller sites in addition (Alexander 2011).

Other invertebrates

Snow Flea *Boreus hyemalis*. Known from one section of Sherwood Forest NNR, where it was discovered in 2014; there are no other Nottinghamshire records. More details at: http://www.eakringbirds.com/eakringbirds2/insectinfocusboreushyemalis.htm

Heath Assassin Bug *Coranus subapterus*. Discovered in Sherwood Forest NNR in 2012; this was the first record for Sherwood, and possibly Nottinghamshire (Pendleton & Pendleton 2014c). More details at: http://www.eakringbirds.com/eakringbirds5/insectinfocuscoranussubapterus.htm

A cranefly *Ctenophora ornata* (RDB1). Discovered new to Sherwood in 2009 and recorded again in 2013. More details at: http://www.eakringbirds.com/eakringbirds4/insectinfocusctenophoraornata.htm



Ctenophora ornata (©Trevor & Dilys Pendleton)

White-clawed Crayfish *Austropotamobius pallipes* (S41). Within Sherwood, a population of White-clawed Crayfish is known to exist on short section (c.500m) of the Cauldwell Brook to the south of Mansfield, where the species has been most recently recorded in 2012. The species may be present further downstream towards the confluence with the River Maun, where there are records from 2003. [Data held by Nottinghamshire Biodiversity Action Group].

Fungi

A range of notable fungi have been recorded in Sherwood (see Table 16), but recording has been focussed on a small number of sites and much still remains to be learnt about this group.

Table 16. Notable fungi in Sherwood

Species	Conservation Status	Location	Most recent record	National records since 2000 (hectads)	Notes
An oysterling *Arrhenia peltigerina*		Bestwood CP	post-2000	2	
Devil's Bolete *Boletus satanas*	Vulnerable	Clumber Park	2005	24	Possibly the most northerly British occurrence
A funnel *Clitocybe alobfragrans*		Clumber Park	post-2000	1-2	
A webcap *Cortinarius rigidus*		Sherwood Heath SSSI	post-2000	5	
A webcap *Cortinarius saturninus*		Haywood Oaks	post-2000	2	*var bresadolae*
Branched Shanklet *Dendrocollybia racemosa*	Near Threatened	Bestwood CP	post-2000	3	
A pinkgill *Entoloma hispidulum*		Welbeck Estate	post-2000	3	
A pinkgill *Entoloma subradiatum*		Maun Valley Park, Mansfield	post-2000	3	
Weathered Earthstar *Geastrum corollinum*	S41; Critically Endangered	Rise Park, Nottingham	2012	3	
Daisy Earthstar *Geastrum floriforme*	Endangered	Nottingham University campus	2011	1	
Beaked Earthstar *Geastrum pectinatum*	Vulnerable	Bestwood CP	2010	36	
A cup fungi *Geopora semi-immersa*		Bestwood CP	post-2000	1	
A cup fungi *Geopora sepulta*		Bestwood CP	post-2000	3	
Anise Mazegill *Gloeophyllum odoratum*	Vulnerable	Normanshill Wood	post-2000	3	
A saddle *Helvella costifera*		Bestwood CP	post-2000	1	
Date-coloured Waxcap *Hygrocybe spadicea*	S41	Sherwood Forest NNR	2006	19	3 fruitbodies found in Compartment 16
A fibrecap *Inocybe glabrodisca*		Rufford CP	post-2000	4	
Bear Lentinellus *Lentinellus ursinus*	Near Threatened	Rufford CP	2015	9	
Umber Brown Puffball *Lycoperdon umbrinum*	Vulnerable	Scofton (Osberton Estate); Clumber Park; Bestwood CP; Sherwood Pines	2005; 2007; 2008; 2014	36	

Table 16. Notable fungi in Sherwood (continued)

Species	Conservation Status	Location	Most recent record	National records since 2000 (hectads)	Notes
A cavalier *Melanoleuca oreina*		Retford Cemetery	post-2000	3	
Oak Polypore *Piptoporus quercinus*	S41	SK67 (presumed to be Clumber Park); Sherwood Forest NNR;	2004; 2015	49	Recorded in Compartments 8, 12, 16, 17, 18a, 21 of the NNR. Older records from the SK66 presumably relate to the NNR (but possibly other sites); records from SK67 presumably relate to Clumber Park.
Umbrella Polypore *Polyporus umbellatus*	Near Threatened	Clumber Park	post-2000	5	
A brownie *Psilocybe medullosa*		Sherwood Pines	2014	1	The first British record

[Data source: Howard Williams (Nottinghamshire Fungi Group) and National Biodiversity Network]



Beaked Earthstar (©Richard Rogers)

Lichens

The majority of recent lichen records accessed all came from Sherwood Forest NNR or Clumber Park (Table 17); like fungi, more remains to be learnt about lichens in Sherwood, and the current picture should be considered as partial and incomplete.

Table 17. Notable lichens in Sherwood

Species	Conservation Status	Site	Most recent record	Notes
Absconditella trivialis	Nationally Rare	Ransom Wood	2012	(NBN record)
Arthopyrenia analepta	None	Clumber Park	2015	1st site in Nottinghamshire
Aspicilia contorta subsp. hoff-manniana	Nationally Scarce	Clumber Park	2015	
Bacidia neosquamulosa	Nationally Scarce	Sherwood Forest NNR	2015	
Bacidia sulphurella	Nationally Scarce	Clumber Park	2015	
Caloplaca arcis	Nationally Scarce	Clumber Park	2015	
Chaenotheca brachypoda	None	Clumber Park	2015	1st site in Nottinghamshire
Chaenotheca stemonea	Nationally Scarce	Sherwood Forest NNR, Clumber Park	2015	1st and 2nd sites for Nottingham-shire
Chaenothecopsis nigra	Nationally Scarce	Clumber Park	2015	
Chaenothecopsis pusilla	Nationally Scarce	Sherwood Forest NNR	2015	
Halecania viridescens	Nationally Scarce	Sherwood Forest NNR	2015	
Hertelidea botryose	Nationally Rare	Sherwood Forest NNR	2015	First discovered in 2013; known in Britain from one other site, in Derbyshire
Hypocenomyce caradocensis	None	Clumber Park	2015	2nd site in Nottinghamshire
Illosporiopsis christiansenii	Nationally Scarce	Clumber Park	2015	
Lecania inundata	Nationally Scarce	Clumber Park	2015	
Lecanora barkmaniana	Nationally Scarce	Sherwood Forest NNR	2015	
Lecanora horiza	Nationally Scarce	Clumber Park	2015	
Micarea misella	Nationally Scarce	Clumber Park	2015	1st site in Nottinghamshire
Micarea prasina	Nationally Scarce	Sherwood Forest NNR	2015	
Microcalicium ahlneri	Nationally Scarce	Sherwood Forest NNR	2015	
Piccolia ochrophora	None	Clumber Park	2015	1st site in Nottinghamshire
Strangospora moriformis	Nationally Scarce	Sherwood Forest NNR	2015	
Strangospora pinicola	Nationally Scarce	Sherwood Forest NNR	2013	
Strigula jamesii	Nationally Scarce	Clumber Park	2015	1st site in Nottinghamshire
Syzygospora physciacearum	Nationally Scarce	Clumber Park	2015	
Verrucaria ochrostoma	Nationally Rare	Clumber Park	2015	
Xanthoria ucrainica	Nationally Scarce	Clumber Park	2015	

Data source: British Lichen Society (via Natural England), National Trust, and the National Biodiversity Network

Vascular plants

Ancient trees. Information regarding the size, distribution and condition of the ancient/veteran tree population of Birklands and Bilhaugh was gathered during the period 1996-99, and published in Clifton (2000). This remains the most up-to-date information about ancient trees in this part of Sherwood; in summary, of the 2386 veteran trees recorded in the Birklands and Bilhaugh area, 1643 (69%) were standing trees, of which 991 (42%) were living trees (Table 18).



The Major Oak (©Nick Crouch)

Table 18. Ancient trees in Birklands and Bilhaugh

	Birklands	Bilhaugh	TOTALS
Standing live	670	321	991
Standing dead	545	107	652
Fallen tree/ trunk	423	122	545
Stump	70	128	198
TOTAL	**1708**	**678**	**2386**

Data source: Clifton (2000)

Fragrant Agrimony *Agrimonia procera* (Least Concern). Since the 1960s the species has been lost from several sites in the Sherwood area (RPR 2013); since 2000 it has been recorded at three sites – Normanton Larches, Clumber Park (8 sub-locations) and Harlow Wood (5 sub-locations) (Wood & Woods 2013).

Cross-leaved Heath *Erica tetralix* (Least Concern). This species has declined within Sherwood, and has been lost from a number of sites in recent times. It remains at six sites – Rainworth Marsh, Walesby Forest, Rainworth Heath, Clipstone Heath, Clipstone Forest and Budby South Forest - but is no longer abundant at any, and has not been recorded at two (Rainworth Marsh and Walesby Forest) since prior to 1992. The other four sites all have post-2008 records (Wood & Woods 2013).

Glandular Eyebright *Euphrasia anglica* (S41, Endangered). In Nottinghamshire, this species only occurs within Sherwood, and has its stronghold in Clumber Park (most recent record 2012); it has also been recorded nearby in the Manor Hills area to the west. There is a recent record from Rufford Pit Tip (2012) and an older record from Newstead Park (last recorded 1999); since 2000, the species has been recorded in 8 1km squares (Wood & Woods 2013).

Petty Whin *Genista anglica* (Near Threatened). Petty Whin is a scarce species having undergone a serious decline prior to the 1970's; since 2000, it has been recorded at six locations – Clipstone Colliery, Rainworth Dismantled Railway Line, Sherwood Heath, Ollerton Assarts, Clumber Park and West Drayton; its current status at some of these is unknown. In addition, it was last recorded at Clipstone Heath (two sub-locations) in 1997 and was lost from Harlow Wood in 1972, whilst its future at Ollerton Assarts is far from certain, given an ongoing decline in plant numbers at that site (Wood & Woods 2013).

Heath Cudweed *Gnaphalium sylvaticum* (Endangered, Nationally Scarce). Prior to 1970, this species was common on heaths and woods in Sherwood; since then, it has declined and has been recorded in 15 1km squares since 2000 (Wood & Woods 2013).

Stag's-horn Club-moss *Lycopodium clavatum* (Least Concern). Since 1970 this species has been recorded at five sites in Sherwood; previously, it was considered to be frequent, but by the 1960s habitat destruction had contributed to the decline of the species and Howitt & Howitt (1963) described it as being very rare. The species currently occurs in six locations in Sherwood – Clipstone Heath (two sub-locations), Clipstone Forest, Sherwood Forest Golf Course, and Sherwood Heath (two sub-locations). However, it has only been recorded at two of these since 2000 (the Sherwood Heath populations), and none since 2005 (Wood & Woods 2013).

Yellow Bird's-nest *Monotropa hypopitys* (S41, Endangered). Currently known from a single site in Sherwood, between Clumber Park and Osberton, where it was recorded in 2000, although a search for it in 2012 failed to locate it here (Wood & Woods 2013).

Tubular Water-dropwort *Oenanthe fistulosa* (S41, Vulnerable)**.** This species has been recorded at two sites in the north-east of Sherwood; a seasonally wet unimproved pasture at West Drayton, where it was found to be locally frequent in hollows in 1996 (not visited since, but site still present), and a nearby site to the south of

Retford where it was last recorded in 2008 (Wood & Woods 2013).

Heath Milkwort *Polygala serpyllifolia* (Least Concern). Already in decline by the middle of the 20th Century, this species has been recorded in 13 1km squares since 2000 in Sherwood (Wood & Woods 2013).

Bilberry *Vaccinium myrtilus* (Least Concern). This formerly frequent species of heaths and sandy woods was, by the early 1960's, found to be rapidly declining by Howitt & Howitt (1963). In Sherwood, it is now confined to four sites - Newlands Plantation, Robin Hood Hills, Birklands and Thieves Wood (four sub-locations). In addition, it was previously recorded at a fifth prior to 1996 (Ratcher Hill), and is known to have been lost from Coxmoor Plantation in modern times (Wood & Woods 2013).



Bilberry (©Nick Crouch)

Creeping Willow *Salix repens* (Least Concern). Recorded by Howitt as occurring on 'moist heaths', there are no modern records from Sherwood; Howitt recorded the species at West Drayton and Bothamsall (Wood & Woods 2013). The species has recently been (re-) introduced to Budby South Forest, with 15 plants (males and females) planted in 2015 from stock sourced from Stapleford Woods in east Nottinghamshire.

Annual Knawel *Scleranthus annuus* (S41, Endangered). Annual knawel has its Nottinghamshire stronghold on Sherwood, although records are only sparsely scattered in the NCA. It has been recorded in 8 1km squares since 2000, with records from a further 15 1km squares, pre-2000 (Wood & Woods 2013).

Wild Thyme *Thymus polytrichus* (Least Concern). Howitt & Howitt (1963) indicated this species to be rather rare and scattered in its distribution. Since 2000 it has been recorded from 8 1km squares in Sherwood (Wood & Woods 2013).

Dwarf Gorse *Ulex minor* (Least Concern). Dwarf Gorse is a scarce plant in Nottinghamshire and is occasionally found growing alongside Western Gorse within Sherwood. Its population has remained fairly stable since the 1980's. It has been recorded in 29 1km squares in the Sherwood NCA; 23 since 1987 (Wood & Woods 2013).

Heath Dog-violet *Viola canina* (Near Threatened). Described by Howitt & Howitt (1963) as being a locally frequent native of heathlands and sandy woods, this species has undergone local declines, reflecting those occurring nationally. It has been recorded in 8 1km squares in Sherwood since 2000 (Wood & Woods 2013).

Invasive non-native species

A number of invasive non-native species (INNS) of plants are known to occur in Sherwood. The most widespread and problematic are Japanese Knotweed, Himalayan Balsam and Rhododendron. A number of other invasive species are also present (Table 19), some of which pose an increasing risk. See also Figure 8.

Rhododendron *Rhododendron ponticum*. This species is the most widespread of the Invasive non-native species in the Sherwood NCA. It has been found in 149 1km squares, spread widely across the Sherwood area. Control is taking place, although the number of sites where this is occurring is currently unknown.

Japanese knotweed *Fallopia japonica*. There are currently 325 known records of Japanese Knotweed found in 123 1km squares within the Sherwood Natural Area. The majority of these records are associated with the main urban areas of Greater Nottingham, Mansfield and Worksop. Of these, it is known that 25 patches are currently being treated (although it is too early to say if their treatment has led to eradication).

Himalayan Balsam *Impatiens glandulifera*. Himalayan Balsam is currently known to be present on all of Sherwood's major water courses - the Rivers Leen, Maun, Meden, Poulter and Ryton. The species is particularly prevalent on the Maun and the stretch of the Leen that runs through the city. Himalayan balsam is also present on a few of Sherwood's smaller water courses, including the Daybrook, Woodborough Dumble, Rainworth Water and Vicar Water. There are some sections of river or stream where there are currently no records for this species, and as such they are currently assumed to be free of Himalayan Balsam. In addition, there are a number of locations away from the river and stream network that currently support Himalayan Balsam, including woodlands and areas of damper ground. Examples include Sherwood NNR, Sherwood Heath, Burntstump Country Park, Rufford Colliery Restoration Site, Gibralter Plantation, Duncan Wood and Hannah Park.

In total, records indicate that Himalayan Balsam is present in 114 1km squares within the Sherwood NCA. This is likely, however, to be an under representation of the actual distribution because many downstream sections of the Ryton and Poulter currently have no records for Himalayan balsam, but in reality it is very likely that Himalayan Balsam is present.

Work is currently underway to control this species on watercourses in the Sherwood NCA, covering 9km of the Maun, 8.5km of the Meden, 6km of the Leen and 1.5km of the Daybrook, although the majority of the work on the Meden and on the Leen is upstream of the Sherwood NCA. The majority of the work on the Maun and all the work on the Daybrook falls within the Sherwood NCA area. In total, control work covers approximately 11km of watercourse within the NCA boundary. In addition, control is taking place at a number of other sites, notably Clumber Park, Sherwood NNR, Sherwood Heath, Vicar Water, Rufford CP and Sherwood Pines. Overall, it is estimated that Himalayan balsam control work is being undertaken in 37 1km squares within the Sherwood NCA.



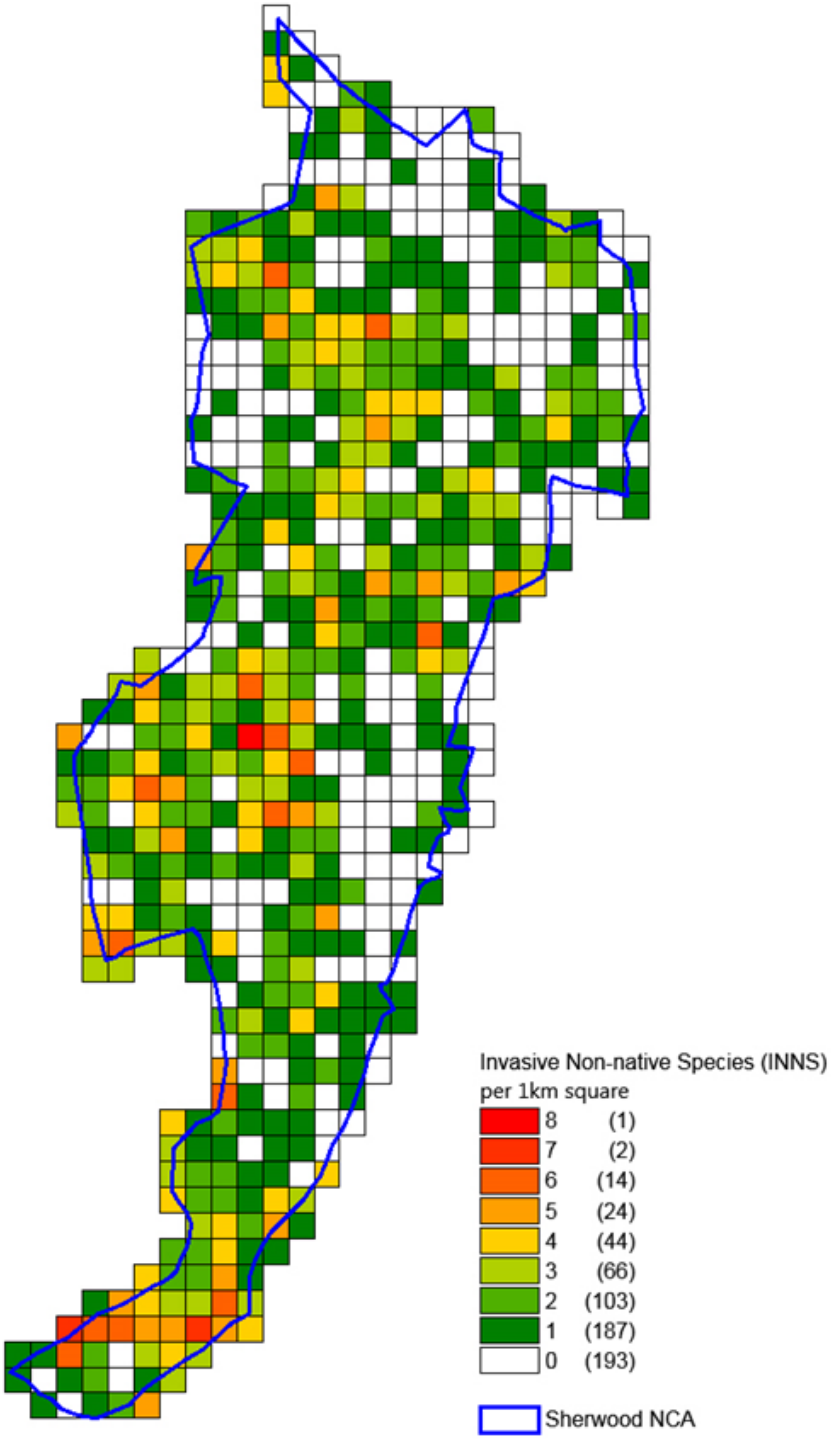
Himalayan Balsam on the River Meden at Bevercotes (©Amy Chandler)

Table 19. Invasive non-native plants species in Sherwood

Species	No. of 1km squares with records	No of 1km squares where control is taking place
Turkey Oak *Quercus cerris*	81	None
Cotoneaster species *Cotoneaster* sp. (*horizontalis/ integrifolius/ simonsii/ bullatus)*	65	None
Monbretia *C. x crocosmiiflora*	62	None
Variegated Yellow Archangel *Lamiastrum galeobdolon ssp.argentatum*	59	None
Rum Cherry *Prunus serotina*	54	None
False Acacia *Robinia pseudoacacia*	37	None
Japanese Rose *Rosa rugosa*	30	None
Giant Hogweed *Heracleum mantegazzianum*	21	1
Spanish Bluebell *Hyacinthoides hispanica*	21	None
New Zealand Pigmyweed *Crassula helmsii*	18	None
Himalayan Knotweed *Persicaria wallichii*	3	1
Water Fern *Azolla filiculoides*	9	None
Parrot's Feather *Myriophyllum aquaticum*	3	None
Pirri-Pirri-bur *Acaena novae-zelandiae*	1	1

Data source: Nottinghamshire Biodiversity Action Group

Figure 8. The number of selected INNS plant species (as listed above) recorded in each 1km squares in Sherwood



Data source: Nottinghamshire Biodiversity Action Group

In addition to plants, a number of invasive animal species also occur in Sherwood:

Muntjac *Muntiacus reevesi*. This species is found in 21 1km squares across the Sherwood area. It is very likely that Muntjac are under recorded, and hence likely to be much more widespread.

American Mink *Neovison vison*. There are 17 1km squares within which there are records of American Mink in Sherwood, most found on or near to watercourses. However it is very likely that mink are under recorded in Sherwood and that they are therefore much more widespread.

Signal Crayfish *Pacifastacus leniusculus*. In the Sherwood NCA there are 3 1km squares where Signal Crayfish have been recorded. Two of these were found in the upper reaches of the Dover Beck (North of Calverton), and the other record came from the Arboretum Pond in Nottingham. In addition, two other river catchments which fall partly within the Sherwood NCA are known to support populations of Signal Crayfish, the River Greet and the River Leen; however, these records all fall out-

side of the NCA. In addition, there is a record of Redclaw crayfish *Cherax quadricarinatus* from within the NCA; an individual specimen was recorded in the University of Nottingham Lake in 2012. However, this species is currently thought to be unable to breed in the UK.

Midwife Toad *Alytes obstetricans*. There is only 1 1km square with a record of Midwife Toad presence in Sherwood, at an urban site near Worksop.

[Data provided by the Nottinghamshire Biological and Geological Records Centre and Nottinghamshire Biodiversity Action Group].

ISSUES & TRENDS

The production of this report has highlighted a number of issues regarding our knowledge of Sherwood's designated sites, habitats and species:

- We still don't know the extent of some of our key habitats in Sherwood, including oak-birch woodland, whilst more accurate information is required or heathland/acid grassland, wood pasture, parkland and ponds
- There is little information about the condition of key habitats in Sherwood outside of SSSIs
- Knowledge about many of Sherwood's important species is sparse, especially for invertebrates

Looking to the future, it can be expected that there will be ongoing changes to the status of Sherwood's designated sites, habitats and species, some positive and some negative. In particular:

- The restoration of colliery pits tips, in particular those at Rufford and Thoresby, provides an opportunity to create extensive areas of heathland, acid grassland and oak-birch woodland habitat; it is important that these opportunities are maximised, as other such opportunities are limited
- Climate change, with hotter and drier summers, warmer and wetter winters and more severe weather events will impact negatively upon some habitats and species, but may provide opportunities for others
- An increased human population living in and around Sherwood can be expected to result in increased pressure on sites and species due to recreational activities causing disturbance and habitat degradation
- Changes to agricultural land-use may occur, with potentially increased intensification and pesticide use, mitigated by environmental stewardship, but some abandonment may conceivable occur as a result of climate change



Heathland restoration at Rufford Colliery (©Janice Bradley)

- Increasing development pressure may result in both direct and indirect impacts on sensitive sites and species; however, development also provides an opportunity to deliver new or improved habitat through the provision of Green Infrastructure

- New pests and diseases may threaten our woodlands and change the way that commercial forestry is managed and the make-up of the species that are planted, potentially affecting species which rely on the rotational felling of conifers

RECORDING

A range of formal and informal biological recording takes place within Sherwood NCA. As well as general (and often ad hoc) recording by individuals and groups (species or site based), formalised surveys/monitoring takes place:

Wetland Bird Survey (BTO/JNCC/RSPB)

A total of 10 Wetland Bird Survey sites are located wholly or partially within the Sherwood NCA:

- Clumber Lake
- Thoresby Lake
- Welbeck Great Lake (and associated lakes)
- Rufford Lake
- Center Parcs
- King's Mill Reservoir, Mansfield
- Wollaton Park Lake
- Newstead Abbey Park Lake
- Cauldwell Dam
- Bleak Hills Fishing Lakes

Breeding Bird Survey (BTO/JNCC/RSPB/WWT)

A total of 25 Breeding Bird Survey squares are located wholly or partially within the Sherwood NCA:

- SK5158 Sutton-in-Ashfield
- SK5254 Kirkby Forest
- SK5357 Stonehills/Thieves' Wood
- SK5462 River Maun, Mansfield
- SK5544 Basford N
- SK5552 Newstead Grange
- SK5740 St Anne's
- SK5765 Clipstone
- SK5768 Clipstone
- SK5769 Meden Vale
- SK5830 Bradmore
- SK5964 Clipstone
- SK6046 Arnold NE
- SK6050 Calverton
- SK6051 Calverton
- SK6172 Carburton
- SK6182 Osberton
- SK6256 White Post
- SK6276 Clumber N
- SK6286 Blyth
- SK6483 Bilby
- SK6769 Boughton Brake
- SK6872 Haughton
- SK6880 Babworth
- SK7278 Eaton

Butterfly transects (organised by Butterfly Conservation)

A total of 5 Butterfly Conservation butterfly transects are located wholly or partially within the Sherwood NCA:

- Beeston Sidings
- Wollaton Park
- Newstead Abbey Park
- Ollerton Pit Wood
- Clumber Park

In addition, Birklands Ringing Group undertakes surveys for key Sherwood bird species at a selection of sites (including census work and ringing/tracking), whilst a range of other organisations carry out recording activities within Sherwood, including (but not limited to) the Derbyshire and Nottinghamshire Entomological Society (DaNES), Sorby Natural History Society, Nottinghamshire Birdwatchers, Butterfly Conservation East Midlands, Nottinghamshire Fungi Group and Nottinghamshire Bat Group.

The following list provides contact details for biological recorders, including the Nottinghamshire Biological and Geological Record Centre and County Recorders, to whom records of particular species groups can be submitted:

ALL SPECIES - Nottinghamshire Biological and Geological Record Centre (NBGRC); Communities Courtyard, Wollaton Park, Nottingham, NG8 2AD; tel. 0115 8762188, email nbgrcg@nottinghamcity.gov.uk

AMPHIBIANS & REPTILES - John Osborne; 21 Hill Syke, Lowdham Grange, Lowdham, Notts, NG14 7DE; tel. 0115 9664915, email jeosborne@btinternet.com

BIRDS - Andy Hall; 10 Staverton Rd, Bilborough, Nottingham, NG8 4ET; tel. 0115 9169673, email andy.h11@ntlworld.com

BRYOPHYTES - Sue Knight; The Barn, Bell Lane, Collingham, Newark, Notts, NG23 7LR; email lesknight@btinternet.com

BUTTERFLIES - Richard Rogers; 19, Arundel Drive, Bramcote, Nottingham, NG9 3FX; email RichardVC56@gmail.com

CRAYFISH - Chris Jackson; email chris.jackson@nottscc.gov.uk

DIPTERA (flies, including Hoverflies) - Derek Whiteley; 6 Dale View Terrace, Cressbrook, Derbyshire, SK17 8SY; tel. 0114 2798588

DRAGONFLIES - David Goddard; 30 Cliffe Hill Avenue, Stapleford, Nottingham, NG9 7HD; email david.goddard@wyg.com

FUNGI - Di Mears; tel. 01246 857371; email dimears@sky.com

MAMMALS - Michael Walker; c/o Nottinghamshire Wildlife Trust, Old Ragged School, Brook Street, Nottingham NG10 5NA; tel. 0115 9588242, email mwalker@nottswt.co.uk

MICRO-MOTHS & BUGS - Dave Budworth; email dbud01@aol.com

MOTHS (and all other invertebrates not listed) - Dr Sheila Wright; c/o Nottingham Natural History Museum, Wollaton Hall, Nottingham, NG8 2AE; tel. 0115 876 1048; email shelia.wright@nottinghamcity.gov.uk

ORTHOPTERA (Grasshoppers & Crickets) - Roy Frost; 66 St Lawrence Rd, North Wingfield, Chesterfield, Derbyshire, S42 5LL; Tel. 01246 850037, email frostra66@btinternet.com

PLANTS - David Wood or Mark Woods; email nbgrcg@nottinghamcity.gov.uk

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APPENDICES

Appendix 1. Section 41 species (species of principal importance for the purpose of conserving biodiversity in England) occurring in Sherwood

Scientific Name	Common Name	Year of most recent record	Notes
Birds			
Alauda arvensis arvensis/scotica	Sky Lark	2015	
Anthus trivialis	Tree Pipit	2015	
Caprimulgus europaeus	Nightjar	2015	
Carduelis cabaret	Lesser Redpoll	2015	
Carduelis cannabina autochthona/ cannabina	Linnet	2015	
Coccothraustes coccothraustes	Hawfinch	2015	
Cuculus canorus	Common Cuckoo	2015	
Dendrocopos minor comminutus	Lesser Spotted Woodpecker	2015	
Emberiza citronella	Yellowhammer	2015	
Emberiza schoeniclus	Reed Bunting	2015	
Locustella naevia	Grasshopper Warbler	2015	
Lullula arborea	Wood Lark	2015	
Miliaria calandra calandra/clanceyi	Corn Bunting	2015	
Motacilla flava flavissima	Yellow Wagtail	2015	
Muscicapa striata	Spotted Flycatcher	2015	
Numenius arquata	Curlew	2015	A non-breeder in Sherwood
Parus montanus kleinschimdti	Willow Tit	2015	
Parus palustris palustris/dresseri	Marsh Tit	2015	
Passer domesticus	House Sparrow	2015	
Passer montanus	Tree Sparrow	2015	
Perdix perdix	Grey Partridge	2015	
Prunella modularis occidentalis	Dunnock	2015	
Pyrrhula pyrrhula pileata	Bullfinch	2015	
Streptopelia turtur	Turtle Dove	2015	
Sturnus vulgaris vulgaris	Starling	2015	
Turdus philomelos clarkei	Song Thrush	2015	
Vanellus vanellus	Lapwing	2015	
Fish			
Anguilla Anguilla	European eel	2015	
Cobitis taenia	Spined loach	2000	
Salmo trutta	Brown/Sea trout	2014	
Fungi			
Geastrum corollinum	Weathered Earthstar	2012	
Hygrocybe spadicea	Date-Coloured Waxcap	2008	
Piptoporus quercinus	Oak Polypore	2015	
Herpetofauna			
Anguis fragilis	Slow-worm	2015	
Bufo bufo	Common Toad	2015	
Lacerta vivipara	Common Lizard	2015	
Natrix natrix	Grass Snake	2014	
Triturus cristatus	Great Crested Newt	2013	
Vipera berus	Adder	2005	Now extinct in Sherwood?
Beetles			
Dromius quadrisignatus	Mab's Lantern	1978	

Cryptocephalus coryli	Hazel Pot Beetle	2015	
Meloe proscarabaeus	Black Oil Beetle	2015	
Butterflies			
Coenonympha pamphilus	Small Heath	2015	A 'research only' species
Erynnis tages	Dingy Skipper	2015	
Lasiommata megera	Wall	2011	
Satyrium w-album	White-letter Hairstreak	2015	
Crustaceans			
Austropotamobius pallipes	White-clawed Crayfish	2012	
Moths			
Acronicta psi	Grey Dagger	2015	A 'research only' species
Acronicta rumicis	Knot Grass	2015	A 'research only' species
Adscita statices	The Forester	2014	
Agrochola helvola	Flounced Chestnut	2014	A 'research only' species
Agrochola litura	Brown-spot Pinion	2015	A 'research only' species
Agrochola lychnidis	Beaded Chestnut	2015	A 'research only' species
Allophyes oxyacanthae	Green-brindled Crescent	2014	A 'research only' species
Amphipoea oculea	Ear Moth	2015	A 'research only' species
Amphipyra tragopoginis	Mouse Moth	2015	A 'research only' species
Apamea anceps	Large Nutmeg	1996	
Apamea remissa	Dusky Brocade	2015	A 'research only' species
Aporophyla lutulenta	Deep-brown Dart	2009	A 'research only' species
Arctia caja	Garden Tiger	2004	A 'research only' species
Asteroscopus sphinx	The Sprawler	1990	A 'research only' species
Atethmia centrago	Centre-barred Sallow	2014	A 'research only' species
Blepharita adusta	Dark Brocade	2007	
Caradrina morpheus	Mottled Rustic	2015	A 'research only' species
Celaena leucostigma	The Crescent	1999	
Chesias legatella	The Streak	2014	A 'research only' species
Chiasmia clathrata	Latticed Heath	2015	A 'research only' species
Cymatophorima diluta	Oak Lutestring	1985	
Dasypolia templi	Brindled Ochre	1996	
Diarsia rubi	Small Square-spot	2015	A 'research only' species
Diloba caeruleocephala	Figure Of Eight	2005	
Ecliptopera silaceata	Small Phoenix	2015	A 'research only' species
Ennomos erosaria	September Thorn	2015	A 'research only' species
Ennomos fuscantaria	Dusky Thorn	2015	A 'research only' species
Ennomos quercinaria	August Thorn	2010	
Epirrhoe galiata	Galium Carpet	1999	
Eugnorisma glareosa	Autumnal Rustic	2015	A 'research only' species
Eulithis mellinata	The Spinach	2008	A 'research only' species
Euxoa nigricans	Garden Dart	2009	A 'research only' species
Graphiphora augur	Double Dart	2013	
Hemistola chrysoprasaria	Small Emerald	1999	
Hepialus humuli	Ghost Moth	2015	A 'research only' species
Hoplodrina blanda	The Rustic	2015	A 'research only' species
Hydraecia micacea	Rosy Rustic	2014	A 'research only' species
Lycia hirtaria	Brindled Beauty	2014	A 'research only' species
Macaria wauaria	V-moth	1996	A 'research only' species
Malacosoma neustria	The Lackey	2001	A 'research only' species
Melanchra persicariae	Dot Moth	2015	A 'research only' species
Melanchra pisi	Broom Moth	2014	A 'research only' species
Mesoligia literosa	Rosy Minor	2015	A 'research only' species

Mythimna comma	Shoulder-striped Wainscot	2015	A 'research only' species
Orgyia recens	Scarce Vapourer	2000	
Orthosia gracilis	Powdered Quaker	2014	A 'research only' species
Pelurga comitata	Dark Spinach	1992	A 'research only' species
Scotopteryx chenopodiata	Shaded Broad-bar	2015	A 'research only' species
Spilosoma lubricipeda	White Ermine	2015	A 'research only' species
Spilosoma luteum	Buff Ermine	2015	A 'research only' species
Stilbia anomala	The Anomalous	2009	
Tholera cespitis	Hedge Rustic	2015	A 'research only' species
Tholera decimalis	Feathered Gothic	2015	A 'research only' species
Timandra comae	Blood-vein	2015	A 'research only' species
Trichiura crataegi	Pale Eggar	2000	A 'research only' species
Tyria jacobaeae	The Cinnabar	2015	A 'research only' species
Watsonalla binaria	Oak Hook-tip	2015	A 'research only' species
Xanthia gilvago	Dusky-lemon Sallow	1999	
Xanthia icteritia	The Sallow	2015	A 'research only' species
Xanthorhoe ferrugata	Dark-barred Twin-spot Car-	2015	A 'research only' species
Xestia agathina	Heath Rustic	2009	
Spiders			
Midia midas	Midas Tree-weaver	2014	
Mammals			
Arvicola terrestris	Water Vole	2015	
Erinaceus europaeus	West European Hedgehog	2015	
Lepus europaeus	Brown Hare	2015	
Micromys minutus	Harvest Mouse	2015	
Mustela putorius	Polecat	2013	
Nyctalus noctula	Noctule	2015	
Pipistrellus pygmaeus	Soprano Pipistrelle	2015	
Plecotus auritus	Brown Long-eared Bat	2015	
Vascular plants			
Euphrasia anglica	Glandular Eyebright	2014	
Monotropa hypopitys	Yellow Bird`s-nest	2006	
Oenanthe fistulosa	Tubular Water-dropwort	2006	
Scleranthus annuus	Annual Knawel	2012	

Appendix 2. Birds listed in Annex 1 of the Birds Directive and Animals listed in Annex 2 of the Habitats Directive occurring in Sherwood

Scientific Name	Common Name	Most recent record	Notes
Birds			
Alcedo atthis	Kingfisher	2015	
Caprimulgus europaeus	Nightjar	2015	Nationally important breeding popn. (>1%)
Lullula arborea	Woodlark	2015	Nationally important breeding popn. (>1%)
Pernis apivorus	Honey Buzzard	2015	Nationally important breeding popn. (>1%)
Animals			
Austropotamobius pallipes	White-clawed Crayfish	2012	
Cobitis taenia	Spined loach	2000	
Triturus cristatus	Great Crested Newt	2013	

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Woodlark - one of Sherwood’s special species (©John Smith)