Topic Paper on Biodiversity
Calne Community Neighbourhood Plan
Ver. DRAFT 10 22/12/23

Water Vole in Abberd Brook. Image Credit: Tamzyn Long, River Warriors 17.4.23

Contents

Introduction and Summary

This topic paper has been prepared to aid in the review, update and understanding of the Natural Environment policies of the Calne Community Neighbourhood Plan (CCNP). In summary it was found that:

- The area has a rich biodiversity with some two thousand species recorded some of which are nationally rare species. For example, the area is home to 14 of the 18 native bat species,
- Four areas of Special Scientific Interest and One Area of Outstanding Natural Beauty are within or nearby to the area,
- The area has 13 blue – green strategic wildlife corridors as identified by Wiltshire Council,
- The area contains two nature reserves,
- The species recorded in the area includes 95 species in the Wiltshire Biodiversity Action Plan (those that are rare or locally rare) and 80 priority species that are protected under section 41 of the Natural Environment and Rural Communities Act 2006. Such protection has important implications for any future development proposals,
- Six opportunities for biodiversity improvement are identified, and
- Principles are proposed to guide the development of policies in the updated CCNP as well as 11 guidance points for proposed developments.

The paper provides links to resources for further information and reference materials.

This topic paper guides the reader through the large and somewhat complex body of legislation and regulation concerning wildlife protection and planning. Some of which is yet to become in force.

It is noted that public awareness of biodiversity and more generally of the state of the environment has increased since the made version of the CCNP was prepared. In 2021 residents of the area held a River Day and made a declaration of rights of the Marden Valley. There is an expectation that this subject, which overlaps topics concerning green spaces, trees and hedgerows and climate change, will all be addressed effectively in the next CCNP.

Declaration of the Rights of the Marden Valley

We, the residents of the Marden Valley, declare that the Marden Valley is a living entity and ourselves, are one of its Guardians.
The Marden Valley is entitled to the following fundamental rights.
To be clean and clear of litter, pollution and spills,
To run with a natural flow pattern free of excessive extraction,
To have the capacity to support its native biodiversity,
To evolve naturally without undue development, and
To have these rights so as to protect its existence.

As one of the Guardians of the Marden Valley we will do our best to ensure these rights are respected and protected.

Background

The made version of the plan (2018) states an objective: *To preserve and enhance the biodiversity of Calne and Calne Without developments that are carried out within the plan area should view biodiversity as an integral positive element rather than a hindrance.*

The CCNP also includes the following policy:

In addressing Wiltshire Core Strategy Core Policy 50, development proposals for Calne & Calne Without should consider, assess and address their potential to:

- *create additional habitat space, including roosting, nesting or shelter opportunities for wildlife; and*
- *facilitate or include wildlife corridors; and*
- *protect and enhance riparian corridors for protected species, such as otter, kingfisher and water vole, especially along the River Marden and the Wiltshire & Berkshire Canal to the west of Calne.*

Thus, the present CCNP acknowledges the need to consider the biodiversity implications in making planning decisions. It also notes that biodiversity results from the diversity of habitats as the movement and success or failure of wildlife species cannot be directly managed. It also emphasises the habitat provided by the River Marden and its associated feeder streams and a few key species at some risk.

Since the last plan was made in 2018 there has been a growing public awareness of the threats to species and the risk of species extinction; some may consider this is merely a media induced "*Attenborough effect*" but certainly his television documentaries and associated media have significantly increased awareness and deepened understanding of the sometimes-dire situation parts of the natural world face. It is thus appropriate that biodiversity takes again a strong role in underpinning the CCNP policies regarding Green Spaces, and for Trees and Hedgerows.

The importance of biodiversity

What is biodiversity?

Biodiversity[1] is essentially the variety of life on our planet or more usually of a particular defined area within it. It encompasses diversity on many levels; the vast number of species of plants and animals, the genetic diversity within and between these species and the different biomes (large communities of vegetation and wildlife adapted to a specific habitat and climate) and the ecosystems of which they are part, including woodlands, rivers, and grassland. Biodiversity also includes the diversity within microscopic organisms, including bacteria, viruses, and fungi. This may seem a very global view, but it applies equally well on a smaller scale. Local biodiversity is simply the variety of life species within a particular area.

Why is biodiversity important?

Biodiversity[2] is essential for the processes that support all life on Earth, including human life. Without a wide range of animals, plants, and microorganisms, we cannot have the healthy ecosystems that we rely on to provide us with the air we breathe or the food we eat.

Some aspects of biodiversity are instinctively widely valued, such as the variety of birds at a garden feeder, but the more biodiversity is researched the more it is seen that all aspects are important, even bugs and bacteria that we can't see or may not like the look of. There are many ways that we humans depend upon biodiversity, and it is vital for us to conserve it. It is estimated that a third of the world's crop production depends on pollinators such as birds, bees, and other insects. Agriculture is also reliant upon invertebrates that help to maintain the health of the soil allowing crops to flourish. Soil contains microbes that are vital for releasing nutrients that plants need to grow and then for us to use. Many of our medicines, along with other complex chemicals that we use such as latex and rubber, also originate from plants.

There are also more subtle benefits: spending time in a natural environment is understood to lead to improvements in people's physical and mental health. Having green spaces and trees in urban areas has been shown to decrease hospital admissions, reduce stress and lower blood pressure.

Ecosystem benefits include factors such as animals and plants that remove detritus from waterways, plants that capture airborne contaminants. Biodiversity also provides an aesthetic and cultural value to an area.

While some of the above observations may seem to be perhaps more applicable to exotic locations like the rain forests of the Amazon basin – they also apply to our own locality. The Marden Valley hosts some rare species (for example water voles, rare birds, orchids, bats, and butterflies); thus, the planning area is not only a valuable habitat for many endangered species but also provides a

[1] Much of this section is based on Sophie Pierce, University of Oxford report for the National Trust
[2] Much of this section is based on The Royal Society statements on biodiversity

connection between the town and its surrounding countryside that provides aesthetic and recreational value for its residents and visitors.

Thus, in summary, biodiversity contributes to healthier and happier lives; it provides us with food through pollination, medical discoveries, and ecosystem benefits.

Legislative and Regulatory context

Wildlife Related Legislation

The legislation regarding wildlife is complex due to the number of laws and regulations that apply to the protection of animals and plants. The UK is also a signatory to international conventions that have implications for wildlife protection. The following gives an overview of the major elements of the relevant legislation[3].

Statutory designated sites

If a site of nature conservation importance has 'Statutory Protection', it means that it receives protection by means of legislation in recognition of its biodiversity and/or geological value. For more information about protected sites see Reference 4.

Protected species

Some species of wildlife are protected by legislation and planning policy because of their rarity, biodiversity significance or historical persecution. These species are termed '*protected and notable species'*, and the legislation applies to anyone managing land, as well as local authorities and developers, to ensure that any work is not breaking the law. Natural England has produced advice on protected sites and species which is specifically aimed towards developments. See Reference 4.

The JNCC (Joint Nature Conservation Committee) is the public body that advises the UK Government and other administrations on UK and international nature conservation. It produces regularly-updated information in the form of spreadsheets of conservation designations for all UK species. For more information and the status of protected species see Reference 5.

The Wildlife & Countryside Act 1981 (as amended) is the principal piece of UK legislation relating to the protection of wildlife. See Reference 6. The Wildlife & Countryside Act (WCA) consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) in Great Britain.

Wild Birds: The Act makes it an offence (with some exceptions) to intentionally kill, injure, or take any wild bird or their eggs or nests. Special penalties for offences related to birds are listed as well as additional offences for disturbing birds at their nests, or their dependent young. It also prohibits certain methods of killing, injuring, or taking birds, restricts the sale and possession of captive bred birds, and sets standards for keeping birds in captivity.

[3] This overview is based on *Wildlife and the Law* by the Leicester and Rutland Wildlife Trust

Wild Animals: The Act makes it an offence (subject to exceptions) to intentionally kill, injure, or take, possess, or trade in any wild animal, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals occupying such places. It also prohibits certain methods of killing, injuring, or taking wild animals.

Wild Plants: The Act makes it an offence (subject to exceptions) to pick, uproot, trade in, or possess (for the purposes of trade) any listed wild plant, and prohibits the unauthorised intentional uprooting of such plants.

Non-native Species: The Act contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of certain animals and the planting of certain plants.

Designated Sites: SSSIs (Sites of Special Scientific Interest) have protection under the WCA. The Act also allows for the designation of National Nature Reserves.

Conservation of Habitats and Species Regulations 2017
The Conservation of Habitats and Species Regulations 2017 protects European sites (SPAs and SACs) and European Protected Species. Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are sites that are considered to be of importance at a European level.

Natural Environment and Rural Communities Act 2006 (NERC Act) See Reference 8.
Section 40 of the NERC Act 2006 carries an extension of the 'biodiversity duty' originally stipulated in the Countryside and Rights of Way Act 2000 (CRoW Act). Public organisations operating under section 40 of the NERC Act must consider the conservation of biodiversity in the exercising of their duties.
Section 41 of the NERC Act requires the Secretary of State to publish a list of habitats and species of principal importance for the purpose of conserving biodiversity in England. A total of 56 habitats and 943 species of principal importance are included on the Section 41 list. See Reference 9.
The Act also affords protection to floral, faunal, geological, and physiographical features of SSSIs.

Countryside and Rights of Way Act 2000 (CRoW Act) Reference 11.
The protection of SSSIs, already established in the Wildlife and Countryside Act 1981, is strengthened in this legislation. The Act also allows for prosecution of third parties that damage or destroy a SSSI.

Hedgerow Regulations 1997 Reference 12.
These regulations protect species-rich and ancient hedgerows (but not garden hedges). Owners and managers must request permission from their local authority before removing a hedgerow, and permission may not be granted if it supports a diverse range or protected species. The hedgerow must meet the Hedgerow Regulations Criteria if it is to be given protection.

Note that some of the above legislation is modified by the Environment Act (2021) that is described below.

Planning Policy and Legislation

National Planning Policy Framework

The National Planning Policy Framework (NPPF) (Reference 15.) has an entire section (section 15. Conserving and Enhancing the Natural Environment) that is essentially devoted to biodiversity through habitat protection. The following paragraphs of the NPPF are all applicable:

8(c) an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

119. …Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously developed or 'brownfield' land[4]

153. Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures…

174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

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[5].

179. To protect and enhance biodiversity and geodiversity, plans should:

a) 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; and

b) 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.

180. When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons, and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements

[4] Except where this would conflict with other policies in this Framework, including causing harm to designated sites of importance for biodiversity.

[5] Except where this would conflict with other policies in this Framework, including causing harm to designated sites of importance for 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.

181. The following should be given the same protection as habitats sites:
a) Potential Special Protection Areas and possible Special Areas of Conservation;
b) Listed or proposed Ramsar sites; and
c) Sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

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 either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site. Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

Where areas that are part of the Nature Recovery Network are identified in plans, it may be appropriate to specify the types of development that may be suitable within them. For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat

The Environment Act 2021

The aim of the Environment Act 2021 is to bring about positive changes to biodiversity and includes a complete section on biodiversity and nature (Part 6) with 18 specific provisions (98 to 116). The act includes provisions to:

- Strengthen biodiversity reporting and the setting of long-term species diversity targets (3),
- Require a biodiversity index net gain of at least 10% as a condition for any development (98),
- Require authorities to define Local Nature Recovery Areas and for each one to prepare a Local Nature Recovery Strategy (104 to 106),
- Allow Natural England to prepare and publish a Species Conservation Strategy for improving the conservation status of any species of fauna or flora. All local planning authorities must in have regard to such a species conservation strategy (109)
- Allow Natural England to prepare and publish a strategy for
    - (a)improving the conservation and management of a protected site, and
    - (b)managing the impact of plans, projects or other activities on the conservation and management of the protected site.

  All local planning authorities must in have regard to such a Protected Site Strategy (110)

Note that many of the provisions of the Act are yet to come into force.

On the 16th December 2022 the Minister announced the following legally binding targets to protect the 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

- Halve the waste per person that is sent to residual treatment by 2042

- Cut exposure to the most harmful air pollutant to human health – PM2.5

- Restore 70% of designated features in our Marine Protected Areas to a favourable condition by 2042, with the rest in a recovering condition.

- Our world-leading target to halt the decline in species abundance will be followed by a target to reverse that decline, alongside a further target to reduce the risk of species extinction. This will be supported by our target to restore or create more than 500,000 hectares of wildlife-rich habitat, which will also help the UK to meet its international commitment to protect 30% of its land and ocean by 2030.

On December 19th an agreement to protect nature has been agreed by 190 countries at the UN biodiversity summit, COP15. The agreement includes a global commitment to halt and reverse biodiversity loss by 2030 and to protect 30% of land and oceans by the same date.

Biodiversity Net Gain

Biodiversity net gain is defined as an overall increase in habitat area and/or quality following a new development[6]. DEFRA's chosen approach is to mandate net gain using a specified biodiversity metric. The habitats are to be managed for up to 30 years and must satisfy a 10% net gain in biodiversity points before they are granted planning permission by LPAs, the developer would then have the option between several different actions to deliver net gain. Offsite enhancements must be secured under either a section 106 agreement or a conservation covenant and be registered in the new, publicly available, biodiversity gain site register. In order to calculate biodiversity net gain a biodiversity metric 3.0 calculation tool and user guide were launched in July 2021 and are currently published on Natural England's Access to Evidence website. The user guide describes how to gather the information needed for the metric calculations.

Full details of the biodiversity net gain regime are still being developed at the time of writing (November 2022) and a new biodiversity metric version 3.1 is now available on the DEFRA website. See Reference 17.

[6] https://naturalengland.blog.gov.uk/2021/09/21/biodiversity-net-gain-more-than-just-a-number/

Wiltshire Core Strategy Development Plan 2015

The following policies in the Wiltshire Core Strategy Development Plan (See Reference 18.) are applicable

- Core Policy 8: Calne Community Area strategy: This states that development proposals in the Calne Community Area will need to demonstrate how the relevant issues and considerations listed in paragraph 5.41 will be addressed. This paragraph includes the following:
    - Consideration is needed for making greater use of the River Marden, which runs through the town centre and could be utilised more successfully as an attractive feature of future regeneration projects, while protecting and enhancing the import ecological value and landscape character of the river corridor,
    - All development within the Community Area will need to conserve the designated landscape of the North Wessex Downs AONB and its setting, and where possible enhance its locally distinctive characteristics,
    - The historic alignment of the Wilts and Berks Canal passes through Calne Community Area and will be safeguarded in accordance with Core Policy 53,
    - Paragraph 5.42 also states that by 2026 progress will have been made towards the restored Wilts and Berks Canal and the River Marden will provide social, environmental and economic assets to the area as part of a wider green infrastructure network linking Calne with Chippenham and the wider countryside.

- Core Policy 50: Biodiversity and Geodiversity: The whole policy is relevant. It includes the requirement for development to ensure no net loss of local biodiversity resource and security of integrity of local ecological networks and provision of ecosystem services. Also includes requirement for all development to seek opportunities to enhance biodiversity (relevant to local landscape character). Also includes requirement that development proposals must make a reasonable contribution to their favourable management in the long term.

- Core Policy 51: Landscape: Requires development proposals to demonstrate that inter alia: locally distinctive pattern and species composition of natural features (land and water), transition between man-made and natural landscapes, visually sensitive skylines, soils, geological and topographical features, and important views and visual amenity, have been conserved and where possible enhanced.

- Core Policy 52: Green Infrastructure: The whole policy is relevant. It makes reference to Green Infrastructure projects and initiatives being supported and that financial (and other) contributions from developers to support such projects will be required.

Wiltshire Local Plan Review

The Wiltshire Local Plan Review (Regulation 18 draft, January 2021) (Reference 19) included the consultation draft '*Addressing Climate Change and Biodiversity Net Gain through the Local Plan – Raising the Ambition*'.

Policy Theme 2 – Enhancing Green/Blue Infrastructure (GBI) and Biodiversity sets five ideas which could be integrated into policy options, these are:

- Development should be ambitious in enhancing and creating new GBI assets.

- This should largely be guided by Wiltshire's emerging GBI Strategy, but all major development schemes should be supported by an audit of existing GBI that is used as a template for planning areas of built and natural form.

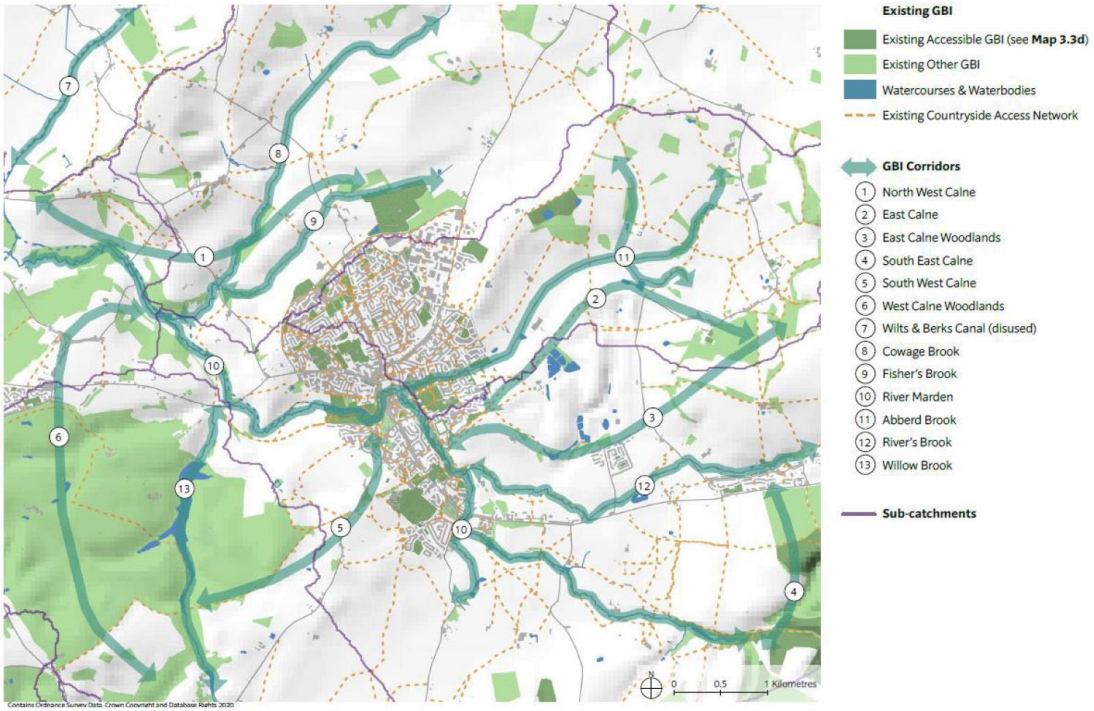
- GBI should be accessible for all and should be designed to incorporate the benefits, such as carbon sequestration, air quality improvements, passive cooling, health and wellbeing and biodiversity enhancement.

- All new development will provide a minimum of 10% net biodiversity gain on site, or off-site in accordance with measures to be set out in policy and the emerging GBI Strategy.

- All areas of biodiversity net gain should be protected and positively managed through a long-term (minimum 30 years) programme of maintenance.

The Planning for Calne document included a map showing Calne Green and Blue Infrastructure Network and improvement corridors (below)

Figure 2 Map showing Calne Green and Blue Infrastructure Network and improvement corridors (numbered).
(These are draft plans from the emerging Green and Blue Infrastructure Strategy and may change)



Green & Blue Infrastructure Strategy for Wiltshire

In February 2022, Wiltshire Council adopted a Green & Blue Infrastructure Strategy for Wiltshire (Reference 20.) This document sets out the vision, goals, and principles for Green and Blue Infrastructure across Wiltshire.

As shown in the above map this identifies 13 corridors for wildlife in the area. Both hedgerow and woodland corridors (1 to 6 above) and stream and river corridors (7 to 13 above). It should be noted that streams, rivers, and hedgerows are used by bats and moths for navigation and provide corridors

for their flight paths. From the above map it may appear that the urban area of Calne is a blockage to wildlife movement. In fact, wildlife, including bats and otters, have been observed moving through the area following the River Marden. The River Marden in the Castlefields Park that reaches well into the town probably greatly assists in this regard.

The appropriate width of a wildlife corridor will vary depending on the species and the local terrain.

Wiltshire Biodiversity Action Plan (2008)

The 2008 Wiltshire Biodiversity Action Plan (WBAP) (Reference 21) includes a section on Built Environment that includes the vision statement that: '*All of Wiltshire's residents have access to high quality green space, and their gardens and school grounds are species-rich, having been designed with wildlife in mind'*. The WBAP includes a Priority Species List of species present in Wiltshire that have either a national or local priority for protection.

Priority Habitats

Priority habitats are those included within the list prepared under section 4.1 of the Natural Environment and Rural Communities Act. Natural England maintains inventories of Priority Habitats.

Priority River habitats identified in the area are the River Marden from a point just before it reaches the A4 until approximately at Hazeland together with parts of the Whetham Stream. Some of the upper reaches of the River Marden and other feeder streams from the downs are identified as chalk stream priority habitats.

Ancient woodland is identified in the area between Derry Hill and Studley as well as areas of Ancient replanted woodland within the Bowood Estate. There are numerous areas of deciduous woodland that are identified as priority habitats throughout much of the CCNP area. There are large areas of priority habitats of woodpasture and parkland identified with the Bowood estate and near Quemerford.

Priority habitats of Lowland meadows are identified near Derry Hill and Studley

Nature Recovery Network

The Nature Recovery Network (NRN) is a national network of sites that are rich in wildlife. The objective is to expand, improve and connect such places. 'Bigger, better, more joined up' were the key recommendations of the Lawton Review[7] of 2010. There are opportunities to improve biodiversity through NRN supported initiatives. The NRN supports the setting up of farmer clusters and their funding by DEFRA as well as the collaborative catchment based approach to improving water environments. The NRN is a major part of the government's 25 year Environment Plan[8]. The 2021 Environment Act is designed to support it. (Reference 37 provides additional information on these initiatives as well as much reference material on such topics as the quantity and quality issues for chalk springs and particular habitats and priorities for the area)

[7] Making Space for Nature: A review of England's Wildlife Sites and Ecological Network, Sir John Lawton, 16 September, 2010
[8] A Green Future: Our 25 year plan to improve the environment, DEFRA, 2018

Current Situation in the CCNP area

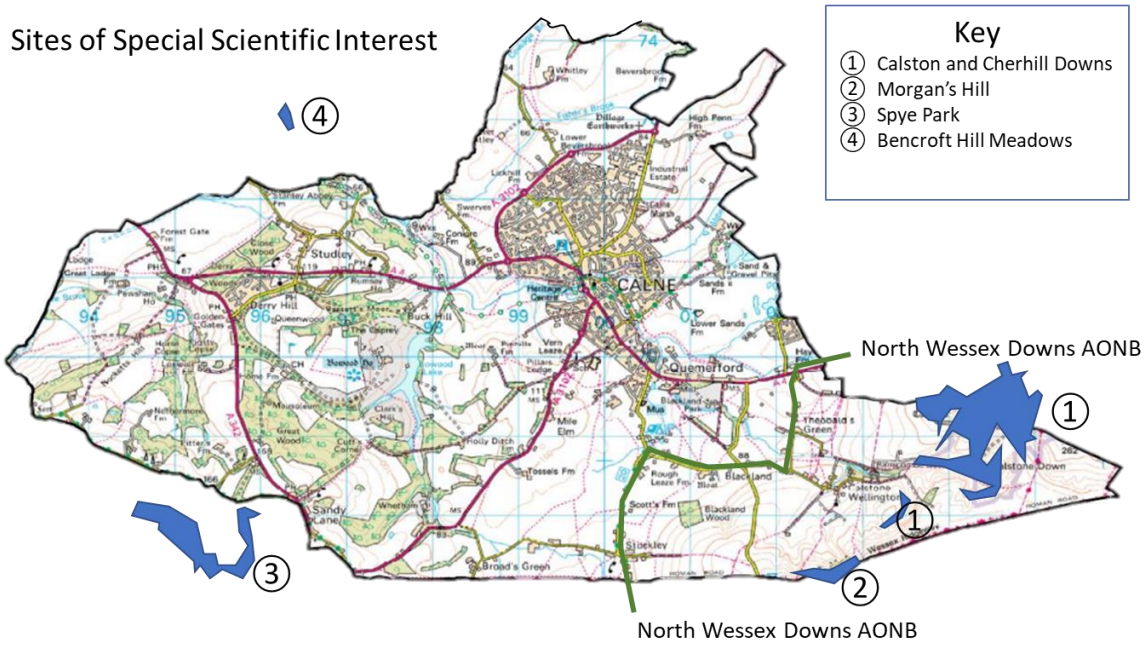
Protected Areas

The following sites within the Calne Community Neighbourhood Area are subject to local planning constraints related to the protection of habitats (Reference 23):

Area of Outstanding Natural Beauty

The western most part of the CCNP area lies in the North Wessex Downs AONB as is illustrated below.

Sites of Special Scientific Interest



The basic nature conservation designation in the UK is the Site of Special Scientific Interest (SSSI) as set out in the Wildlife and Countryside Act 1981. These are sites that have been chosen because of the value, importance or rarity of the habitats and species that they contain. It is a legal designation overseen by Natural England that offers a high level of protection. Designation as a SSSI means that the landowner '***must***' manage the land for the benefit of the special features that it contains. As shown on the above map the CCNP area contains part of one SSSI the Calston and Cherhill Downs SSSI it abuts the Morgan's Hill SSSI. Noteworthy are two nearby SSSI's at Spye Park and at Bencroft Hill Meadows.

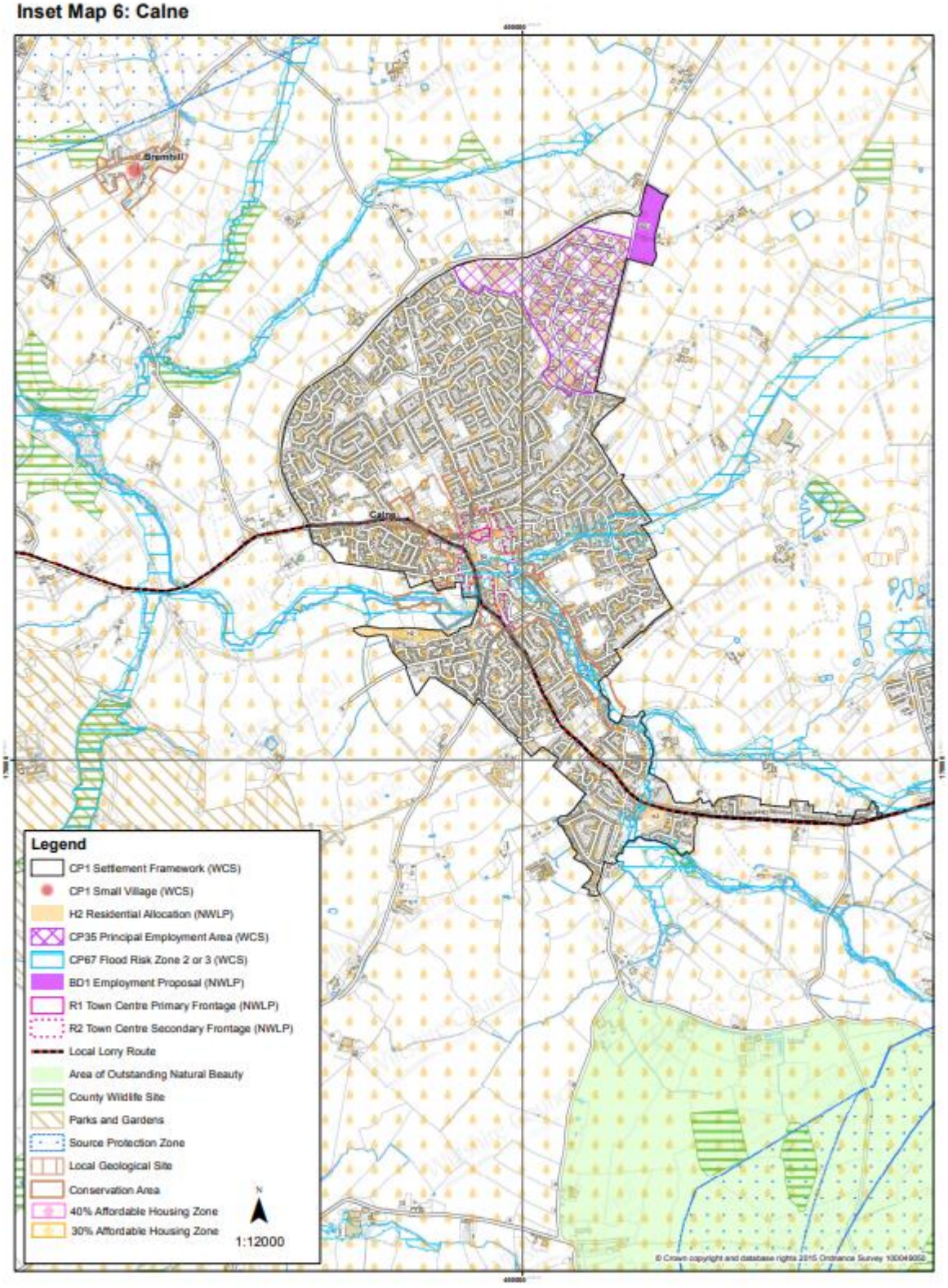
County wildlife sites

In 2016, the Wildlife Sites Project, managed by Wiltshire Wildlife Trust set forth a list of County Wildlife Sites (CWS) that were important for biodiversity, but below the level needed for designation as a SSSI. County Wildlife Sites (CWSs) are areas of land important for their wildlife and can be on public and

private land. CWS recognition is non-statutory but is recognition of a site's high value for biodiversity. They vary in size and shape from small meadows, green lanes, ponds, and hedges through to much larger areas of ancient woodlands, species rich grassland, heathland and commons. There are 1545 CWSs in Wiltshire. While the CWS designation does not provide statutory protection in the same way as an SSSI designation it allows sites to receive management advice and support[9] at a local level. County Wildlife Sites near Calne are shown in the following map.

[9] Wiltshire Wildlife Site Handbook Ver.2

Inset Map 6: Calne



Nature Reserves

The CCNP area contains the 7.7 ha. Nature reserve at Penn Woods Calne (Reference 24) managed by the Wiltshire Wildlife Trust. Hibernation mounds and heat traps have been created there for slow worms and two ponds for frogs and toads. Grass snakes and southern marsh and common spotted orchids are at the site. In 2010 some ten thousand young blackthorn, oak, ash, lime, black poplar, downy birch and a few Norway spruce and Scots pine trees were planted that now make up the wood. Between the saplings are poles where kestrel, buzzard and owls can perch and some of them have bat boxes attached. Roe deer and badgers already use the site. Skylarks, lapwings and red kite can also be seen there. At the entrance a wildflower meadow has been planted and will be cut annually for hay. This area is publicly accessible and is well used.

The area also contains the Quemerford Mill Community Nature Reserve this is a small nature reserve along the River Marden just south of the A4 run by the Marden Conservation and Wildlife Trust (MCWT). It includes a small lake that was excavated in 1990. This Nature Reserve was founded in 2001 as a result of the development at the Quemerford Mill site.

Biodiversity of the CCNP area

Overview

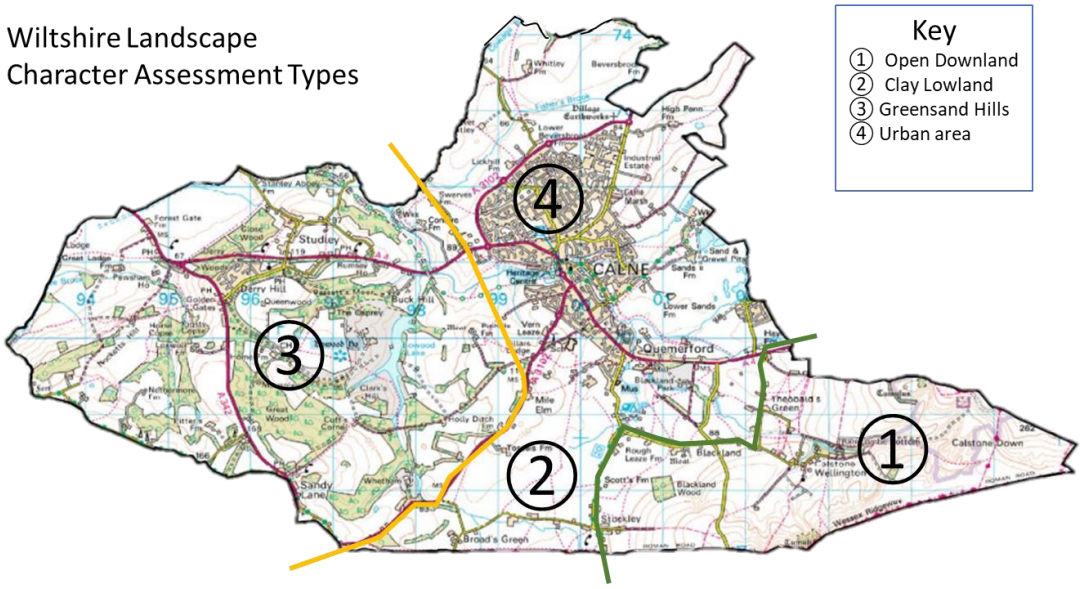
The biodiversity of an area is a function of the habitats within the area. For a small area such as the CCNP area the species in the surrounding areas must also be considered as animals will not be constrained by parish boundaries. Thus, an integrated approach with surrounding planning areas is essential for a meaningful biodiversity plan.

The CCNP area contains a diversity of habitats: woodlands, chalk downs, grasslands, open farmland as well as rivers, some lakes, wet-lands, and brooks. This range of habitats results in nearly two thousand different species recorded in the area 95 of which are rare or locally rare.

Any consideration of development in the area should be particularly careful to preserve critical habitats as this part of the Marden Valley is home to some protected species notably European Otter, Water Vole and four species of bats.

Habitats and Landscape

As noted above biodiversity is driven by the habitats and the landscape of the area. In the CCNP area there are three characteristic landscape areas together with a small largely urban area in the town and the industrial area to the north-east of the town. Each supports a different set of habitats and thus a different variety of species.



Reference: Wiltshire Wildlife Trust Report for Friends of the Marden Valley

1. Chalk Downland

The eastern section of the CCNP area contains the impressive chalk escarpment that forms the western edge of the North Wessex Downs. The scarp is seen at Cherhill Down overlooked by the prominent Lansdowne monument and white horse hill figure from here the scarp runs south to Morgan's Hill. Historically, the chalk uplands of Wiltshire were an open, unfenced expanse that was grazed with large herds of sheep. However, recent farming practices have resulted in the remaining chalk grassland sites being restricted to fragmented areas on steep, otherwise unproductive, slopes. The string of chalk grassland sites on the chalk scarp is botanically very diverse and has four SSSI's within, or adjacent to, the CCNP are the following:

i. Calstone and Cherhill Down SSSI

The 128 ha. Calstone and Cherhill Down SSSI (Reference 25) lies within the CCNP area. Among the several plant species of nationally restricted distribution occurring on the downland are field fleawort *Senecio integrifolius*, bastard-toadflax *Thesium humifusum*, round-headed rampion *Phyteuma orbiculare*, and burnt orchid *Orchis ustulata*. Other orchids present are with fragrant orchid *Gymnadenia conopsea*, bee orchid *Ophrys apifera*, and frog orchid *Coeloglossum viride*, while juniper Juniperus communis, an uncommon species in southern England can also be seen. The site supports an outstanding invertebrate fauna to become established. Of the 25 resident breeding butterfly species several are relatively uncommon nationally, such as the small blue *Cupido minimus*, chalkhill blue *Lysandra coridon*, Duke of Burgundy *Hamearis lucina* and marsh fritillary *Eurodryas aurinia*. Other important invertebrates observed at the site include the heath snail *Helicella itala*, a local and declining species characteristic of chalk grassland, and the uncommon plant bug *Sehirus dubius*. Of particular interest is the occurrence of the rare and vulnerable wart-biter bush cricket *Decticus*

verrucivorus, which is found in the longer vegetation. This species is only known at a few other localities in Britain.

ii. Morgan's Hill SSSI

Morgan's Hill (Reference 26) is an adjacent Wiltshire Wildlife Trust site that supports a number of species of nationally restricted distribution, such as round-headed rampion *Phyteuma tenerum* and bastard-toadflax *Thesium humifusum*, whilst on the slightly deeper and richer soils near the tops of the slopes, meadow saxifrage *Saxifraga granulata* is locally abundant. Orchids are well represented, especially in and around the old chalk pits. Here, fly orchid *Ophrys insectifera*, bee orchid *Ophrys apifera*, pyramidal orchid *Anacamptis pyramidalis* and fragrant orchid *Gymnadenia conopsea* can be found. Also present in considerable numbers are lesser butterflyorchid *Platanthera bifolia* and frog orchid *Coeloglossum viride*, whereas marsh helleborine *Epipactis palustris*, an unusual species in such a dry habitat, and the nationally rare musk orchid *Herminium monorchis* are also present but is scarce. At least 20 species of butterfly breed regularly on the site including chalkhill blue *Lysandra coridon*, brown argus *Aricia agestis* and the uncommon marsh fritillary *Eurodryas aurinia* and Duke of Burgundy *Hamearis lucina*

2. Clay Lowland

The Clay Lowland area of the CCNP area is a long, narrow undulating area that lies between the high ground Greensand Hills and the Chalk Scarp. Views to the surrounding hills emphasise the comparatively open character of the area. This area has a network of streams that feed the River Marden. Farming in this area is mostly intensively managed pastureland. Some of this area is neutral grassland perhaps the priority habitat in most need of conservation within the River Marden Catchment area. Hay meadows, mostly on clay soils and often near rivers, were once the ubiquitous grassland of lowland England. Every manor and village would have had meadows that were 'shut up' for hay until June and then grazed. A process from Saxon times until World War II when farming intensification such as increases in chemical fertilizers and better drainage have changed this practice. Some of these grasslands also act as a buffer between Calne and surrounding villages such as Bremhill. One SSSI that contains this habitat is near the CCNP area:

Bencroft Hill Meadows SSSI

The Bencroft Hill Meadows SSSI (Reference 27.) Bencroft Hill Meadow comprises an area of unimproved pasture of exceptional botanical quality. It is one of the most species-rich examples in southern England of a habitat type which has been largely lost in Britain due to adoption of intensive farming methods. The site lies on the eastern edge of the Oxford Clay Vale of North Wiltshire and has neutral clay soils on a north-west facing hummocky hillside, overlooking the valley of the River Marden. The unimproved sward supports a wide variety of grasses and sedges including the locally uncommon heath-grass *Danthonia decumbens*. There are large populations of devil's-bit scabious *Succisa pratensis*, cowslip *Primula veris*, pignut *Conopodium majus*, common spotted-orchid *Dactylorhiza fuchsii*, lady's bedstraw *Galium verum* and oxeye daisy *Leucanthemum vulgare*. Less common are meadow vetchling *Lathyrus pratensis*, tufted vetch *Vicia cracca*, common knapweed *Centaurea nigra*, common bird's-foot-trefoil *Lotus corniculatus* and tormentil *Potentilla erecta*. As well as species indicative of a long period of uninterrupted grassland management without the use of chemicals or artificial fertilisers are widespread and include adder's-tongue *Ophioglossum vulgatum,* dyer's greenweed *Genista tinctoria*, betony *Stachys officinalis*, saw-wort *Serratula*

tinctoria, pepper-saxifrage *Silaum silaus* and the locally rare hairy lady's-mantle *Alchemilla filicaulis*.

3. Wooded Greensand Hills

To the west of the CCNP area around Bowood the land is undulating, well-wooded and reaches over 160 m. in places. The lower greensand in this area gives rise to deep, sandy, acidic soils, an unusual soil type for Wiltshire. Here, the River Marden passes through a narrow valley. The clay and loam soils of the valley bottom contain a patchwork of wet woodland and pastureland. Near the CCPN area is the Spye Park SSSI.

Spye Park SSSI

Spye Park is an 90,3 ha. habitat mosaic comprising large expanses of some of the finest undisturbed alderwoods in the county, along with oakwoods, parkland and an area of dry acidic grassland containing several locally uncommon plants. Rich communities of lichens, bryophytes and vascular plants flourish in the wet soil conditions prevailing over much of the park.
The geology of this fragmented site comprises Oxford Clay, Corallian Beds and Lower Greensand. Above the springline the soil is well drained but in low lying areas the ground is frequently waterlogged, with many wet flushes and streams. Supporting many woodland birds, lichens and insects.

4. Urban Area

The final landscape area is the urban part of Calne. Particularly the North of the town and the industrial area of Porte Marsh is largely a built environment with somewhat lower biodiversity. This urban area is not extensive and contains many small green spaces. So that even within this area there is evidence of rare species such as water vole on the banks of the Abberd Brook also otters have been observed in the River Marden in the town centre at the Warf and on Beach terrace.

Species Observations

Wildlife will of course cross parish boundaries as they need to, an otter may travel as far as the entire length of the river Marden in one night to feed or to breed, bats are known to fly as much as 10 km. from their roost to feeding areas, so that in the following data for the entire Marden valley catchment area[10] is used to describe the species observations. A summary of the results is given in the following tables. More detailed results are given in Appendix 1.

- 781 species of animals of which 73 are listed in the Wiltshire Biodiversity action plan (WBAP).
- 1080 species of plants of which 21 are listed in the WBAP.
- 331 species of fungi recorded of which 1 is listed by WBAP

[10] Biodiversity Report prepared by The Friends of the Marden Valley (FoMV), June 2022

Animals	Number of Species Observed
Fish	22
Birds	149
Butterflies and Moths	108
Other Insects	396
Bats	14
Other Mammals	24
Other Animals	68
All animals	781

Plants	Number of Species Observed
Trees	53
Mosses	150
Orchids	24
Grasses	121
Other plants	732
All Plants	1080

Fungi	Number of Species Observed
Mushrooms and Jelly fungi	88
Lichens and lichenised fungi	197
Other fungi	46
All fungi	331

Protected and rare species

What is possibly more important than the fact that the area contains nearly two thousand individual species is that nearly one hundred are rare species or locally rare species. In particular, the area is home to many protected species. The following protected species (section 41 species) have been recorded in the CCNP area and its surrounding areas. Any development must have regard for the conservation of a Section 41 species as part of the planning decision. UK BAP priority species were those that were identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). The original list of UK BAP priority species was created between 1995 and 1999. In 2007a revised list was produced, following a 2-year review of UK BAP processes and priorities, which included a review of the priority species and habitats lists. Following the review, the list of UK BAP priority species increased from less than 600 to 1,150.

The priority species (section 41 species) that have been observed in the Marden Valley and thus in and around the CCNP area are all listed in Appendix 1. In summary they are:

Class	Observed Section 41 Priority species
Mammals	7
Birds	25
Butterflies and Moths	15
Fish	2
Herptiles	4
Other animals	4

Plants	21
Fungi	2
Total	80

The following highlights just some of the section 41 species in the planning area.

Bats have a complex lifecycle and rely on many different roosting throughout the year. Hibernation and maternity roosts are the most critical, but other "transitory" roosts are used as bats move from one area to another, accessing different seasonal food sources. All UK bats feed on insects a small pipistrelle bat can eat over three thousand insects in a single night. "Swarming" sites where bats congregate for socialising and mating in the autumn and in the spring are also essential for maintaining populations. The River Marden and it's feeder streams are ideal habitats for bats offering connective corridors and wetlands with their 'sonar' commuting routes along hedgerows to reach them. Old buildings, barns, mature trees, provide habitat for many types of bats. As was noted above the CCNP area is home to 14 of the 18 native species of bat four of which are section 41 species these are the Barbastelle Bat (*Barbastella barbastellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Brown Long-eared Bat (*Plecotus auratus*), and the Greater Horseshoe Bat (*Rhinolophus ferrumequinum*). (Reference 36.)

Water voles (*Arvicola amphibious*) are one of the mammals that is experiencing a steep decline in its population and are near the top of Britain's red list and are potentially in danger of extinction. It is estimated that up to 90% of the population has been lost since the 1970s. Reasons for this decline include habitat loss and fragmentation of habitats into smaller, disconnected parts. Other causes are predators such as the American mink and even domestic cats. A recent water vole survey[11] commissioned by FoMV was conducted along part of Abberd Brook where water voles were suspected. This found evidence of a small but well-established water vole colony. Water voles are listed as a rare and most threatened species under section 41 of the Natural Environment and Rural Communities Act (2006). Natural England provides detailed advice regarding any planning decisions that could disturb water vole colonies [12]

The Eurasian otter (*Lutra lutra*) has been recently observed along the length of the Marden Valley. Including observations at the Warf, The Beach, Horsebrook (only their calling was heard in this site), and upstream of Quemerford. Otters have also recently been filmed downstream of the CCNP area as well, so it can be concluded that there are breeding otters along the length of the river in the CCNP area.

Otters are designated and protected as European protected species (EPS) and are protected under the Conservation of Habitats and Species Regulations 2017. Otters are strictly protected by the Wildlife and Countryside Act 1981 (as amended) and by the EC Habitats Directive, (transposed into domestic law through the Conservation (Natural Habitats &c) Regulations 1994 (as amended) (the Habitats Regulations). Under the Habitats Regulations otters are classed as a European protected species and therefore given the highest level of protection. Otters are also listed as a rare and most threatened species under Section 41 of the Natural Environment and Rural Communities Act (2006)[13]. If otters could be affected by a development proposal, then any impacts on such a protected species

[11] Abberd Brook Water Vole Survey Report Document reference: 22025: BART – 1 Date: 28/09/2022
[12] https://www.gov.uk/guidance/water-voles-advice-for-making-planning-decisions
[13] See Natural England Species Information Note SIN006 October 2007

must be fully considered prior to the determination of planning applications[14]. Natural England guidance suggests among other considerations leaving a buffer zone along a river. The size of the buffer zone along the stretch of water will vary depending on:

- how otters use the area
- the type of vegetation at the site
- the level of existing background disturbance
- the level of proposed disturbance

While it isn't strictly applicable here the guidance for planning in Scotland provides some more specific advice[15]. All suitable otter habitat within 200m of the proposed works should be surveyed. The aim should be to avoid, in the first instance, disturbance to the otter's habitat by leaving a buffer zone along the river. The size of the buffer zone along the stretch of water will vary. If otters are breeding, there should be an exclusion zone around any holts or shelters of at least 200m. However, it could be reduced to 100m depending on the nature of the works, topography, and natural screening.

The adjacent area of Bremhill has a Neighbourhood Plan (made in 2018) which includes a defined buffer requirement to the River Marden in Policy 4 of the Plan – through this Plan we can coordinate local ambitions for nature protection and recovery.

Bremhill Neighbourhood Plan (Made 2018)
NP4 BIODIVERSITY
POLICY 4

Permission should be refused for development that results in the loss or deterioration of irreplaceable or fragile habitats in line with National Policy. Development should protect and, wherever possible enhance landscapes, woodland, hedgerows, ponds, lakes, rivers, streams, ditches, and wildlife habitats. This includes ecology buffers of approximately 200m of the main watercourses, Rivers Avon and Marden. Also, 100m of other key watercourses including Cade Burna, Fishers Brook, Cowage Brook and the disused Wiltshire & Berkshire Canal

[14] https://www.gov.uk/guidance/otters-advice-for-making-planning-decisions
[15] https://www.nature.scot/doc/standing-advice-planning-consultations-otters

Opportunities and priorities for improvement

The following are all opportunities[16] for habitat and thus biodiversity improvements (not prioritised):

1. Supporting developments that meet the Building with Nature Standards 2.0 (BwN 2.0) Building with Nature[17] (BwN) is a non-profit organisation which began in 2015 as a research initiative between Gloucestershire Wildlife Trust and the University of the West of England, Bristol. Building with Nature was created in partnership with planners, developers, and other key stakeholders, focused on the key question: what is preventing the consistent and effective delivery of green infrastructure in the UK or in development? Their findings confirmed that what we need in the UK, to help mainstream high-quality green infrastructure in development, is a shared understanding of 'what good looks like' throughout the whole lifecycle of green infrastructure – from the policy framework to early-stage design, and through to implementation, and beyond to long-term management and maintenance. The BwN Standards Framework provides that shared understanding and is updated periodically to keep pace with changes in legislation, policy, and the latest good industry practice. Building with Nature is the first evidence-based benchmark for high-quality green infrastructure in the UK. Adopting BwN Standards will help developers and planners deliver climate-responsive designs and policies, as well as tangible long-term benefits including wildlife enhancements, improved health and wellbeing, and sustainable water management. The following standards relate to biodiversity:

   Standard 11 Delivers Wildlife Enhancement

   This optimises long term and climate resilient net benefits for nature, by retaining and enhancing existing ecological assets and creating locally relevant new habitats within the boundary of the project. Wildlife measures are secured at all stages of implementation and where applicable, across multiple phases of development.

   Standard 12 Underpins Nature's Recovery

   This creates effective links with existing and planned for ecological features and networks beyond the boundary of the development project to support the creation and restoration of resilient ecological networks in the wider landscape.

2. Installation of artificial nesting sites
   Natural nest sites are disappearing particularly in many urban areas. This puts pressure on bird and bat populations. Artificial nest boxes provide nesting and roosting sites for a wide range of birds and bats, including species under threat. There are many different types of nest box that cater for different species. They can be fitted to existing buildings and incorporated into new developments relatively easily and at little cost.

   Bat bricks and boxes can be incorporated into a development to provide roosting sites for bats, although to encourage bats to use the boxes, it is important that foraging habitats for bats are also incorporated within any landscape design.

[16] Summarised from the Wiltshire Council Planning Biodiversity improvements web pages
[17] Building with Nature Standards Framework March 2022

Some artificial nesting sites can be imaginative and on a large scale. Sucha as a 'fauna flat' erected in the Netherlands or an 8m high tower in Lincolnshire that contains 75 nest boxes for swifts as well as bat bricks.

3. Landscape schemes can be designed to benefit wildlife through:

    Planting of trees
    Planting hedges
    Landscaping with plants that encourage wildlife
    Incorporation of climbers on walls
    Creation of wetlands
    Creation of Ponds
    Meadow areas
    Addition of features such as log piles, stone piles, rockeries

    Landscape designs can provide for both amenity and biodiversity. The local context should be considered in developing a landscape design. Locally appropriate plant species should be incorporated wherever possible to maximise biodiversity benefits. The development should also be considered in its wider landscape context to ensure opportunities to promote green infrastructure and connectivity are maximised. Verges can create green corridors which connect fragmented or isolated habitats by allowing species to travel between them. Natural areas can cost less in maintenance costs than formal landscaping.

    Careful habitat enhancement can also enable ecosystems to adapt to the effects of climate change and contribute to the development's long-term resilience. Consideration should be given to planting habitats that will extend the existing range of wildlife species and allow them to move within the landscape.

4. Expanding the number and connectivity of Local Green Spaces. In particular those that form part of the green-blue wildlife corridors.

5. Improving public knowledge of, and access to, greenspaces and nature reserves.

6. Encouraging public participation in conservation and protection of the environment.

Risks and Threats to Biodiversity

Biodiversity is in decline globally due to activities such as deforestation, land-use change, agricultural intensification, over-consumption of natural resources, pollution, and climate change. These are global concerns but are also applicable to local areas for example local urban expansion and pollution clearly puts most pressure on the natural habitats of that local area. Thus, whilst the scale of biodiversity loss may seem overwhelming, it is important to realise that multiple small local actions to protect and manage critical habitats can add up to make a significant positive impact. Specific threats are:

1. There is uncertainty regarding the scale of further development in the CCNP area. Such development if of an inappropriate scale or type might well reduce the quality or quantity of wildlife habitats,

2. Notwithstanding recent legislation (The Environment Act 2021) there is still a lack of currently implemented and effective standards for the preservation of habitat and wildlife in many cases,

3. There is limited formal integration of local planning with adjacent authorities; yet biodiversity is a subject that is best tackled on a larger scale commensurate with the movement and distribution of species,

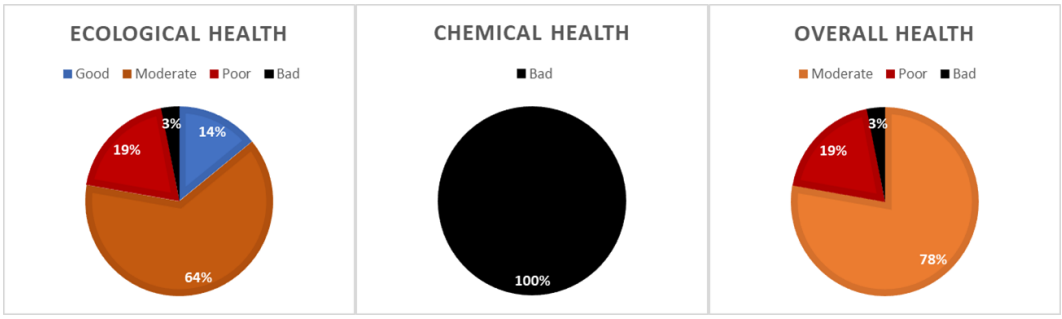
4. Native species in the CCNP area are under threat from invasive species such as American Mink (displacing Otters and threat to voles), Muntjac deer (removing food supplies and destructive of habitats for many species), there have been reports of Signal Crayfish (*Pacifastacus leniusculus*) on the River Marden at Horsebrook this highly aggressive species attacks water vole and the native, white-clawed crayfish (*Austropotamobius pallipes*). Invasive plant species are also present including Himalayan Balsam (*Impatiens glandulifera*), and Japanese Knotweed (*Fallopia japonica*). Without natural predators or pests, the population of invasive species can increase rapidly.

5. To some extent all species have always been at risk from disease and pests, recently however, there has been a measurable increase in incidences from outside the UK, such as avian flu, ash die back, and Dutch Elm disease. The RSPB is calling on the Westminster government to respond to the bird flu situation to deal with the current outbreak of Highly Pathogenic Avian Influenza (HPAI) (Reference 31) that has already killed tens of thousands of wild birds across the UK. This is a new virulent form of bird flu that originated in poultry in east Asia and has now killed thousands of wild geese and seabirds across Scotland, and in recent weeks birds have died in eastern and south-east England, with several species affected. There is also increasing evidence of impacts on birds of prey, particularly red kite and buzzard. There are many pests and diseases that threaten our native trees (Reference 32 gives a good overview of 24 key tree diseases and pests). Perhaps the most infamous tree disease that has killed millions of elm trees is Dutch Elm disease it is caused by the fungus *Ophiostoma novo-ulmi* which is spread by the elm bark beetle that was introduced from Canada in the 1960's. Ash dieback is expected to kill perhaps 80% of ash trees across the UK. It will change the landscape and threatens many species which rely on ash. Ash dieback (*Hymenoscyphus fraxineus*) is a fungus which originated in Asia. It doesn't severely damage its native hosts, the Manchurian ash, and the Chinese ash. However, its introduction to Europe about 30 years ago has devastated the European ash (*Fraxinus excelsior*) as it has no natural defence against the fungus. There are also threats to Birch, Chestnut, Beech, Oak, Plane and Juniper trees that are all in the CCNP area.

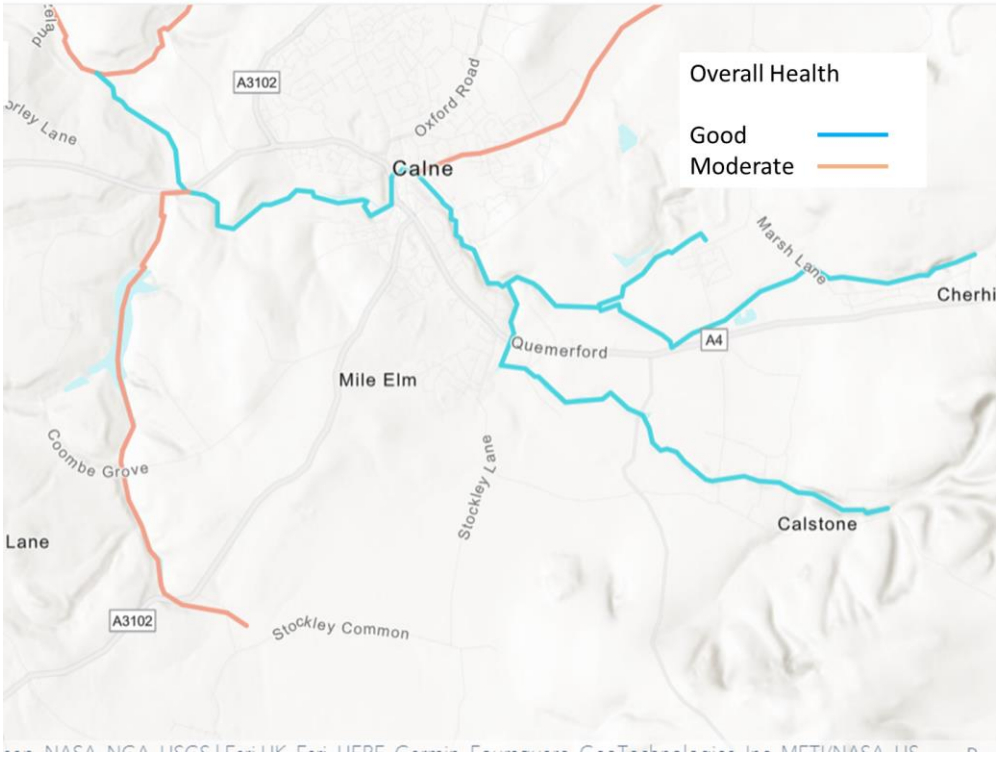
6. Pollution

    a. Water Pollution

    The Environment Agency in October 2021 stated that only 16% of England's water bodies are at good ecological status and over 10% of our freshwater and wetland species are threatened with extinction with two thirds of existing species in decline.



The health of our rivers is of major concern. Chemical health considers the presence (or absence) of a list of chemical pollutants using water sampling. Ecological health looks at what's living in the river. The presence, absence and abundance of species is a good indication of the general health of a river. While this is based on nationwide data; we are fortunate that the River Marden upstream of Cowage Brook is of good overall health and the Whetham Stream and Abberd Brook are of moderate health. As shown on the following map. Within this overall classification, however, are contained some issues that the River Marden fails to meet[18].



There are many pressures on rivers and wetlands but in a joint report (Reference 33) by the wildlife trusts, the Rivers Trust, the National Trust, similar bodies in Wales and the RSPB it indicates pollution to be the greatest impact to wildlife in and on England's waterways and wetlands. The six types of pollution are identified as:

[18] Environment Agency Catchment Data Explorer (August 2022) indicates the Marden fails to meet required levels for mercury compounds, Polybrominated diphenyl ethers (PBDE), and nickel compounds.

i. Sewage and storm overflows

The single activity with the most widespread impact on rivers is discharges of treated sewage effluent. This impacted 1,602 river waterbodies in 2020 (43% of river water bodies) Water companies are in theory only allowed to discharge untreated sewage into the environment in exceptional circumstances. However, in 2020 they released raw sewage into rivers over 400,000 times! Impacts from raw sewage spills via storm overflows contributed towards 12% of river water bodies failing standards. As a whole, the water sector contributed more than half of our river water bodies (53%) failing to achieve good status[19].

ii. Nutrients from agricultural land run-off

Agriculture uses fertilizers, manure, and slurry that all contain nitrates, ammonia, and phosphates to improve plant development. Run off from farmland can reach watercourses. These excess nutrients cause eutrophication, this is the overfeeding of aquatic plants such as algae, with a corresponding lowering of dissolved oxygen levels in the water, resulting eventually the death of aquatic plants and animals. Run off from farmland also is a cause of high sediment levels in brooks and streams in the area.

In rural areas, poor nutrient management (fertiliser) is the agricultural activity that has the greatest negative impact, affecting 36% of all river waterbodies, and poor livestock management affects 28%. This is usually poor management of manure and slurry, which when not properly contained, treated, or spread, can get washed off into rivers.

iii. Pesticide and herbicide usage

Agricultural practice frequently employs large scale usage of pesticides and herbicides. As these chemicals make their way into water courses, they can be highly damaging to aquatic plants and animals. Some pesticide usage is made of highly toxic chemicals. The impact of long-term low-level exposure to such toxic chemicals on aquatic animals is detrimental but the severity is not fully understood.

iv. Chemical pollution from mineral extraction and waste heaps

The CCNP area does not have active or abandoned mineral processing waste heaps, however, there is an active waste processing and land fill area within the area.

v. Plastic pollution in freshwater systems

The impact of microplastic particles on water quality has been studied mainly in the marine environment, there is little research on the impact of plastic in freshwater systems, however, studies suggest that such pollution has detrimental effects to ecosystems.

[19] Data in this section is taken from the Rivers Trust report 'State of Our Rivers'

vi. Pharmaceutical residues

When pharmaceuticals used in human or animal health measures, such as pet flea treatments, enter freshwater systems they can cause changes in aquatic animal behaviour and their reproductive success.

b. Air Pollution

The subject of air quality has often focussed on the impact on peoples' health and less on the impact on other species. There is, however, a link between certain air pollutants and biodiversity loss. (Reference 34.) There is now a concern about the amount of nitrogen and ammonia from vehicle emissions, fossil fuel usage and agriculture that enters the environment. This eutrophication causes an excess of nitrogen-loving plants like nettles, brambles and cow parsley driving out other vulnerable plants. Verges that are heavy with such species may be indicative of this effect. Many catalytic converters change nitrogen oxides into ammonia, better for humans, but possibly much worse for roadside habitats. Hybrid vehicles are a particular concern as their ammonia pollution spikes when their engine starts.

Air quality has been a long-standing concern in the area as the A4 and the A3102 run through the planning area and high levels of air-borne particulate levels have been measured for many years.

7. Climate change

The environmental changes being driven by climate change are disturbing natural habitats and species in ways that are still not clear. There are signs that rising temperatures are affecting biodiversity, while changing rainfall patterns, extreme weather events, are putting pressure on some species. The threat posed by climate change to biodiversity is expected to increase, yet thriving ecosystems also have the capacity to help reduce the impacts of climate change. Climate change, that is rising global temperatures, can lead to:

i. Reduction in water vapour levels (observed since 1970's)
ii. Periods of low rain or even droughts
iii. Increase in grassland and woodland fires
iv. Increased intensity storms
v. Changes in plant phenology – recent studies by the University of Cambridge (Reference 35) indicate UK plants are flowering a month earlier than historical records this leads to a phenomenon termed ecological mismatch as other species that synchronise their migration or hibernation can be left without the flowers and plants; they rely on which in turn can lead to biodiversity loss if populations cannot adapt quickly enough.

All these factors have the potential to impact biodiversity both directly and indirectly through lower water levels, the drying out of wetlands, increased soil erosion. Water table levels in chalk lands that are already be under pressure from water abstraction are likely to further fall.

Proposed Principles for the CCNP

The following principles are proposed to guide the development of policies in the CCNP.

Proposed Principles for CCNP

1. Only development proposals that improve habitats for wildlife will be supported. This may be demonstrated by:
    a. Showing a net increase the biodiversity index of 10% or greater within the CCNP area, or
    b. Demonstrating full compliance of the standards of BwN 2.0.

2. Development proposals for areas that are identified as blue-green wildlife corridors will not be supported if they are adjudged to reduce the quality or effectiveness of the corridor materially. Development should protect and, wherever possible enhance landscapes, woodland, hedgerows, ponds, lakes, rivers, streams, ditches, and wildlife habitats. Such corridors should include ecology buffers of 200m of the main watercourse of the River Marden and 100m of other watercourses including the disused Wiltshire & Berkshire Canal.

3. Permission should be refused for development that results in the loss or deterioration of irreplaceable or fragile habitats in line with National Policy. In particular:

    a. Development should not be approved within 200m of the river Marden where the adjacent land is accessible to otters,
    b. Development should not be approved that would reduce or damage the habitat of water voles (in particular in the Abberd Brook area),
    c. Development should not be approved that would require the removal of hedgerows or trees. As these support the movement of bats along the Marden Valley.

4. Development proposals must include provisions for the protection, enhancement and maintenance of wildlife habitats and biodiversity in accordance with the following guidance.

Guidance for Proposals

Development proposals should contain provisions where applicable for:

1. Protecting and enhancing designated sites, including SSSI's, designated County Wildlife Sites, local green spaces, green corridors, sites with observations of protected species, ancient or species-rich woodland, hedgerows, and grasslands,

2. Preserving ecological networks and the migration of flora and fauna between the proposed development area and the surrounding countryside habitats along green/blue corridors,

3. Protecting ancient trees or trees of arboricultural value, and where appropriate enhancing woodlands,

4. Promoting the enhancement, preservation, restoration and recreation of wildlife habitats, and the protection and recovery of priority species, and using appropriate mitigation to offset any potential harm,

5. Providing a Biodiversity Net Gain (BNG) of 10% within the CCNP area. The process followed to design and implement BNG will be in accordance with DEFRA 3.0

6. Adopting best practice in application of Sustainable Urban Drainage Systems for enhancing biodiversity,

7. Providing native pollinator-friendly planting in landscaping proposals,

8. Demonstrating how development proposals for sites adjacent to existing green spaces and to open countryside will provide an appropriate and sensitive interface or 'buffer' through their layout and/or landscape design to minimise negative impacts on these existing habitats and retain the overall ecological integrity and habitat connectivity,

9. Demonstrating the development proposal is compliant with and accredited as meeting Building with Nature Standards,

10. Maximising opportunities to support biodiversity within building design such as through the use of green roofs, bat and bird boxes, and swift and bat bricks, and

11. Developer contributions shall be used to invest in the enhancement of biodiversity within the CCNP area's green spaces.

Conclusion

Within the context of the climate and ecological emergency, and with increasing emphasis on the importance of bio-diversity, the Neighbourhood Plan should be updated to ensure that development, where it is necessary, is designed and managed in ways that protect and conserve critical habitats and species.

Glossary

The following is a glossary of technical terms and abbreviations

AONB	Area of Outstanding Natural Beauty
BGI	Blue Green Infra structure
BwN	Building with Nature
CCNP	Calne Community Neighbourhood Plan
CRoW	Countryside and Rights of Way Act 2000
CWS	County Wildlife Site
DEFRA	Department for Environment, Food and Rural Affairs
EPS	European Protected Species
FoMV	Friends of the Marden Valley
HPAI	Highly Pathogenic Avian Influenza
LPA	Local Planning Authority
JNCC	Joint Nature Conservation Committee
MCWT	Marden Conservation and Wildlife Trust
NCA	National Character Area
NERC	Natural Environment and Rural Communities Act (2006)
NPPF	National Planning Policy Framework
NRN	Nature Recovery Network
PBDE	Polybrominated Diphenyl ethers
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
UK BAP	UK Biodiversity Action Plan
WBAP	Wiltshire Biodiversity Action Plan
WCA	Wildlife & Countryside Act 1981
WWT	Wiltshire Wildlife Trust

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Appendix 1 Detailed Species Observations

Observations in the area were taken from the National Biodiversity Network Atlas and Field Studies in the area. Over 74,000 records were examined and old ones (prior to 1980) were removed to provide a 'Recent data set'. The overall results are as follows.

	'Recent data' set
Number of observations	71,431
Number of species S	1,957
Shannon index H	5.73
Simpson index D	128

The observations were of Animals, Plants and Fungi only. So, protozoa and bacteria are excluded. The species richness index, the total number of different species observed, S (all dates) is made up as follows:

- 780 species of animals of which 73 are listed in the Wiltshire Biodiversity action plan (WBAP).
- 1080 species of plants of which 21 are listed in the WBAP.
- 331 species of fungi recorded of which 1 is listed by WBAP

In some classes of species, the area is indeed biologically diverse for example of the 18 species of bat found in the UK 14 are found in the area. The area contains 95 rare or locally rare species that are identified by the Wiltshire Biodiversity action plan.

The number of recorded observations was used as a proxy for population abundancies to calculate the Shannon and Simpson indices above.

Priority Species found in the area

The priority species are as listed by the UK Biodiversity Action Plan (Reference 10.) that is they are essentially section 41 species. The following priority species have been observed in the CCNP area and its surroundings.

Priority Animal Species

7 Mammals

Arvicola amphibius	European Water Vole
Barbastella barbastellus	Barbastelle Bat
Lepus europaeus	Brown Hare
Lutra lutra	Eurasian Otter
Pipistrellus pygmaeus	Soprano Pipistrelle
Plecotus auritus	Brown Long-eared Bat

Rhinolophus ferrumequinum	Greater Horseshoe Bat

25 Birds

Alauda arvensis	Skylark
Anser albifroms	European White-fronted Goose
Anthus trivialis	Tree Pipit
Coccothraustes coccothraustes	Hawfinch
Cuculus canorus	Cuckoo
Dryobates minor	Lesser Spotted Woodpecker
Emberiza calandra	Corn Bunting
Emberiza citrinella	Yellowhammer
Emberiza schoeniclus	Reed Bunting
Larus argentatus	Herring Gull
Locustella naevia	Grasshopper Warbler
Motacilla flava	Yellow Wagtail
Muscicapa striata	Spotted Flycatcher
Numenius arquata	Curlew
Passer domesticus	House Sparrow
Passer montanus	Tree Sparrow
Perdix perdix	Grey Partridge
Phylloscopus sibilatrix	Wood Warbler
Poecile montanus	Willow Tit
Poecile palustris	Marsh Tit
Pyrrhula pyrrhula	Bullfinch
Streptopelia turtur	Turtle Dove
Sturnus vulgaris	Starling
Turdus philomelos	Song Thrush
Vanellus vanellus	Lapwing

2 Fish

Anguilla anguilla	European Eel
Salmo trutta	Brown Trout

15 Butterflies and Moths

Adscita statices	Forester
Anchoscelis litura	Brow-Spot Pinion
Cupido minimus	Small Blue
Diarsia rubi	Small Square Spot
Diloba caeruleocephala	Figure of Eight
Erynnis tages	Dingy Skipper
Hamearis lucina	Duke of Burgundy
Hemaris tityus	Narrow-bordered Bee Hawk Moth
Lasiommata megera	Wall
Pyrgus malvae	Grizzled Skipper
Rhizedra lutosa	Large Wainscot
Satyrium w-album	White-letter Hairstreak
Scotopteryx chenopodiata	Shaded Broad-bar
Spilosoma lubricipeda	White Ermine
Tyria jacobaeae	Cinnabar

1 Beetle

Meloe proscarabaeus	Black Oil Beetle

1 Bee

Bombus humilis	Brown-banded carder bee

1 Cricket

Decticus verrucivorus	Wart-biter

1 Crustacean

Austropotamobius pallipes	Freshwater White-clawed Crayfish

4 Herptiles

Anguis fragilis	Slow-worm
Bufo bufo	Common Toad
Triturus cristatus	Northern Crested Newt
Zootoca vivipara	Common Lizard

Priority Plant Species

Arabis glabra	Tower Mustard
Astragalus danicus	Purple Milk-vetch
Bupleurum rotundifolium	Thorow-wax
Centaurea cyanus	Cornflower
Cephalanthera damasonium	White Hellborine
Clinopodium acinos	Basil Thyme
Coeloglossum viride	Frog Orchid
Didymodon glaucus	Glaucous Beard-moss
Euphrasia pseudokerneri	Chalk Eyebright
Galium tricornutum	Corn Cleavers
Gentianella anglica	Early Gentian
Herminium monorchis	Musk Orchid
Juniperus communis	Juniper
Moehringia trinervia	Three-nerved Sandwort
Oenanthe fistulosa	Tubular Water-dropwort
Ophrys insectifera	Fly Orchid
Platanthera bifolia	Lesser Butterfly-orchid
Ranunculus arvensis	Corn Buttercup
Silene gallica	Small-flowered Catchfly
Valerianella rimosa	Broad-fruited Cornsalad
Weissia sterilis	Sterile Beardless-moss

Priority Fungi Species

Caloplaca herbidella s. lat.	
Tracya hydrocharidis	Frogbit Smut