The State of Staffordshire's Nature

2016 Summary Report

Staffordshire Wildlife Trust

Staffordshire Ecological Record

Registered charity no 259558 Limited company no 959609 www.staffs-wildlife.org.uk 01889 880100

Working for a **Living Landscape**

River Dane at Three Shires Head
Nick Mott

Bluebell woodland
Victoria Liu

Jackson's Coppice and Marsh Nature Reserve
Victoria Liu

Main photo: Fen Meadow Rudyard - Victoria Brooks. Water vole - Nick Mott. Lapwing - Darin Smith. Green tiger beetle - Victoria Liu

From towering crags to ancient woodlands and heather-clad moorlands to flower-rich meadows, Staffordshire's surprising array of habitats makes it a gloriously diverse county for wildlife. Born and bred in Stafford, and being the place where I learnt my 'naturalist's trade', has resulted in what I suspect is now a life-long bond with this most underrated of counties. So deep do my roots penetrate into this county's soil that this resulted in me being asked to become Vice-President of Staffordshire Wildlife Trust in 2016.

Ensuring the county continues to punch above its weight in terms of biological diversity is probably the most challenging job for the local conservation community, which is why I'm so delighted with the publication of the 'State of Staffordshire's Nature' report. For 12 months, a dedicated team have been investigating the state of the county's nature, by both looking at differing landscapes, and populations of the key species they hold, such as the otter or the now threatened lapwing.

Inevitably the findings are like a 'curate's egg' - or good in parts. While some conservation initiatives have been an unqualified success, the continued disappearance of prime habitat is a constant worry, resulting in the 'Sword of Damocles' hanging over a number of already threatened species such as the adder, water vole and hazel dormouse to name just a few.

Although vast, the picture needs to be firstly looked at on a county-wide level before any decisions can be made on where the Trust and other organisations must focus both their efforts and limited financial reserves for the maximum effect. I urge anyone who reads this report to take a moment to think how they might be able to either help or continue their support.

If it inspires a few Trust members to either create a wildlife haven in their garden, or encourages farmers to continue working with SWT staff on the best management practices for wildlife, then it will have been worth all the effort. So please read, absorb and feel empowered to help in any way you can - your county needs you!

Mike Dilger
Naturalist, TV Presenter and Writer

Contents

Key terms used throughout the report

BIODIVERSITY OFFSETTING
Biodiversity offsetting is used where mitigation of impacts on habitats is not possible on a development site. Habitats are created elsewhere by legal agreement. Defra has approved a system of calculation to ensure impacts are fully mitigated.

CITIZEN SCIENCE
The collection and analysis of data relating to the natural world by members of the general public, typically as part of a collaborative project with professional scientists.

ECOLOGICAL NETWORKS
A way of thinking about landscapes and how we can create linkages between key wildlife areas to benefit habitats and species. Ecological networks are created by identifying opportunities to connect habitats through the provision of corridors, stepping stones and buffer zones.

ECOSYSTEM SERVICES
These are the services provided to society by the environment. They include food production, carbon storage in soils and vegetation, flood alleviation by water storage in wetlands, and the spiritual value of natural landscapes.

GOOD OVERALL STATUS
An assessment of the biological quality of UK watercourses based on standards set in accordance with the Water Framework Directive and other EU water directives.

LOCAL WILDLIFE SITES
Sites that are of county importance for the conservation of wildlife. They are identified and selected for containing exemplar habitats and species.

NATURAL FLOOD MANAGEMENT
Natural flood management is the alteration, restoration or use of landscape features, working with natural hydrological and morphological processes, in order to reduce flood risk.

PRIORITY SPECIES
These are those listed by Defra in relation to the Natural Environment & Rural Communities Act 2006 Section 41: Species of Principal Importance in England, and Staffordshire Biodiversity Action Plan (SBAP) priority species.

PROTECTED SPECIES
These are the species protected by European and UK legislation including the EU Birds and Habitats Directives, the Conservation of Habitats and Species Regulations 2010, the Wildlife and Countryside Act 1981 and the Protection of Badgers Act 1992.

SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)
SSSI is a statutory designation placed on an area of land that is considered to be of special interest at the national level for its fauna, flora, geological or geomorphological features. Consent is required from Natural England for any activity that may affect the habitats, species or geological features of an SSSI.

CONDITION STATUS OF SSSIs
The condition of SSSIs in England is assessed by Natural England. There are six reportable condition categories: Favourable; Unfavourable Recovering; Unfavourable No Change; Unfavourable Declining; Part Destroyed and Destroyed. Favourable and Unfavourable Recovering are most frequently referred to within this document, and are defined by Natural England:

- Favourable: The designated feature(s) within a unit are being adequately conserved and the results from monitoring demonstrate that the feature(s) in the unit are meeting all the mandatory site specific monitoring targets. A unit can only be considered favourable when all the component designated features are favourable.
- Unfavourable Recovering: Often known simply as 'recovering'. Units/features are not yet fully conserved but all the necessary management mechanisms are in place. At least one of the designated feature(s) mandatory attributes are not meeting their targets. Provided that the recovery work is sustained, the unit/feature will reach favourable condition in time.

SUSTAINABLE DRAINAGE SYSTEMS (SuDS)
SuDS are a natural approach to managing surface water run-off from hard surfaces in order to prevent new or existing development increasing flood risk.

Headline findings 2015 - 2016

- Over 23,582 hectares (8.7%) of Staffordshire is covered by a nature conservation or geological designation, of which 3.2% is designated with Site of Special Scientific Interest (SSSI) status and 4.4% is classed with Local Wildlife Site status.
- There are many and varied threats to Staffordshire's nature, with loss of habitats affecting all species groups. Habitat condition is also a major concern:
  - Just 32% of Staffordshire's geological and nature conservation SSSIs are in a Favourable condition and only 45% of Local Wildlife Sites are under appropriate conservation management.
  - Only 5% of Staffordshire's waterbodies are classified as being in Good Overall Status with 46% classed as either in Poor or Bad Overall Status.
- Over 9,800 species have been recorded in Staffordshire, including invertebrates, fish, birds, mammals, amphibians, reptiles, fungi and vascular plants. Of these, 501 are classed as Priority Species and 205 are legally protected.
- Based on expert knowledge and the best available data we have found that many species in Staffordshire are declining, including water vole, hazel dormouse and a number of invertebrate species, such as the small heath butterfly and white-clawed crayfish.
- There are also conservation success stories, with targeted actions leading to increasing populations of species such as otter, polecat and the logjammer hoverfly, showing that positive change is possible.
- Many important species have been recorded in Staffordshire and are faring well in the county, including dingy skipper and great crested newt. Staffordshire also holds important populations of fish including Atlantic salmon, brown trout and European eel and birds such as nightjar, woodlark and willow tit. Some of Staffordshire's nationally rare plant species include floating water-plantain, yellow bird's-nest and frog orchid.
- To ensure the survival of Staffordshire's wildlife, new habitats need to be created and all our habitats need to be larger, in a better condition, and be better connected within landscapes to facilitate species movement.
- As well as its inherent value, wildlife and habitats provide important 'ecosystem services' that benefit us all. The capital value of ecosystems to society in Staffordshire is at least £7.19 billion, with the services provided by the ecosystems worth at least £111 million per year.
- There are hundreds of individuals and many organisations working passionately to help Staffordshire's wildlife. They contribute their time, money and expertise to benefit wildlife conservation in many different ways such as through volunteering, recording, monitoring and undertaking practical conservation works on the ground.

Water vole
Derek Crawley /
Staffordshire Mammal Group

Introduction

Biodiversity forms an integral part of our everyday lives. Nature inspires and enriches our lives and we depend upon the benefits that it gives us for our own survival. Nature in the UK, however, is not faring well[1], and within this report we hope to gauge the current state of Staffordshire's nature, highlight its value and make recommendations that will help it to flourish.

Across the UK, increasing demands on our natural environment have led to a significant decline in biodiversity. Staffordshire is no exception and has suffered losses of habitats and species through increasing pressures including changes in land use and pollution. 8.7% of Staffordshire is covered by a nature conservation or geological designation, but only 32% of our most important, nationally designated sites (SSSIs) are in Favourable condition. Less than half of Local Wildlife Sites are considered to be in appropriate conservation management. Without collective action we will continue to see the loss of wildlife-rich habitats and the decline of species.

Numerous organisations, landowners, voluntary groups and businesses are already working hard to improve habitats and species populations across Staffordshire and there have been many success stories through habitat creation and restoration schemes, as well as targeted species projects, but there is much more to be done.

In publishing this report, we hope that we are taking a step forward for nature conservation in Staffordshire. By undertaking an in depth assessment of its current state we can be better informed and equipped to recommend the best and most appropriate action to improve the state of Staffordshire's nature in the future.

Aims of the report

In partnership with Staffordshire Ecological Record, Staffordshire Wildlife Trust has teamed up with a number of nature conservation organisations and county wildlife experts. We aim to bring together the best available data and expert knowledge to build upon previous local and national publications, such as other "State of..." reports, to summarise how Staffordshire's nature is faring. We have gathered this information together into two reports, this summary report and a more detailed technical report, to raise the profile of the state of nature conservation in Staffordshire to a wide and influential audience including Local Authorities, politicians, farmers, planners and businesses.

Within this report we assess the current status of habitats and species across the county and identify the threats they face. We also make a wide range of targeted and general recommendations and provide case studies to give examples of where successes have been achieved. Where information is available we have also assessed how species and habitat trends have changed over time, though comparable historical data is limited and this has influenced the scope of the report.

Far Brook near Flash
Nick Mott

The foundations of biodiversity

The diverse landscapes of Staffordshire are a mosaic of different habitats owing their origin to geology, geography and climate, combined with land use and management, with each being special and unique. Once lost, a geological or geomorphological feature cannot easily be restored or re-introduced. The Earth's 4.6 billion year history has been divided into 12 geological time periods and Staffordshire has exposures of rock from half of these periods, dating from the Carboniferous through to the Triassic and from the Paleogene to the Quaternary, helping make it one of the most geodiverse counties in Britain.

North Staffordshire geology is dominated by Carboniferous limestones, sandstones and mudstones. These resistant rocks generate the hilly upland, peak and moorland areas, of which there are 2,000 hectares in Staffordshire, with a generally cooler and wetter climate providing ideal conditions for habitats such as blanket bog, upland heath, acid grassland, rush pasture and wet flushes. Lower-lying, drier and warmer South Staffordshire is generally underlain by softer Permian and Triassic conglomerates, sandstones and mudstones, that help form its rare lowland heathland habitat.

The Ice Age also played its part in shaping Staffordshire's landscape. Glacial meltwaters carved deep, wide, flat-bottomed river valleys that form some of Staffordshire's main transport pathways, although many watercourses have since been severely modified from their natural state. Natural resources such as coals, ironstones and clays enabled industrialisation and partly determined settlement patterns within Staffordshire that, together with the transport pathways, make up what we can call the built environment. Transport networks such as canals, railways and roads linking urban and brownfield areas can also be important wildlife corridors and refuges.

What wildlife does for us

Overview

Staffordshire's natural assets, the rocks, soils, water, air, habitats and wildlife, are of fundamental importance. We derive a range of services from these natural assets – often called ecosystem services – that make human life possible.

The most obvious ecosystem services are food, water and raw materials such as timber. We can put a clear value on these services as we are used to paying for them. However, there are other, less obvious, ecosystem services that we are dependent on, including the climate regulation and flood prevention roles played by our woodlands, the storage of carbon in peatlands and the pollination of our crops by insects. There are also cultural services that are perhaps even less tangible but no less important, such as the inspiration and wellbeing we draw from being in beautiful natural landscapes, or the physical and mental health benefits of exercise in green spaces.

There is considerable evidence of the health benefits delivered by natural habitats and green space, but assigning financial values to these is difficult. The annual cost of physical inactivity to health services in Staffordshire is estimated as £18 million. Nationally the Department of Health suggests that an increase in accessible open spaces could reduce healthcare costs by more than £2 billion per year.

Headlines[2]

The capital value of ecosystems to society in Staffordshire is at least £7.19 billion, but not all services have yet been assessed so the figure is much higher.

- The services these ecosystems provide are worth in excess of £111 million per year.
- The value of carbon storage provided by Staffordshire's woodlands is around £1.5 billion and for wetlands is around £600 million.
- Natural flood regulation services provided by habitats in Staffordshire are worth around £14.5 million per year.
- Monthly (or more frequent) use of urban green spaces can be valued at between £112 and £377 annually per person in terms of health benefits.
- An assessment of Staffordshire County Council's six main country parks, Stoke-on-Trent City Council's 28 parks and open spaces, and 26 of Staffordshire Wildlife Trust's nature reserves, found that collectively these sites delivered over £3.3 million of benefits each year, excluding health and amenity benefits.

Ruddy darter
Nick Mott

Swallow Moss
David Cadman

Polecat
Derek Crawley /
Staffordshire Mammal Group

Common frog
Nick Mott

How you can help Staffordshire's wildlife to flourish

From small gardens to large areas of habitat and industrial land, you can make a difference to Staffordshire's wildlife. We can help you identify opportunities and advise on how best to achieve them.

MPs and Councillors can use their influence to bring about change at a local, regional and national level. Help us to put wildlife at the heart of relevant policies and make a pledge for the environment. Ensure that the UK leads on climate change and create a countryside richer in wildlife by supporting farmers and landowners to deliver environmental benefits.

Parish councils can draw up effective neighbourhood plans that help protect biodiversity and identify opportunities to enhance and create habitats.

Local Authorities - see Key messages for Local Authorities on page 10.

Businesses can make the most of biodiversity opportunities on their land, which can be aided by the production of a biodiversity action plan. By ensuring nature is protected and not harmed through everyday business practices and by highlighting the importance of nature to stakeholders, companies will have a wider positive impact on Staffordshire's wildlife. Businesses can also organise staff team building days to carry out important improvements to Staffordshire's habitats and get involved in wildlife surveys in their local area. Providing funding for larger scale habitat creation or restoration can make an even more significant contribution to the local environment.

Developers can help by ensuring that developments are designed with the best possible gains for biodiversity, taking opportunities to go beyond the compulsory biodiversity work required. There may also be opportunities to contribute to strategic priorities by acquiring sites for habitat creation in locations that connect existing habitats.

Land managers can help by ensuring they have the most up-to-date knowledge of how best to manage their land to benefit the wildlife that depend upon it. More information on specific habitats and species are provided on the following pages.

Volunteer / local groups can help by campaigning for better wildlife protection, raising awareness of the importance of wildlife, helping improve knowledge of Staffordshire's wildlife by carrying out surveys, getting involved in enhancing the local environment or offering time to help a local conservation organisation.

Individuals can help by managing gardens to benefit biodiversity, getting involved in wildlife surveys, volunteering to help conserve and enhance habitats, campaigning for better wildlife protection and supporting local conservation organisations.

Key messages for Local Authorities

Local Authorities are required to have due regard for biodiversity in all of their functions, such as:

- Policy creation
- Development management
- Green and open spaces and property management
- Community education

National legislation and policy provides Local Authorities with powers to conserve species and habitats within their area. These can be further strengthened by the creation of policies in local plans, neighbourhood plans, supplementary planning documents and biodiversity strategies. It is vital that Local Authorities use these powers to achieve the best possible outcome for biodiversity. In 2008 all Staffordshire Councils signed the West Midlands Biodiversity Pledge commitment to the conservation of biodiversity.

There is a wide variety of legislation and policy relating to biodiversity that Local Authorities should comply with and through the correct implementation of these, councils have real opportunities to protect biodiversity and to create significant net gains.

Local planning authorities should ensure they have access to ecological advice and expertise, and this is best provided via in-house support. Proposals for development should be informed by robust survey and assessment to ensure effects on wildlife and habitats are better understood; net losses can then be easily identified and net gains become measurable. In line with legislation and policy, impacts should be avoided where possible and unavoidable impacts fully mitigated or compensated for.

Ecological experts should be involved in the writing of planning conditions relating to biodiversity, habitat or protected species to ensure the conditions are appropriately worded. Where developments will involve the creation or management of habitats or species, regular monitoring must be carried out by developers. This requirement, and the submission of regular results to the Local Authority, should be written into planning conditions.

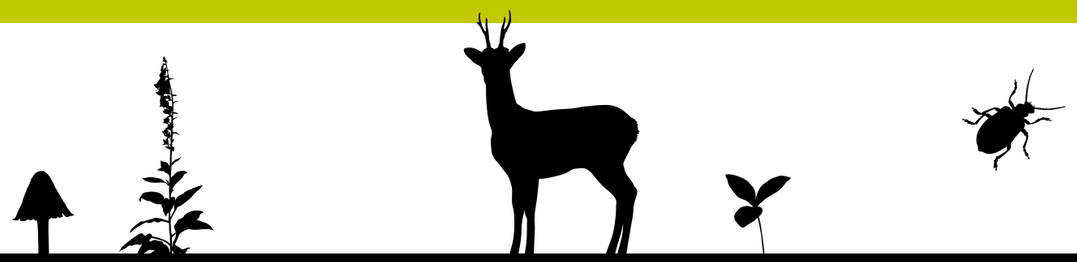
Where Local Authorities own designated sites, e.g. Sites of Special Scientific Interest (SSSIs), these must be managed to maintain their nature conservation value. Local Authorities also have the power to designate land in their ownership as Local Nature Reserves (LNRs) in recognition of their importance for wildlife and to local communities.

Case Study

The Burntwood Milestone Way Strategic Development Allocation provides 750 new dwellings in Lichfield District. The development, whilst considered sustainable, necessitates the destruction of priority habitat. Lichfield District Council's Ecology Team, supported by Staffordshire Wildlife Trust and Staffordshire County Council, negotiated that:

- The best habitats would be saved, translocated and managed.
- All protected species would be captured and relocated.
- New high quality habitat would be created on the development site.
- A substantial sum would be provided via S106 Agreement to the Ecology Team for the strategic creation/restoration of 9.1 hectares of heathland over 25 years.
- Funding was also provided to mitigate impacts on the nearby SSSI.

This creates a significant net gain to the District's biodiversity and habitat connectivity. The development was approved in 2015.



Key messages for your area

Common themes across all of Staffordshire:

- **Ensure no net loss of habitat** within developments, and aim for net biodiversity gain.
- **Reduce habitat fragmentation and increase connectivity** by linking, buffering and expanding existing sites of importance.
- **Protect and improve existing sites** by securing and maintaining appropriate conservation management.
- **Recognise the value of ecosystem services.** Staffordshire's habitats play an important role in providing valuable ecosystem services, especially water quality and flood prevention.

Specific Locality Priorities

Stafford Borough

- **Connect wetland habitats.** Ensure developers consider provision for species such as otter, harvest mouse and water shrew.
- **Achieve net biodiversity gain through HS2 Ltd.** Carry out opportunity mapping and aim to designate any new Local Wildlife Sites (LWS).

Staffordshire Moorlands District

- **Prevent the decline of moorland waders.** The area is currently a stronghold for nationally declining wader species.
- **Protect water voles.** The Cecilly Brook in Cheadle supports a healthy and important population of water voles.
- **Increase the area of important habitats.** Continue to identify opportunities for habitat creation as part of quarry restoration.

South Staffordshire District

- **Increase populations of lesser horseshoe bat and water voles.** South Staffordshire is the only district where lesser horseshoe bat has been recorded and the watercourses around Coven and Wombourne are important for water voles.
- **Reconnect the southern heathlands.** Provide ecological connectivity between sites such as Highgate Common, Kinver Edge and Penn Common.

Newcastle-under-Lyme Borough

- **Protect and reconnect populations of hazel dormouse.** The only natural sites in the county lie within Newcastle Borough.
- **Achieve net biodiversity gain through HS2 Ltd.** Carry out opportunity mapping and aim to designate any new Local Wildlife Sites (LWS).

Stoke-on-Trent City

- **Provide opportunities for key species to move across urban areas.** Provide suitable quality greenspace and brownfield sites.
- **Improve wetland habitats.** Carry out habitat improvements on watercourses, including creating and protecting fringe habitats.

East Staffordshire Borough

- **Provide opportunities for key species to move across urban areas.** Provide suitable quality greenspace and protect fringing habitats along watercourses.
- **Increase the area of important habitats.** Continue to identify opportunities for habitat creation as part of quarry restoration.

Cannock Chase District

- **Protect Cannock Chase Special Area of Conservation (SAC).** Mitigate the impact of development and recreation on Cannock Chase SAC and link heathland sites in the Cannock Chase to Sutton Park area in collaboration with Lichfield District, South Staffordshire District and Stafford Borough.
- **Retain a mosaic of brownfield habitats in the District.**

Tamworth Borough

- **Provide opportunities for key species to move across urban areas.** Provide suitable quality greenspace and protect fringing habitats along watercourses.
- **Increase the extent of nature conservation quality grassland on Broad Meadow,** host to one of Staffordshire's two native populations of snake's head fritillary.

Lichfield District

- **Provide opportunities for key species to move across urban areas.** Provide suitable quality greenspace and protect fringing habitats along watercourses.
- **Achieve net biodiversity gain through HS2 Ltd.** Carry out opportunity mapping and aim to designate any new Local Wildlife Sites (LWS).

The State of Staffordshire's habitats

Mottey Meadows National Nature Reserve
Victoria Brooks

Where are Staffordshire's most important habitats and geological sites?

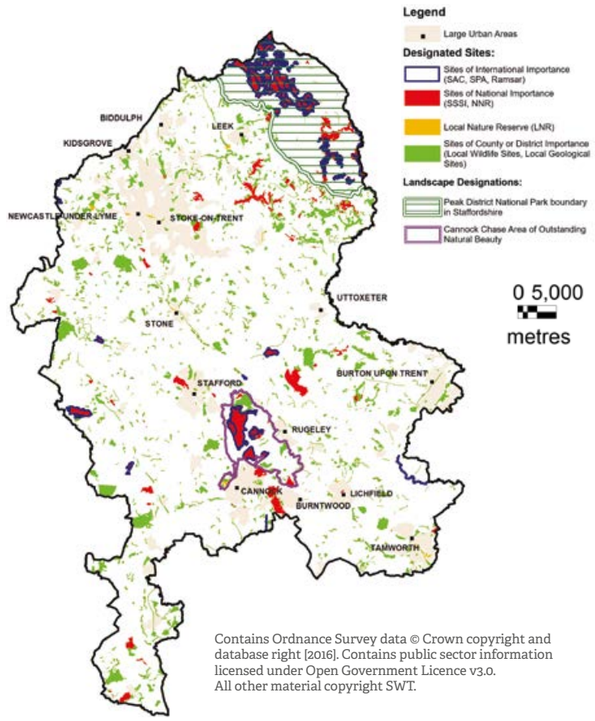


Figure 1. Designated sites of international, national and local importance within Staffordshire

What condition are our nationally important habitats and geological sites in?

Condition of SSSI Units in Staffordshire

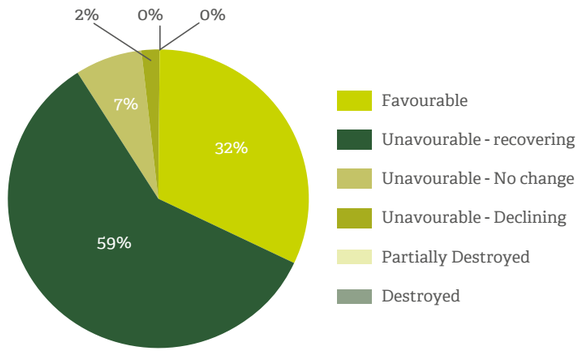


Figure 2. The percentage of nature conservation and geological Site of Special Scientific Interest (SSSI) units in each condition category within Staffordshire

Oak and ash woodland of the Coombes Valley SSSI, in the Churnet Valley. RSPB images

Woodlands and trees

Woodlands and trees occur widely in Staffordshire, including long-standing ancient woodland, coniferous and broadleaved plantations, wet woodland, parkland, ancient trees, orchards and scrub. Staffordshire's woodlands provide a range of important ecosystem services, including flood regulation services.

Headlines

- There are over 25,000 hectares (ha) of woodland cover in Staffordshire[3]. Of this, 2,193 ha have Site of Special Scientific Interest (SSSI)[4] status and 6,072 ha are on the ancient woodland inventory[5].
- 27% of SSSI lowland woodland and 41% of SSSI upland woodland is in Favourable condition[6].
- Many characteristic woodland species in Staffordshire are experiencing strong declines.
- The value of carbon storage by Staffordshire's woodlands is around £1.5 billion[2].

Threats

- Lack of management and neglect, impacting on woodland structure, ground flora and deadwood habitats.
- Habitat fragmentation.
- Invasive species.
- Lack of financial markets for sustainably produced local wood products.
- Climate change.
- Plant diseases, such as ash dieback and *Phytophthora*.

Recommendations

- Restore ancient semi-natural woodland sites.
- Manage and retain woodland edge, scrub, deadwood features and wet woodland.
- Support landscape-scale woodland restoration and creation, such as in the Churnet Valley and The National Forest.
- Explore potential for the Payment for Ecosystem Services schemes to support future woodland creation and management.

Wood warbler
Margaret Holland

Veteran oak tree
Kate Dewey

Bluebell
Catherine Williamson

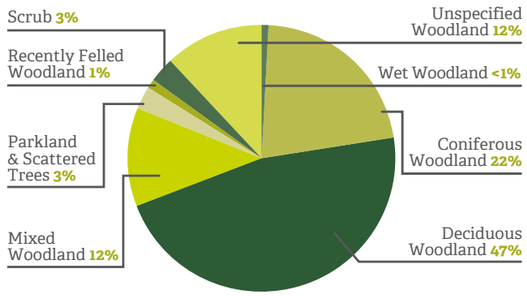
Hazel dormouse
Danny Green

Current status

Ancient and long-established woodland ecosystems contain a range of unique plants and animals. Currently Staffordshire has approximately 9% of woodland cover[3] compared to 8.4% of England under woodland cover at the turn of the 21st century[7].

Although county specific information is not available, it is likely that populations of priority woodland species are largely mirroring national and regional declines, e.g. woodland butterflies declined by 55% in England between 1990 and 2014[8]. However, important populations of characteristic species such as lesser spotted woodpecker, pied flycatcher, willow tit and argent & sable moth persist.

Types of Woodland Total Area = 21,942 ha



NB: This includes wet woodland which is also shown on the wetlands page. Note: Data from Staffordshire Ecological Record (SER) (June 2016). 53 % of Staffordshire is mapped on the SER system. This figure is lower that the headline figure for woodland cover in Staffordshire provided by the Forestry Commission (FC) as SER did not have a full breakdown of all habitat types for the figures provided by the FC.

Figure 3. Percentage breakdown of different types of woodland recorded to occur within Staffordshire

Causes of change

The quality of many of Staffordshire's woodlands has been impacted by a lack of management, habitat fragmentation, invasive species and the historic establishment of commercial plantation on ancient woodland sites. However, more than half of the woodland resource is now in some form of management, improving the quality of woodland habitats.

Key areas

Extensive woodland planting has occurred in the National Forest and there are important parkland and wood pasture sites in East Staffordshire, near Cannock Chase and in South Staffordshire. The Churnet Valley, Loggerheads area, the Wilderness and Vermin Valley, the Peak District and Marchington Woodlands are also notable.

Case study: Churnet Valley

Woodland cover exceeds 3,000 ha in the Churnet Valley, a large proportion of which is of ancient origin. Woodland birds such as pied flycatcher and wood warbler are found throughout, whilst rare invertebrates include argent & sable. Though many woodlands have fallen out of active management, recent efforts by the Churnet Valley Living Landscape Partnership and woodland owners are improving habitats.

Caldon Dales SSSI
David Cadman

Grassland

Grassland of conservation value includes a range of grass-based communities that are typically wildflower-rich, but exhibit different species depending on the underlying soil and rock types, residual moisture and management regimes. Generally three broad categories are defined: acid grassland, neutral grassland and calcareous grassland.

Headlines

- There are more than 47,000 hectares (ha) of grassland habitat in Staffordshire[9], of which 1,010 ha is designated with Site of Special Scientific Interest (SSSI) status[6].
- 40% of SSSI grasslands are in Favourable condition and 54% are in Unfavourable Recovering condition.
- 206 ha of wildflower-rich grassland were lost from Local Wildlife Sites (LWS) between 1979 & 2000[10].

Threats

- Grassland lost to urban fringe development and large infrastructure projects.
- Continued loss of grassland biodiversity due to neglect or inappropriate management, e.g. overgrazing.
- Species extinctions due to small and isolated sites.
- Decline in biodiversity due to intensive agriculture.
- Decreasing availability of agri-environment schemes promoting sustainable environmental management practices due to increasingly limited funds.

Recommendations

- Increase awareness and understanding of issues surrounding grassland losses.
- Promote biodiversity offsetting and grassland habitat creation including working with the quarry industry where there is scope for large-scale creation projects.
- Connect and expand existing good-quality grassland creating ecological networks.
- Encourage farmers to take up and maintain grant schemes such as Countryside Stewardship.

Snake's head fritillary
Anna Maxwell

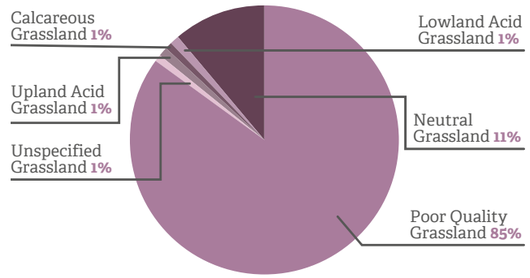
Roesel's bush cricket
Nick Mott

Dark green fritillary
Mike Williams

Current status

Since the mid-20th century an estimated 97% of wildflower-rich lowland grassland has been lost in Great Britain[11]. Losses continued through the 1990s but in recent years this has slowed. Similar patterns are reflected in Staffordshire.

Types of Grassland Total Area = 47,210 ha



NB: Upland acid grassland is also included on the Moorland page. Lowland acid grassland is also included on the lowland heathland page. Note: Data from Staffordshire Ecological Record (SER) (June 2016). 53% of Staffordshire is mapped on the SER System

Figure 4. Percentage breakdown of different types of grassland recorded to occur within Staffordshire

Causes of change

Biodiversity losses have occurred through non-sustainable agricultural practices, including intensive farming where fertilisers and pesticides ensure increased productivity of selected species, and lack of appropriate management including overgrazing and unsuitable cutting regimes. Some grasslands have been lost due to urban expansion and neglect.

Recently, several quarry companies in the county have taken a sympathetic approach to restoration with innovative and collaborative working involving Staffordshire County Council (SCC) and Staffordshire Wildlife Trust (SWT), setting a benchmark for habitat restoration/creation.

Key areas

The Churnet Valley/Weaver Hills area supports examples of Staffordshire's nationally important grassland types. Mottey Meadows National Nature Reserve (NNR) is a notable site and significant acid grassland concentrations occur around Cannock Chase and Kinver.

Case study: Grassland restoration

In order to offset quarrying of sections of the Caldon Dales and Rue Hill SSSIs, SCC, SWT and the quarry operators have been working to translocate SSSI grassland and to create, link up and restore wildflower-rich grassland in the restored areas of the quarries and on non-operational land. The target habitats include calcareous and neutral grasslands of local and national priority. The project commenced in 2010 and so far over 10 ha have been created with more work planned over the next 5-10 years.

Lowland heathland
Victoria Liu

Lowland heathland

Lowland heathland is characterised by a range of shrubs of the heather family interspersed with gorse, bilberry, acidic grasses, bracken and scattered scrub and trees. It usually occurs on acidic, free draining soils.

Headlines

- There are over 1,700 hectares (ha) of lowland heathland (including lowland acid grassland) in Staffordshire[12]. 1,691 ha has Site of Special Scientific Interest (SSSI) status[6].
- A study in 1990 showed that almost 90% of heathland in Staffordshire had been lost over 215 years[13].
- Through careful management, 90% of Staffordshire's SSSI lowland heathland is in Unfavourable Recovering condition, but only 7% is already in Favourable condition[6].

Threats

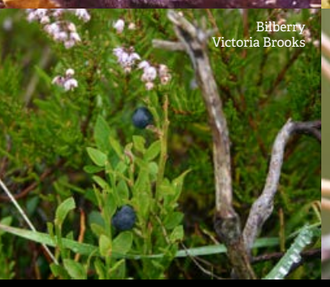
- Insufficient resources to fund sustainable, appropriate management on all sites.
- Disturbance to sensitive species and habitats through recreation.
- Isolation of heathland sites.
- Atmospheric pollution.
- Climate change.
- Invasion by trees, scrub and bracken.
- Difficulties in changing management, e.g. introducing grazing on Common Land.

Recommendations

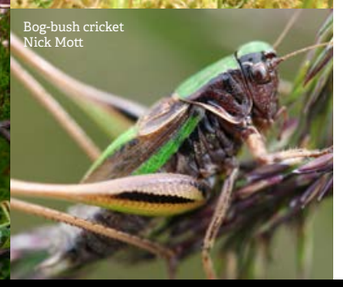
- Additional funding is required and more sustainable appropriate management on sites where it is lacking.
- Link isolated heathland in key areas, particularly Cannock Chase to Sutton Park.
- Further investigate opportunities for creation through the planning system.
- Monitor habitats and the impacts of changes in climate.
- Minimise disturbance and site damage caused by recreation, through continued work by the Cannock Chase Special Area of Conservation partnership.

Nightjar
Nick Aldridge

Adder
Victoria Brooks



Bilberry
Victoria Brooks



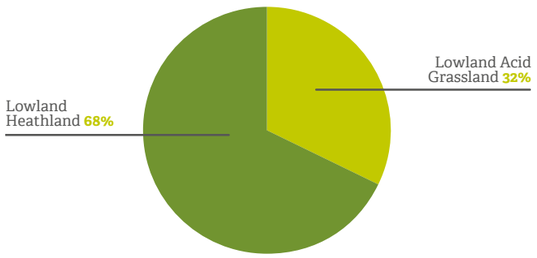
Bog-bush cricket
Nick Mott

Current status

The UK holds 20% of the world's lowland heathland[1]. It is an internationally rare habitat that is home to many important species, and we therefore have an important responsibility to protect it. Staffordshire lost an estimated 90% of heathland between 1775 and 1990[13]; we must conserve what remains.

Lowland Heathland & Lowland Acid Grassland

Total Area = 1,731 ha



NB: Lowland acid grassland is also included on the grasslands page. Note: Data from Staffordshire Ecological Record (SER) (June 2016). 53% of Staffordshire is mapped on the SER system.

Figure 5. Percentage breakdown of lowland heathland and lowland acid grassland recorded to occur within Staffordshire

Causes of change

Much of the decline in heathland has been due to changes in land use including intensive grazing and modern arable practices, conifer plantations, mining and urban development. Further to this, the declines in the traditional uses of heathland, for example cutting vegetation and livestock grazing, has led to many heathlands reverting to woodland or scrub. To address these issues, many organisations have been involved in excellent heathland management and creation, but more work is still required.

Key areas

In addition to the extensive Cannock Chase and Southern Staffordshire Coalfield heathlands there are many small isolated heathland sites found between Cannock Chase and Sutton Park, between Kinver and Highgate Common, and at Wetley Moor.

Case study: Connecting Cannock Chase

From 2012 - 2015 this project contributed to the process of restoring 65 ha of heathland on Forestry Commission land in corridors that connect with SSSI heathland. Light cattle grazing was introduced, bracken control was carried out and bare ground was created. Volunteers helped to control scrub and spread heather brash to encourage heather regeneration. The project was managed by Staffordshire Wildlife Trust, working closely with the Forestry Commission and other partner organisations.

Leek Moors
Colin Hayes

Moorland

Moorland is an all-embracing term covering a wide range of upland habitats found at altitudes between 300 m and 550 m. Moorland includes peat-based blanket bogs, dwarf shrub heath on peaty or mineral soils, acid grassland, rush pastures and wet flushes.

Headlines

- There are more than 2,000 hectares (ha) of moorland in Staffordshire[14]. Over 900 ha is designated within a Site of Special Scientific Interest (SSSI)[15].
- Staffordshire's Moorlands are particularly important for their intimate mosaic of moorland, grassland and rush pastures.
- 66% of SSSI moorland habitats are in Unfavourable Recovering condition, but only 21% are in Favourable condition[16].
- Moorland peat holds a significant store of carbon and can have an important role in flood water storage.

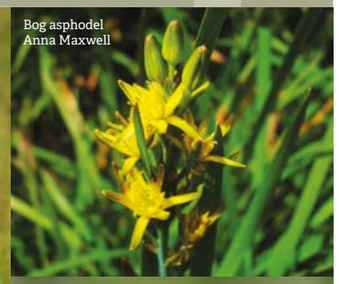
Threats

- Marginal economic viability for farmers; 50% of landholdings within the South West Peak National Character Area cover less than 20 ha[17].
- Drainage in areas of marshy grassland.
- Agricultural improvement and heavy grazing of wet grassland.
- Loss of flower-rich grasslands in pastures and hay meadows.
- Climate change.

Recommendations

- Increase habitat connectivity by enhancing the wildlife value of moorland fringe and associated upland habitats.
- Support a return to mixed livestock grazing systems and the use of traditional breeds.
- Work at a landscape-scale to carry out management for the benefit of upland waders, including predator control.
- Identify further opportunities for drain blocking to retain water, to slow down run-off and to help restore peat habitats.

Curlew
Jon Hawkins



Bog asphodel
Anna Maxwell

Lapwing
Darin Smith

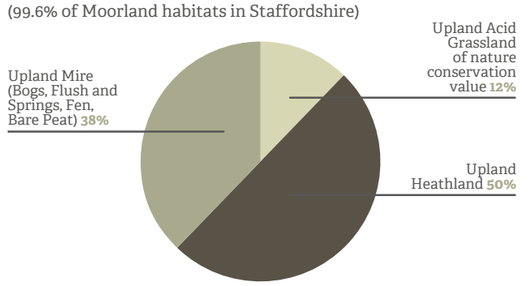
Current status

The upland habitats within Staffordshire are internationally important, with the majority under statutory protection at both the European and national level. The Countryside Survey 2000 found that the quantity of moorland habitats has largely remained unchanged across the UK, but habitat quality of bog and dwarf shrub heath has declined since 1990[18]. A repeat survey in 2007 found that habitat quality was relatively stable in England[19]. Despite this, only 21% of SSSI moorland in Staffordshire is currently classed as being in Favourable condition[16].

A number of moorland birds continue to decline, but Staffordshire remains a 'hotspot' for populations of upland waders in the Peak District, though these are threatened by drainage and agricultural improvement of grasslands.

Moorland habitats in Staffordshire Moorlands District

(99.6% of Moorland habitats in Staffordshire)



NB: Upland acid grassland is also included on the grasslands page. Note: Data from Staffordshire Ecological Record (SER) (June 2016). 53% of Staffordshire is mapped on the SER system.

Figure 6. Percentage breakdown of different types of moorland recorded to occur within the Staffordshire Moorlands District

Causes of change

It is widely recognised that moorland habitats have been adversely affected by historic factors including overgrazing, drainage, air pollution and inappropriate burning. Whilst the causes are starting to be addressed, it will take some time for habitats to return to Favourable condition, especially for those sites on peaty soils. Areas of land that fall outside designated sites are particularly susceptible to change through inappropriate management.

Key areas

Staffordshire's moorlands are largely confined to the northeastern corner of the county within the Staffordshire Moorlands Local Authority and Peak District National Park. Notable sites include Middle Hills, The Roaches, and areas around Swallow Moss moors.

Case study: Brund Hill Plantation

55 ha of land at Brund Hill, near Leek, was planted with conifers in the mid-seventies. Surrounded by a landscape of nationally protected habitats the site, now owned by Staffordshire Wildlife Trust, is undergoing restoration. 16 ha of upland broadleaf woodland and 14 ha of moorland and rush pasture have been restored to date. Annual bird monitoring has been ongoing since 2005 and is providing an important dataset for monitoring future changes.

Mermaid Pool
Nick Mott

Wetland

A broad range of wetland habitats can be found in Staffordshire including rivers, streams, canals, lakes, reservoirs, meres and mosses, inland saltmarsh, wet woodlands, fens, marshes, swamps, bogs and reedbeds.

Headlines

- There are over 3,740 hectares (ha) of wetland habitats in Staffordshire[20]. 2,112 ha are designated with Site of Special Scientific Interest (SSSI)[6] status.
- It is estimated that over 85% of the UK's rivers and streams have been severely modified from their natural state[21].
- Restoration of sand and gravel quarries provides a significant opportunity for wetland creation and river restoration in the Trent and Tame valleys.

Threats

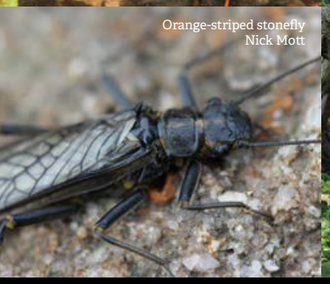
- Habitat destruction including dredging and drainage.
- Removal of bankside vegetation.
- Pollution and nutrient enrichment from industry (including heavy metals), agriculture and urban areas.
- Habitat fragmentation and isolation.
- Drainage and habitat conversion for agriculture.
- Climate change, atmospheric pollution, acid rain and increasing river water temperatures.
- Invasive non-native species and the spread of animal and plant diseases.

Recommendations

- Produce a 50 year vision for 'Staffordshire's Natural Rivers and Wetlands'.
- Promote the establishment of wider vegetation corridors for watercourses.
- Raise the profile of the ecosystem services that wetlands provide.
- Increase community-led initiatives and citizen science.
- Continue to protect, restore and create new wetlands.

White-clawed crayfish
Nick Mott

Electrofishing at Gayton Mill Weir
Nick Mott



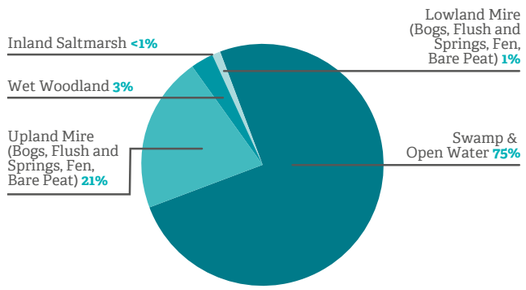
Orange-striped stonefly
Nick Mott

Timberjam on the River Dane
Nick Mott

Current status

Staffordshire is home to a series of internationally important meres, mosses, blanket bogs and inland saltmarshes. 5% of waterbodies in Staffordshire are in Good Overall Status, 49% are in Moderate, 35% are in Poor and 11% are in Bad Overall Status[22].

Wetland Habitats Total Area = 3,740 ha



NB: Some habitats are also included in graphs on other pages. Note: Data from Staffordshire Ecological Record (SER) (June 2016). 53% of Staffordshire is mapped on the SER system.

Figure 7. Percentage breakdown of different types of wetland recorded to occur within Staffordshire

Causes of change

Sections of Staffordshire's main rivers were pronounced 'biologically dead' in the early 1970s. Pollution, urbanisation, insensitive land drainage, river modifications and agricultural intensification resulted in catastrophic decreases in the area and complexity of Staffordshire's wetlands.

Improvements to the quality of Staffordshire's watercourses since the 1970s are attributed to reductions in pollution, river restoration schemes, and developments and flood defence schemes that benefit wetlands. Despite this, setbacks still occur due to major pollution incidents and the effects of invasive species.

Key areas

Key wetland areas include the Meres and Mosses, quarries restored to wetland habitats along the Trent and Tame between Burton and Tamworth, and the Upper Dove river catchment.

Case study: River restoration at Middleton Hall and Dosthill Quarry

Large-scale river restoration was carried out along a two kilometre section of the River Tame between 1998 and 2005. Work was carried out by Hanson Aggregates and the Environment Agency with support from Staffordshire County Council. During the life of the quarries, permission was secured to remove aggregate along the Tame to double the width of the river and allow natural processes to re-assert themselves to create a mix of habitats. This pioneering work has inspired other mineral companies and river restoration workers in Europe.

Bradeley Fields,
a Blooming Stoke meadow
Bernadette Noake

Built Environment

The network of habitats associated with the built and industrial environment includes roadside verges, railway embankments, parks, cemeteries, gardens, street trees, buildings with wildlife features, previously developed land (brownfield sites) and quarries. Not all of these habitats occur within urban areas.

Headlines

- Staffordshire has approximately 24,000 hectares (ha) of urban area (9.1% of the county)[23].
- There are 227 ha of open mosaic brownfield habitats mapped in Staffordshire, approximately 1,200 ha of urban broadleaved woodland and approximately 600 ha of urban meadows[23].
- Over 100 roadside Local Wildlife Sites[24] (LWS) have been designated in Staffordshire.

Threats

- Habitat loss and fragmentation.
- Lack of awareness and information about the wildlife value of built sites and their associated habitats.
- Developments not incorporating habitats and features for wildlife.
- Lack of monitoring and enforcement on development sites.
- Poor habitat management, e.g. cutting regimes of roadside verges.

Recommendations

- Improve understanding of habitats and species, particularly regarding brownfield sites.
- Connect isolated habitats.
- Continue best practice restoration of quarries to wildlife habitat and secure long-term management.
- Ensure appropriate management and protection of habitats within the built environment.
- Incorporate habitats and features for wildlife in developments, e.g. work with HS2 Ltd to create new habitats, retain and enhance connectivity and ensure habitat losses are mitigated.

Bee orchid
Victoria Brooks

Redstart
Amy Lewis

Road verge
David Cadman

Current status

Staffordshire's built environment supports a range of habitats that are important for both wildlife and the health and wellbeing of people. These can be found in parks, informal open spaces, cemeteries, school and business grounds and along roadsides, and include canals, rivers and greenways.

Causes of change

It is not possible to provide trends on changes in the built environment, however there are many examples where development has resulted in the loss of important habitats, with the approach to biodiversity in developments and by local planning authorities being varied. Many habitats suffer from inappropriate management and watercourses are threatened by pollution. Infill development can result in the loss of mature gardens and trees while the density of new development means that there may be no space for street trees.

Despite this, there are positive examples of habitat protection and creation (see case study). There are opportunities to create and improve habitats through the planning process such as at Redhill Business Park, Stafford, and initiatives such as the Blooming Stoke project, which created a series of wildflower meadows linking habitat through Stoke-on-Trent, show what can be achieved.

Key areas

Brownfield habitats are a distinctive characteristic of historical industrial towns such as Stoke-on-Trent, which often support rare plants and invertebrates not found in the wider countryside. The verges and embankments along Staffordshire's network of transport routes also provide valuable wildlife corridors.

Case Study: Love Your River

Love Your River is a community project run in partnership by the Environment Agency and Groundwork West Midlands aimed at improving the water quality of River Trent tributaries, in particular the Lyme Brook in Newcastle. The project has brought together the expertise of a number of partners with practical interventions, including the help of volunteers, to deliver environmental improvements. The project draws upon the principles of Sustainable Drainage Systems (SuDS) to tackle diffuse pollution, raising community awareness, and training local 'River Wardens' to enable future monitoring.

Clive Farm floristic margin
Chris Seabridge

Farmland

Staffordshire's agricultural landscape includes a patchwork of habitats valuable to wildlife including arable field margins, ponds, hedgerows, veteran trees, overwintering stubble and conservation headlands. Agricultural land also provides a range of ecosystem services including provisioning, flood alleviation and carbon storage benefits.

Headlines

- Approximately 71% of Staffordshire is in agricultural production[25].
- Specialist arable plants, insects and birds are declining; the UK farmland bird indicator reached its lowest ever level in 2013, just 45% of the 1970 baseline value[26].
- 15,610 ha (6% of Staffordshire) was under Higher Level Stewardship (HLS) agreements in 2016 (this includes non-agricultural land)[27]. There is evidence that UK farms under HLS have greater abundance of farmland birds[26].

Threats

- Difficulty of producing food efficiently and profitably, whilst carrying out conservation management for wildlife and meeting environmental commitments.
- Uncertainty regarding future farm subsidies and agri-environment funding following the vote to exit the EU.
- Diffuse water pollution.
- Soil erosion and loss of micro-organism diversity.

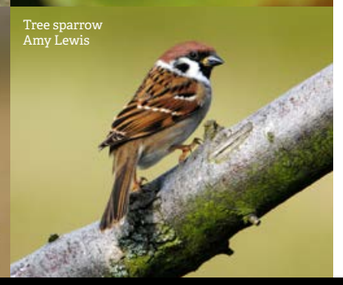
Recommendations

- Provide a supportive framework for farmers to adopt best environmental practice through promotion of initiatives such as the Campaign for the Farmed Environment.
- Continue and evolve agri-environment schemes to maximise environmental benefits and ensure they are practicable.
- Promote farmer involvement in wildlife recording.
- Maintain and enhance semi-natural habitats and provide wildlife corridors and networks, e.g. hedgerows, field margins, ponds and small woodlands.
- Expand existing and develop new schemes to improve water quality.

Brown hare
Richard Bowler

Early mining bee
A.Jukes

Yellowhammer
Damian Waters



Tree sparrow
Amy Lewis

Current status

Farming provides vital breeding and feeding habitats for many species, with specialist farmland birds largely reliant on these habitats.

Approximately 71% of Staffordshire is agricultural land, with arable representing about 31% of this, dairy 25%, other grazing livestock 32% and mixed farming 10%. Horticulture represents 1%, with several large market gardening and fruit farm enterprises. The hill farms in the uplands of northeast Staffordshire are primarily grazed by livestock.

Causes of change

Despite some excellent work on many farms, issues such as pollution, management that does not take account of wildlife and loss/fragmentation of habitats remain. Agricultural change since the post-war era, driven by changing farming policy and food production demands, has seen substantial declines in farmland habitats including wildflower-rich grassland, ponds, trees and hedgerows, and declines in species. Since the advent of agri-environment schemes in the 1990s, a significant amount of farmland has been brought into improved environmental management, with evidence of positive benefits to farmland wildlife and habitats.

Key areas

The wildflower-rich grasslands of the Churnet Valley and South West Peak. Scattered lowland hay meadows, most notably Mottey Meadows. Arable land around Lichfield, Wolverhampton and Newcastle-under-Lyme is important for farmland birds.

Case study: Staffordshire Farm Wildlife Competition Winners, 2014

Clive Farm, near Wolverhampton, is an excellent example of profitable farming and wildlife conservation. The farm is predominantly arable with grassland grazed by livestock. The farm has been in HLS since 2012, which has enabled sympathetic management. Pollinators benefit from beetle banks, field margins and pollen and nectar flower mixtures. Bird counts are carried out by the landowner with species including lapwing, corn bunting and grey partridge.

The State of Staffordshire's Species

Harvest mouse
Amy Lewis

Oil beetle
A.Jukes

Invertebrates

Invertebrates are animals without a backbone. They are incredibly diverse, ranging from sponges, snails, worms and arthropods including spiders, crayfish, woodlice to insects such as dragonflies, butterflies and moths.

Headlines

- 5,559 invertebrate species have been recorded in Staffordshire since 1990[35] (40,000 in the UK[36]).
- Of these, 385 are Priority Species and two are legally protected[37].
- Four bumblebee species have become extinct since 1920, with the colonisation of one species.
- Invertebrates that require habitat features such as old trees with deadwood, arable margins and bare ground with pioneer vegetation have declined.

Threats

- Land use change, including insufficient or inappropriate woodland management and agricultural intensification.
- Destruction and deterioration of habitats including the isolation and loss of wildflower-rich habitats.
- Insufficient mitigation on development sites.
- Climate change and weather extremes.
- Modification of watercourses.
- Non-native invasive species.
- Changes in legislation and agri-environment schemes.
- Pollution and pesticides (particularly neonicotinoid pesticides).

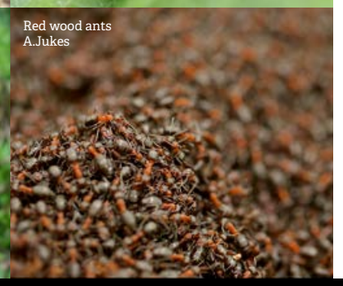
Recommendations

- Promote landscape-scale conservation projects targeting threatened/vulnerable species.
- Increase habitats of importance, particularly features such as woody debris in watercourses, bare ground with pioneer vegetation, veteran trees and deadwood.
- Increase consideration for invertebrates in developments.
- Increase survey, monitoring and research to inform conservation, incorporating citizen science.
- Reduce pollution and pesticide use.

Logjammer hoverfly
Nick Mott

Southern iron blue mayfly
Nick Mott

Broad-bodied chaser (female)
A.Jukes



Red wood ants
A.Jukes

Current status

Invertebrates are incredibly important and are found in a broad range of habitats. They provide crucial pollination services and food for other wildlife, and they play important roles such as breaking down waste and creating healthy soils[38]. They are one of the most effective indicators of environmental health and ecological change.

Expert knowledge and available data give an indication of the state of invertebrates in Staffordshire. Many species are declining, for example four species of bumblebee have become extinct since 1920. In contrast, some species have increased in abundance and/or population size or have colonised the county.

Causes of change

The condition of the modern landscape is extremely challenging for invertebrates. Declines in wildflower-rich grassland, woodlands with varied structure and features such as veteran trees, deadwood and patchy bare ground, have had a negative effect. Very few watercourses and wetlands have been unmodified. The isolation of habitats in the landscape has made populations of sedentary invertebrates more vulnerable.

Despite this, some species have increased due to climate change or habitat improvements (see case study). Efforts are underway to expand and link remaining habitats to allow species to move through the landscape.

Key areas

The Leek Moors, northeast Staffordshire calcareous grasslands, central Staffordshire wood pastures and parklands, southern heaths and southern dingle woodlands.

Case Study: Logjammer hoverfly

Following investigations into the specific habitat requirements of the fly in 2009[39],[40], further sites for the species were discovered. Coarse woody debris installation into watercourses in strategic locations such as the Churnet Valley and Cannock Chase has resulted in stronger populations of the fly over a wider area.

Dingy skipper
Rory Middleton

Invertebrates: Butterflies and Moths

Headlines

- 34 species of butterfly (including three migrants), and 1,295 species of moth have been recorded in Staffordshire[41],[42]. Another 150 moth species have been recorded historically (before 1990).
- 60 species of butterfly (including four migrants), and over 2,500 moths have been recorded in the UK[8],[43].
- There are seven Priority Species of butterfly in Staffordshire[44]. Of these, six are contracting in range and one is expanding, with five decreasing in abundance, one having a stable population and one increasing in abundance in the West Midlands region[41].
- There are 76 Priority Species of moth in Staffordshire[45].

Threats

- See the Invertebrates page.

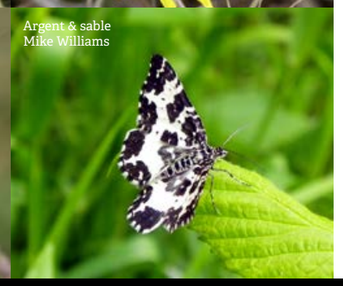
Recommendations

- Increase the number of targeted species surveys to determine locations of Priority Species throughout the county.
- Ensure that established monitoring (e.g. transects) is carried out on a regular basis to provide an accurate picture of population changes.
- Continue and develop landscape-scale projects for target species, e.g. small pearl-bordered fritillary.
- Take account of butterfly and moth habitat and food plant requirements in the design of development landscaping and minerals site restoration.

Small pearl-bordered fritillary
Victoria Liu

Grizzled skipper
Mike Williams

Small heath
Victoria Liu



Argent & sable
Mike Williams

Current status

Butterflies and moths are a highly diverse and important group of invertebrates and long-term trends show they have seen significant declines across Britain. Recent studies show that declines in some species have slowed, however even for those species, remaining populations are generally smaller than they once were and their status remains concerning[8].

All seven Priority Species of butterflies in Staffordshire show either declining abundance or distribution in the West Midlands (Table 1). The picture for some species is more positive locally however; Staffordshire is a stronghold for the dingy skipper in the West Midlands and new populations are being discovered[41].

Species	Distribution	Abundance
Dingy skipper	↓	↓
Grizzled skipper	↓	stable
Small pearl-bordered fritillary	↓	↑
Wall	↓	↓
White-letter hairstreak	↓	↓
Small heath	↓	↓
White admiral	↑	↓

Table 1. Distribution and abundance changes for priority butterfly species between 2005 and 2015 within the West Midlands region[41]

Causes of change

See Invertebrate page.

As with other invertebrates, some butterflies and moths thrive in a wide variety of habitats that support a range of plant species, some are poor fliers and others require specific "niche" habitat conditions. For example, small pearl-bordered fritillary caterpillars only feed on marsh violet or common dog-violet. A diverse landscape with different and connecting ecological "niche" habitats is therefore key.

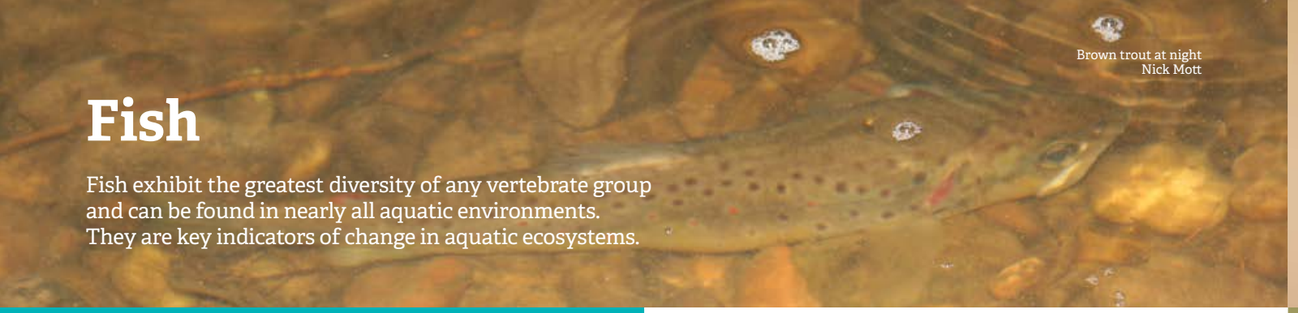
Conservation efforts have made a positive impact to certain species in Staffordshire: following Staffordshire County Council management works in the Sherbrook Valley, an increase in small pearl-bordered fritillary numbers was observed.

Key areas

Staffordshire Moorlands, The Weaver Hills, Cannock Chase, Kinver Edge, Highgate Common, Churnet Valley, woodlands near Loggerheads and brownfield sites of Stoke-on-Trent and Newcastle-under-Lyme.

Case Study: Argent & sable

Argent & sable is a day-flying moth that was once well distributed in England and Scotland but has suffered recent declines[46]. Targeted management and natural birch regeneration have been key drivers in Staffordshire having a number of woodland sites where it has been recorded over the last decade, including Coombes Valley and a number of sites near Loggerheads.



Brown trout at night
Nick Mott

Fish

Fish exhibit the greatest diversity of any vertebrate group and can be found in nearly all aquatic environments. They are key indicators of change in aquatic ecosystems.

Headlines

- 24 species of freshwater fish have been recorded in Staffordshire since 1990[47].
- Four are classed as Priority Species and four are protected[48].
- Three species are classed as invasive non-native species.
- Four additional species have not been recorded since 1990.

Threats

- Introduction of non-native species.
- Illegal removal of fish, e.g. poaching.
- Degradation of watercourses, including pollution and sedimentation.
- Elevated water temperatures due to lack of riparian shade.
- Channel realignment and straightening.
- Disease spread by poor biosecurity and illegal movement of fish.
- Man-made obstructions to migration routes and lack of spawning habitat.
- Habitat fragmentation.

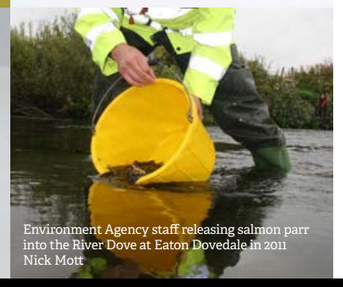
Recommendations

- Invasive species control.
- Increase run-off control, for example through Sustainable Drainage Systems (SuDS).
- Better planning of the use of chemicals.
- Improvements to river and stream habitat diversity and naturalisation of modified watercourses.
- Increase biosecurity, following the Check, Clean, Dry campaign.
- Continue to improve water quality.
- Promote habitat improvement strategies, e.g. riparian tree planting schemes and bankside protection.

Roach
Ian Sheridan

Bullhead
Nick Mott

Spined loach
Nick Mott



Environment Agency staff releasing salmon parr into the River Dove at Eaton Dovedale in 2011
Nick Mott

Current status

Fish are a crucial part of the food chain and they play important roles such as recycling nutrients. They can also act as indicators of ecosystem health as they are sensitive to disease and water quality changes.

The variety of watercourses, open waters and wetlands in Staffordshire provide suitable conditions for a number of native fish species, including important populations of spined loach, Atlantic salmon, brown trout and European eel.

Causes of change

Increased legislation and habitat restoration schemes have helped improve water quality since the 1970s, however many challenges remain. Development, historical river engineering and continued dredging has resulted in the removal and fragmentation of many aquatic habitats. Reservoir dams and other structures create barriers to natural fish movement and migration routes. Major pollution incidents can also impact negatively on water quality and the introduction of non-native species including American signal crayfish and American mink have had major negative impacts on fish populations.

Key areas

Within waterbodies such as rivers, lakes and streams, ideal fish habitat includes backwaters and pools for nursery habitat, woody debris, rocks and undercut banks for refuge areas and territory markers. Gravels for spawning and lowering water temperatures during prolonged summer periods of low river flows are also important.

Case Study 1: Gayton Brook Catchment 2010-2014

A partnership of the Environment Agency, Staffordshire Wildlife Trust and landowners was successful in removing two weirs to restore fish passage from the River Trent confluence to the headwaters for the first time in one hundred years.

Case Study 2: Atlantic salmon reintroduction

Atlantic salmon were successfully reintroduced to the River Dove catchment by the Environment Agency and Trent Rivers Trust. The project commenced in the mid-1990s and was completed by 2012.

Great crested newt

Amphibians and Reptiles

Amphibians and reptiles are cold-blooded animals with a backbone. Reptiles include snakes and lizards, amphibians include frogs, toads and newts. They are key features of a healthy ecosystem.

Headlines

- Nine of the UK's 13 native amphibian and reptile species occur in Staffordshire[49].
- This comprises five amphibians and four reptiles.
- Six of these are Priority Species and four are legally protected[50].
- An additional species is thought to be extinct and a number of non-native species are also present.

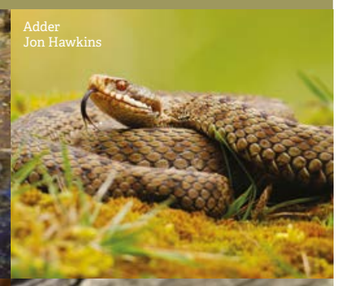
Threats

- Degradation, fragmentation and loss of habitats, e.g. loss of breeding ponds and suitable terrestrial habitats nearby.
- Pond/waterway degradation through pollutant run-off, siltation and shading.
- Disruption of toad migration routes, e.g. due to road construction.
- Spread of infectious diseases amongst amphibians such as Ranavirus and Chytrid.
- Intensification of farming practices.
- Persecution, particularly of snakes.

Recommendations

- Ensure continuity of widespread interconnected high quality habitats over time.
- Create and restore habitats such as wildlife ponds.
- Utilise opportunities provided through agri-environment schemes and developments, e.g. using Sustainable Drainage Systems to create beneficial habitats.
- Increase knowledge of reptiles and amphibians through further recording and research, and identify trigger points to indicate when action is required.

Common toad
Victoria Liu



Adder
Jon Hawkins

Slow-worm
Amy Lewis

Common lizard
Rory Middleton

Current status

Due to large declines in great crested newt populations across Europe during the 20th century, the species has more protection under British and European law than other reptiles and amphibians[51]. This species is more widespread in Staffordshire compared to other areas of the UK, and can be locally common.

Common frog and smooth newt are common in Staffordshire in suitable habitats but common lizard is recorded to have declined in south Staffordshire, although is showing recent signs of recovery. Common toad has suffered from large declines in the number of breeding sites in south Staffordshire but data is scarce on how toad populations have fared. Grass snake is widespread but usually found in low numbers. Palmate newt is probably the rarest of the newts and is found sporadically across Staffordshire[52].

There is a low and vulnerable population of adder in the south of Staffordshire, a species which has suffered serious declines nationally[53]. However, all the reptiles and amphibians in Staffordshire, including slow-worm, are likely to be under-recorded.

Causes of change

Numbers of many reptile and amphibian species in the UK are declining[54], largely due to destruction, alteration and fragmentation of their habitats. Additionally, adder has declined in numbers following persecution[53].

However, efforts to enhance habitats and protect species under law, particularly the great crested newt, have had a positive impact.

Key areas

Ponds in urban Stoke-on-Trent and Newcastle-under-Lyme are important for great crested newt. Due to declines in ponds in the wider countryside, ponds in gardens may be playing an increasingly important role for all amphibian species. Cannock Chase is particularly important for Staffordshire's reptiles.

Barn owl
Jon Hawkins

Birds

Birds are one of the most familiar species groups in Staffordshire, found from urban gardens to the uplands of the Peak District. Whilst common species are present throughout Staffordshire, habitat specialists form characteristic assemblages in woodland, heathland, upland meadows and lowland farmland.

Headlines

- 317 bird species had been recorded in Staffordshire up until the end of 2015[55].
- 41 of these are Priority Species and 162 are legally protected[56].
- Staffordshire holds nationally and regionally important populations of several bird species, including nightjar, woodlark, curlew and willow tit.
- Though county trends are not available, grey partridge, lesser spotted woodpecker, corn bunting, tree sparrow, willow tit and spotted flycatcher have experienced national declines of more than 75%.

Threats

- Loss and fragmentation of important habitats, including woodland, grassland, heathland and wetland.
- Arable cropping regimes and loss of field boundary habitats.
- Lack of Favourable condition on nationally and internationally designated sites.
- Inappropriate development and insufficient mitigation.
- Predation of suppressed populations, particularly breeding waders.
- Illegal persecution, particularly involving birds of prey.

Recommendations

- Manage, restore, create and connect habitats at a landscape-scale.
- Secure environmental funding for landowners through the rural development programme.
- Work with minerals operators to maximise opportunities for high quality restoration of sites following extraction.
- Ensure that consideration of measures for Priority Species of bird are incorporated into rural and urban planning policies.

Lesser spotted woodpecker
Sergey Yeliseev

Willow tit
Harry Hog

Little egret
Amy Lewis

Curlew
Damian Waters

Current status

Birds can be good indicators of habitat condition, particularly as they are extensively monitored and can be sensitive to habitat quality, with many species associated with particular habitats. Whilst county-level trends are not available, it is expected that Staffordshire avifauna are following national trends.

Many species largely restricted to particular habitats are in decline, such as corn bunting, tree sparrow and grey partridge on lowland farmland, curlew and snipe on upland meadows and lesser spotted woodpecker and spotted flycatcher in woodlands. Generalist species able to utilise a variety of habitats, and typically found in gardens, are faring better with largely positive population trends.

Causes of change

Historic farmland intensification, driven by government agricultural policies, had a significant effect on birds in lowland and upland farmland landscapes. The reduction in active woodland management and impact of invasive species are important factors in woodland bird declines, and the loss of Favourable condition and fragmentation of lowland heathland has affected heathland species. However, much land is now in positive management, particularly through agri-environment schemes.

Key areas

Key sites include Cannock Chase, the Churnet Valley, Doxey Marshes and other lowland wet grassland sites, Middleton Lakes, Blithfield and Belvide Reservoirs, Aqualate Mere and the uplands of the Peak District.

Case study: Staffordshire Barn Owl Action Group

Staffordshire Barn Owl Action Group has been working since 2001 to conserve barn owls in the county. The species has been steadily declining since the 1930s in Britain[57]. Volunteers install owl nest boxes in prime habitat to provide alternative nest and roost sites in areas where barns have been lost. The group now has over 400 nest boxes, which it monitors to provide an insight into population trends and to help conserve this species.

Otter,
Derek Crawley /
Staffordshire Mammal Group

Mammals

A wide range of mammals are found in Staffordshire. These include otters, deer, bats, hedgehogs, rabbits and hares, rodents such as the water vole, insectivores such as the mole, and carnivores such as the fox.

Headlines

- 43 species of mammal have been recorded in Staffordshire since 1990, two of which are now considered extinct (the red squirrel and wallaby)[58].
- 13 of these present-day species are Priority Species and 17 are legally protected[59].
- Current limited knowledge suggests that six species are declining, four are increasing, 18 are stable, and 13 species have unknown status (Table 2).

Threats

- Illegal release of species, particularly non-native species.
- Habitat loss and isolation of habitats.
- Poaching or other forms of deliberate killing.
- Road casualties.
- Government policy in regard of culls for disease control.
- Pollution and pesticides.
- Dredging of watercourses.
- Climate change (although this may benefit some species).
- New buildings and roads isolating populations of mammals.

Recommendations

- More specific studies to give accurate data on population changes.
- Encourage further citizen science participation in recording common species.
- Improve protection and mitigation in new built infrastructure, e.g. roads, rail, culverts, bridges, new buildings.
- Retain habitat and improve management.

Polecat
Derek Crawley / Staffordshire Mammal Group

Hedgehog
Derek Crawley / Staffordshire Mammal Group

Noctule
Vicky Worrall

Water vole
Derek Crawley / Staffordshire Mammal Group

Current status

Mammals are excellent indicators of environmental health and many play important roles as predators or prey. Although in-depth statistical analysis is not currently possible, expert knowledge and available data give an indication of the state of mammals in Staffordshire (Table 2).

Staffordshire population status	Species
Stable	mole, badger, red deer, grey squirrel, rabbit, brown hare, brown rat, fox, fallow deer, harvest mouse, bank vole, field vole, wood mouse, whiskered bat, Brandt's bat, natterer's bat, common pipistrelle, brown long-eared bat
Increasing	roe deer, polecat, muntjac, otter
Declining	hedgehog, hazel dormouse, Daubenton's bat, water vole, pine marten, American mink
Unknown	stoat, weasel, common shrew, pygmy shrew, water shrew, yellow-necked mouse, house mouse, noctule, Leisler's bat, serotine, soprano pipistrelle, Nathusius' pipistrelle, lesser horseshoe bat

Table 2. The population status of mammal species that have been recorded in Staffordshire since 1990[60,61,62].

Causes of change

The causes of decline vary between species but can generally be attributed to changes in habitat quality, habitat destruction, pollution, pesticides, deliberate killing and road deaths. However, efforts are underway to improve habitats through conservation management and regulations, and species knowledge has been greatly enhanced thanks to local groups; the discovery of hazel dormouse around Loggerheads led to management benefitting the species and greater recognition of the woodlands in the area.

Case study: Otters in Staffordshire

Following drastic declines from 1950 onwards, otters were considered absent from Staffordshire by the early 1980s. As river quality improved and pesticides in watercourses reduced, otters started to recolonise. Surveys found otters in most catchments by the 1990s, but a lack of suitable resting and breeding sites. As a result, many artificial holts were built by volunteer groups, notably Staffordshire Mammal Group. In 2007 it was reported that recolonisation had taken place faster than predicted and the species was present in all sub-catchments, canals and riverside towns.

Cowslips at Rue Hill SSSI
Victoria Brooks

Plants

This section includes flowering plants, ferns, conifers and stoneworts. Mosses and liverworts are not covered.

Headlines

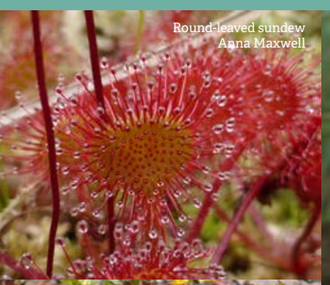
- There are nearly 2,200 species, subspecies or hybrid plant species recorded in Staffordshire[28] (4,273 in the UK[29]).
- Of the species, 50 are Priority Species and 15 are protected[30].
- Many species of semi-natural habitats have decreasing ranges, particularly those associated with meadows, nutrient-poor water or wetlands.
- Species of brownfield habitats have increased since the 1970s.

Threats

- Land use change, including unsympathetic/unsuitable management (e.g. cutting regimes of verges/hedgerows, lack of woodland management meaning loss of ground flora species).
- Isolation and loss of habitats, particularly through more intensive agricultural production.
- Climate change.
- Land drainage and modification of watercourses.
- Invasive species.
- Changes in legislation and agri-environment schemes.
- Pesticides, herbicides and pollution.
- Declines in pollinating insects.
- Nitrogen deposition due to agriculture, power generation and transport.

Recommendations

- Protect remaining habitat.
- Encourage good conservation management.
- Restore damaged habitat and create new areas using local seed sources such as from green hay.
- Expand existing projects that are creating and restoring new habitats.



Round-leaved sundew
Anna Maxwell

Common cow-wheat
David Cadman

Yellow bird's-nest
Ian Hopkins

Current status

Staffordshire is centrally located in the UK and therefore has few nationally rare species; rarities are usually restricted to the south or north. Exceptions include species of the Meres and Mosses such as cowbane, floating water-plantain on canals and canal reservoirs, yellow bird's-nest in willow scrub, and some species, such as bee orchid, that have become associated with post-industrial habitats.

As habitats are usually defined by their plant composition, changes to habitats described elsewhere in the report also reflect changes to plants, and vice versa. Analysing data on the distribution of species between the mid-20th century and late 20th / early 21st century (Figure 8)[31,32] indicates that plants of natural habitats such as ancient woodlands, flower-rich grasslands and moorlands have declined.

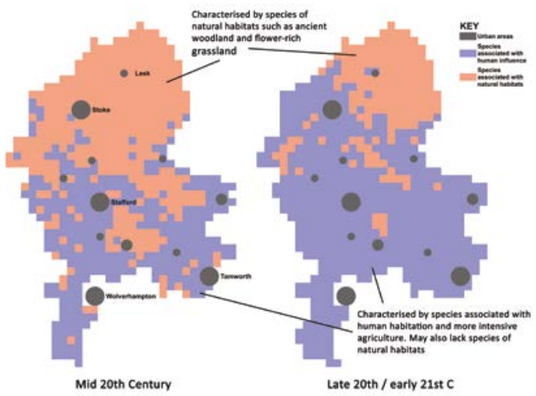


Figure 8. Comparison of the distribution of plant species characteristic of natural habitats and those characteristic of human habitat and more intensive agriculture in the mid-20th century (left) to the late 20th / early 21st century (right)

Causes of change

Species of flora have been greatly affected by the declines in various habitats, partly resulting from land use change such as agricultural intensification, lack of habitat management and increasing nitrogen deposition, for example from the atmosphere, vehicles and agriculture.

There are however some excellent examples of positive action to address declines through the creation of new flower-rich habitats, such as by the Churnet Valley Living Landscapes Partnership.

Key areas

The Meres and Mosses; Chartley Moss for sundew, cranberry, bog rosemary; Mottey Meadows for snake's head fritillary, meadow thistle, saw-wort; Allimore Green Common, Thorswood for butterfly orchid.

Fly agaric
Keith Bloor

Fungi

Fungi are distinct organisms belonging to a kingdom separate from both plants and animals. As well as the familiar 'mushrooms' and 'toadstools', fungi include moulds, yeasts and plant and animal pathogens. They are the main recyclers of nutrients and decomposers of organic material.

Headlines

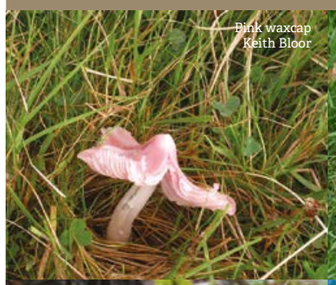
- A total of 1,669 species of fungi and slime mould have been recorded to date in Staffordshire, equating to around 10% of the species found in the UK[33]. Of these two are Priority Species, and one is legally protected[34].
- 27 new sites were identified in the county for the pink waxcap, characteristic of traditionally managed grasslands, during recent surveys.

Threats

- Habitat loss and changes in management, particularly woodlands and grasslands.
- Habitat fragmentation.
- Loss of veteran trees.
- Potential loss of key sites due to HS2.
- Climate change.
- A lack of information due to very limited capacity to carry out surveys.

Recommendations

- Establish and maintain beneficial management practices to increase populations. In key woodlands increase the amount of fallen deadwood, retain stumps and reduce the loss of veteran trees.
- Carry out surveys for development proposals that may affect key species or sites.
- Improve knowledge by ensuring regular monitoring at key sites, identifying new sites and increasing management of fungi data.
- Increase awareness and identification skills by holding workshops to ensure accurate identifications.



Pink waxcap
Keith Bloor

Shaggy inkcap
Keith Bloor

Stinkhorn
Keith Bloor

Orange peel fungus
Keith Bloor

Current status

Fungi are key ecosystem components playing an essential role in breaking down dead branches and leaves. Some fungi live in the roots of plants such as trees and orchids, without which they would not survive. Some fungi are important pathogens of plants and animals, including humans, and others can cause commercial losses in agriculture and forestry. Fungi are important to both the conservation of other organisms that depend on them and to man, being of great economic benefit, providing food and medicines, and helping produce chemicals.

Despite their importance, the status of fungi within Staffordshire is poorly understood as capacity to record them is limited. Fungi are in need of conservation and becoming part of the broader conservation agenda within the county.

Causes of change

The main threats causing changes in populations of fungi are habitat loss, loss of veteran trees and changes in management regime e.g. of grasslands. Some species have expanded their range northwards into the county such as common porecrust, and others have been recorded at a greater number of sites, although this is probably due to increased awareness and recording effort, such as with pink waxcap.

Key areas

The principal habitats with the greatest diversity of fungi in the county are woodland and unimproved/semi-improved grassland. The county's heathland also supports distinctive species.

Why is nature changing?

Following the overview of Staffordshire's habitats and species provided on the previous pages, it is evident that the overall picture for the state of Staffordshire's nature includes both losses and some gains. Staffordshire's remaining habitats and species are still under threat: many species are in decline, some areas of habitat are still being lost, and the majority of Staffordshire's most important wildlife sites are not in Favourable condition. However, a number of notable wildlife benefits have been achieved in recent years.

Threats to nature: nature declining

Declines in Staffordshire's wildlife results from three broad issues: habitat losses, habitat fragmentation and reduced habitat quality. Loss of habitat has resulted from, for example, urbanisation, historical agricultural intensification, drainage of wetland habitats and modification of watercourses. These pressures have resulted in habitats becoming fragmented, thereby reducing species abilities to move across landscapes. Reasons for poor habitat quality include lack of appropriate management or neglect, the spread of non-native species, and pollutants such as pesticides and fertilisers.

Government funding for conservation work, such as agri-environment schemes, has come under increased pressure in recent years. The decision for the UK to leave the EU has also resulted in uncertainty regarding the long-term future for agri-environment funding. However with uncertainty comes opportunity to implement a range of policies for farming, fishing and wildlife protection that will help improve our natural environment.

Positive stories: nature improving

Targeted use of agri-environment schemes and appropriate options have made a positive contribution to the quality of habitats, especially on farmland where options for hedgerow management and bird cover plots has benefitted some farmland bird species.

Improvements to the quality of Staffordshire's watercourses since the 1970s have resulted in increasing population numbers for species such as otter and wintering wildfowl, and can partly be attributed to reductions in pollution, river restoration schemes and incorporating nature conservation benefits into planning schemes. Although the quantity of lowland heathland in Staffordshire declined by nearly 90% between 1775 and 1990, the quality of much of the remaining habitat has improved in recent years as a result of appropriate management.Many habitats are also being created and restored through the action of landowners, managers, organisations and businesses and the contribution of voluntary groups to the conservation of species is significant.

What needs to happen

Landowners, conservation groups, Local Authorities and statutory agencies are crucial to ensuring Staffordshire is rich in wildlife for future generations, however a wide range of other partners, such as businesses, local communities and schools, all have an important role to play. Each section below highlights specific actions that we must work together to achieve.

"More, Bigger, Better and Joined" (The Lawton Principle)[63]

To ensure the survival of Staffordshire's wildlife, additional new habitats need to be created and all habitats need to be larger, in a better condition, and better connected within landscapes to facilitate species movement. The keystone of this is the conservation and enhancement of what we already have. This is what we call landscape-scale conservation. We need to work collectively to achieve a landscape rich in wildlife that benefits society through the ecosystem services it provides.

To achieve this, partners need to work together:

Protect and improve Staffordshire's habitats and create more areas for wildlife

- **Ensure wildlife is a key consideration within developments**.
  Local Authorities should seek ecological advice to assist with assessment of applications and securing mitigation of impacts, utilising biodiversity offsetting where appropriate. Development can provide significant opportunities for habitat creation and enhancement in strategic locations.
- **Local Authorities should adopt strong biodiversity policies**, through their Local Plans, biodiversity action plans and the use of existing or new biodiversity and green infrastructure strategies and planning documents.
- **Ensure that important habitats are protected**, through increasing survey coverage and the designation of important habitats such as Local Wildlife Sites. Continue to use Local Authority plans and policies to protect Local Wildlife Sites.

We need to improve the condition of our habitats, particularly aiming to reach Favourable condition on our designated sites. By utilising the expertise of landowners and managers, and by providing support through resources and ecological advice, improvements can be made.

- **Work towards achieving Favourable condition on all SSSIs:** adopt an interim target toward achieving Natural England's target of 50% of SSSIs in Favourable condition by 2020[64] and carry out regular monitoring to assess progress towards meeting the target.
- **Continue to improve the habitat quality of Local Wildlife Sites**: increase monitoring of sites and provision of advice. Local Authorities should consider new targets for the proportion of Local Wildlife Sites in appropriate management, expanding on previous targets from the 2011 Local Area Agreement Target.
- **Pollution control:** work with landowners and facility managers to find creative solutions to reducing pollution and minimising chemical and pesticide use, particularly near watercourses.
- **Deliver a co-ordinated programme of control of invasive non-native species**.
- **Promote the importance of habitat variation**: including provision of a range of niche habitat features such as bare ground with pioneer vegetation or the provision of deadwood.
- **Continue and improve agri-environment schemes to maximise environmental benefits**: provide a supportive framework for profitable farming and best environmental practice through agri-environment schemes and the promotion of voluntary initiatives, such as the Campaign for the Farmed Environment.

We need to work together to create new habitat to form better connected landscapes for wildlife.

- **Undertake habitat connectivity mapping and use this to inform strategic planning**: work collectively to undertake habitat connectivity mapping across the county. This should bring together existing information, best practice guidance and biodiversity opportunity maps into one location.

Recognise the value of Staffordshire's nature in decision making

As well as their inherent value, wildlife and habitats provide important 'ecosystem services' that benefit us all. We need to raise the profile of the vital roles Staffordshire's habitats and species play in the economy and well-being of people, such as those related to pollination and reduction of flooding. Ecosystem services should be considered in land use decision making.

Direct more resources towards ensuring Staffordshire's habitats are protected and enhanced for wildlife and public benefit

It is important to have the resources required to create a county richer in nature by supporting land managers to deliver environmental benefits alongside a thriving farming sector. We also need to ensure we have the resources to survey, monitor and understand Staffordshire's nature as this is key to effectively conserving it. Although the decision to leave the EU has caused uncertainty, there is an opportunity to look at how future agri-environment schemes and land subsidies can deliver more benefits for wildlife and the public.

Work in partnership

To achieve gains for Staffordshire's wildlife, businesses, conservation organisations and many others must work together. Existing partnership projects such as Transforming the Trent Valley Washlands and Connecting Cannock Chase, and partnership work with farmers and quarry companies, must be continued, whilst innovative and new partnerships need to be formed and expanded.

Improve the knowledge of Staffordshire's nature

To adequately protect and enhance Staffordshire's habitats we must fully understand what habitats there are; currently only 53% of Staffordshire is mapped by habitat type with many records over 10 years old.

- Each Local Authority should aim to have 100% up-to-date habitat mapping coverage.

There needs to be more recording of Staffordshire's species.

- Increase targeted surveys and monitoring across Staffordshire through the continuation and expansion, where appropriate, of national monitoring programmes such as butterfly transects.
- Support and work with volunteers and specialist species conservation groups to maintain and improve understanding of the species found in Staffordshire and their needs.
- Increase the use of species as indicators of habitat quality. Analysis systems, such as the Invertebrate Species – Habitat Information System, should be more widely used to provide an indication of habitat condition and the provision of specific niche habitat features such as deadwood.

We need to continue to store and use this information in an effective way through Staffordshire Ecological Record (SER), but also look to expand the work of SER.

- Manage additional data and computerise historical data so that we can better understand how nature has changed.

Provide more opportunities for people to get involved and engage with nature

In order to secure a sustainable future for our wildlife and habitats it is important that as many people as possible are involved.

- Improve access to high quality green space for wildlife, particularly in urban areas, and promote the value of habitats for human health and well-being.
- Provide more opportunities for people of all ages to learn about wildlife.

Volunteers can play a key role in helping to protect and manage Staffordshire's habitats and species.

- Support community-led initiatives and schemes that get people involved in citizen science, carrying out surveys and monitoring wildlife in their local area.
- Provide more opportunities to increase involvement through volunteering.

Otter
Derek Crawley /
Staffordshire Mammal Group

Information on partnership

The State of Staffordshire's nature report has been produced by a partnership of organisations, with Staffordshire Wildlife Trust acting as joint publisher with Staffordshire Ecological Record. The project was led by Staffordshire Wildlife Trust with the support of a steering group, with significant advice and input from a wider partnership of organisations and specialist groups, some of whom were also chapter authors.

Steering Group
Staffordshire Wildlife Trust
Staffordshire Ecological Record
Dr Sue Lawley, Staffordshire Flora expert
RSPB
Staffordshire County Council
Butterfly Conservation West Midlands Branch
Lichfield District Council
GeoConservation Staffordshire
Staffordshire Invertebrate Group
Staffordshire Mammal Group
Natural England

Wider Partnership
British Geological Survey
Buglife
BSBI
BTO
Campaign for the Farmed Environment (Staffordshire)
Cannock Chase District Council
Cannock Chase AONB
East Staffordshire Borough Council
Environment Agency
Forestry Commission
Individual recorders/experts for Lichens, Mosses and Flora
The National Forest Company
The National Trust
Newcastle-under-Lyme Borough Council
Peak District National Park Authority
Potteries Museum & Art Gallery
South East Staffordshire Bat Group
Severn Trent Water
South Staffordshire Council
South Staffordshire Water
Stafford Borough Council
Staffordshire Amphibian and Reptile Group
Staffordshire Barn Owl Action Group (BOAG)
Staffordshire Bat Group
Staffordshire Fungus Group
Staffordshire Moorlands District Council
Staffordshire Moth Group
Stoke-on-Trent City Council
Tamworth Borough Council
West Midland Bird Club/county bird recorder
Wild about Tamworth

Acknowledgements

Report editors
Bernadette Noake (Staffordshire Wildlife Trust)
Victoria Liu (Staffordshire Wildlife Trust)
Sue Lawley (Independent flora expert)
Ali Glaisher (Staffordshire County Council)

Authors and contributors

Foundations of biodiversity
Ian Stimpson (GeoConservation Staffordshire/University of Keele)

What wildlife does for us
Sarah Bentley (Staffordshire County Council)

Key messages for Local Authorities
Justine Lloyd (Lichfield District Council), Christopher Walsh (Lichfield District Council)

Key messages for your area
David Cadman (Staffordshire Wildlife Trust), Helen Dale (Staffordshire Wildlife Trust)

Woodland
Mike Shurmer (RSPB), Bernadette Noake (SWT), Sue Lawley (Independent flora expert); input from David Cadman (Staffordshire Wildlife Trust), Sarah Bentley (Staffordshire County Council), Ali Glaisher (Staffordshire County Council)

Grassland
David Cadman (Staffordshire Wildlife Trust), Victoria Brooks (Staffordshire Wildlife Trust), Anna Maxwell (Staffordshire Wildlife Trust); input from Ali Glaisher (Staffordshire County Council), Sue Lawley (Independent flora expert)

Lowland heathland
Bernadette Noake (Staffordshire Wildlife Trust), David Cadman (Staffordshire Wildlife Trust), Ali Glaisher (Staffordshire County Council)

Moorland
Helen Dale (Staffordshire Wildlife Trust); input from Penny Anderson (Penny Anderson Associates Ltd)

Wetland
Nick Mott (Staffordshire Wildlife Trust), Bernadette Noake (Staffordshire Wildlife Trust), Anna Maxwell (Staffordshire Wildlife Trust); input from Andrew Crawford (Environment Agency)

Built environment
Bernadette Noake (Staffordshire Wildlife Trust), Victoria Brooks (Staffordshire Wildlife Trust), Mike Shurmer (RSPB), Craig Slawson (Staffordshire Ecological Record)

Farmland
Bernadette Noake (Staffordshire Wildlife Trust), Nigel Baskerville (Campaign for the Farmed Environment), Mike Shurmer (RSPB), David Cadman (Staffordshire Wildlife Trust); input from NFU, Sue Lawley (Independent flora expert)

Plants
Sue Lawley (Independent flora expert), David Cadman (Staffordshire Wildlife Trust); input from Ian Hopkins (BSBI Staffordshire county recorder), John Hawksford (BSBI Staffordshire county recorder)

Fungi
Keith Bloor (Staffordshire Fungus Group)

Invertebrates
Andy Jukes (Staffordshire Invertebrate Group), Bernadette Noake (Staffordshire Wildlife Trust), Craig Slawson (Staffordshire Ecological Record), Nick Mott (Staffordshire Wildlife Trust)

Invertebrates - Butterflies and Moths
Rhona Goddard (Butterfly Conservation), Victoria Liu (Staffordshire Wildlife Trust), Bernadette Noake (Staffordshire Wildlife Trust)

Fish
Victoria Liu (Staffordshire Wildlife Trust), Nick Mott (Staffordshire Wildlife Trust); input from Chris Grzesiok (Environment Agency)

Reptiles and Amphibians
Craig Slawson (Staffordshire Ecological Record), Victoria Liu (Staffordshire Wildlife Trust), Paul Wilkinson (Canal and River Trust)

Birds
Mike Shurmer (RSPB), Helen Cottam (Staffordshire Barn Owl Action Group); input from Nick Pomiankowski (county bird recorder, West Midlands Bird Club), Scott Petrek (Staffordshire Wildlife Trust)

Mammals
Derek Crawley (Staffordshire Mammal Group), Debby Smith (Staffordshire Mammal Group), Nick Mott (Staffordshire Mammal Group), Bernadette Noake (Staffordshire Wildlife Trust)

Additional main contributors
Victoria Brooks (Staffordshire Wildlife Trust), Helen Dale (Staffordshire Wildlife Trust), Victoria Liu (Staffordshire Wildlife Trust), Anna Maxwell (Staffordshire Wildlife Trust), Bernadette Noake (Staffordshire Wildlife Trust), Rory Middleton (Staffordshire Wildlife Trust), Craig Slawson (Staffordshire Ecological Record)

Reviewers
Emma Lloyd (Staffordshire Wildlife Trust), Martin Adams (Staffordshire Wildlife Trust), Sarah Bentley (Staffordshire County Council), David Cadman (Staffordshire Wildlife Trust), Nick Mott (Staffordshire Wildlife Trust), Mike Shurmer (RSPB)

Funders
The State of Staffordshire project has been funded by Staffordshire Wildlife Trust and Staffordshire Ecological Record, with valuable time contributions from the steering group, wider partnership and authors.

The organisations involved in this project are very grateful for the continued support provided by many grant bodies and other organisations including Heritage Lottery Fund, charitable trusts, Landfill Communities Fund, corporate supporters, legacy donors, statutory agencies, Local Authorities and individual donations. This funding enables the valuable work described in case studies in this report, and the great amount of other work that is ongoing to conserve and enhance Staffordshire's nature.

Volunteers and land managers
This report would not have been possible without the thousands of wildlife sightings recorded and submitted by volunteers each year to recording schemes and Staffordshire Ecological Record. Much of our knowledge of the state of Staffordshire's nature is based upon this data and for this we are very thankful.

We also recognise the value of volunteers and land managers who work with conservation organisations on projects on the ground aimed at improving areas or habitats for the benefit of wildlife across the county, as shown by case studies throughout this report. We hope to continue to work together with volunteers, recorders and land managers to further increase our knowledge and better inform our future conservation efforts.

Methods

Species in Staffordshire

The number of species in Staffordshire was either calculated by County Recorders, Special Interest Groups or by interrogating the Staffordshire Ecological Record (SER) database. Table 3 explains the dates used as a cut off for each taxonomic group when running searches. Different dates were used depending on the taxonomic group; some groups are better recorded permitting a more recent cut off date to be used.

Taxon Group	Cut off	Data Source
Invertebrates (excl Lepidoptera)	**1990**	Staffordshire Ecological Record
Butterflies	**Unknown**	Butterfly Conservation West Midlands
Moths	**1990**	Staffordshire Ecological Record
Fish	**1990**	Staffordshire Ecological Record
Fungi	**1990**	Staffordshire Fungus Group
Birds	**None**	County Bird Recorder, West Midlands Bird Club
Mammals (excl marine)	**1990**	Mammal Society
Amphibians & Reptiles	**None**	Staffordshire Ecological Record
Vascular Plants	**1995**	A Checklist of the Flora of Staffordshire, revised 2016 (BSBI)

Table 3. The source of data and cut off years used to calculate the number of species of each taxonomic group presented in this report

Priority Species are defined as including those listed as NERC Act 2006, Schedule 41: Species of Principal Importance in England, and Staffordshire Biodiversity Action Plan (SBAP) priority species. **Protected Species** are defined as those listed on the Birds Directive, Habitats Directive, Badgers Act, and the Wildlife and Countryside Act 1981 excluding those on Schedule 9(5) Sale only.

Habitats in Staffordshire

The amount of habitat in Staffordshire was calculated using data held by Staffordshire Ecological Record (SER). Habitats were grouped into simplified broad categories grouped by Staffordshire Wildlife Trust, more details can be found in the technical report[65].

The amount of habitat in urban areas was calculated by analysing habitat data using JNCC broad habitat categories that occur within the in-house created layer of main conurbations.

SSSI data

The amount of habitat classed within Sites of Special Scientific Interest (SSSI) was derived from figures supplied by Natural England.

All SSSI data was correct as of 4th December 2015, when it was downloaded from the Natural England Designated Sites website[6]. To calculate the habitat condition for different habitats, the information on the "main habitat" in each SSSI unit was used as the habitat for that unit. As there may have been other habitats within the unit, the condition of different habitats presented should be treated with this understanding.

Some SSSI habitats have been combined to make simplified overall groupings for the habitat pages in this report, and some are included in more than one overall grouping as they are relevant to that habitat as well. Further information can be found in the technical report[65].

References

1. Burns, F., Eaton, M.A. & Gregory, R.D. *et al.* (2013) State of Nature report. The State of Nature partnership.
2. Hölzinger, O. and Everand, M. (2014) Staffordshire Ecosystem Assessment. Stafford: Staffordshire County Council.
3. Forestry Commission. (2016) Woodlands in Management in Staffordshire & Stoke-on-Trent data request. [data file]. Forestry Commission England National Forest Inventory (NFI) Woodland Map spatial data, version dated: 31 March 2014. Forestry Commission, UK. [Accessed: 16th August 2016].
4. Natural England. (2015) GIS Digital Boundary Datatsets: Digital Boundary Data for Wildlife Sites and related information. [data file]. Natural England, UK. [Accessed: 10th August 2016].
5. Natural England. (2015) GIS Digital Boundary Datatsets: Ancient Woodland Inventory (Provisional) for England - Digital Boundaries. [data file]. Natural England, UK. [Accessed: 11th August 2016].
6. Natural England. (2015) Designated Sites View: County Level Reports. [online]. https://designatedsites.naturalengland.org.uk/SearchCounty aspx [Accessed: 4th December 2015].
7. Smith, S. (undated) The National Inventory of Woodland and Trees – England. [Online]. http://www.forestry.gov.uk/pdf frnationalinventory0001.pdf/$FILE/frnationalinventory0001.pdf [Accessed: 25th August 2016].
8. Fox, R., Brereton, T.M.& Asher, J. *et al.* (2015) The State of the UK's Butterflies 2015. Butterfly Conservation and the Centre for Ecology & Hydrology, Wareham, Dorset.
9. Staffordshire Ecological Record. (2016) Area of Grassland Habitat in Staffordshire dataset. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 13th May 2016].
10. Cadman, D. (2002) Changes to Staffordshire Habitats (1979-2000). Staffordshire Wildlife Trust, Stafford.
11. Fuller, R.M. (1987). The changing extent and conservation interest of lowland grassland in England and Wales. A review of grassland surveys 1930 – 1984. Biological Conservation, 40: 281 – 300.
12. Staffordshire Ecological Record. (2016) Area of Lowland heathland Habitat in Staffordshire dataset. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 9th May 2016].
13. Adams, M. B. (1990) Lowland heathland loss in Staffordshire 1775 - 1989. Staffordshire Nature Conservation Trust.
14. Staffordshire Ecological Record. (2016) Area of Moorland Habitat in Staffordshire dataset. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 9th August 2016].
15. Staffordshire Ecological Record. (2016) Habitat composite dataset - moorlands. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 2nd August 2016].
16. Natural England. (2016) Designated Sites View: County Level Reports. [online]. https://designatedsites.naturalengland.org.uk/SearchCounty aspx [Accessed: 10th August 2016].
17. Natural England. (2013) National Character Area profile. 53: South West Peak. [online]. http://publications.naturalengland.org.uk publication/12392045?category=587130 [Accessed: 23rd August 2016].
18. Haines-Young, R.H. *et al.* (2000) Accounting for nature: assessing habitats in the UK countryside. DETR, London ISBN 1 85112 460 8.
19. Carey, P.D., Wallis, S. & Chamberlain, P.M. *et al.* (2008) Countryside Survey: UK Results from 2007. NERC/Centre for Ecology & Hydrology, 105 pp. (CEH Project Number: C03259).
20. Staffordshire Ecological Record. (2016) Area of Wetland Habitat in Staffordshire dataset. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 2nd August 2016].
21. Raven, P.J., Holmes, N.T.H., Dawson, F.H., Fox, P.J.A., Everard, M., Fozzard, I.R., & Rouen, K.J. (1998) River Habitat Quality: the physical character of rivers and streams in the UK and Isle of Man. Environment Agency, Bristol.
22. Crawford, A. (2016) Water Bodies in Staffordshire. [email].
23. Staffordshire Ecological Record. (2016) Habitat composite dataset. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 2nd August 2016].
24. Staffordshire Ecological Record. (2016) Local Wildlife Sites data [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 9th September 2016].
25. Department for Environment, Food & Rural Affairs. (2014) 'Table 3 Commercial holding counts by farm type - 2013', English Geographical breakdowns In: Structure of agricultural industry in England and the UK at June [Online]. https://www.gov.uk/government/statistical-data sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at june [Accessed: 16th August 2016].
26. Hayhow, D.B., Bond, A.L. & Eaton, M.A. *et al.* (2015) The state of the UK's birds 2015. RSPB, BTO, WWT, JNCC, NE, NIEA, NRW & SNH, Sandy, Bedfordshire.
27. Natural England. (2016) Area (in hectares) managed under HLS and 'Classic' AE Schemes in Staffordshire at 31 Dec in each year 2006 - 2016. [data file]. Natural England, UK. [Accessed: 17th August 2016].
28. Hawksford, J.E. (2016) A Checklist of the Flora of Staffordshire. [online]. http://bsbi.org/staffordshire [Accessed: 15th March 2016].
29. Kent, D.H. (1992) List of Vascular Plants of the British Isles. BSBI Publications, London.
30. Staffordshire Ecological Record. (2016) Priority and Protected Plant Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 26th July 2016].
31. Edees, E.S. (1972) Flora of Staffordshire: Flowering Plants and Ferns. Newton Abbot, David & Charles.
32. Hawksford, J.E., Hopkins, I.J. & Cadman, D. *et al.* (2011) The Flora of Staffordshire. Staffordshire Wildlife Trust, England.
33. Staffordshire Fungus Group. (2016) Staffordshire Fungus Records. [data file]. Staffordshire. [Accessed: 28th August 2016].
34. Staffordshire Ecological Record. (2016) Priority and Protected Fungi Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 5th May 2016].
35. Staffordshire Ecological Record. (2016) Invertebrate Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 12th April 2016].
36. Buglife (2016) All About Bugs (Online) http://www.buglife.org.uk/ bugs-and-habitats/all-about-bugs, [Accessed on 1st September 2016].
37. Staffordshire Ecological Record. (2016) Priority and Protected Invertebrate Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 12th April 2016].
38. Buglife. (Undated) Discover Bugs. [Online]. https://www.buglife.org.uk bugs-and-habitats/discover-bugs [Accessed: 26th August 2016].
39. Jukes, A. (2009) *Chalcosyrphus eunotus* - A red data book hoverfly. Its status, distribution, ecology and conservation. An unpublished report for Staffordshire Wildlife Trust.
40. Jukes, A. (2010) *Chalcosyrphus eunotus* Year 2 - investigation into species; mobility and metapopulations. An unpublished report for Staffordshire Wildlife Trust.
41. Duncan, I., Seal, P., Tilt, J., Wasley, R. & Williams, M. (2016) Butterflies of the West Midlands: Birmingham & the Black Country, Herefordshire, Shropshire, Staffordshire and Worcestershire. Pisces Publications, Berkshire.
42. Staffordshire Ecological Record. (2016) Butterfly & Moth Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 4th July 2016].
43. Fox, R., Parsons, M.S., Chapman, J.W., Woiwod, I.P., Warren, M.S. & Brooks, D.R. (2013) The State of Britain's Larger Moths 2013. Butterfly Conservation and Rothamsted Research, Wareham.
44. Staffordshire Ecological Record. (2016) Priority and Protected Butterfly Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 4th July 2016].
45. Staffordshire Ecological Record. (2016) Priority and Protected Moth Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 4th July 2016].
46. Waring, P. & Townsend, M. (2009) Field guide to the moths of Great Britain and Ireland. British Wildlife Publishing, Dorset.
47. Staffordshire Ecological Record. (2016) Fish Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 10th June 2016].
48. Staffordshire Ecological Record. (2016) Priority and Protected Fish Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 10th June 2016].
49. Staffordshire Ecological Record. (2016) Amphibian and Reptile Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 9th August 2016].
50. Staffordshire Ecological Record. (2016) Priority and Protected Amphibian and Reptiles Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 9th August 2016].
51. Amphibian and Reptile Conservation. (Undated) Great Crested Newt. [Online]. http://www.arc-trust.org/great-crested-newt [Accessed: 16th August 2016].
52. Wilkinson, P. (2016) For comment - State of Staffs reptiles and amphibians text for Glossy. [email].
53. The Wildlife Trusts. (Undated) Adder. [Online]. http://www wildlifetrusts.org/species/adder [Accessed: 16th August 2016].
54. Humphreys, E., Toms, M., Newson, S., Baker, J. & Wormald, K. (2010) An examination of reptile and amphibian populations in gardens, the factors influencing garden use and the role of a 'Citizen Science' approach for monitoring their populations within this habitat. BTO, 572: pp 1 - 43.
55. Pomiankowski, N. (2016). SoS Bird Chapter. [email].
56. Staffordshire Ecological Record. (2016) Priority and Protected Bird Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 19th August 2016].
57. Staffordshire Barn Owl Action Group. (Undated) The Staffordshire Barn Owl Action Group (BOAG). [Online]. http:/ staffordshirebarnowlactiongroup.weebly.com/. [Accessed: 12th July 2016].
58. Staffordshire Mammal Group. (2016) Mammal Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 3rd September 2016].
59. Staffordshire Ecological Record. (2016) Priority and Protected Mammal Species. [data file]. Staffordshire Wildlife Trust, Stafford. [Accessed: 3rd September 2016].
60. Crawley, D. *et al.* (2016 Unpublished knowledge) Mammal Atlas of Britain. The Mammal Society.
61. South East Staffs Bat Group. (2016 Unpublished knowledge) Status of bats in Staffordshire. South East Staffs Bat Group.
62. Staffordshire Mammal Group. (2016 Unpublished knowledge) Status of mammals in Staffordshire. Staffordshire Mammal Group.
63. Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., & Wynne, G.R. (2010) Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra.
64. Department for Environment, Food and Rural Affairs. (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Defra (Biodiversity and Ecosystems), Ref: PB13583.
65. Staffordshire Wildlife Trust. (unpublished) The State of Staffordshire's Nature - Technical Report. Staffordshire Wildlife Trust, Stafford.

This report should be referenced as:
Noake, B., Liu, V., Lawley, S. & Glaisher, A. (eds) (2016) The State of Staffordshire's Nature - Summary Report, Staffordshire Wildlife Trust and Staffordshire Ecological Record. Wolseley Bridge, Stafford.

For more information on the State of Staffordshire's Nature, or to read the technical report visit **www.staffs-wildlife.org.uk/stateofstaffordshirereport**

Staffordshire Wildlife Trust

Staffordshire Wildlife Trust

Staffordshire Wildlife Trust is one of 47 Wildlife Trusts across the UK working to bring about nature's recovery, and to reconnect people to the natural world.

Registered Charity Number: No. 259558

Staffordshire Wildlife Trust, The Wolseley Centre, Wolseley Bridge, Stafford, ST17 0WT.

Tel: 01889 880100
Fax: 01889 880101
Email: info@staffs-wildlife.org.uk
www.staffs-wildlife.org.uk

@StaffsWildlife
@StaffsWildlife

Staffordshire Ecological Record

Staffordshire Ecological Record

Staffordshire Ecological Record (SER), based at Staffordshire Wildlife Trust, maintains a database of all records of wild species in the county. The database currently holds 2.5 million records.

SER is a partnership operated by Staffordshire County Council, Stoke-on-Trent City Council and Staffordshire Wildlife Trust, together with additional funding from Natural England, most Local Authorities in Staffordshire and other partners.

Staffordshire Ecological Record, The Wolseley Centre, Wolseley Bridge, Stafford, ST17 0WT.

Tel: 01889 880100
Fax: 01889 880101
Email: info@staffs-ecology.org.uk
www.staffs-ecology.org.uk

@StaffsEcology

12th October 2016. Printed on recycled paper using vegetable-based inks. Designed by **www.nectarcreative.com**. ISBN 978-0-9549385-3-6