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Appendix A The Legislative and Policy Background

In England, a range of legislation and policy at international, national, county and local level requires and encourages the protection, restoration and expansion of natural habitats and native species. The link between beauty, healthy surroundings, wellbeing and prosperity is also recognised by other guidance that seeks to enable better access and engagement with nature and landscapes. As well as complying with legal and policy requirements, protecting and restoring biodiversity helps to hit many other environmental targets and bring multi-functional benefits. By contrast, failing to meet obligations can have legal implications, slow down or prevent development proposals, and miss opportunities to invest in local resources.

1.2.1. International Policy

On 19th December 2022, the 15th Conference of Parties to the UN Convention on Biological Diversity adopted the "Kunming-Montreal Global Biodiversity Framework" (GBF), including four global goals and 23 targets for achievement by 2030.

These targets will likely drive further action from the UK government, and local councils should be ready to contribute in the future; they can inform plans now, and could form part of future monitoring programmes.

30 by 30

30 by 30 (or 30x30) is a worldwide initiative for governments to designate 30% of Earth's land and ocean area as protected areas by 2030. 30 by 30 was agreed at COP15 as part of the Kunming-Montreal Global Biodiversity Framework. Roughly 190 countries have signed up to the target, including the UK.

The 30 by 30 target was developed by scientists in order to prevent catastrophic biodiversity decline and bolster resilience to climate change: protecting at least 30% of land and sea for nature is required to remain below a 1.5 degrees C rise in average global temperature.

The Wildlife Trusts and other wildlife NGOs are promoting the 30 by 30 target. In Staffordshire, SWT is measuring progress towards this target by recording the area of land subject to appropriate management that is positive for biodiversity. It is a useful 'yardstick' for districts to aim for, and to measure progress.

1.2.2 National Policy

Wildlife and Countryside Act 1981 (as amended)

This law protects a list of birds, animals and plants; and provides measures to prevent the establishment of non-native species which may be detrimental to native wildlife. It also includes the legal basis for designation of Sites of Special Scientific Interest (SSSI).

Natural Environment and Rural Communities Act 2006

Section 40 of this Act applies a biodiversity duty on public bodies (all local authorities, community, parish and town councils, police, fire and health authorities and utility companies) which states that: "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity"

Section 41 of the Act refers to a published list of habitats and species which are of principal importance for the conservation of biodiversity in England. This list is a useful guide when choosing where to focus action in local strategies. The Secretary of State updates this list periodically. More information can be found

at <https://www.gov.uk/government/publications/habitats-and-species-of-principal-importance-in-england>

25-Year Environment Plan 2018

The 25-year Environment Plan sets out the Government's plan to improve the environment and includes national targets for habitats and species. Targets relating to the natural environment and biodiversity include:

Thriving plants and wildlife

This goal outlines how the Government will achieve a growing and resilient network of land, water and sea that is richer in plants and wildlife. This will be achieved through the following measures:

- Restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term.
- Creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected site network, focusing on priority habitats as part of a wider set of land management changes providing extensive benefits.
- Taking action to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human induced extinction or loss of known threatened species in England and the Overseas Territories.
- Increasing woodland in England in line with our aspiration of 12% cover by 2060: this would involve planting 180,000 hectares by end of 2042.

(According to DEFRA's Woodland cover target Detailed Evidence report dated 28 April 2022, woodland cover in England is currently (as of March 2021) 1.32 million hectares or 10.1% of land area. This rises to 14.5% if tree cover of small woods (less than 0.5 ha in area), groups of trees, linear features and individual trees is also included. Woodland cover in England is still much lower than in Wales (15%), Scotland (19%) or the EU-27 average of 40%.)

Enhancing beauty, heritage and engagement with the natural environment

This goal concerns conserving and enhancing the beauty of the natural environment, and making sure it can be enjoyed, used by and cared for by everyone. The Government will do this by:

- Safeguarding and enhancing the beauty of our natural scenery and improving its environmental value while being sensitive to considerations of its heritage.
- Making sure that there are high quality, accessible, natural spaces close to where people live and work, particularly in urban areas, and encouraging more people to spend time in them to benefit their health and wellbeing.
- Focusing on increasing action to improve the environment from all sectors of society.

Environment Act 2021

The Government set out its overarching targets for the Environment Act in December 2022 and the legislation sets out a number of obligations and actions for local authorities to help achieve these.

The targets include the following which concern biodiversity and the natural environment:

Halt the decline in species populations by 2030, and then increase populations by at least 10% to exceed current levels by 2042

Restore precious water bodies to their natural state by cracking down on harmful pollution from sewers and abandoned mines and improving water usage in households

Deliver our net zero ambitions and boost nature recovery by increasing tree and woodland cover to 16.5% of total land area in England by 2050

Restore or create more than 500,000 hectares of wildlife-rich habitat.

To help meet these ambitions, the Environment Act includes new requirements for local authorities around protecting the natural environment. These include:

Local Nature Recovery Strategies (LNRS)

A new system of spatial strategies for nature will cover the whole of England and act as tools to drive more coordinated, practical and focussed action to help nature.

Each Strategy will, for the area that it covers;

- Agree priorities for nature's recovery,
- Map the most valuable existing areas for nature.
- Map specific proposals for creating or improving habitat for nature and wider environmental goals.

Staffordshire County Council is the responsible authority for Staffordshire's LNRS, and it is intended that local authorities will be key stakeholders in its development. Local authorities must 'have regard' to the Local Nature Recovery Strategy in local planning policy and decisions.

Biodiversity duty and reporting

Under the Environment Act 2021, all local authorities (excluding parish councils) and local planning authorities must publish a biodiversity report. A biodiversity report documents the policies and actions the authority has carried out to comply with its biodiversity duty. The report should communicate what the organisation is doing to improve the environment and to show the positive change it is making. For more guidance on what to include in the biodiversity report, see www.gov.uk/guidance/reporting-your-biodiversity-duty-actions

Local authorities must complete their first consideration of what action to take for biodiversity by 1 January 2024. Policies and objectives must be agreed as soon as possible after this. The end date of the first reporting period should be no later than 1 January 2026.

What is the 'biodiversity duty'?

The strengthened biodiversity duty for public authorities in England under the Environment Act 2021 is a requirement to:

- Consider what you can do to conserve and enhance biodiversity.
- Agree policies and specific objectives based on your consideration.
- Act to deliver your policies and achieve your objectives.

Biodiversity Net Gain (BNG)

Under the Environment Act, from November 2023, the majority of developments will need to deliver a minimum of 10% biodiversity net gain, via an approved net gain plan and the habitat secured, managed and monitored for at least 30 years via obligations or a legal agreement such as a conservation covenant. BNG will apply to small sites from April 2024.

BNG uses a metric developed by DEFRA to calculate the value of a site's habitats before and after they are affected by any proposal, meaning that designs can be changed to ensure biodiversity increases, or compensation and enhancement provided elsewhere if appropriate. The mitigation hierarchy must first be followed, and loss of irreplaceable habitats cannot be included in net gain calculations.

Many developers will be able to achieve a net gain for biodiversity on the development site itself, by putting in features such as ponds or wildlife areas. But if they're not able to do this on their own site, they will need to create natural habitat elsewhere. To ensure that BNG delivers maximum benefits for nature, it is important that this offsite BNG mitigation is delivered in the right locations – in line with the Local Nature Recovery Strategy.

The Adopted DEFRA metric 4.0, which will be used for mandatory BNG, includes a multiplier that increases the score for units provided in strategic areas that have been identified in a published strategy, as well as semi-strategic areas. The best practice guidance requires that any off-site compensation should be close to the impact site where possible, and within the same local authority, with the last resort being purchase of nationally provided biodiversity credits. These are priced in such a way as to deter use of this method. As well as planners and ecologists having a role in deciding the best location for any offsetting, the practical and financial issues of providing off-site compensation mean that enhancing biodiversity on-site, or on the same landholding, is usually the most cost and time effective option for developers, as well as retaining the benefits of greenspace for the development itself. However, in some cases, particularly

small urban sites that are isolated from green areas, it can be more economic and appropriate to provide units off-site within an existing ecological corridor where they will be more beneficial and easier to manage.

The following brochure explains more: https://naturalengland.blog.gov.uk/wp-content/uploads/sites/183/2022/04/BNG-Brochure_Final_Compressed-002.pdf

National Planning Policy Framework

National guidance for plan-making for England includes a number of requirements for gathering an environmental evidence base, forming policies for protection and enhancement of important sites and habitats, and identifying key spatial areas for action.

Plans should:

- Allocate land with the least environmental or amenity value.
- Take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure.
- Plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.
- Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation.
- Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

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• National Planning Policy Framework 2023 relevant paragraphs

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• Paragraph 120. Planning policies and decisions should:

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- a) encourage multiple benefits from both urban and rural land, including through mixed use schemes and *taking opportunities to achieve net environmental gains*
– such as developments that would enable new habitat creation or improve public access to the countryside;
- b) recognise that some undeveloped land can perform many functions, such as for wildlife, recreation, flood risk mitigation, cooling/shading, carbon storage or food production;

-

- Paragraph 174 (NPPF). Planning policies and decisions should contribute to and enhance the natural and local environment by:
 -
 - a) protecting and enhancing valued landscapes, sites and soils
 -
 - b) recognising the character and beauty of the countryside, benefits from natural capital and ecosystem services, best and most versatile agricultural land, and trees and woodland;
 -
 - *d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
 -
 - *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
 - *f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*
 -
 - 179. Identifying and safeguarding components of ecological networks; conserving priority habitats and species; securing measurable net gains for biodiversity
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 - 180.
 - Development causing significant harm to biodiversity; affecting a SSSI, impacting irreplaceable habitats should be refused.
 -
 - *d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.*
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 - 181. Various types of designated areas given the same protection as habitats sites
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- 182. The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site... unless an appropriate assessment has concluded that the plan or project will not adversely affect the site's integrity.
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- Paragraph 131. Trees make an important contribution to the character and quality of urban environments, and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined, that opportunities are taken to incorporate trees elsewhere in developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly-planted trees, and that existing trees are retained wherever possible. Applicants and local planning authorities should work with highways officers and tree officers to ensure that the right trees are planted in the right places, and solutions are found that are compatible with highways standards and the needs of different users.
- Paragraph 145. Once Green Belts have been defined, local planning authorities should plan positively to enhance their beneficial use, such as looking for opportunities to provide access; to provide opportunities for outdoor sport and recreation; to retain and enhance landscapes, visual amenity and biodiversity; or to improve damaged and derelict land
- Paragraph 185. Limiting impacts from pollution, noise and light on local amenity, landscapes and the natural environment
-
- Paragraph 186. Sustaining and contributing towards compliance with relevant objectives for pollutants. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement.
-
- Paragraph 161. c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management)
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Environmental Land Management (ELM) schemes

The Government is currently developing its offering of agri-environment incentive schemes and they are therefore liable to change, but the current environmental land management schemes that are being introduced are;

Sustainable Farming Incentive (SFI)

To pay farmers to manage their land in an environmentally sustainable way.

Local Nature Recovery (LNR)

To pay for actions that support local nature recovery and meet local environmental priorities.

Landscape Recovery (LR)

To support landscape and ecosystem recovery through long-term projects.

Water Framework Directive

The Water Environment (Water Framework Directive) (England & Wales) Regulations 2017 (referred to as the WFD Regulations) is an EU-derived law which remains on the UK statute book as part of EU retained law. Under the EU Retained Law Act, the legislation can be revoked or amended by Government, but at the time of writing it is active.

The WFD Regulations provide a framework for managing the water environment in England. Under the WFD Regulations, a river basin management plan must be prepared for each river basin district by the Environment Agency, and reviewed and updated every 6 years. The plan includes environmental objectives and a summary of the programmes of measures required to achieve those objectives, for example in relation to sustaining or improving local water quality.

The WFD regulations cover all types of water bodies. These can include lakes, reservoirs, streams, rivers, canals, groundwater, transitional waters (estuaries) and coastal waters. Each management plan has ecological objectives for each water body with deadlines for these to be met. Depending on how and why a waterbody may be failing its objectives, improvements can be made by managing the quality and quantity of water flowing from surrounding land, or improving waterbody condition directly by removing issues such as weirs, and restoring natural habitats.

Natural flood management, restoring habitats on land in river catchments, tackling pollution sources and building sustainable developments can all contribute to achieving WFD water quality targets.

Habitat Directive and Wild Birds Directive

The Habitats Directive is an EU-derived law which remains on the UK statute book as part of EU retained law. Like the WFD Regulations, under the Retained EU Law Act this legislation can be amended or revoked by the Government but is currently active.

The Habitats Directive ensures the conservation of a wide range of rare, threatened or endemic animal and plant species. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right. It requires Member States to report on the conservation status of habitats and species, on compensation measures taken for projects having a negative impact

on Natura 2000 sites. The Birds Directive requires similar actions and designation of particular sites for birds and laws for protection of species.

The directives are translated into English law via the Habitats Regulations. These cover legal protection of certain species, such as otters, great crested newts, bats and threatened bird species. In England the designation of Natura 2000 sites includes Special Protection Areas (SPAs) and Special Areas of Conservation (SACs). There are also targets for the conservation of a number of irreplaceable and important habitats, such as peatlands, mature woodlands and native diverse grasslands- listed in Annex1 of the regulations.

The Moorlands supports significant areas designated as SPAs and SACs, many Annex 1 habitats and several European protected species. As well as legal requirements, maintaining the health of these sites, habitats and species is a good indicator of environmental quality, conserving the landscape and quality of our water, soil and air

Local Plan Policy

Policy NE 1 Biodiversity and Geological Resources

'The biodiversity and geological resources of the District and neighbouring areas will be conserved and enhanced by positive management and strict control of development (and having regard to relevant ecological evidence).'

The policy includes:

The requirement to have regard to surveys and actions recommended by the Council's Extended

Phase-1 Habitat Surveys and Local Wildlife Assessment;

Protecting and enhancing designated wildlife sites

Expecting all development where possible seeks to deliver a net gain in biodiversity proportionate to the size and scale of the development. In circumstances where adverse impacts are demonstrated to be unavoidable, developers will be required to ensure that impacts are appropriately mitigated, with suitable compensation measures towards loss of habitat used only as a last resort where there is no alternative. Where any mitigation and compensation measures are required, they should be appropriately scheduled and managed according to the nature, size and scale of the development so as to minimise impacts that may disturb protected or important habitats and species.

Supporting opportunities to improve site management and increase public access to wildlife sites including supporting the objectives of the Staffordshire County Council Rights of Way Improvement Plan.

Ensuring development promotes the appropriate maintenance, enhancement, restoration and/or re-creation of biodiversity through its proposed nature, scale, location and design.

Protecting and enhancing habitats and species of principal importance

Recognising the value of the natural environment for sport and leisure activities and the need to manage such activities to ensure there is no conflict.

Ensuring the provision and protection of green infrastructure networks

Policy NE 2 Trees, Woodland and Hedgerows

'The Council will protect existing trees, woodlands and hedgerows, in particular, ancient woodland, veteran trees and ancient or species-rich hedgerows from loss or deterioration.'

This will be achieved by:

Requiring that existing woodlands, healthy trees and hedgerows are retained and integrated within a proposed development unless the need for, and benefits of, the development clearly outweigh their loss.

Requiring new developments to provide tree cover that secures a good level of sustainability through tree retention, planting and soft landscaping, and where not possible on-site to ascertain if suitable site(s) can be found off-site for replacement planting in the locality;

Resisting development that would directly or indirectly damage existing ancient woodland, veteran trees and ancient or species-rich hedgerows.

The Council will refer to its adopted Tree Strategy in the consideration of proposals.

Policy C 3 Green Infrastructure

The Council will, through partnership working with local communities, organisations, landowners and developers, develop an integrated network of high quality and multi-functional green infrastructure that will:

- Support and improve the provision of open space, sport and recreational facilities for local communities and enhance the settings of neighbourhoods;
- Link existing and potential sites of nature conservation value and historic landscape features, create new wildlife habitats, increase biodiversity, and increase tree cover where it is appropriate to the landscape;

- Enhance the natural, man-made and cultural features that are crucial to the local landscape and create opportunities for the restoration of degraded landscapes and the enhancement of the urban fringe;
- Mitigate the negative effects of climate change and maximise potential climate change benefits including effective flood risk and waterways management;
- Create appropriate access for a wide range of users to enjoy the countryside, including improved linkages to and provision of formal and informal recreation opportunities and accessible woodland areas, encouraging walking, cycling and horse riding;
- Contribute to the diversification of the local economy and tourist development through the enhancement of existing, and provision of new facilities.

The Council will identify, protect and enhance Green Infrastructure assets through the Green Infrastructure Strategy.

Policy DC 4 Local Green Space and Policy DC 3 Landscape and Settlement Setting also support the protection and enhancement of open green spaces and landscape features such as woodland, hedgerows and ponds for their visual amenity.

Local Plan

Appendix B Designated Sites

Table 1 Staffordshire Moorlands SSSI Site Details

Site	Area (Ha)	Detail
Bath Pasture	9.08	The site is a large, floristically-rich unimproved acid grassland, with both dry and wet communities well represented, complemented by a number of other semi-natural habitats including wet neutral grassland, swamp, scrub and woodland. Flush communities present supporting county rarities Heath Spotted-orchid (<i>Dactylorhiza maculata</i> ssp. <i>ericetorum</i>) and Marsh Lousewort (<i>Pedicularis palustris</i>) are some of the least modified of their type in lowland Staffordshire.
Caldon Dales	14.23	Caldon Dales is a steep-sided dry valley on the southern edge of the Carboniferous Limestone dome of south Derbyshire and north Staffordshire. Its importance lies in the local combination of unimproved, traditionally managed calcareous and neutral grassland, a phenomenon now rare in Staffordshire and the Midlands generally. Furthermore, the site contains one of the largest surviving examples of the meadow oat-grass <i>Avenula pratensis</i> – sheep’s-fescue <i>Festuca ovina</i> grassland community in Staffordshire and many of the higher plants that occur are infrequent or rare in the county.
Caldon Low	0.88	This outstanding site shows a Carboniferous Limestone section of considerable palaeogeographic and stratigraphic significance. During the Lower Carboniferous the site lay in an area at the margin of a shelf area, extending north from the Wales-Brabant landmass, and of the so called Widmerpool Gulf. The sequence

		exposed includes the Hopedale Limestone (Asbian) and the underlying Milldale Limestone (precise age uncertain) with, separating the two formations, the quartzose Caldun Low Conglomerate.
Cauldon Railway Cutting	2.19	The rock exposures within this site provide an important cross-section through shales and limestones of the Namurian Series originally formed during the Carboniferous Period about 325 million years ago. The shales and limestones contain unusually well-preserved fossil remains of marine animals that inhabited the Carboniferous sea. Of particular importance at this locality are the fossils known as goniatites which enable geologists to date the strata accurately and make detailed comparisons with rocks of similar age elsewhere in Britain..
Churnet Valley	348.67	These valleys retain the largest remaining concentration of semi-natural ancient woodland in Staffordshire, intermixed with scrub, unimproved neutral and acid grassland and large areas of mire, marsh and carr. The area supports an outstanding assemblage of woodland birds. The unimproved grasslands which invariably have very high botanical diversity, range from neutral to acidic, with examples of dry, flushed and waterlogged communities. Many of the grasslands show transition between types and grade through either scrub or fen can to true woodland. The unimproved grasslands which invariably have very high botanical diversity, range from neutral to acidic, with examples of dry, flushed and waterlogged communities. Many of the grasslands show transition between types and grade through either scrub or fen can to true woodland.
Combes Valley	113.04	The valley is clothed with variably structured, ancient broadleaved woodland and both acidic and neutral grasslands. It supports outstanding assemblages of woodland breeding birds, beetles

		Coleoptera and moths and butterflies Lepidoptera. The site supports an especially good range and high density of woodland birds, The beetle fauna is especially rich in species which are dependent on a continuity of dead or decaying timber. These include many nationally important species and several national rarities.
Dimmings Dale & The Ranger	23.35	Dimmings Dale is a predominately wooded valley. The stream, a tributary of the River Churnet, carries exceptionally clean water which hosts a rich invertebrate fauna. Remnants of ancient semi-natural oak woodland along the valley have important populations of dead-wood invertebrates and, together with the outcrops, also support a rich community of mosses and liverworts. There has been a long history of invertebrate recording on this site and a high number of rare and nationally scarce species have been found, The continuity and consistent quality of this record shows that the invertebrate fauna has remained of very high value.
Froghall Meadow and Pastures	11.25	Froghall Meadow and Pastures is located in the steep-sided Churnet Valley to the south east of Froghall. It consists of a series of unimproved, species-rich fields, showing a range of grassland types which are locally flushed, and areas of scrub. The steep valley sides have suffered extensive landslips with flushes and smaller seepages locally common across the area. The complexity of the local geology has resulted in an intricate soil pattern ranging from seasonally flooded alluvial soils on the valley floor, through

		neutral soils of the lower valley sides derived from the mudstones and siltstones which, in places, are waterlogged, to dry, free-draining acid soils of the upper slopes derived from the underlying sandstones. This variation in soil types and drainage is reflected in the distribution of the various vegetation communities across the site.
Hulme Quarry	12.6 (28.15 outside district)	Hulme Quarry, located 5 km east of the centre of Stoke-on-Trent within Park Hall Country Park, provides magnificent exposures of the lower Triassic Bunter Pebble Beds (Cannock Chase Formation) of the Sherwood Sandstone Group. The Pebble Beds are texturally mature pebble/cobble conglomerates, arranged in poorly-sorted horizontal sheets on better-sorted cross-bedded sets. Thick sheets of conglomerate are associated with interbedded sandstones, in coarsening upwards units. Comparison with recent fluvial (river) sediments, indicates that the Bunter Pebble Beds were deposited by substantial, braided streams carrying much coarse-grained material. This is, therefore, an important site for the study of the environmental conditions which occurred during the Triassic Period.
Rue Hill	15.54	Rue Hill SSSI consists of several small parcels of calcicolous grassland* developed on the sites of old limestone workings. Such

		<p>grassland is geographically very restricted in Staffordshire, furthermore, both here and nationally, it is now much reduced in extent through changes in land use and farming practices. The site is primarily of interest for its characteristic and diverse flora, including a number of nationally uncommon plants and many others rare in the county. Former mineral working has given rise to an irregular, small-scale topography of spoil mounds interspersed with pits, banks and levels, rock outcrops and cliff faces. The disturbed ground has revegetated with plants that have gradually colonised from neighbouring unimproved limestone pastures, these are now largely destroyed or botanically impoverished. Rue Hill thus provides an important refuge for many species intolerant of modern grassland management.</p>
<p>Saltersford Lane Meadows</p>	<p>4</p>	<p>The site encompasses two species rich meadows, both examples of a traditionally managed hay-meadow. Such hay-meadows are now uncommon in Staffordshire, having declined due to changes in agricultural practice. Both fields are undulating, but generally slope to the south. The soils are of variable drainage and nutrient status. They have been formed over Mercia Mudstones of</p>

		<p>the</p> <p>Triassic age. The grass-dominated field to the west contains soils of varying drainage. This is reflected by the transitional nature of the plant communities, which exhibit similarities with both the traditionally managed, drier hay-meadows and the hay-meadows of seasonally flooded land.</p>
Stanton Pastures & Cuckoocliff Valley	<p>12.27</p> <p>(96.54 outside district)</p>	<p>Stanton Pastures and Cuckoocliff Valley is an extensive area of unimproved grassland, heathland and deciduous woodland situated between the Weaver Hills and the Dove Valley in north east Staffordshire. Lying astride the junction between Carboniferous limestones and acid Triassic sandstones, the site is notable for its size, diversity of habitats, range of grassland communities and floristic richness. Neutral grasslands, which occupy the greater part of the site, and the majority of the acidic grasslands, have developed on soils derived from mudstones, siltstones and sandstones of the Lower Carboniferous. Calcareous grassland is located on outcrops of Ecton and Milldale Limestones, again of the Lower Carboniferous, in the valley of the Ellishill Brook and to the north of Thorswood Plantation. As well as these differences in soil chemistry, drainage characteristics vary considerably across the site, resulting in grassland communities which range from marshy through to dry and free-draining. There are also areas of localised flushing. The variation in soil chemistry and moisture content has given rise to both gradual and sharp transitions</p>

		between the different grassland types.
Swineholes Wood & Black Heath	46.22	<p>The Millstone Grit ridge of Ipstones Edge is a prominent topographical feature in north Staffordshire, rising to 380 metres and forming the extreme south-western tip of the Pennines. The upland acidic dwarf shrub heath that formerly clothed much of the ridge has been largely converted to pasture. Swineholes Wood and Black Heath are the largest heathland remnants. They represent outlying examples of the submontane 'gritstone moors' of the Peak District.</p> <p>The site occupies the crest and steepest part of the north facing slope. Its exposure, gradient and rocky outcrops have deterred agricultural improvement but Swineholes Wood has been partially reforested. There are marked differences in the structure and composition of the ericaceous vegetation. Black Heath is a relatively uniform tract of mature heather <i>Calluna vulgaris</i>, with abundant bilberry <i>Vaccinium myrtillus</i>, wavy hairgrass <i>Deschampsia flexuosa</i> and prominent tussocks of the moss <i>Polytrichum commune</i>.</p>
Thornccliffe Moor	57.58	<p>Thornccliffe Moor lies to the north-east off Leek at an altitude of 330--445 metres. It is an isolated block of gritstone moorland, characteristic of the nearby Warslow Moors (Peak District), but with an unusually wide range of upland vegetation types for its size. The moor is of special interest for its extensive spring-fed fens which are the largest and most floristically diverse examples known of their type in Staffordshire. Similarly, in the western Peak District, few other moorlands</p>

		<p>display such well-developed spring-fed, wetland features. Thorncliffe Moor constitutes the largest remaining area of upland heath and associated unimproved acidic grassland in the administrative county of Staffordshire;</p> <p>the majority of such outlying moorland on the southern fringes of the Pennines having</p> <p>been reclaimed for agriculture.</p>
Wetley Moor	69.47	<p>Wetley Moor is situated to the east of Stoke-on-Trent near the village of Werrington in</p> <p>north Staffordshire. The site comprises one of the largest areas of lowland heathland</p> <p>remaining in Staffordshire, although it is only a remnant of a much larger area of heathland which has been reduced to its present extent through enclosure and agricultural improvement. Dry heathland predominates on the higher, steeper slopes, whilst wet heath and small areas of mire occur on the lower, flatter ground. These wetland communities are more extensive than on any of the other lowland heathland sites in the county and are a</p> <p>particularly important feature of Wetley Moor. The Moor also shows transitional</p> <p>characteristics between the true moorland of the adjacent Pennines and the low-lying heaths of the Cannock Chase area.</p>
Whiston Eaves	10.44	<p>The semi-natural grassland at Whiston Eaves is situated to the south of the</p>

		<p>village of</p> <p>Whiston in north Staffordshire. The site encompasses a series of species-rich meadows, all of which have been traditionally managed as either hay-meadow or grazing pasture. As elsewhere in lowland England, such areas are now rare in Staffordshire, having largely been lost as a result of changes in agricultural practices. Although consisting predominantly of semi-natural grassland, the site does include areas of rush pasture, scrub and running water.</p> <p>The topography of the site is very varied because it is based around the confluence of three small tributary streams of the River Churnet which, in places, have cut steeply through the underlying Westphalian Coal Measures of the Upper Carboniferous period. Whilst some fields are almost level, others are on gentle south-west facing slopes, and one of the fields, towards Rake Edge, is on the steep, east-facing side of a valley cut by the combined stream.</p>
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Table 2 Staffordshire Moorland NNR Site Details

Site	Area (Ha)	
Hulme Quarry NNR	12.6 (28.15 outside district)	Please see SSSI site entry in Table 2.1 for details.

Table 3 Staffordshire Moorlands LNR Site Details

Site	Area (Ha)	
Biddulph Valley Way LNR	4.4	<p>The Biddulph Valley Way lies just west of the town of Biddulph following the old railway with a mixture of embankments, cuttings, small copses, hedgerows and ditches.</p> <p>The Whitemore Local Nature Reserve at the northern end of Biddulph Valley Way is a Staffordshire Site of Biological Importance due to its woodland wildlife.</p> <p>The Way provides access directly or visually to areas with historical or natural history interest. Whitemore Wood has a diverse springtime flora whilst Bailey's Bank Wood (accessed by courtesy of the Woodland Trust) contains the remains of the medieval Biddulph Castle. Biddulph Old Hall is clearly visible from the Way at Whitemore Access onto the Staffordshire Way leads either to the Stone Age megalith known as the Bridestones or up onto Congleton Edge to Mow Cop, a famous landmark of the locality. The site has hedgerows and has geological interest.</p>
Brough Park Fields LNR	6.3	<p>Brough Park Fields nature reserve is a site of unimproved and semi-improved neutral grassland and woodland at the back of Brough Park in the centre of Leek.</p> <p>The grassland areas are of such quality that together they are designated as a County Site of Biological Interest. The grassland is particularly striking when in flower in spring and summer. The woodland contains mixed deciduous and coniferous trees. Beech dominates the heart of the woodland with Oak, Horse</p>

		<p>Chestnut, Norway Maple, Poplar, Sycamore within the canopy layer. The grassland, hedgerow and woodlands are used by resident and migrant birds for shelter, feeding and nesting. Look out for Chaffinch, Dunnock, Bullfinch, Whitethroat, Wren, Willow Warbler, Long-tailed Tit and Tree Creeper.</p> <p>There are many pollinating insects using the meadows in summer. Look out for Orange Tip, Painted Lady, Small Copper, Small Tortoiseshell and Speckled Wood butterflies.</p>
Cecilly Brook LNR	6.4	<p>Situated in the centre of Cheadle the nature reserve surrounds a 1.25km stretch of Cecilly Brook. It is one of the most important sites for water voles in Staffordshire. Ancient flower rich meadows occur at edge of the brook near Thorley Drive. Mature hawthorn and blackthorn hedges surround the fields with dog rose, elder and hazel. Ivy and honeysuckle provide rich nectar sources for insects.</p> <p>The site follows a 1.25 km stretch of Cecilly Brook through Cheadle and is one of the most important sites for water voles in Staffordshire. Ancient flower rich meadows occur at Thorley Drive adjacent to Cecilly Brook and are of county importance for their flora. Mature hawthorn-blackthorn hedges surround the fields with dog rose, elder and hazel. Ivy and honeysuckle provide rich nectar sources for invertebrates.</p>
Consall LNR	93.5	<p>A broad-leaved woodland with an ancient woodland ground flora and diverse ditches, a small area of semi-improved neutral grassland which contains some diversity and two water bodies with some marginal vegetation.</p>

		Variety of habitats, woodland and grassland. There are 3 different nature trails with increasing difficulty which highlight the flora and fauna found here.
Hales Hall Pool LNR	2.9	<p>A double line of yew trees link the 1.76 hectare lake with Hales Hall built in 1712. The pool edges are a designated as a Site of Biological Importance with Marsh Marigold, Flag Iris, Greater Tussock Sedge and Bulbous Rush growing.</p> <p>The most obvious plants of the poolside are the Greater Tussock Sedge and Lesser Reedmace. Tussock Sedge forms bushy rounded tufts about 0.5m to 1m high. Lesser Reedmace is now rare in this county and is similar to its relative the more commonly known bulrush. The site hosts a number of waterfowl that include Moorhen, Coot, Great-crested grebe, Reed-bunting, Mute swans and Mallard duck. During the summer months dragonflies and damselflies are also present at the site.</p>
Hoftens Cross Meadows LNR	1.5	<p>Hoftens Cross Meadow Local Nature Reserve is a small, 1.4 hectare, area of meadow and scrub. Much of the semi-improved neutral grassland is managed as a hay meadow, together with a strip of marginal vegetation adjacent to the stream.</p> <p>A wide range of herbs and grasses can be found on the site including Field woodrush, Meadow saxifrage, Lady's smock, Water avens, Lesser cellandine, Knapweed and Pignut. The most important area is down the banks by the stream where the flora is particularly rich and varied. These areas are of such quality that the site is designated as a County Site of Biological Interest.</p>
Ladderedge Country Park LNR	23.3	Ladderedge country park is divided into two areas either side of the road. The main section is an undulating landscape of meadows and woodlands with great

		<p>views over Leek towards the Peak District. The other section is generally flatter where the River Churnet meanders along next to the meadow and woodland walk.</p> <p>Unimproved grassland meadows dominated by Red Fescue with abundant Yorkshire Fog, Common Ben and Sweet Vernal grass. Other species such as Meadow Buttercup, Bird's Foot Trefoil, Common Sorrel, Field Wood rush and Germander speedwell are also dominant. The Marsh supports a variety of habitats and vegetation communities. The woodland is at the southern limit of Lonsdon Wood, one of a series of woods which extends about 2km along the Churnet Valley to the north. The site includes mature oak, birch and sycamore with hazel, hawthorn and holly understory. Honeysuckle, bramble and bracken dominate the ground layer. Bluebells are also prolific over wide areas. A breeding population of great crested newts have been located in one of the ponds at Ladderedge Country Park.</p>
Marshes Hill Common LNR	6.4	<p>Marshes Hill Common Local Nature Reserve is all that's left of a once extensive heathland that covered the area. It is now an island of good quality heathland dominated by Heather.</p> <p>The site offers commanding views over the surrounding countryside. Marshes Hill is a small six hectare remnant of a once extensive heathland that covered the surrounding agricultural land. Now an island of heathland, the site is an important wildlife habitat. Designated a Site of Biological Importance in recognition of its County importance for wildlife. Typical heathland plants of heather and bilberry are found with common gorse, cotton grass and purple moor grass. The best stands of heather and bilberry are found on the western side of</p>

		<p>the ridge. August and September are the best times to see the heather in flower.</p> <p>Birds to look out for include Linnet and meadow pipit.</p>
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Table 4 Staffordshire Moorlands Non-Statutory Nature Reserve Site Details

Site	Area (Ha)	
Biddulph Valley Way	4.4	This site is designated as a LNR and is managed by Staffordshire Wildlife Trust. Please see LNR site entry in Table 2.3 for details.
Biddulph Grange Country Park	73	This site comprises meadows, woodland, lakes and ponds within the setting of a Victorian Estate landscape, managed by Staffordshire Wildlife Trust.
Brough Park Fields	6.3	This site is designated as a LNR and is managed by Staffordshire Wildlife Trust. Please see LNR site entry in Table 2.3 for details.
Cecilly Brook LNR	6.4	This site is designated as a LNR and is managed by Staffordshire Wildlife Trust. Please see LNR site entry in Table 2.3 for details.
Consall	93.5	This site is designated as a Churnet Valley SSSI and is managed by the RSPB. Please see SSSI site entry in Table 2.1 for details.
Combes Valley	113.1	This site is designated as a SSSI and managed by the RSPB. Please see SSSI site entry in Table 2.1 for details.
Cotton Dell	70	Cotton Brook flows through the centre of the reserve with a diverse range of habitats from steep sided woodland valleys to flower rich grasslands. Ponds, scrub and boggy areas along with the stream itself all add to the wildlife value of

		the reserve. This site contains the smaller Bath Pasture SSSI (see Table 2.1) and is managed by Staffordshire Wildlife Trust.
Hales Hall Pool	2.9	This site is designated as a LNR and is managed by Staffordshire Wildlife Trust. Please see LNR site entry in Table 2.3 for details.
Harston Wood	4.6	This site is part of the larger Churnet Valley SSSI and is managed by Staffordshire Wildlife Trust. Please see SSSI site entry in Table 2.1 for details.
Hoftens Cross Meadows	1.5	This site is designated as a LNR and is managed by Staffordshire Wildlife Trust. Please see LNR site entry in Table 2.3 for details.
Ipstones Edge	61	This site is comprised of Swineholes Wood & Black Heath SSSI (see Table 2.1) and Casey Bank where previous farming methods have ensured that this site retains a diverse range of plants, including several which are uncommon like bog asphodel, cranberry, common spotted orchids, marsh violets, marsh valerian, ragged robin and water forget-me-not. The drier areas in between the wet flushes support plants like lousewort, moonwort, adder's tongue fern, tormentil and bilberry. Managed by Staffordshire Wildlife Trust.
Ladderedge Country Park	23.3	This site is designated as a LNR and is managed by Staffordshire Wildlife Trust. Please see LNR site entry in Table 2.3 for details.
Marshes Hill Common	6.4	This site is designated as a LNR and is managed by Staffordshire Wildlife Trust. Please see LNR site entry in Table 2.3 for details.
New Pool Meadow	5.5	The site has marshy grassland habitat, dominated by soft rush and tufted hair grass. A small open water scape also provides habitat for amphibians such as frogs, dragonflies and damselflies. The rest of the site is drier and features large areas of tall herb grassland. Managed by Staffordshire Wildlife Trust.
Rod Wood	21.8	The site is an interesting mosaic of scrub, unimproved pasture, hay meadows and woodland. This diversity of habitats is one of the reasons why Rod Wood is so

		important for wildlife. Managed by Staffordshire Wildlife Trust.
Wetley Moor	69.1	This site is designated as a SSSI and is managed by Staffordshire Wildlife Trust. Please see SSSI site entry in Table 2.1 for details.

Table 5 Staffordshire Moorlands RIGS Site Details

Site	Size (Ha)	Details
Huntley Railway Cutting	0.63	Designated as a RIGS for the exposure of Triassic Hawksmoor Formation sandstones and the close proximity of exposures of the older Coal Measure rocks.
Hazles Wood	0.37	Designated as a RIGS for the exposure of a geologically important time boundary; that between the Namurian and Westphalian rock series.
Highshutt Quarry, Hawksmoor	0.46	Designated as a RIGS as an easily accessible and impressive exposure of Triassic conglomerate which contains a variety of derived pebble material.
Peakstone Rock, Alton Common	0.17	Designated as a RIGS as an outstanding example of a pillar structure formed by differential erosion.
Starwood	0.16	Designated as a RIGS because of the unusual occurrence of a richly fossiliferous goniatite bed.
Hofton's Cross, Caldon Low	0.14	Designated as a RIGS as a good exposure of a fossiliferous 'reef' limestone.

Combes Brook, Combes Valley	0.63	Designated as a RIGS as an accessible exposure of fossiliferous Kinderscoutian shales.
Knyoersley Meltwater Channel	6.1	Designated as a RIGS for the largest example of a subglacial meltwater channel that cuts across a drainage divide, namely the Trent/Mersey watershed.
Knypersley Reservoir Sandstones, Greenway Bank Country Park	0.05	Designated as a RIGS as an example of sandstone from the lower Coal Measures.
Wickenstone Rocks	0.44	Designated as a RIGS as a superb example of the Trent/Mersey watershed.
Far Kingsley Banks	0.15	Designated as a RIGS as it is one of the few exposures of a coal seam in the area.
Baddeley Edge Ridge	0.07	Designated as a RIGS as a prominent ridge feature formed from the Namurian Chatsworth Grits.
Houghwood	0.03	Designated as a RIGS as a ridge feature made from Namurian Kinderscoutian sandstone.

Table 6 Staffordshire Moorlands Species with European Protection

Species	Records Details	Other Protection/Status
Great Crested Newt (<i>Triturus cristatus</i>)	Over 200 records, recorded as recently as 2020.	UK Protection & Species of Principal Importance. SBAP species.

European Otter (<i>Lutra lutra</i>)	Over 60 records, as recent as 2020. Now present in many water courses in Staffordshire.	UK Protection & Species of Principal Importance. SBAP species.
Hazel Dormouse (<i>Muscardinus avellanarius</i>)	Three records between 1997 and 2009.	UK Protection & Species of Principal Importance.
Noctule (<i>Nyctalus noctula</i>)	Nearly 150 records between 1979 and 2020.	UK Protection & Species of Principal Importance. SBAP species.
Leisler's Bat (<i>Nyctalus leisleri</i>)	Only recorded 4 times between 1990 and 2014.	UK Protection.
Common Pipistrelle (<i>Pipistrellus pipistrellus</i>)	Over 570 records between 1993 and 2020. Identified as a species distinct from Soprano Pipistrelle in the 90's.	UK Protection & Species of Principal Importance. SBAP species.
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	Over 170 records between 1997 and 2020. Identified as a species distinct from Common Pipistrelle in the 90's.	UK Protection & Species of Principal Importance. SBAP species.

Pipistrelle (Pipistrelle sp.)	Over 530 records between 1946 and 2020. Common, Soprano and Nathusius' Pipstrelle were all thought to be the same species before the 90's. As there are no records of Nathusius' Pipistrelle it is likely that these records are only comprised of Common and Soprano Pipistrelle.	UK Protection & Species of Principal Importance. SBAP species.
Brown Long-eared Bat (Plecotus auritus)	Over 240 records between 1966 and 2021.	UK Protection & Species of Principal Importance.
Brandt's Bat (Myotis brandtii)	11 Records between 1998 & 2019.	UK Protection.
Daubenton's Bat (Myotis daubentonii)	Over 110 records between 1990 and 2020.	UK Protection.
Whiskered Bat (Myotis mystacinus)	11 Records between 1991 and 2014.	UK Protection.
Whiskered/ Brandt's Bat (Myotis mystacinus/brandtii)	Whiskered and Brandt's are both very similar species, and (since its discovery in 2010 Alcatheo Bat would also be considered within this species complex.	UK Protection.

Natterer's Bat (Myotis nattereri)	Over 50 records between 1998 and 2019.	UK Protection.
Myotis (Myotis sp.)	Over 150 records between 2003 and 2020. Myotis species can be difficult to determine, particularly when analysing their echolocation calls, but also when they are in the hand.	UK Protection.
Bittern (Botaurus stellaris)	11 records between 1981 and 2015.	UK Protection & Species of Principal Importance.
Hen Harrier (Circus cyaneus)	18 Records between 1993 and 2018. A rare winter migrant.	UK Protection & Species of Principal Importance.
Corncrake (Crex crex)	2 Records between 1982 and 1986. A rare passage migrant.	UK Protection & Species of Principal Importance.
Bewick's Swan (Cygnus columbianus)	20 records between 1968 and 2006. A rare winter migrant.	UK Protection & Species of Principal Importance.
Woodlark (Lullula arborea)	12 records between 2009 and 2012.	UK Protection & Species of Principal Importance. SBAP species.
Kingfisher (Alcedo atthis)	Over 660 records between 1959 and 2021.	UK Protection.

Purple Heron (<i>Ardea purpurea</i>)	2 records in 2020. A rare vagrant.	UK Protection.
Ruff (<i>Calidris pugnax</i>)	Over 21 records between 1993 and 2018.	UK Protection.
Dotterel (<i>Charadrius morinellus</i>)	2 records, from 1922 and 1998. A rare passage migrant.	UK Protection.
Black Tern (<i>Chlidonias niger</i>)	Over 50 records between 1973 and 2019. A passage migrant.	UK Protection.
Marsh Harrier (<i>Circus aeruginosus</i>)	9 records between 2000 and 2014. An uncommon passage migrant.	UK Protection.
Montagu's Harrier (<i>Circus pygargus</i>)	A single record in 1960. A rare passage migrant.	UK Protection.
Whooper Swan (<i>Cygnus cygnus</i>)	70 records between 1968 and 2021. A rare winter migrant.	UK Protection.
Merlin (<i>Falco columbarius</i>)	32 records between 1975 and 2019.	UK Protection.

Peregrine (Falco peregrinus)	Over 750 records between 2000 and 2022.	UK Protection.
Great Northern Diver (Gavia immer)	17 records between 1976 and 2012. Occasional winter migrant to reservoirs.	UK Protection.
Red-throated Diver (Gavia stellata)	2 records, from 1997 and 2011. A rare winter migrant.	UK Protection.
Little Gull (Hydrocoloeus minutus)	12 records between 1983 and 2014.	UK Protection.
Bluethroat (Luscinia svecica)	A single record from 1994. A rare migrant.	UK Protection.
Red Kite (Milvus milvus)	172 records between 1998 and 2022.	UK Protection.
Osprey (Pandion haliaetus)	90 records between 1975 and 2020. A passage migrant.	UK Protection.

Honey-buzzard (Pernis apivorus)	2 records, from 1998 and 2006. A rare passage migrant.	UK Protection.
Slavonian Grebe (Podiceps auritus)	2 records, from 1996 and 2007. A rare winter migrant.	UK Protection.
Avocet (Recurvirostra avosetta)	3 records between 1994 and 2009. A rare passage migrant.	UK Protection.
Little Tern (Sternula albifrons)	2 records from 1984 and 1998. A rare passage migrant.	UK Protection.
Wood Sandpiper (Tringa glareola)	17 records between 1975 and 2020. An uncommon passage migrant.	UK Protection.
Nightjar (Caprimulgus europaeus)	5 records between 1993 and 2020.	Species of Principal Importance. SBAP species.
Lesser White-fronted Goose (Anser erythropus)	A single record from 2007, considered to be an accidental occurrence.	

Short-eared Owl (Asio flammeus)	Over 50 records between 1975 and 2016.	
Ferruginous Duck (Aythya nyroca)	14 records between 2001 and 2010. A rare vagrant.	
Barnacle Goose (Branta leucopsis)	Over 120 records between 1975 and 2020. A rare winter migrant.	
White Stork (Ciconia ciconia)	9 records between 2002 and 2007 considered to be accidental occurrences.	
Black Stork (Ciconia nigra)	2 records, from 1983 and 1985 considered to be accidental occurrences.	
Little Egret (Egretta garzetta)	Over 230 between 1992 and 2021.	
Crane (Grus grus)	2 records between 1975 and 1990. A rare passage migrant.	
Caspian Tern (Hydroprogne caspia)	6 records from 2013 considered to be accidental occurrences.	

Bar-tailed Godwit (<i>Limosa lapponica</i>)	21 records between 1984 and 2018. A rare passage migrant.	
Smew (<i>Mergellus albellus</i>)	4 records between 1989 and 1990. A rare winter migrant, mainly to reservoirs.	
Night-heron (<i>Nycticorax nycticorax</i>)	A single record from 1984 considered to be an accidental occurrence.	
Glossy Ibis (<i>Plegadis falcinellus</i>)	9 records from 2013. A rare vagrant.	
Golden Plover (<i>Pluvialis apricaria</i>)	150 records between 1981 and 2021. A winter species of farmland, breeding on moorlands in the Peak District.	
Common Tern (<i>Sterna hirundo</i>)	Over 270 records between 1959 and 2020.	
Arctic Tern (<i>Sterna paradisaea</i>)	36 records from 1975 and 2018. A passage migrant.	

Ruddy Shelduck (<i>Tadorna ferruginea</i>)	66 records between 2006 and 2011. Potentially genuine wild vagrants, but most believed to be feral birds.	
Floating Water-plantain (<i>Luronium natans</i>)	Several records between 1968-1988, mostly known from SSSIs in the district.	UK Protection & Species of Principal Importance. SBAP Species.

Table 7 Staffordshire Moorlands Species with UK Protection

Species	Records Details	Other Protection/Status
Slow-worm (<i>Anguis fragilis</i>)	28 records, the most recent being from 2020.	Species of Principal Importance.
Grass Snake (<i>Natrix helvetica</i>)	Over 260 records between 1889 and 2021.	Species of Principal Importance. SBAP species.
Adder (<i>Vipera berus</i>)	19 records between 1878 and 2008. Mainly confined to heathland areas.	Species of Principal Importance.
Common Lizard (<i>Zootoca vivipara</i>)	47 records, the most recent being from 2022.	Species of Principal Importance.

White-clawed Crayfish (<i>Austropotamobius pallipes</i>)	Over 60 records between 1961 and 2009.	Species of Principal Importance. SBAP species.
European Water Vole (<i>Arvicola amphibius</i>)	Over 170 records, the most recent being from 2019.	Species of Principal Importance. SBAP species.
Pine Marten (<i>Martes martes</i>)	4 records between 1996 and 2004.	Species of Principal Importance.
Polecat (<i>Mustela putorius</i>)	35 records between 1987 and 2019.	Species of Principal Importance.
Eurasian Red Squirrel (<i>Sciurus vulgaris</i>)	A single records from 1927. Species now considered extinct in the county.	Species of Principal Importance.
Eurasian Badger (<i>Meles meles</i>)	Nearly 900 records between 1968 and 2021.	Protection of Badgers Act 1992
Scaup (<i>Aythya marila</i>)	Over 110 records between 1987 and 2021. An uncommon winter migrant.	Species of Principal Importance.

Wryneck (<i>Jynx torquilla</i>)	3 records between 1968 and 2011. A rare passage migrant.	Species of Principal Importance.
Black-tailed Godwit (<i>Limosa limosa</i>)	Over 60 records between 1995 and 2019. A passage migrant.	Species of Principal Importance.
Common Scoter (<i>Melanitta nigra</i>)	Over 50 records between 1959 and 2021. Uncommon passage migrant.	Species of Principal Importance.
Barn Owl (<i>Tyto alba</i>)	Over 610 records between 1900 and 2021. A local species outside of Staffordshire Moorlands.	Species of Principal Importance. SBAP species.
Goshawk (<i>Accipiter gentilis</i>)	Over 50 records between 1968 and 2019. A rare breeding species.	
Pintail (<i>Anas acuta</i>)	100 records between 1975 and 2019. A wintering species.	
Greylag Goose (<i>Anser anser</i>)	Over 270 species between 1978 and 2021. Mainly feral population in Staffordshire, although some genuine wild winter migrants.	
Goldeneye (<i>Bucephala clangula</i>)	Over 240 records between 1959 and 2020. Wintering on lakes and reservoirs.	

Purple Sandpiper (<i>Calidris maritima</i>)	3 records between 1982 and 1993. A passage migrant.	
Temminck's Stint (<i>Calidris temminckii</i>)	4 records between 1982 and 1993. A passage migrant.	
Cetti's Warbler (<i>Cettia cetti</i>)	2 records, from 1975 and 2021.	
Kentish Plover (<i>Charadrius alexandrinus</i>)	A single record from 1995. A rare passage migrant.	
Little Ringer Plover (<i>Charadrius dubius</i>)	Over 590 records between 1975 and 2020.	
Long-tailed Duck (<i>Clangula hyemalis</i>)	A single record from 1987. A rare winter migrant.	
Quail (<i>Coturnix coturnix</i>)	3 records between 2007 and 2016. A rare breeding species.	

Shore Lark (<i>Eremophila alpestris</i>)	A single record from 1996. A coastal winter species.	
Hobby (<i>Falco subbuteo</i>)	Over 300 records between 1995 and 2020.	
Brambling (<i>Fringilla montifringilla</i>)	Over 410 records between 1959 and 2021. A wintering species only.	
Common Crossbill (<i>Loxia curvirostra</i>)	Over 130 records between 1990 and 2021.	
Bee-eater (<i>Merops apiaster</i>)	A single record from 2015. A rare passage migrant.	
Whimbrel (<i>Numenius phaeopus</i>)	Over 70 records between 1984 and 2021. An uncommon passage migrant.	
Bearded Tit (<i>Panurus biarmicus</i>)	A single record from 2018. A rare vagrant.	

Black Redstart <i>(Phoenicurus ochruros)</i>	42 records between 2015 and 2019.	
Snow Bunting <i>(Plectrophenax nivalis)</i>	3 records between 1983 and 2000. A rare winter migrant.	
Black-necked Grebe <i>(Podiceps nigricollis)</i>	20 records from 2015. An uncommon passage migrant.	
Firecrest <i>(Regulus ignicapilla)</i>	5 records between 1987 and 2008. A rare winter migrant.	
Serín <i>(Serinus serinus)</i>	A single record from 1995. A very rare vagrant.	
Greenshank <i>(Tringa nebularia)</i>	Over 90 records between 1959 and 2018. A passage migrant.	
Green Sandpiper <i>(Tringa ochropus)</i>	110 records between 1975 and 2019. An uncommon passage migrant.	

Redwing (<i>Turdus iliacus</i>)	Over 1,000 records between 1959 and 2021. A winter visitor.	
Fieldfare (<i>Turdus pilaris</i>)	Over 670 records between 1959 and 2021. A winter visitor.	
Hoopoe (<i>Upupa epops</i>)	4 records between 1988 and 2017. A rare passage migrant.	
Pennyroyal (<i>Mentha pulegium</i>)	7 records, the most recent being from 2007. Not naturally occurring.	Species of Principal Importance.
Bluebell (<i>Hyacinthoides non-scripta</i>)	Over 760 records, the most recent being from 2022.	
Limestone Woundwort (<i>Stachys alpina</i>)	A single record from 2014.	
Spiked Speedwell (<i>Veronica spicata</i>)	4 records between 1993 and 2011. Not native to Staffordshire, likely to be garden escapes.	

Sites of Specific Scientific Interest

Bath Pasture			
Site of Special Scientific Interest (SSSI) – Biological			
Area (ha):	9.07019	GID:	1002306
Grid Ref:	sk063459	EnsisID:	1003862
Management recommendations			
<p>Neutral and acidic pastures require active management if they are to retain their conservation interest. In order to maintain a species-rich sward, each year's growth of vegetation must be removed. Otherwise the sward becomes progressively dominated by tall and vigorous grasses which, together with an associated build-up of dead plant matter, suppress less vigorous species and reduce the botanical diversity of the site. On pasture land this management is achieved by grazing. The precise timing and intensity of grazing will vary both between and within sites, according to local conditions and requirements (such as, for example, type or availability of stock or the needs of individual plants or animals of conservation concern) but should aim to keep a relatively open sward without causing excessive poaching. Light trampling can be of benefit by breaking down leaf litter and providing areas for seed germination. No other management should be routinely required. Any surrounding, well-managed hedgerows may considerably add to the habitat in providing shelter for invertebrates. The application of pesticides including herbicides or fertiliser (including manure or slurry) would be damaging and should be avoided.</p> <p>For damper pastures, regular and careful maintenance of surface drainage including ditches and drains can be essential to prevent adverse changes in the plant species composition of the sward. Deepening of surface drainage should be avoided.</p>			

Caldon Dales

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	14.2295	GID:	1002310
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Grid Ref:	sk093489	EnsisID:	1003878
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Management recommendations

Limestone grasslands occur on shallow soils over limestone rock and can support a rich variety of plants and animals, including a number of rare plant species. Management has played an important role in the creation and survival of limestone grassland habitats and is important for maintaining the characteristic species-rich sward associated with these grasslands. Without management limestone grasslands may rapidly become dominated by stands of rank grasses, lowering the species diversity of the site and eventually the site will scrub over.

Traditionally, management of limestone grassland is achieved by grazing. The precise timing and intensity of grazing will vary both between and within sites and may need to be judged on a year by year basis. Light winter grazing is often the preferred management for limestone grasslands. Low stocking rates can help to create a diverse mosaic of tall and short vegetation, which can support a wide range of wildlife and is especially valuable to invertebrates. Winter grazing can help prevent the build-up of vegetation and stop scrub invasion, whilst still allowing plants to flower and set seed. Grazing should be avoided or reduced during the summer months as it tends to encourage the spread of the more common and competitive grass species, which are able to survive and reproduce despite being repeatedly defoliated during the growing season. Leaving some areas ungrazed from time to time may also be of benefit by encouraging the creation of a mixture of habitat types and structures. Heavy grazing should be avoided as it is more likely to result in a uniformly short and less diverse sward, which is likely to be of lower nature conservation importance.

The application of pesticides including herbicides would be damaging and should be avoided, although the careful and targeted application of weedkiller may sometimes be appropriate to control invasive plants such as creeping thistle or ragwort. Limestone grasslands support species that have developed

in nutrient-poor conditions and the application of fertilisers would also be damaging, by encouraging species better suited to increased fertility at the expense of less vigorous limestone grassland species, therefore reducing the overall diversity of the sward.

Caldon Low

Site of Special Scientific Interest (SSSI) – Geological

Area (ha):	0.879486	GID:	1002227
Grid Ref:	sk076491	EnsisID:	1004479

Management recommendations

Active quarries form a very important part of the geological resource of England for two reasons. First, many of these sites are in areas where natural geological exposures are rare or absent. Second, these sites often provide much better exposure of geological features than comparable natural exposures, because quarrying has revealed vertical rock sections not visible in natural outcrops.

There are two main management principles for active quarries. The first is to maintain exposure of the geological features during the working life of the quarry. The second is to ensure that representative sections of exposure are retained once works have ceased. Exposure is usually maintained when the quarry is active as a natural consequence of the extraction process. However, positive management during the working life of the quarry may be required to ensure that important sections are not concealed by, for example, quarry waste or buildings.

In planning restoration and after-use of the quarry, it is important to consider geological conservation at an early stage. After-use should include the maintenance of exposures which are sufficiently extensive to demonstrate the important geological interest.

It is desirable for scientific researchers to have access to important geological exposures during the working life of the quarry, where health and safety considerations allow safe access. This is particularly important on sites where scientifically interesting fossil or mineral material is being extracted and which would be permanently lost if not examined and collected.

Caldon Railway Cutting

Site of Special Scientific Interest (SSSI) – Geological

Area (ha):	2.19189	GID:	1002229
Grid Ref:	sk077496	EnsisID:	1004515

Management recommendations

Disused quarries and road and rail cuttings form a very important part of the geological resource of England for two reasons. Firstly, many of these sites are in areas where natural geological exposures are rare or absent. Secondly, these sites often provide much better exposure of geological features than comparable natural exposures, as they reveal vertical rock sections not visible in natural outcrops.

Most disused quarries need active management to maintain exposure of the important geological features. This is because erosion rates are usually too low to ensure that fresh geological exposures are maintained naturally. Management usually involves periodic clearance of vegetation and rock debris. Vegetation growth is a particular problem for geological conservation in many inland disused quarries.

It may not be always practical or entirely necessary to maintain full exposure of the geological features on a site. Site management will often involve defining specific areas that need to be kept clear of vegetation.

The main threats to the conservation of disused quarries, pits and cuttings are landfill and developments which obscure the geological features. Such

developments should be avoided where possible. However, where authorised landfill or development is planned, it may be possible to maintain a conservation face on the site. Similarly, restoration plans for quarries that have closed in recent years may also include the maintenance of a conservation face. In such cases, the conservation face should be maintained clear of vegetation and build-up of rock debris.

Collecting of geological specimens may be acceptable if undertaken in a responsible manner. However, there are some sites where the geological interest is very finite in nature and over-collecting can result in damage or destruction of the interest.

Similar principles apply to road and rail cuttings. Management of vegetation is often required to maintain the geological exposures. Any development or activity that leads to concealment of the interest features is likely to damage the site.

Churnet Valley

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	348.668	GID:	1002020
Grid Ref:	sk002489	EnsisID:	1007135

Management recommendations

Floodplain Fen

Floodplain fens develop on flat areas that have historically been flooded by waters from rivers and streams that meander across the plains. Floodplain vegetation may also be dependent on water seepage from subterranean aquifers or from seepage down or at the base of the constraining slopes.

Floodplain fen is commonly composed of tall grasses and herbs, such as reed,

willowherb, milk parsley, meadowsweet, angelica and nettles. If left unmanaged the sward becomes dominated by tall, vigorous grasses and rushes which, together with an associated build up of dead plant matter and the encroachment of scrub, suppress less vigorous species, thus lowering the botanical richness of the sward. Rotational cutting or intermittent grazing is usually required. Cattle are often the preferred stock, being relatively tolerant of wet conditions and able to control tall grasses and rank vegetation. Cattle also tend to produce a rather uneven, structurally diverse sward. However, ponies, or even hill sheep, can be used if necessary. Grazing usually takes place at times between late spring and early autumn, but the precise timing and intensity will depend on local conditions and requirements, such as the need to avoid trampling ground-nesting birds. Heavy poaching should be avoided but light trampling can be beneficial in breaking down leaf litter and providing areas for seed germination.

Rivers are dynamic and can cause erosion on some parts of the floodplain and deposit of silt in others. Management should not necessarily aim to maintain each component of the floodplain fen in exactly the same place, but should ensure that the full range of niches remain available for use by plants and animals over the course of time.

River water quality is important for floodplain fen and management should ensure it remains within acceptable limits. It is normal for the lower reaches of rivers to contain more plant nutrients than at source, and most floodplain fens depend on an adequate supply of nutrients being maintained. However, excessive nutrient enrichment may result in the replacement of the characteristic floodplain fen communities with very species-poor vegetation, composed of little but a tall dominant grass such as reed or reed sweet grass with nettles.

Winter flooding is an important factor in the management of some floodplain habitats and management should ensure the frequency and extent of flooding is appropriate for maintaining the nature conservation interest of the site where this is the case. For example, river engineering has in many cases reduced the frequency and extent of flooding. Changes in agriculture and the use of floodplains for built development have also often resulted in smaller floodplains and the requirements of floodplain habitats should be considered in the design of such schemes in the future. The balance between groundwater and floodwater influence on the floodplain should be identified and maintained when designing the extent and frequency of controlled flood events.

Lowland wet woodland

Wet woodland includes a range of different woodland types but usually is dominated by ash, alder and willow species. It often supports important invertebrate species and assemblages.

Areas usually benefit from minimum intervention and are often best left undisturbed to limit damage to their fragile soils. This allows the development of old stands where individual trees reach maturity and die naturally to create gaps in the canopy, leading to a diverse woodland structure. However, works to remove dangerous trees in areas of public access may be necessary.

Where particularly important light-demanding or glade species interests are present, including where the woodland is spreading on to valuable open wetland habitat, it may be necessary to periodically clear areas of vegetation. In some woods a more active programme of management by coppice may be appropriate, where this has been the historical management and the conditions are such that it will not lead to heavy ground disturbance.

Broadleaved semi-natural woodland

There are many different ways in which broadleaved woodland can be managed to conserve its value for wildlife. Along with lowland wet woodland, it often supports a diverse breeding bird community. The following gives broad views on a range of regimes that may be appropriate on your site.

A diverse woodland structure, with open space, a dense understory, and a more mature overstory is important. A range of ages and species within and between stands is desirable. Some dead and decaying wood, such as fallen logs, can provide habitats for fungi and invertebrates. However, work may be needed to make safe dangerous trees in areas of high public access. Both temporary and permanent open spaces benefit groups of invertebrates such as butterflies. They may require cutting to keep them open, and should be of sufficient size to ensure that sunny conditions prevail for most of the day.

Felling, thinning or coppicing may be used to create or maintain variations in the structure of the wood, and non-native trees and shrubs can be removed at this time. To avoid disturbance to breeding birds the work is normally best done between the beginning of August and the end of February. Work should be avoided when the ground is soft, to prevent disturbing the soil and ground

flora. Normally successive felling, thinning or coppicing operations should be spread through the wood to promote diversity, but where there is open space adjacent plots should be worked to encourage the spread of species that are only weakly mobile. Natural regeneration from seed or stump regrowth is preferred to planting because it helps maintain the local patterns of species and the inherent genetic character of the site.

Deer management and protection from rabbits or livestock are often necessary. Whilst light or intermittent grazing may increase woodland diversity, heavy browsing can damage the ground flora and prevent successful regeneration. Invasive species, such as Rhododendron, sycamore or Himalayan balsam, should be controlled.

Parts of a wood should be left unmanaged to benefit species that do best under low disturbance or in response to natural processes. Within these areas some trees will eventually die naturally and dead wood accumulate.

Neutral hay meadow, neutral pasture and marshy grassland

The above habitats require active management if they are to retain their conservation interest. In order to maintain a species-rich sward, each year's growth of vegetation must be removed. Otherwise the sward becomes progressively dominated by tall and vigorous grasses which, together with an associated build up of dead plant matter, suppress less vigorous species and reduce the botanical diversity of the site.

In neutral hay meadows, the above objective is traditionally achieved by closing the fields to stock in the autumn and cutting the resultant growth as hay. The cut is usually done in early July, but the precise timing depends on local factors, including past management and current weather conditions. It should always be after groundnesting birds have fledged their young and any short-lived, characteristic plants have set seed. The aftermath is then grazed in late summer/autumn. Aftermath grazing is important for maintaining a species-rich sward, both through controlling competitive grasses and through hoof-prints providing suitable sites for seedlings to establish. Heavy poaching must be avoided, however.

In neutral pasture and marshy grassland, management is achieved by grazing.

This usually takes place at times between late spring and early autumn, but the precise timing and intensity will depend on local conditions and requirements, such as the need to avoid trampling ground-nesting birds, but should aim to keep a relatively open sward without causing excessive poaching. Cattle are often the preferred stock on the wetter pastures, being relatively tolerant of wet conditions and able to control tall grasses and rank vegetation. Cattle also tend to produce a rather uneven, structurally diverse sward. However, ponies, or even hill sheep, can be used if necessary. Heavy poaching should be avoided but light trampling can be beneficial in breaking down leaf litter and providing areas for seed germination. An element of managed scrub, both within and fringing a field can be of importance to birds and invertebrates, as can a surrounding hedge. Occasional dressings of lime may be acceptable on some neutral pastures.

For damper pastures, regular and careful maintenance of surface drainage including ditches and drains can be essential to prevent adverse changes in the plant species composition of the sward. Deepening of surface drainage should be avoided.

Species interest

The vascular and lower plant flora and bird and invertebrate fauna of the site is of special interest. The species are found in the above habitats and in general the management described above will meet their needs. There may however be circumstances when specific management measures are needed to ensure the wellbeing of a species. In these situations the management will be discussed and agreed on a case by case basis.

All habitats

The habitats within this site are highly sensitive to inorganic fertilisers and pesticides, applications of which should be avoided both within the site itself and in adjacent surrounding areas. Herbicides may be useful in targeting certain invasive species, but should be used with extreme care. Access to this site, and any recreational activities within, may also need to be managed.

Coombes Valley

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	113.049	GID:	1002232
Grid Ref:	sk006526	EnsisID:	1000026

Management recommendations

Broadleaved semi-natural woodland

There may be several different ways in which the wood can be managed to best conserve its value for wildlife - by promoting an appropriate woodland structure, by ensuring regeneration and by maintaining the special features of the woodland. This note gives broad views on a range of regimes that may be appropriate on your site.

A diverse woodland structure with some open space, some areas of dense understory, and an overstory of more mature trees (which may be the standard trees under a coppice-with-standards regime) is important. A range of ages and species within and between stands is desirable.

Some dead and decaying wood such as fallen logs, old hollow trees or old coppice stools is essential for providing habitats for fungi and dead wood invertebrates. Work may, however, be needed to make safe dangerous trees where they occur in areas of high public access.

Open space, either temporary gaps created by felling or coppicing, or more permanent areas such as rides and glades, benefit other groups of invertebrates such as butterflies. Open spaces should be of sufficient size to ensure that sunny conditions prevail for most of the day. Rides and glades may require cutting to keep them open.

Felling, thinning or coppicing may be used to create or maintain variations in the structure of the wood, and non-native trees and shrubs can be removed at

this time. To avoid disturbance to breeding birds the work is normally best done between the beginning of August and the end of February. Work should be avoided when the ground is soft, to prevent disturbing the soil and ground flora. Wet woodland by streams and other waterbodies is often best left undisturbed. Normally successive felling, thinning or coppicing operations should be spread through the wood to promote diversity but where there is open space adjacent plots should be worked to encourage the spread of species that are only weakly mobile.

Natural regeneration from seed or stump regrowth (as in coppice) is preferred to planting because it helps maintain the local patterns of species and the inherent genetic character of the site. Deer management and protection from rabbits or livestock are often necessary. Whilst light or intermittent grazing may increase woodland diversity, heavy browsing can damage the ground flora and prevent successful regeneration.

Parts of a wood may be left unmanaged to benefit species that do best under low disturbance or in response to natural processes. Within these areas some trees will eventually die naturally and dead wood accumulate.

Where they are a threat to the interest of the wood, invasive introductions such as *Rhododendron ponticum* or Himalayan balsam should, where practical, be controlled.

Dimmings Dale & The Ranger

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	23.3492	GID:	1002235
Grid Ref:	sk050429	EnsisID:	1007136

Management recommendations

Rivers and streams

Rivers and streams naturally provide a diversity of habitats for plants and

animals, including invertebrates, fish, mammals and birds. Some of these habitats are directly connected with the physical form of the channel and its banks; others are created by the vegetation which the river's form supports. Despite their varied character however, there are some common management principles that apply to all rivers and streams.

The rivers natural structure and form should be maintained. This will support a natural flow regime that will help conserve the geomorphological features of interest. It will also ensure the provision of resting pools for fish, conserve the quality of the riverbed as fish spawning habitat, and avoid the creation of artificial barriers to the passage of migratory fish and other animals, such as otters. Natural barriers to the movement of fish (such as waterfalls) should be left alone. Where artificial modifications have occurred - such as weirs and impoundments, embankment, straightening and dredging - the restoration of natural channel profiles and dynamics is desirable where appropriate. Any new infrastructure, such as road and rail bridges should be carefully designed to avoid the constriction of the river or blockage of its floodplain. Opportunities should be taken to create additional riparian areas where flooding is acceptable, in order to reconnect the river with its floodplain.

Management should maintain the natural flow regime of the river or stream, including natural erosion and sedimentation processes, in order to meet the requirements of the full range of flora and fauna it supports. Abstraction levels should be managed to protect the characteristic flow regime, including seasonal base flows and flushing flows. Compensation flows are generally not an acceptable alternative to reducing abstraction, and river transfers may also have an undesirable effect on river ecology.

Bank-side vegetation should be allowed to develop, allowing characteristic plants to flourish as well as benefiting those animals that spend part of their life-cycle out of the water. A mix of trees, bushes, tall and short fen and grass is desirable and can be encouraged by careful management. For example, grass swards are best managed by cutting once or twice a year or lightly grazing with stock at low densities. If it is not possible to reduce stocking densities on bank-side habitats, it may be necessary to consider fencing the bank-side habitat as an alternative measure to addressing artificially exacerbated bank-side erosion caused by excessive trampling by livestock. Associated habitats, such as oxbow lakes, areas of marshland, vernal pools and floodplain woodland, can all be very important for invertebrates and should be considered integral with the river system.

The characteristic aquatic plant communities associated with in-channel vegetation should be allowed to flourish, including fringing emergent vegetation and beds of submerged plants. Any cutting of vegetation should aim to leave at least 50% of the channel vegetated, comprising an active marginal fringe and a mosaic of submerged and floating beds that are allowed to flower and set seed.

Rivers and streams are susceptible to the introduction of invasive plant and animal species e.g. mink and signal crayfish. Surrounding Japanese knotweed and Himalayan balsam should also be controlled.

The maintenance of good water and sediment quality are essential to maintaining a healthy river system. Management should minimise pollution of the river from point and diffuse sources, including discharges of domestic and industrial effluent, and runoff from agriculture, forestry and urban land. Effluents entering the river directly or indirectly should be treated to reduce the levels of phosphorus contained within them to concentrations that will not lead to a proliferation of algae or the disappearance of characteristic plants and animals. Organic pollution should also be controlled to avoid de-oxygenation of the water or any toxic effects on aquatic animals and plants. Siltation of the river bed can smother and infill coarse gravels, which can affect fish spawning success and the establishment of submerged plants, as well as having an impact on the invertebrates living in and on the riverbed. Riparian areas and the wider catchment need to be managed sensitively to avoid excessive run-off of soil particles and nutrients into the river. Ploughing should not be allowed to destabilise river banks and an unploughed strip of at least 2m should be left adjacent to the riverbank.

Any exploitation of fish populations or other native animals or plants should be at a sustainable level, without manipulation of the river's natural capacity to support them or augmentation by excessive stocking. Where stocking is carried out it should be done such that it does not compromise the genetic integrity of natural populations, which can be a particular issue where existing fish populations have not previously been subject to stocking.

Dry and wet lowland heath

On this site, a mosaic of both wet and dry heath communities occur. Heathland supports the greatest diversity of plants and animals (including a diverse invertebrate fauna and a number of characteristic bird species) where

management maintains the open nature of the heath and by promoting a varied structure of uneven-aged stands of native heathers and other characteristic plants. It is generally beneficial if all stages of the heather life cycle are present. Without such management, heathland becomes progressively dominated by bracken, gorse and, on wet ground, purple moor grass tussocks. Eventually scrub and trees will invade. The precise management requirements will vary both between and within sites according to the needs of the different heathland interests present and site conditions.

Low intensity grazing is a suitable means of managing areas of dry heath. Generally areas of wet heath require limited management but light grazing may also be useful for maintaining the variation in vegetation composition and structure, and for controlling invasive grasses such as purple-moor grass. By feeding selectively in different areas and on different plants, free-roaming livestock help to maintain variation in the vegetation composition and structure. They can also suppress scrub encroachment and provide some light poaching to create small pockets of bare peat and sandy ground that are of benefit to a variety of specialised plants, invertebrates and reptiles. Grazing with sheep, cattle or hardy ponies is an acceptable method of management, although care must be taken to avoid damage to the heather by trampling. An appropriate stocking rate should take into account local conditions and the timing and length of grazing, but an off-take of between 30-40% of the current growth increment is desirable. Heavy grazing should be avoided on wet heath as it can lead to a decline in characteristic dwarf shrub cover in favour of grass and sedge species, as well as excessive poaching and erosion of the underlying peat.

Alternatively, cutting or mowing may be useful options for managing dry heath where a mosaic of patches of heather of different ages is desired. The cut material should be removed to avoid nutrient accumulation on site and to allow the cut plants to re-sprout successfully. However, mowing or cutting may not be suitable on wet heath or on mature stands of dry heath of importance for rare reptiles.

Prescribed burning can also be a useful tool for maintaining the structural diversity of some dry heathlands and for re-establishing areas of pioneer heath required by certain species, but special care is required when sensitive species are present and burning should not be used on wet heath vegetation. Burning must be used with caution, as inappropriate burning can be very damaging to both plant and animal communities and careful consideration should be given to the timing of the burn.

There is some benefit in retaining a few scattered individual trees and some small patches of scrub. However, this should not encroach on the open nature of the habitat, and mechanical control or manual cutting followed by the careful application (spot application on areas of wet heath) of a suitable herbicide may be necessary to prevent this. Bracken invasions may need to be controlled in the same way.

Where gorse is present, scattered stands with a bushy structure rather than large continuous blocks are of greater benefit to the characteristic bird and invertebrate species associated with gorse scrub. Winter cutting of 'leggy' stands of gorse and the removal of cut material will maintain gorse at different stages of re-growth and avoid nutrient accumulation in the soil.

Although careful maintenance of existing ditches and drains is usually acceptable, the abandonment or deepening of ditches or drains should be avoided. Water levels within areas of wet heath should be maintained to avoid adverse changes to the characteristic plant composition of the habitat. In some instances it may be appropriate to restore natural drainage where this is possible.

Broadleaved semi-natural woodland

There are many different ways in which broadleaved woodland can be managed to conserve its value for wildlife. The following gives broad views on a range of regimes that may be appropriate on your site.

A diverse woodland structure, with open space, a dense understory, and a more mature overstory is important. A range of ages and species within and between stands is desirable. Some dead and decaying wood, such as fallen logs, can provide habitats for fungi and invertebrates. However, work may be needed to make safe dangerous trees in areas of high public access. Both temporary and permanent open spaces benefit groups of invertebrates such as butterflies. They may require cutting to keep them open, and should be of sufficient size to ensure that sunny conditions prevail for most of the day.

Felling, thinning or coppicing may be used to create or maintain variations in the structure of the wood, and non-native trees and shrubs can be removed at

this time. To avoid disturbance to breeding birds the work is normally best done between the beginning of August and the end of February. Work should be avoided when the ground is soft, to prevent disturbing the soil and ground flora. Normally successive felling, thinning or coppicing operations should be spread through the wood to promote diversity, but where there is open space adjacent plots should be worked to encourage the spread of species that are only weakly mobile. Natural regeneration from seed or stump regrowth is preferred to planting because it helps maintain the local patterns of species and the inherent genetic character of the site.

Deer management and protection from rabbits or livestock are often necessary. Whilst light or intermittent grazing may increase woodland diversity, heavy browsing can damage the ground flora and prevent successful regeneration. Invasive species, such as Rhododendron, sycamore or Himalayan balsam, should be controlled. Parts of a wood should be left unmanaged to benefit species that do best under low disturbance or in response to natural processes. Within these areas some trees will eventually die naturally and dead wood accumulate

Species interest

The lower plant flora and invertebrate fauna of the site is of special interest. The species are found in the above habitats and in general the management described above will meet their needs. There may however be circumstances when specific management measures are needed to ensure the well-being of a species. In these situations the management will be discussed and agreed on a case by case basis.

All habitats

The habitats within this site are highly sensitive to inorganic fertilisers and pesticides, applications of which should be avoided both within the site itself and in adjacent surrounding areas. Herbicides may be useful in targeting certain invasive species, but should be used with extreme care. Access to this site, and any recreational activities within, may also need to be managed.

Froghall Meadow and Pastures

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	11.2479	GID:	1007198
Grid Ref:	sk023469	EnsisID:	2000357

Management recommendations

Neutral pasture requires active management if it is to retain its conservation interest. In order to maintain a species-rich sward, each year's growth of vegetation must be removed. Otherwise the sward becomes progressively dominated by tall and vigorous grasses which, together with an associated build up of dead plant matter, suppress less vigorous species and reduce the botanical diversity of the site. On pasture land this management is achieved by grazing. The precise timing and intensity of grazing will vary both between and within sites, according to local conditions and requirements (such as, for example, type or availability of stock or the needs of individual plants or animals of conservation concern) but should aim to keep a relatively open sward without causing excessive poaching. Light trampling can be of benefit by breaking down leaf litter and providing areas for seed germination. No other management should be routinely required. Any surrounding, well-managed hedgerows may considerably add to the habitat in providing shelter for invertebrates. The application of pesticides including herbicides or fertilizer (including manure or slurry) would be damaging and should be avoided. Mowing neutral pastures for hay followed by aftermath grazing is also an acceptable form of management, where previously practiced.

For damper pastures, regular and careful maintenance of surface drainage including ditches and drains can be essential to prevent adverse changes in the plant species composition of the sward. Deepening of surface drainage should be avoided.

Hulme Quarry

Site of Special Scientific Interest (SSSI) - Geological
National Nature Reserve

Area (ha):	40.7456	GID:	1002470
Grid Ref:	sj928444	EnsisID:	1004088

Management recommendations

Disused quarries and road and rail cuttings form a very important part of the geological resource of England for two reasons. First, many of these sites are in areas where natural geological exposures are rare or absent. Second, these sites often provide much better exposure of geological features than comparable natural exposures, as they reveal vertical rock sections not visible in natural outcrops.

Most disused quarries need active management to maintain exposure of the important geological features. This is because erosion rates are usually too low to ensure that fresh geological exposures are maintained naturally. Management usually involves periodic clearance of vegetation and rock debris. Vegetation growth is a particular problem for geological conservation in many inland disused quarries.

It may not be always practical or entirely necessary to maintain full exposure of the geological features on a site. Site management will often involve defining specific areas that need to be kept clear of vegetation.

The main threats to the conservation of disused quarries, pits and cuttings are landfill and developments which obscure the geological features. Such developments should be avoided where possible. However, where authorised landfill or development is planned, it may be possible to maintain a conservation face on the site. Similarly, restoration plans for quarries that have closed in recent years may also include the maintenance of a conservation face. In such cases, the conservation face should be maintained clear of vegetation and build-up of rock debris.

Collecting of geological specimens may be acceptable if undertaken in a responsible manner. However, there are some sites where the geological interest is very finite in nature and over-collecting can result in damage or

destruction of the interest.

Similar principles apply to road and rail cuttings. Management of vegetation is often required to maintain the geological exposures. Any development or activity that leads to concealment of the interest features is likely to damage the site.

Rue Hill

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	15.5297	GID:	1002226
Grid Ref:	sk081482	EnsisID:	1004469

Management recommendations

In order to maintain a species-rich sward and its associated insects and other invertebrates, calcareous grassland requires active management. Without management it rapidly becomes dominated by stands of rank grasses. These grasses, together with the build up of dead plant matter, suppress less vigorous species and lower the diversity of the site. Eventually, the site will scrub over. Traditionally, management of calcareous grassland is achieved by grazing. The precise timing and intensity of grazing will vary both between and within sites, according to local conditions and requirements (such as type of stock or the needs of particular vegetation types, individual plants or animals; certain invertebrates, for example, can benefit from the presence of taller vegetation) but should aim to keep a relatively open sward without causing excessive poaching. Light trampling can be beneficial by breaking down leaf litter and providing bare patches for seed germination and some invertebrates. An element of managed scrub, both within and fringing calcareous grassland, can be of great importance to certain birds and invertebrates but excessive scrub should be controlled. No other management should be routinely required. The application of pesticides, including herbicides, or any fertilizer would be damaging and should be avoided.

Saltersford Lane Meadows

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	3.99813	GID:	1002035
Grid Ref:	sk083418	EnsisID:	1007149

Management recommendations

Neutral hay meadows require active management if they are to retain their conservation interest. In order to maintain a species-rich sward, each year's growth of vegetation must be removed. Otherwise the sward becomes progressively dominated by tall and vigorous grasses which, together with an associated build up of dead plant matter, suppress less vigorous species and reduce the botanical diversity of the site. In neutral hay meadows, the above objective is traditionally achieved by closing the fields to stock in the autumn and cutting the resultant growth as hay, usually in mid-July. The precise timing of the cut depends on local factors, including past management and current weather conditions, but should be after ground-nesting birds have fledged their young and any short-lived, characteristic plants have set seed. The aftermath is then grazed in late summer/autumn. Aftermath grazing is important for maintaining a species-rich sward, both through controlling competitive grasses and through hoof-prints providing suitable sites for seedlings to establish. Heavy poaching must be avoided, however. The application of pesticides including herbicides or fertilizers would be damaging but periodic dressings of well-rotted farmyard manure may be acceptable if the sward does not receive regular input of nutrients from flooding.

For the damper meadows, regular and careful maintenance of surface drainage including ditches and drains can be necessary to prevent adverse changes in the plant species composition of the sward. Deepening of surface drainage should be avoided.

Stanton Pastures & Cuckooclipf Valley

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	108.803	GID:	1002332
Grid Ref:	sk128471	EnsisID:	1001324

Management recommendations

Lowland acid grassland

Free-draining, acidic soil is the key requirement of the grassland communities at this site, but their maintenance also depends on active management. If neglected, the sward becomes dominated by tall, vigorous grasses or bracken which, together with an associated build up of dead plant matter, suppress less vigorous species and reduce the botanical richness of the site. Eventually the sward reverts to scrub and even woodland. Traditionally, management has consisted of stock grazing and this remains the most appropriate management tool. Grazing, through the removal of plant matter and nutrients, helps to maintain an open sward of small tussocky grasses. It also, through disturbance and trampling, creates areas of open ground suitable for colonization by the lichens, ephemeral plants and invertebrates that are often characteristic of this type of grassland. However, rabbit grazing, though difficult to control, can also be a useful management tool in some situations. Occasional management of invasive scrub and bracken may be necessary.

Calcareous grassland

In order to maintain a species-rich sward and its associated insects and other invertebrates, calcareous grassland requires active management. Without management it rapidly becomes dominated by stands of rank grasses, such as Tor-grass. These grasses, together with the build up of dead plant matter, suppress less vigorous species and lower the diversity of the site. Eventually, the site will scrub over. Traditionally, management is achieved by grazing. The precise timing will vary both between and within sites, according to local conditions and requirements. These may include stock type or the needs of particular plants or animals; certain invertebrates, for example, can benefit from the presence of taller vegetation. However, grazing should generally aim to keep a relatively open sward without causing excessive poaching. Light trampling can be beneficial by breaking down leaf litter and providing bare patches for seed germination and some invertebrates. An element of managed scrub, both within and fringing calcareous grassland can be of great

importance to certain birds and invertebrates, but excessive scrub should be controlled

Neutral hay meadow, neutral pasture and marshy grassland

The above habitats require active management if they are to retain their conservation interest. In order to maintain a species-rich sward, each year's growth of vegetation must be removed. Otherwise the sward becomes progressively dominated by tall and vigorous grasses which, together with an associated build up of dead plant matter, suppress less vigorous species and reduce the botanical diversity of the site.

In neutral hay meadows, the above objective is traditionally achieved by closing the fields to stock in the autumn and cutting the resultant growth as hay. The cut is usually done in early July, but the precise timing depends on local factors, including past management and current weather conditions. It should always be after ground-nesting birds have fledged their young and any short-lived, characteristic plants have set seed. The aftermath is then grazed in late summer/autumn. Aftermath grazing is important for maintaining a species-rich sward, both through controlling competitive grasses and through hoof-prints providing suitable sites for seedlings to establish. Heavy poaching must be avoided, however.

In neutral pasture and marshy grassland, management is achieved by grazing. This usually takes place at times between late spring and early autumn, but the precise timing and intensity will depend on local conditions and requirements, such as the need to avoid trampling ground-nesting birds, but should aim to keep a relatively open sward without causing excessive poaching. Cattle are often the preferred stock on the wetter pastures, being relatively tolerant of wet conditions and able to control tall grasses and rank vegetation. Cattle also tend to produce a rather uneven, structurally diverse sward. However, ponies, or even hill sheep, can be used if necessary. Heavy poaching should be avoided but light trampling can be beneficial in breaking down leaf litter and providing areas for seed germination. An element of managed scrub, both within and fringing a field can be of importance to birds and invertebrates, as can a surrounding hedge. Occasional dressings of lime may be acceptable on some neutral pastures.

For damper pastures, regular and careful maintenance of surface drainage including ditches and drains can be essential to prevent adverse changes in the

plant species composition of the sward. Deepening of surface drainage should be avoided.

Dry and wet lowland heath

On this site, a mosaic of both wet and dry heath communities occur. Heathland supports the greatest diversity of plants and animals (including a diverse invertebrate fauna and a number of characteristic bird species) where management maintains the open nature of the heath and by promoting a varied structure of uneven-aged stands of native heathers and other characteristic plants. It is generally beneficial if all stages of the heather life cycle are present. Without such management, heathland becomes progressively dominated by bracken, gorse and, on wet ground, purple moor grass tussocks. Eventually scrub and trees will invade. The precise management requirements will vary both between and within sites according to the needs of the different heathland interests present and site conditions.

Low intensity grazing is a suitable means of managing areas of dry heath. Generally areas of wet heath require limited management but light grazing may also be useful for maintaining the variation in vegetation composition and structure, and for controlling invasive grasses such as purple-moor grass. By feeding selectively in different areas and on different plants, free-roaming livestock help to maintain variation in the vegetation composition and structure. They can also suppress scrub encroachment and provide some light poaching to create small pockets of bare peat and sandy ground that are of benefit to a variety of specialised plants, invertebrates and reptiles. Grazing with sheep, cattle and hardy ponies is an acceptable method of management, although care must be taken to avoid damage to the heather by trampling. An appropriate stocking rate should take into account local conditions and the timing and length of grazing, but an off-take of between 30-40% of the current growth increment is desirable. Heavy grazing should be avoided on wet heath as it can lead to a decline in characteristic dwarf shrub cover in favour of grass and sedge species, as well as excessive poaching and erosion of the underlying peat.

Alternatively, cutting or mowing may be useful options for managing dry heath where a mosaic of patches of heather of different ages is desired. The cut material should be removed to avoid nutrient accumulation on site and to allow the cut plants to re-sprout successfully. However, mowing or cutting may not be suitable on wet heath or on mature stands of dry heath of importance for rare reptiles.

Prescribed burning can also be a useful tool for maintaining the structural diversity of some dry heathlands and for re-establishing areas of pioneer heath required by certain species, but special care is required when sensitive species are present and burning should not be used on wet heath vegetation. Burning must be used with caution, as inappropriate burning can be very damaging to both plant and animal communities and careful consideration should be given to the timing of the burn.

There is some benefit in retaining a few scattered individual trees and some small patches of scrub. However, this should not encroach on the open nature of the habitat, and mechanical control or manual cutting followed by the careful application (spot application on areas of wet heath) of a suitable herbicide may be necessary to prevent this. Bracken invasions may need to be controlled in the same way.

Where gorse is present, scattered stands with a bushy structure rather than large continuous blocks are of greater benefit to the characteristic bird and invertebrate species associated with gorse scrub. Winter cutting of 'leggy' stands of gorse and the removal of cut material will maintain gorse at different stages of re-growth and avoid nutrient accumulation in the soil.

Although careful maintenance of existing ditches and drains is usually acceptable, the abandonment or deepening of ditches or drains should be avoided. Water levels within areas of wet heath should be maintained to avoid adverse changes to the characteristic plant composition of the habitat. In some instances it may be appropriate to restore natural drainage where this is possible.

Broadleaved semi-natural woodland

There are many different ways in which broadleaved woodland can be managed to conserve its value for wildlife. The following gives broad views on a range of regimes that may be appropriate on your site.

A diverse woodland structure, with open space, a dense understory, and a more mature overstory is important. A range of ages and species within and between stands is desirable. Some dead and decaying wood, such as fallen

logs, can provide habitats for fungi and invertebrates. However, work may be needed to make safe dangerous trees in areas of high public access. Both temporary and permanent open spaces benefit groups of invertebrates such as butterflies. They may require cutting to keep them open, and should be of sufficient size to ensure that sunny conditions prevail for most of the day.

Felling, thinning or coppicing may be used to create or maintain variations in the structure of the wood, and non-native trees and shrubs can be removed at this time. To avoid disturbance to breeding birds the work is normally best done between the beginning of August and the end of February. Work should be avoided when the ground is soft, to prevent disturbing the soil and ground flora. Normally successive felling, thinning or coppicing operations should be spread through the wood to promote diversity, but where there is open space adjacent plots should be worked to encourage the spread of species that are only weakly mobile. Natural regeneration from seed or stump regrowth is preferred to planting because it helps maintain the local patterns of species and the inherent genetic character of the site.

Deer management and protection from rabbits or livestock are often necessary. Whilst light or intermittent grazing may increase woodland diversity, heavy browsing can damage the ground flora and prevent successful regeneration. Invasive species, such as Rhododendron, sycamore or Himalayan balsam, should be controlled.

Parts of a wood should be left unmanaged to benefit species that do best under low disturbance or in response to natural processes. Within these areas some trees will eventually die naturally and dead wood accumulate.

Lowland wet woodland

Wet woodland includes a range of different woodland types but usually is dominated by ash, alder and willow species. It often supports important invertebrate species and assemblages.

Areas usually benefit from minimum intervention and are often best left undisturbed to limit damage to their fragile soils. This allows the development of old stands where individual trees reach maturity and die naturally to create gaps in the canopy, leading to a diverse woodland structure. However, works

to remove dangerous trees in areas of public access may be necessary.

Where particularly important light-demanding or glade species interests are present, including where the woodland is spreading on to valuable open wetland habitat, it may be necessary to periodically clear areas of vegetation. In some woods a more active programme of management by coppice may be appropriate, where this has been the historical management and the conditions are such that it will not lead to heavy ground disturbance.

All habitats

The habitats within this site are highly sensitive to inorganic fertilisers and pesticides, applications of which should be avoided both within the site itself and in adjacent surrounding areas. Herbicides may be useful in targeting certain invasive species, but should be used with extreme care. Access to this site, and any recreational activities within, may also need to be managed.

Swineholes Wood & Black Heath

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	46.2221	GID:	1002251
Grid Ref:	sk047505	EnsisID:	1000970

Management recommendations

Dry upland heath develops in nutrient-poor, acidic conditions in unenclosed upland areas and is dominated by dwarf shrubs, especially heather. Dry upland heaths are unique plant communities that support a rich variety of plants and animals, including many rare and scarce species of plants, birds and invertebrates.

Dry upland heaths have a long history of active management. Continued habitat management is essential for maintaining the nature conservation interest and open nature of dry upland heaths by preventing the invasion of

scrub and trees that would otherwise dominate these dwarf shrub communities.

Management of upland dry heath should aim to create a structurally diverse mosaic of dwarf shrub vegetation to provide the feeding, breeding and sheltering areas needed by the range of plants and animals that are characteristic of a well-managed upland. For example, structural diversity can be particularly important to the conservation of invertebrate species, which are also an important food source for other animal and bird species. It is generally beneficial if all phases of the heather life cycle are present. Light grazing, particularly in the summer months, is a suitable means of managing dry heath. By feeding selectively on different plants and in different areas, stock can ensure that patches of young, open vegetation growth are found in mosaics with more mature and even degenerate areas of heather. Grazing can be beneficial in more subtle ways, too. For example, dung is an important habitat for certain invertebrates that in turn provide food for birds.

However, grazing must be carefully controlled. Stock levels need to be appropriate to the type and age structure of the vegetation. Heavy grazing can lead to the loss of dwarf shrub cover and a consequent shift to grass and rush communities, which reduce the structural diversity necessary for maintaining a variety of upland animal and plant species. Excessive trampling and poaching by livestock can damage the habitat further. Stock levels should be light, preferably with no or little winter grazing. Increasing altitude and wetness reduces the ability of moorland vegetation to cope with grazing pressure. High deer numbers can also have a significant effect on vegetation and should be taken into account when deciding stocking rates.

Careful periodic burning may be a useful tool for maintaining structurally diverse heath, but burning should not normally be introduced to areas that have not been burned before. Burning must be used with caution, as inappropriate burning can be very damaging to both plant and animal communities. Burning should only be undertaken during the winter and should follow an appropriate burning rotation in order to create a mosaic of habitats with vegetation of different ages, composition and structure, which in turn supports a wide diversity of species. For example, burning small patches on a long rotation creates a diverse structure and reduces the impact on animal populations – invertebrates in particular, are vulnerable to the effects of fire.

Cutting is a possible alternative to burning. If cutting is used, care must be taken to remove the resultant litter, or germination of seedlings will be inhibited. Cutting can be usefully employed to create firebreaks. However, care must be taken when using the

machinery required for cutting as this can be damaging to fragile peat soils.

The application of fertilisers is likely to be damaging and should be avoided. Increasing soil fertility will encourage grasses at the expense of the dwarf shrub species characteristic of dry upland heath habitats.

Thorncliffe Moor

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	57.6622	GID:	1002448
Grid Ref:	sk023587	EnsisID:	1003081

Management recommendations

Neutral pasture and marshy grassland

Neutral pasture and marshy grassland require active management if they are to retain their conservation interest. In order to maintain a species-rich sward, each year's growth of vegetation must be removed. Otherwise the sward becomes progressively dominated by tall and vigorous grasses (and rushes on the damper grasslands) which, together with an associated build up of dead plant matter, suppress less vigorous species and reduce the botanical diversity of the site. This management is achieved by grazing. Grazing usually takes place at times between late spring and early autumn, but the precise timing and intensity will depend on local conditions and requirements, such as the need to avoid trampling ground-nesting birds, but should aim to keep a relatively open sward without causing excessive poaching. Cattle are often the preferred stock on the wetter pastures, being relatively tolerant of wet conditions and able to control tall grasses and rank vegetation. Cattle also tend to produce a rather uneven, structurally diverse sward. However, ponies, or even hill sheep, can be used if necessary. Heavy poaching should be avoided but light trampling can be beneficial in breaking down leaf litter and providing areas for seed germination. An element of managed scrub, both within and fringing a field can be of importance to birds and invertebrates, as can a surrounding hedge. Occasional dressings of lime may be acceptable on some neutral pastures.

For damper pastures, regular and careful maintenance of surface drainage including ditches and drains can be essential to prevent adverse changes in the plant species

composition of the sward. Deepening of surface drainage should be avoided.

Dry upland heath

Dry upland heath develops in nutrient-poor, acidic conditions and is dominated by dwarf shrubs, especially heather. Upland heaths can support a rich variety of plants and animals, including many rare and scarce species of plants, birds and invertebrates. The physical structure of the vegetation is one of the reasons for this; a good mixture of large, old dwarf shrubs along with patches of shorter vegetation will provide feeding, breeding and sheltering areas needed by birds, insects and other plant species.

Dry upland heaths have a long history of active management. Grazing is a very important form of management but must be carefully managed. The numbers and types of grazing animals present as well as the duration and time of year of grazing are all important in determining the value of the vegetation to wildlife. Too little grazing could, in the long term lead to excessive domination of trees and shrubs. Too much grazing (especially in the autumn and winter whilst plants are not actively growing) leads to loss of dwarf shrubs and domination by grasses and rushes.

.Increasing altitude and wetness reduces the ability of moorland vegetation to cope with grazing pressure. Supplementary feeding can also have a significant effect on vegetation and cause damage.

On sites where grazing has been heavy in the past, a period of no grazing, or very low grazing levels can be beneficial as it allows dwarf shrub plants that have been suppressed to recover in size and vigour.

Burning has both advantages and disadvantages which should be carefully weighed up on a site by site basis, in discussion with English Nature. Burning can be helpful in influencing how grazing animals distribute themselves across the site, for the provision of firebreaks (to control possible wildfires) and some species may benefit from the breaking up of large stands of even-aged heather. However, burning can also be damaging and reduce structural diversity. Some plant species are sensitive to burning and could be lost and excessive burning could result in insufficient cover of the mature heather needed by some nesting birds (e.g. Merlin). Burnt sites, especially with thin soils and steep slopes can be vulnerable to soil erosion. Burning can also encourage bracken or gorse invasion (which benefit from the nutrients released from the ash).

If burning is carried out, it should only be undertaken during the winter and should follow an appropriate burning rotation in order to create a mosaic of habitats with vegetation of different ages, composition and structure, which in turn supports a wide diversity of species. Areas with particularly sensitive species or habitats should be identified and avoided. Burning should not be carried out unless a suitable grazing regime is in place because heavy grazing of land that has recently been burnt

(especially in winter) can prevent regeneration of the dwarf shrubs and lead to a rapid conversion of the site to grassland.

Cutting is a possible alternative to burning on dry heath. If cutting is used, care must be taken to remove the resultant litter, or germination of seedlings will be inhibited. Cutting can be usefully employed to create firebreaks. However, care must be taken when using the machinery required for cutting as this can be damaging to fragile peat soils, in particular those of wet heaths and the use of machinery should be avoided where possible on wetter areas.

Flush and spring fen

Groundwater sometimes breaks out on the surface, either as gentle seepages, which give rise to flushes, or through greater flows that are evident as springs. The plants and animals that occur in and around these habitats are dependent on the water chemistry and flow rate. Mosses, liverworts, sedges and rushes are common and often predominate, whilst several species of orchid are also associated with these communities.

The quantity and quality of the groundwater must be maintained, though the quantity is not likely to be naturally constant throughout the seasons or between wet and dry years. Groundwater is often susceptible to contamination by agricultural fertilisers, or by pollution leaking from landfill sites

Grazing is often required to keep the vegetation short and open around springs and flushes. The precise timing and intensity of grazing will vary according to local conditions and requirements but should aim to keep a relatively open sward without causing excessive poaching. Feeding of stock should take place well away from the springs (and any other sensitive habitat), and the location of structures such as animal shelters should not encourage the animals to gather in the area. This is to ensure the springs and flushes do not become enriched by nutrients from animal food or dung, or even from carcasses. Light trampling by grazing animals can be of benefit in moderation by breaking down leaf litter and by creating areas of bare soil, needed by some invertebrates and mosses and for seedling establishment. Drainage schemes should not intercept the source of groundwater to springs or flushes, or reduce the area of surface they irrigate.

All habitats

The habitats within this site are highly sensitive to inorganic fertilisers and pesticides,

applications of which should be avoided both within the site itself and in adjacent surrounding areas. Herbicides may be useful in targeting certain invasive species, but should be used with extreme care. Access to this site, and any recreational activities within, may also need to be controlled.

Wetley Moor

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	69.4656	GID:	1002040
Grid Ref:	sj930483	EnsisID:	2000209

Management recommendations

Dry and wet lowland heath

Heathland has been maintained for centuries on nutrient-poor acidic soils by a long history of traditional management using extensive livestock grazing and cutting. These uses depleted the thin acid soils of nutrients and kept the land mostly free of scrub and trees, which, together with natural variations in soil conditions and drainage have created conditions favouring a diversity of heathland habitats, including acid grassland and mire communities as well as dwarf shrub heath. On this site, a mosaic of both wet and dry heath communities occur. Heathland supports the greatest diversity of plants and animals (including a diverse invertebrate fauna and a number of characteristic bird species) where management maintains the open nature of the heath and by promoting a varied structure of uneven-aged stands of native heathers and other characteristic plants. It is generally beneficial if all stages of the heather life cycle are present. Without such management, heathland becomes progressively dominated by bracken, gorse and, on wet ground, purple moor grass tussocks. Eventually scrub and trees will invade. The precise management requirements will vary both between and within sites according to the needs of the different heathland interests present and site conditions.

Low intensity grazing is a suitable means of managing areas of dry heath. Generally areas of wet heath require limited management but light grazing may also be useful for maintaining the variation in vegetation composition and structure, and for controlling invasive grasses such as purple-moor grass. By feeding selectively in different areas and on different plants, free-roaming livestock help to maintain variation in the vegetation composition and structure. They can also suppress scrub encroachment and provide some light poaching to create small pockets of bare peat and sandy ground that are of benefit to a variety of specialised plants, invertebrates and reptiles. Sheep, cattle or hardy ponies are acceptable grazing stock, although care

must be taken to avoid damage to the heather by trampling. An appropriate stocking rate should take into account local conditions and the timing and length of grazing, but an off-take of between 30-40% of the current growth increment is desirable. Heavy grazing should be avoided on wet heath as it can lead to a decline in characteristic dwarf shrub cover in favour of grass and sedge species, as well as excessive poaching and erosion of the underlying peat.

Cutting or mowing may be useful options for managing dry heath where a mosaic of patches of heather of different ages is desired, usually in association with light grazing. The cut material should be removed to avoid nutrient accumulation on site and to allow the cut plants to re-sprout successfully. However, mowing or cutting may not be suitable on wet heath or on mature stands of dry heath of importance for rare reptiles.

Prescribed burning can also be a useful tool for maintaining the structural diversity of some dry heathlands and for re-establishing areas of pioneer heath required by certain species, but special care is required when sensitive species are present and burning should not be used on wet heath vegetation. Burning must be used with caution, as inappropriate burning can be very damaging to both plant and animal communities and careful consideration should be given to the timing of the burn. Again, this is likely to be part of a management regime that includes light grazing.

Management should ensure the predominantly open nature of the dry and wet heathland vegetation is maintained, but there is some benefit in retaining a few scattered individual trees, small clumps of birch and willow and some small patches of scrub. For example, the maintenance of scattered mature birch will provide suitable song perches for nightjars. An element of native deciduous woodland fringing the heath may add to the conservation interest by providing habitat edge environments favoured by some heathland birds and invertebrates and mature oak is particularly valuable for these interests. A diverse woodland structure with some open space, some areas of dense understory, and an overstory of more mature trees is important. This may be achieved by grazing the woodland in conjunction with the heath, creating local mosaics of woodland and heath, with some scrub and young trees.

Where gorse is present, scattered stands with a bushy structure rather than large continuous blocks are of greater benefit to the characteristic bird and invertebrate species associated with gorse scrub. Winter cutting of 'leggy' stands of gorse and the removal of cut material will maintain gorse at different stages of re-growth and avoid nutrient accumulation in the soil.

Some additional management may be required to remove any dense bracken or scrub invasions or to control tree encroachment where this begins to impact on the open nature of the heath. This may be achieved either by mechanical control or manual cutting (depending on ground conditions) followed by the careful application (spot

application on areas of wet heath) of a suitable herbicide where necessary.

Streams and ponds may add considerably to the heathland interest by providing habitat for a range of specialised plants, amphibians and invertebrates. Careful maintenance of existing ponds to retain a mosaic of open water and marginal/submerged vegetation is usually acceptable practice. Where pond management is required, silt and plant material should only be removed from a portion of the pond at any one time, allowing sufficient time for recovery before other areas are dredged. Particular care should be taken to avoid habitat of conservation value when disposing of pond dredgings.

Although careful maintenance of existing ditches and drains is usually acceptable, the abandonment or deepening of ditches or drains should be avoided. Water levels within areas of wet heath should be maintained to avoid adverse changes to the characteristic plant composition of the habitat. In some instances it may be appropriate to restore natural drainage where this is possible.

Management should ensure that necessary measures are taken to control recreational and other activities that can be damaging to heathland habitats and species, such as fire-setting and vehicle scrambling. Suitable measures may include a system to allow for the effective control of fires, such as firebreaks, access for fire-fighting vehicles and emergency water, and the careful management of public access.

Cultivation and the application of pesticides (including the use of persistent veterinary products on livestock), fertilisers (including manures) and lime are usually damaging and should be avoided. Herbicides should also generally be avoided, although some types can be useful for the targeted control of certain invasive species.

Valley mire

Fen often develops within valleys and the origins and movement of the water within the fen give rise to a number of different vegetation zones. The maintenance of the characteristic composition and diversity of valley mire fens is dependent on a number of factors operating both at the surface and below ground. The quantity and quality of the groundwater must be maintained, though the quantity is not likely to be naturally constant throughout the seasons or between wet and dry years. Drainage schemes should be designed not to intercept the sources of ground and surface water to the valley mire. It is important for the watercourses of the valley mire not to receive runoff from fertilised land or surface water from farmyards. The bed of the watercourse should not be lowered, nor should its water level be artificially raised, other than as part of a well thought-out conservation scheme. This will ensure the various vegetation components of the valley mire are maintained in their ideal proportions, and that

'head-ward' erosion is not triggered, in which increased flow gradually erodes the peat and silt on which the valley mire has developed.

Grazing is important in the management of the valley mire. Animals help to break up the tussocks of rank grasses such as purple moor grass, opening the sward up to a greater variety of plants. The precise timing and intensity of grazing will vary according to local conditions and requirements. Some (but not excessive) trampling is necessary to create open soil, for invertebrates, mosses and seedling establishment. Grazing also limits the spread of willow, alder and birch carr, which naturally tends to develop around the central watercourse and it should be restricted to this area, other than for a few isolated clumps elsewhere for the benefit of birds and invertebrates. Swamps are also important for invertebrates and birds and the inclusion of some swamp vegetation, such as reedbed, within the mosaic of habitats present will add to the conservation value of the site. However, excessive spread of reed, reed canary grass, or reed sweet grass is likely to be an indication of worsening water quality, the cause of which should be investigated and addressed to maintain the characteristic fen communities. Stock feeding, or the location of grazing infrastructure, for example, stock shelters, should take place downstream of the valley mire. This is to ensure the mire vegetation does not become enriched by nutrients from animal food or dung, or even from carcasses, causing unwanted changes in the composition of the characteristic mire vegetation in favour of tall, species-poor communities.

Whiston Eaves

Site of Special Scientific Interest (SSSI) – Biological

Area (ha):	10.4352	GID:	1006632
Grid Ref:	sk037461	EnsisID:	2000137

Management recommendations

Neutral grassland requires active management if it is to retain its conservation interest. In order to maintain a species-rich sward, each year's growth of vegetation must be removed. Otherwise the sward becomes progressively dominated by tall and vigorous grasses which, together with an associated build up of dead plant matter, suppress less vigorous species and reduce the botanical diversity of the site.

The above objective is achieved by either grazing the sward as pasture or cutting it for hay. This site has an established history of using both of these management regimes

within the same individual fields, these some years being managed for hay and other years for pasture.

Hay meadow management traditionally involves closing the fields to stock in the autumn and cutting the resultant growth, usually in mid July. The precise timing of the cut depends on local factors, including past management and current weather conditions, but should be after ground-nesting birds have fledged their young and any short-lived, characteristic plants have set seed. The aftermath is then grazed in late summer/autumn. Aftermath grazing is important for maintaining a species-rich sward, both through controlling competitive grasses and through hoof-prints providing suitable sites for seedlings to establish. Heavy poaching must be avoided, however.

Pasture management, in contrast, involves grazing in the absence of a hay cut. The precise timing and intensity of grazing will vary both between and within sites, according to local conditions and requirements (such as, for example, type or availability of stock or the needs of individual plants or animals of conservation concern) but should aim to keep a relatively open sward without causing excessive poaching. Light trampling can be of benefit by breaking down leaf litter and providing areas for seed germination. No other management should be routinely required.

Any surrounding, well-managed hedgerows may considerably add to the habitat in providing shelter for invertebrates. The application of pesticides including herbicides or fertilizer (including slurry) would be damaging and should be avoided. Periodic dressings of well-rotted farmyard manure may be acceptable if the sward does not receive regular input of nutrients from flooding, and depending on how often the fields are managed for hay. Occasional dressings of lime may be acceptable.

For the damper sites, regular and careful maintenance of surface drainage including ditches and drains can be essential to prevent adverse changes in the plant species composition of the sward. Deepening of surface drainage should be avoided.

Appendix C Examples of Mowing Equipment

Examples of small cut-and –collect machines for urban verges and greenspaces include:

Grillo FD 450

<https://www.grilloagrigarden.co.uk/fd450>

AMAZONE Profihopper 1250 4WDi SmartLine

<https://amazone.co.uk/en-gb/products-digital-solutions/municipal-technology/groundcare-equipment-pasture-management/mowers-collectors/101236-101236>

Where grasslands are flat and wide enough for a tractor, flail and hopper to operate can be used. The flail collectors also cope with cutting heather and light scrub:

RYETEC

<https://www.ryetec.co.uk/contractor-flail-mower-collector/>

AMAZONE Groundkeeper mounted mower

<https://amazone.co.uk/en-gb/products-digital-solutions/municipal-technology/groundcare-equipment-pasture-management/mowers-collectors/groundkeeper-mounted-mower-101216>

Appendix D Catchment Areas

Weaver Gowy Management Catchment

The Weaver Gowy is located along the north of the district comprising the waterbodies Biddulph Brook and Clough Brook, both of which are partially located within SMDC and flow out of the district into the River Dane. Therefore, while there may be immediate localised benefit for any NFM works within the catchments for the Biddulph or Clough Brook, any potential downstream benefits will be experienced on the River Dane outside of the county and district.

Dane Catchment	Length (km)	Catchment Area (Ha)	Ecological Status	Notes
Biddulph Brook	9.96	2775.71	Moderate	Approximately 2/3 in SMDC, the rest in Cheshire.
Clough Brook to Cow Brook	23.14	4323.94	Poor	The county boundary follows the River Dane. Catchment to the south of the Dane between Woodhouse Green and Heaton within SMDC.

Table 8 Dane Operational Catchment

Dove Management Catchment

The Dove catchment covers the majority of SMDC with three operational catchments; the Churnet Rivers and Lakes, the Dove Lower Rivers and Lakes and the Dove Upper Rivers and Lakes.

The Churnet River and Lakes covers a significant portion of the district from Rushton Spencer in the north down to Alton in the south, and from Biddulph in the west to Thorncliffe in the east. Additionally, a large proportion of the catchment is contained within SMDC, therefore any NFM works that are implemented within the catchment, particularly in the headwaters have the potential for large areas of the district to benefit. The River Churnet from Leek downstream and Endon Brook both have residential areas at medium and high

risk of flooding and therefore concentrating NFM upstream of these locations could help to alleviate some of the potential flood risk.

The Dove Lower Rivers and Lakes is located in the south of the district from Kingsley down to Fole, comprising the River Tean, Alders Brook and Mobberley Brook.

The Dove Upper Rivers and Lakes is largely located within the Peak District and Derbyshire with a small amount of the catchment located along the eastern edge of the district. There is only a small section of the River Hamps within the district and therefore the majority of this operational catchment is entering water bodies outside of the district.

Dove Lower Rivers and Lakes Catchment	Length (km)	Catchment Area (Ha)	Ecological Status	Notes
Churnet from Consall to River Dove	27.12	7008.51	Moderate	Majority of catchment is within SMDC, Prestwood to Combridge is outside SMDC.
Churnet from Endon Brook to Consall	9.814	2269.78	Moderate	Entirely within SMDC.
Churnet from Meerbrook to Leekbrook	11.42	2227.98	Bad	Entirely within SMDC.
Churnet from Source to Meerbrook	8.269	1164.27	Moderate	A tiny fragment of the catchment is within SMDC south of the Churnet where it enters Tittesworth Reservoir.
Combes Brook Catch (trib of R Churnet)	6.99	1154.85	Moderate	Entirely within SMDC.

Endon Brook	15.89	5038.98	Poor	Entirely within SMDC.
Leek Brook from Source to River Churnet	1.37	1047.65	Poor	Entirely within SMDC.
Meerbrook – Source to R Churnet	4.71	1237.21	Moderate	Approximately 12% of the catchment west of Tittesworth Reservoir is within SMDC.
Rudyard Reservoir		1116.5	Poor	Entirely within SMDC.
Rudyard Reservoir Catch (trib of River Churnet)	2.79	2564.67	Moderate	A small fragment on the north east corner is outside of SMDC.
Tittesworth Reservoir		2848.25	Moderate	A small fragment at the northern end of Tittesworth Reservoir is outside of SMDC.

Table 9 Dover Lower River and Lakes Operational Catchment

Churnet Rivers and Lakes Catchment	Length (km)	Catchment Area (Ha)	Ecological Status	Notes
Alders Brook	1.592	2340.01	Moderate	Approximately 50% within SMDC following out of the district to the south east.

Mobberley Brook	3.23	1663.21	Moderate	Entirely within SMDC.
Tean from Cheadle Catchment to River Dove	17.83	31.12	Moderate	Approximately 50% within SMDC following out of the district to the south east.
Tean from Source to Cheadle Catchment	7.45	1503.03	Moderate	Entirely within SMDC.

Table 10 Churnet Rivers and Lakes

Dover Upper River and Lakes Catchment	Length (km)	Catchment Area (Ha)	Ecological Status	Notes
Dove – confluence R Manifold to confluence R Churnet	25.54	4229.63	Poor	A tiny section of the upper catchment is within SMDC.
Hamps from Source to R Manifold	25.19	5806	Good	Approximately 15% of the catchment south east of the River Hamps is within SMDC.
Stanton/Wootton/ Ellastone Catchment Tributary of the Dove	2.60	2023.97	Moderate	Approximately upper 10% of the catchment is within within SMDC.

Table 11 Dove Upper Rivers and Lakes

Trent Valley Staffordshire Management Catchment

This catchment covers a significant proportion of Staffordshire from Stoke-on-Trent down to Lichfield, however only a small proportion of the catchment is represented in SMDC. The River Blithe runs from its source in SMDC near Werrington and flows down along the southern boundary of the district and into East Staffordshire District. Similar to the situation on the northern boundary of the district, the headwaters of the River Blithe are located within the district and localised benefit may be experienced through the use of NFM techniques, however potential downstream benefits will largely be present outside of the district.

Blithe Rivers and Lakes Catchment	Length (km)	Catchment Area (Ha)	Ecological Status	Notes
Blithe from Source to Tad Brook Water Body	37.09	9810.25	Moderate	Upper reaches of River Blithe catchment around Hulme, Majority of catchment to north of Blithe from source to Lower Tean, section on southern side of Blithe between Cresswell and Lower Tean.

Table 12 Blithe Rivers and Lakes Operational Catchment

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