

Reading Biodiversity Action Plan

Draft for consultation

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1. Executive summary

[To be completed]

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2. Biodiversity

What is biodiversity?

Biodiversity (a contraction of 'biological diversity') refers to the variety of life and its processes; including the variety of living organisms, the genetic differences amongst them, and the communities and ecosystems in which they occur.

An ecosystem can be as large as a river system or as small as a rotting log. It is a community of plants, animals and microorganisms, along with their environment, that function together as a unit.

Why is biodiversity important?

Biodiversity is important both in its own right and as an indicator of the wider health of the environment.

We all rely on biodiversity for our physical needs; it provides natural services (sometimes referred to as ecosystem services) such as food, clean air and water.

Biodiversity improves people's quality of life, in terms of providing leisure and educational resources for society and opportunities to experience the natural world and access to nature has been shown to have numerous benefits for people's mental and physical health and wellbeing.

Biodiversity will help us adapt to climate change. As the climate changes healthy ecosystems and the services they provide will be increasingly valuable, but at the same time biodiversity will be threatened by an increasingly unpredictable climate.

What is a Biodiversity Action Plan?

A Biodiversity Action Plan (BAP) is a framework for conserving and enhancing biodiversity. It sets out the actions that will be taken to achieve this.

Why does Reading need a Biodiversity Action Plan?

Across the globe biodiversity is declining, with rates of extinction now far in excess of background rates. Many scientists believe that we are entering

the sixth mass extinction. If this loss continues it will have serious consequences for humankind as the natural systems that we all rely on break down particularly as the council tries to tackle the Climate Emergency that was declared by Reading Borough Council and the national government and in 2019.

Reading is rich in biodiversity along its rivers, in its parks, gardens and open spaces. However, without action to prevent activities that harm biodiversity and to encourage those that help it, biodiversity will continue to decline, and we will be much poorer for it.

Actions to conserve biodiversity happen at a local level and Reading's BAP provides a framework to ensure that actions are coordinated and targeted.

The 2006 Reading BAP

Reading's previous BAP was written in 2006 and ran until 2015. It has not been updated. It was organised as a series of 19 'Action Plans', divided into Habitat Action Plans and Species Action Plans. These were:

Habitats

1. Urban I
2. Urban II
3. Semi-Natural Grasslands
4. Parkland and Veteran Trees
5. Ancient and Species Rich Hedgerows
6. Broad Leaved Woodland
7. Ponds (Standing Open Water) and Reedbeds
8. Rivers

Species

1. Black Poplar
2. Loddon Lilly
3. Glow Worm
4. Stag Beetle
5. Bat Species
6. Water Vole
7. Black Redstart

8. House Sparrow
9. Sand Martin
10. Great Crested Newt
11. Slow Worm

The updated BAP will be organised differently, around themes rather than habitats and species.

What is the vision for Reading's biodiversity?

In late 2019 and early 2020, a group of people from the council, nature conservation organisations and voluntary groups came together to write Reading's new BAP. They agreed on the following vision statement for biodiversity in Reading:

By 2030 Reading will be a borough rich in wildlife, accessible to and valued by its residents, better connected to the wider landscape including through its urban areas. The conservation and enhancement of biodiversity will be integral to the actions of the council and others and the decline in biodiversity will have been reversed. Important wildlife sites and habitats will be protected, maintained, restored and enhanced and new wildlife habitats will be created - both for nature itself and for the benefits it provides to the people of Reading - capable of withstanding the climate emergency, and helping to mitigate the effects of a changing climate.

How is the BAP structured, what are its aims, and who will it be used by?

Section 8 of this document sets out the new BAP's Themes for Action. Collectively these will ensure that:

- 1) Reading's biodiversity is protected
- 2) The decline in Reading's biodiversity is reversed
- 3) Important wildlife sites and habitats are restored, extend and enhanced
- 4) New wildlife rich habitats are created
- 5) Reading's biodiversity is valued by its residents

6) Reading's biodiversity is resilient to climate change and will help mitigate its effects.

It will be used by the council, particularly the following departments:

- Planning and development control
- Sustainability
- Highways
- Parks
- Education
- Housing
- Property

and other stakeholders including:

- Developers
- Private landowners
- Wildlife groups
- Governmental organisations such as the EA and the Canals and Rivers Trust
- Volunteer groups.

It will guide their actions, ensure those actions are coordinated and targeted and provide a baseline against which actions can be measured.

The BAP will be overseen by Reading Borough Council's Planning Policy Team. It will be reviewed annually and updated accordingly.

A report detailing the actions that have been taken will be published annually. A review of the BAP's actions will be undertaken when necessary with a report taken to the council committee whenever any major changes are proposed.

3. Policy and legislation

Reading Borough Council, along with all public bodies, has a legal duty to conserve biodiversity. This is set out under section 41 of the 2006 Natural Environment & Rural Communities Act (The NERC Act) as follows:

“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.”

There is also a raft of other policy and legislation, including:

1. The Convention on Biological Diversity - signed by 168 countries including the UK in 1992 at the Earth Summit in Rio de Janeiro.
2. European Union Directives, in particular the Habitats Directive, The Birds Directive and The Water Framework Directive. These have been transposed into UK law and will continue to apply unless or until the acts which have transposed them have been revoked.
3. Domestic legislation such as The Wildlife & Countryside Act, which amongst other things provides protection for nesting birds and prohibits the release of invasive species, and The Badgers Act.
4. Planning Policy, as set out in the National Planning Policy Framework (NPPF) and Reading Borough's Local Plan.
5. Other Council and local policies such as The Tree Strategy and The Climate Change Action Plan (both of which have been updated at the same time as the BAP and provide a comprehensive approach to the conservation of Reading's environment).
6. The Environment Bill (likely to soon become The Environment Act) which sets out the government's targets, plans and policies for improving the natural environment and provisions about nature and biodiversity (if passed it will give the government's 25 Year Environment Plan on a statutory footing)

Further details are provided in Appendix 3

4. The state of biodiversity

We are living through an ecological and climate crisis. Biodiversity is diminishing across the globe and the quantity and diversity of wildlife even at a local level is declining. Many scientists now think that we are living through the sixth mass extinction event with a recent and sobering scientific studyⁱ concluding that:

“The evidence is incontrovertible that recent extinction rates are unprecedented in human history and highly unusual in Earth’s history. Our analysis emphasizes that our global society has started to destroy species of other organisms at an accelerating rate, initiating a mass extinction episode unparalleled for 65 million years. If the currently elevated extinction pace is allowed to continue, humans will soon (in as little as three human lifetimes) be deprived of many biodiversity benefits. On human time scales, this loss would be effectively permanent because in the aftermath of past mass extinctions, the living world took hundreds of thousands to millions of years to rediversify. Avoiding a true sixth mass extinction will require rapid, greatly intensified efforts to conserve already threatened species and to alleviate pressures on their populations—notably habitat loss, overexploitation for economic gain, and climate change. [...] However, the window of opportunity is rapidly closing.”

International context

A recent UN reportⁱⁱ found that:

“The average abundance of native species in most major land-based habitats has fallen by at least 20%, mostly since 1900. More than 40% of amphibian species, almost 33% of reef-forming corals and more than a third of all marine mammals are threatened. The picture is less clear for insect species, but available evidence supports a tentative estimate of 10% being threatened. At least 680 vertebrate species had been driven to extinction since the 16th century and more than 9% of all domesticated breeds of mammals

used for food and agriculture had become extinct by 2016, with at least 1,000 more breeds still threatened.”

National context

About every 3 years, The State of Nature partnership (comprising over 70 partners drawn from conservation NGOs, research institutes, and the UK and national governments) publishes an audit of Nature in the UK. The 2019 reportⁱⁱⁱ found:

1. Our indicator of average species’ abundance of 696 terrestrial and freshwater species has fallen by 13% since 1970; the rate of decline was steeper in the last 10 years, although not statistically significantly so
2. Our indicator of average species’ distribution, covering 6,654 terrestrial and freshwater species over a broad range of taxonomic groups, has fallen by 5% since 1970, and is 2% lower than in 2005.
3. More species have shown strong or moderate decreases in abundance (41%) than increases (26%) since 1970, and likewise more species have decreased in distribution (27%) than increased (21%) since 1970
4. Our wildlife is undergoing rapid change; the proportion of species defined as showing strong changes in abundance, either increasing or decreasing, rose from 33% over the long term to 53% over the short term.
5. Of 8,431 species that have been assessed using regional Red List criteria, 15% have been classified as threatened with extinction from Great Britain, and 2% are already extinct.
6. An assessment based on the best available data indicates that, although progress has been made, the UK will not meet most of the CBD’s 2020 Aichi target [In 2010, in Nagoya, Aichi Province, Japan, the signatories to the CBD published a Strategic Plan for Biodiversity for the years 2011-2020. This included five strategic goals and 20 targets referred to as the ‘Aichi Targets’.]

Local context

Despite being an urban borough Reading is rich in wildlife:

1. It lies next to two Areas of Outstanding Natural Beauty: the Chilterns to the north, and, the North Wessex Downs to the west.
2. It has two large rivers running through it, the Thames and the Kennet (and their floodplains) with a total of 62km of watercourses including streams.
3. Outside of private gardens, there are 200 hectares of woodland and 800 hectares of grassland, equating to around one quarter of the total area of the borough (4000 ha.).
4. There are five local nature reserves - Clayfield Copse, Blundells Copse, Round Copse, McIlroy Park, and, Lousehill Copse
5. There are 21 Local Wildlife Sites (LWSs).
6. There are two woodlands listed on Natural England's Ancient Woodland Inventory
7. Thames Valley Environmental Records Centre (TVERC) hold records of 274 priority, protected and or notable species that have been recorded within the borough since 1970. This includes 8 reptile & amphibian species, 109 bird species, 18 terrestrial mammals, 7 fish, 59 plant and 70 invertebrates. Not all of these species are resident, some may have been seen on just a few occasions, and some such as the palmate newt may no longer be found in the borough.

(See Appendices 1 and 2 for maps and species lists.)

Monitoring in Reading

TVERC collect and collate data about biodiversity in the Thames Valley. Reading Borough Council have a service level agreement with them.

TVERC has mapped habitats in Berkshire and Oxfordshire using a mixture of field survey data and aerial photograph interpretation. The habitat map is constantly improving as new data becomes available.

TVERC also collects and collates ecological records for the borough and members of the public are encouraged to submit their records to them. The council receives regular data updates.

TVERC also run the Local Wildlife Site project in Berkshire. They survey LWSs about once every 10 years. Further information on this is provided below.

Other than TVERC surveys and surveys to inform development proposals, there are very few direct studies of biodiversity in Reading. However, we do know that:

1. 85% of the borough's Local Wildlife Sites have management plans in place, meaning that they are being managed, at least in part, for wildlife, and are classified by DEFRA as being in "positive conservation management"
2. There is anecdotal evidence that some bird populations, including swifts and house sparrows, are declining.
3. Numbers of some species, such as the Red Kite, have increased.
4. Populations of some species, such as glow worms and water vole, are likely to have disappeared.

Recent actions

A number of projects in Reading over the last 10 years have helped conserve biodiversity. These include:

- The implementation of a Higher Level Stewardship agreement with Natural England which resulted in the meadows at Bugs Bottom, Clayfield Copse, McIlroys Park, Prospect Park, Hills Meadow and Arthur Newbury Park being managed as hay meadows.
- The production, with help from The Forestry Commission, of Woodland Management Plans for the majority of the council's woodlands.
- The creation of the Fobney Island Nature Reserve which by 2018 had become rich enough in wildlife to be designated as a LWS
- Detailed design input into new development proposals by the Planning Department's Natural Environment Team to ensure that nature is conserved and new habitat for wildlife is provided.

5. Habitats

TVERC has mapped habitats in Berkshire and Oxfordshire using a mixture of field survey data and aerial photograph interpretation. It includes most open spaces but does not include private residential gardens.

The habitat map is constantly improving as new data becomes available but there tend to be major updates whenever new aerial photography becomes available. In Reading, due to Heathrow airport, new aerial photography is collected less frequently than elsewhere. The most recent aerial photography data for Reading is from 2016.

Habitat classifications

There are a number of ways that habitats are classified in the UK and these are discussed below:

Phase 1

The Phase 1 habitat classification system was first published by the Nature Conservancy Council (NCC) in 1990. It is a standardised system for classifying and mapping wildlife habitats in all parts of Great Britain, including urban areas, and is widely used as the standard technique for habitat surveys. Habitats are classified to a broad habitat such as woodland, grassland, open water etc., and then sub-divided further to provide the Phase 1 habitat type, such as broad leaved semi-natural woodland, calcareous grassland etc.

It was developed before the time when computer based geographical information systems were available and, due to the ways that habitats are mapped (as a mixture of point, line and polygon data), is not best suited to computer based analysis.

National Vegetation Classification

This is a detailed botanical survey. Habitats are classified according to published descriptions given in the National Vegetation Classification (NVC) (e.g. “w6 Alnus glutinosa - Urtica dioica woodland” or “CG1 Festuca ovina-Carlina vulgaris grassland”) developed and published in the 1980s by the

Joint Nature Conservation Council (JNCC). There is very little NVC survey data for Reading.

Integrated Habitats Classification (IHS)

The Integrated Habitat System (IHS) was developed by the Somerset Environmental Records Centre (SERC). It was designed to be used in the UK, and is an integration of existing classification systems including Priority Habitats (as defined under the NERC Act), Phase 1 and NVC.

It was developed for use with modern IT systems and is increasingly used for mapping habitats.

Priority Habitats

Priority Habitats are habitats that are of principal importance for the conservation of biodiversity in England. The secretary of state is required to periodically publish (via the JNCC) a list of these habitats under Section 41 (S41) of the 2006 Natural Environment and Rural Communities (NERC) Act. The list evolved from the UK BAP that was first published in 1994. They are routinely referred to as Habitats of Principal Importance (HPI), Section 41 (S41) Habitats, UK BAP Habitats and Priority Habitats.

We refer to them as Priority Habitats in this document as this is the terminology used in National Planning Policy Framework (NPPF).

An overview of habitats in Reading

The table below lists the Phase 1 habitat types found in Reading and their extent as per the TVERC habitat dataset.

Phase 1 Habitats	Area (Ha.)
Grassland habitats	
Cultivated/disturbed land - amenity grassland	287
Improved grassland	184.6
Neutral grassland - semi-improved	304.6
Parkland and scattered trees	4.3
Total	780.5
Woodland habitats	

Broadleaved woodland - plantation	11.8
Broadleaved woodland - semi-natural	151.5
Coniferous woodland - plantation	0.6
Mixed woodland - semi-natural	3.2
Scrub - dense/continuous	35.2
Scrub - scattered	1.3
Total	203.6
Wetland habitats	
Fen	5
Running water (Excl. River Thames)	23.9
Standing water	15.1
Swamp	22.6
Total	66.6
Other habitats	
Bare ground	2.4
Allotments	31.2
Ephemeral/short perennial	0.2
Tall ruderal herb	4.7
Quarry	8.8
Total	47.3

The table below lists the Priority Habitats found in Reading and their extent as per the TVERC habitat dataset.

Priority habitat	Area (Ha.)
Grassland habitats	
Coastal and floodplain grazing marsh	128.4
Lowland meadows	4.8
Total	133.2
Woodland habitats	
Lowland mixed deciduous woodland	134.5

Lowland wood pasture and parkland	33.9
Wet woodland	8.7
Total	177.1
Wetland habitats	
Reedbeds	1.1
Ponds	0.1
Lowland fens	26
Eutrophic standing waters	10.2
Total	37.4
Other habitats	
Traditional orchards	1.2
Open mosaic habitats on previously developed land	34.8
Total	36

Woodland, trees and hedgerows

Woodland

Excluding scrub, there are approximately 167 ha of woodland in Reading. Of this, RBC owns approximately 92 ha., with the remainder 75ha. in other ownership. There is a mixture of woodland types ranging from the ancient broadleaved woodland at Clayfield Copse to newly planted woodlands such as that at Balmore Walk.

It is important to manage our woodlands because many of our rarer and endangered species rely on the associated habitats, in particular the open and regenerating habitats, that woodland management produces. Lack of management has reduced habitat and structural diversity in Britain's woodlands and is the biggest threat to the UK's small woodlands.

Woodland management

Of the woodland managed by Reading Borough Council, most have a management plan in place. These were produced in conjunction with the Forestry Commission and adopted by the council in 2012. They are 10 year

plans and will need to be reviewed in 2022. The woodlands for which management plans were produced are:

1. Arthur Newbury and McIlroys Park
2. Blundells Copse
3. Bugs Bottom and Furzeplat
4. Clayfield Copse and Blackhouse Woods
5. Beech (or Highdown) Wood, Rotherfield Waye Copse and Balmore Walk
6. Lousehill copse
7. Prospect Park, Devils Dip and Southcote Linear Park
8. Thames woodlands (Hills Meadow, Kings Meadow and View Island)
9. The Cowsey
10. Warren Woodland Escarpment

When the plans are reviewed it will be important to ensure that the following management considerations are addressed:

- New pests and diseases such as ash dieback and oak processionary moth
- Species selection to take account of climate change and resilience to new pests and diseases
- The retention of standing deadwood
- Where the council does not own or manage a woodland, it has only limited options to control changes, mainly through the planning system. For example, where a woodland has a Tree Preservation Order (TPO), the council can request that a management plan is drawn up when a TPO application is submitted, and planning policy protects woodlands (most of which is Priority Habitats) from removal.
- The council does however own small plots of woodland outside of public parks. It will be important that wherever possible these are kept in public ownership, as this means they are more likely to be managed beneficially for biodiversity.

Regenerating Ash at Clayfield Copse, much of which now suffers from Ash dieback. Management of our woodlands will need to account for this disease.



New woodland

Due to the size and urban nature of Reading there are likely only limited opportunities for new woodland planting. Where these opportunities do exist, they are likely to be associated with new development although there may be some areas in Reading's parks and open spaces that can be planted.

Ancient woodland

Ancient woodland is defined as land that has been continuously wooded since at least 1600. This is around the date of the earliest maps, and it is considered that if an area was woodland at this time then it is likely to have always been wooded.

In the 1990s English Nature, now Natural England, reviewed old maps; in particular, Ordnance Survey's First Series 1:25,000 maps, and created an inventory of woodlands more than 2ha in size. This was the basis for the Ancient Woodland Inventory (AWI).

In Reading there are two woodlands listed on the AWI - Kentwood Grove (McIlroys Park) and Blackhouse Woods (Clayfield Copse) (see appendix 1)

Natural England have advised local authorities that they should carry out their own assessments to identify smaller woodlands which were likely to be "ancient" and some authorities in Berkshire have commissioned TVERC to carry out such a review.

The council will work with voluntary groups such as Caversham Globe and Reading's Tree Wardens to carry out a review of ancient woodland in Reading.

Ancient and veteran trees

The NPPF defines an 'ancient' or 'veteran' tree as:

"A tree which, because of its age, size and condition, is of exceptional biodiversity, cultural or heritage value. All ancient trees are veteran trees. Not all veteran trees are old enough to be ancient, but are old relative to other trees of the same species. Very few trees of any species reach the ancient life-stage."

Such trees can be found as individuals or in groups and can be found in historic parkland, hedgerows, gardens and ancient woodlands. They support a variety of wildlife, such as the stag beetle, that are associated with dead or decaying wood.

The Woodland Trust's Ancient Tree Inventory has a map showing ancient and veteran trees and many of Reading's ancient and veteran trees are shown on this map (see <https://ati.woodlandtrust.org.uk/>)

[Text box: Ancient woodlands and veteran trees and development control.

Ancient woodland and veteran trees are specially protected through the planning process and the NPPF reads:

"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"]

Veteran Yew Tree in Caversham Court (photo courtesy of Dave Kenny)



Wood pasture

Parts of Prospect Park fit the priority habitat description of 'Lowland Wood Pasture & Parkland': it is an old parkland landscape containing veteran trees over what was once grazed grassland, relatively unimproved and species rich in places, and managed as a hay meadow on the slopes below the Mansion House.

Street trees

The borough has numerous street trees, many of which were planted in the 19th Century, with particularly fine examples along London and Kendrick Road. These are managed by the council who have a rolling programme of street tree planting and management. The Council have produced a Tree Strategy, which details the measures that the council will take to manage these trees and as such they are outside of the remit of the BAP.

Hedgerows

The Priority Habitat description for hedgerows is as follows:

“any boundary line of trees or shrubs over 20m long and less than 5m wide, and where any gaps between the trees or shrub species are less than 20m wide. Any bank, wall, ditch or tree within 2m of the centre of the hedgerow is considered to be part of the hedgerow habitat, as is the herbaceous vegetation within 2m of the centre of the hedgerow. All hedgerows consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species are covered by this priority habitat, where each UK country can define the list of woody species native to their respective country. Climbers such as honeysuckle and bramble are recognised as integral to many hedgerows, however they require other woody plants to be present to form a distinct woody boundary feature, as such they are not included in the definition of woody species. The definition is limited to boundary lines of trees or shrubs, and excludes banks or walls without woody shrubs on top of them.”

The Hedgerows Regulations 1997 are intended to protect important countryside hedges from destruction or damage. They are part of the planning regulations and administered by the local planning authority. It is an offence to remove an important hedgerow (as defined under the regulations) without have received written notice from the local planning authority that works can commence. They do not apply to hedgerows within the curtilage of, or marking a boundary of the curtilage of, a dwelling-house, and there are a number of other exemptions. An ‘important’

hedgerow is one that fulfils a number of criteria including the number of woody and ground flora species it contains, and its location.

There is no definitive list of hedgerows in Reading. However, it is likely that there are a number of hedgerows that fit the Priority Habitat description, but only a few, such as the hedgerow at the northern end of Bugs Bottom are likely to be considered as ‘important’ under the Hedgerow Regulations.

It will be necessary to ensure that existing hedgerows are retained and managed appropriately (for example by cutting them after the winter, but before the nesting season, so that they provide food for overwintering birds).

A mixed native hedgerow in an urban garden. This provides a greater diversity and abundance of food than ornamental hedgerows



Grasslands

Unimproved grasslands are grasslands that appear never to have been “improved” that is that they have not been reseeded, drained or fertilised. In England there are around 4.5 million hectares of grassland, of which just 100,000ha is “unimproved”.

Unimproved grasslands contain a much greater diversity of grasses, sedges, rushes and wildflowers and are much richer in wildlife. They are often referred to as wildflower meadows. Conversely, “improved” grasslands have far fewer species, often only a few grass species with the occasional weed, and offer very little value for wildlife.

However, there is a continuum between improved and unimproved grasslands and generally speaking the longer a grassland has been left without “improvements” the closer to an unimproved grassland it becomes. These grasslands are referred to as “semi-improved” grasslands.

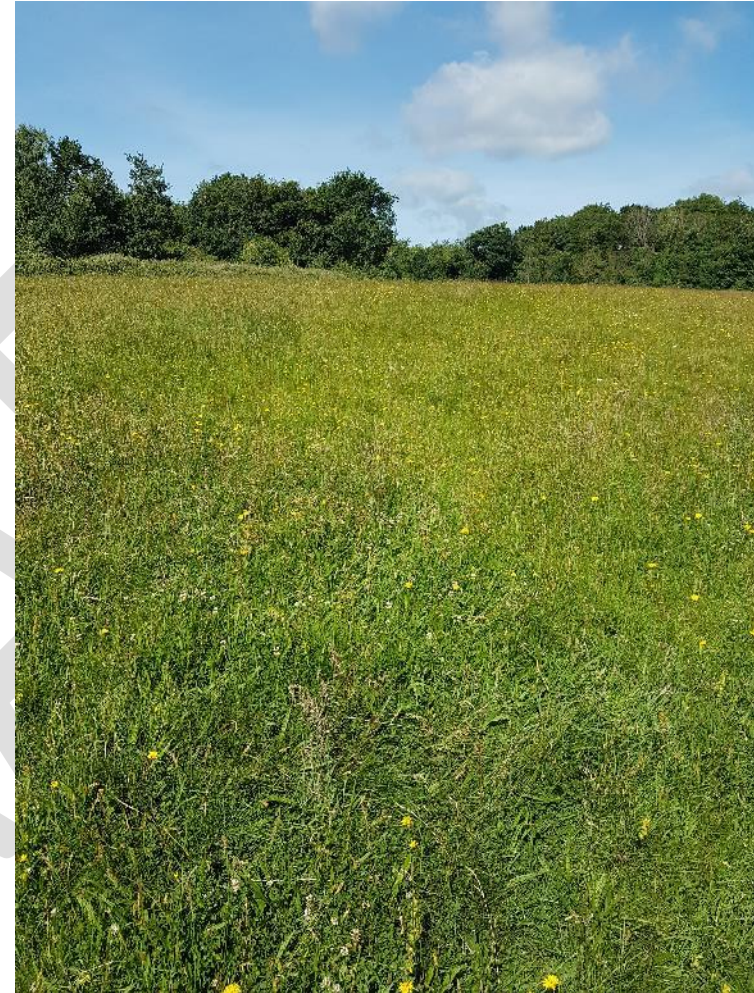
Grasslands can also be classified according to the soil type, either neutral, acid or calcareous, and or their level of waterlogging.

In Reading, other than the marshy grassland along the river valley to the west of the A33, there are no unimproved grasslands (it is possible that the grassland on the steep slopes of Balmore Walk has never been “improved” but due to the heavy mowing regime the species richness is likely to have declined). The majority of the grass is either short cut amenity grassland (287ha.) or other improved grasslands (185 ha.).

Reading’s hay meadows

Some of the semi-improved grasslands were bought into management as hay meadows in 2011 through a grant from Natural England through their Higher Level Stewardship (HLS) scheme, and approximately 35 hectares of grassland are managed as wildflower meadow with a hay cut taken once per annum. Of these, parts of Clayfield Copse, McIlroys Park, Prospect Park and McIlroys Park were sown with a mix of wildflower seeds and the species diversity increased.

The reseeded meadow at Arthur Newbury Park 5 years after it was reseeded



It costs more to manage an area as a hay meadow than as amenity grassland. Therefore, when the HLS agreement comes to an end the council will need to commit to funding this management.

Road verges and roundabouts.

The council’s Highways Department is responsible for the operation and maintenance of 392km of road and 800km of pavements, much of which has

a grassed verge and roundabouts. Some areas are likely to contain rare species such as the Lizard Orchid that was found on the Basingstoke Road in 2019. These areas are, as a rule, managed as regularly cut amenity grassland, with only a few areas managed as less frequently cut grass.

Road verges are very important for allowing wildlife, particularly pollinators (such as bees) and other invertebrates, to move through the landscape. However, it can be more difficult to manage road verges for wildlife. This is because the arisings need to be removed and disposed of, and litter in long grass can be an issue; people's perception of tidiness can conflict with what is good for wildlife.

Parks

As with road verges, there may be parts of Reading's parkland and urban greenspaces that can be managed as less frequently cut grass. The council will need to carry out steps to identify suitable areas.

Watercourses

According to the EA's Detailed River Network dataset, there are 62Km (39 miles) of watercourses in Reading:

- Berry Brook - 0.9 km
- Christchurch Ditch - 1.1 km
- Foudry Brook - 2.2 km
- Green Park Flood Relief Channel - 2 km
- Kennet - 26.4 km
- Kingsley Close Ditch - 0.8 km
- Smallmead Ditch - 0.5 km
- Thames (Upper) - 6.8 km
- Unnamed watercourses - 20.3km

These are shown on in Figure 3(Appendix 1).

Both the Kennet and The Thames are regularly used by otters a species that nearly became extinct in the 1960's and 70's and sand martins nest in old drainage pipes in the brick walls and bridges in and over the Kennet.

Classification of rivers

Watercourses are designated by the Environment Agency (EA) as either Main Rivers or Ordinary Watercourses, primarily for flood risk purposes. Main rivers are usually larger rivers and streams and are shown on the Main River Map:

<https://www.gov.uk/government/collections/main-river-map-for-england-proposed-changes-and-decisions>

The Environment Agency has the powers to carry out maintenance, improvement or construction work on Main Rivers to manage flood risk. The lead local flood authorities (including Reading Borough Council) carry out flood risk management work on ordinary watercourses.

The Main Rivers in Reading Borough are as follows:

1) The River Thames and its tributaries

- a) Christchurch Ditch
- b) Berry Brook

2) River Kennet (this is split into a number of channels in the Fobney area upstream of Reading town centre) and its tributaries:

- a) Holy Brook.
- b) Foudry Brook.
- c) Green Park Flood Relief Channel.
- d) Smallmead Ditch.
- e) Kingsley Close Ditch.

3) The Kennet and Avon Canal.

There are also a number of small ordinary watercourses, most of which are unnamed apart from the Gunters Brook close to the Queen's Road car park.

Water framework directive

Under the EU's Water Framework Directive (WFD) [transposed into UK law via The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017] the EA has legal duties to ensure that waterbodies, including rivers, achieve "good ecological status" or "good ecological potential":

- Good Ecological Potential (GEP) refers to the classification of WFD water bodies that are designated as Heavily Modified Water Bodies (HMWB).
- Good Ecological Status (GES) refers to the classification of WFD water bodies that are not designated as HMWB.

There are five categories of GES or GEP: high, good, moderate, poor and bad, established on the basis of specific criteria and boundaries defined against biological, physico-chemical and hydromorphological elements.

The 2019 WFD water body classifications have not yet been published so the most recent data is currently from 2016.

There are four WFD Cycle 2 river water bodies within Reading Borough, two of which are HMWBs and two are not:

Thames Wallingford to Caversham (EA reference: GB106039030331)

This is designated a Heavily Modified Water Body for navigation, recreation and flood protection reasons.

It was classified as at Moderate Ecological Potential in 2016, failing for invertebrates and phosphate.

Kennet and Holy Brook (EA reference: GB106039023140)

This is designated a Heavily Modified Water Body for recreation reasons.

It was classified as at Moderate Ecological Potential in 2016, failing for fish and dissolved oxygen.

Holy Brook (EA reference: GB106039023141)

This water body is not designated as a Heavily Modified Water Body.

It was classified as at Moderate Ecological Status in 2016, failing for plants and dissolved oxygen.

Foudry Brook (West End Brook to M4) (EA reference: GB106039017380)

This water body is not designated as a Heavily Modified Water Body.

It was classified as at Poor Ecological Status in 2016, failing for fish, plants and phosphate.

6. Designations

There are a series of nature conservation designations, many of which overlap. This section gives an overview of these (a map showing designated sites and priority habitats is given in Appendix 1, Figure 2)

National Character Areas

A National Character Area (NCA) is a natural subdivision of England based on a combination of landscape, biodiversity, geodiversity and economic activity. There are 159 National Character Areas and they follow natural, rather than administrative, boundaries. They are defined by Natural England, the UK government's advisors on the natural environment.

Reading is located within two NCAs: the Chilterns to the north of the River Thames and the Thames Valley to the south.

A map showing the NCAs and their underlying geology is provided in Figure 5 (Appendix 1) and a description of each is given below.

The Chilterns NCA

Caversham to the north of the River Thames and the north facing slopes of Tilehurst lie within the Chilterns NCA, which stretches north-east to Luton and north to Wallingford and Princes Risborough. It is an area of chalk overlain with a glacial outwash of clays, gravels and sands. This acid and calcareous mix gives rise to a patchy distribution of chalk grassland and woodland habitats.

On the northern edges of the borough, grassland, agricultural and woodland features of the Chilterns are evident, such as in Bugs Bottom and Clayfield Copse, and there are some remnants in Tilehurst at McIlroys and Arthur Newbury Park.

The river valley of the Thames to the west also retains significant areas of semi-natural habitat, including The Warren Escarpment, a wooded steep chalk bank, and Little John's Farm.

The Thames Valley NCA

The Thames Valley is a low-lying area stretching from Reading to the southwest fringe of London. The River Thames provides a unifying feature through a very diverse landscape of urban and suburban settlements, infrastructure networks, fragmented agricultural land, historic parks, commons, woodland, reservoirs and extensive minerals workings.

Most of Reading lies within the Thames Valley NCA, including the flood meadows to the south, with areas of mixed broadleaved woodland now only remaining on the steeper ridges.

Biodiversity Opportunity Areas

In Berkshire there are 29 Biodiversity Opportunity Areas (BOAs). These are areas identified by the Berkshire Nature Conservation Forum (which has now become the Berkshire Local Nature Partnership (BLNP)) where action to conserve biodiversity would be most beneficial. There are two such areas in Reading:

Kennet Valley East

This encompasses the floodplains at the eastern end of The Kennet between Reading and Newbury.

West Reading Woodlands

This encompasses the woodlands in Tilehurst, Lousehill Copse, Blundells Copse and McIlroys Park.

The BLNP outlook is currently uncertain and attendance at BLNP meetings has dwindled. As a result, little work has been undertaken on the BOA initiative. It is however likely that BOAs in Berkshire will form the basis for Nature Recovery Areas that are referred to in the government's 25 year Environment Plan.

Statutory Sites of Importance for Nature Conservation

In Reading there are five Local Nature Reserves (LNRs).

1. Blundells Copse
2. Round Copse (which is now part of McIlroys Park)

3. McIlroys Park
4. Lousehill Copse
5. Clayfield Copse

LNRs are designated under the 1949 National Parks and Access to the Countryside Act and are sites owned by the council and of local importance for nature conservation. The four Reading LNRs were designated in 1991 and 1992.

There are no other Statutory Sites of Importance for Nature Conservation in Reading.

Local Wildlife Sites

Local Wildlife Sites (LWS) are sites which include important and rare habitats and species. They are protected from the direct and indirect effects of development through planning policy as set out in Reading's Local Plan. To qualify as an LWS, a site is assessed by the LWS Selection Panel against the LWS Selection Criteria, a detailed document produced by TVERC.

The LWS Selection Panel meets annually and assesses sites that have been surveyed in the preceding year. Panel decisions result in sites being designated as LWS (if they meet the criteria), de-selected (if they don't meet the criteria) or deferred (if further survey information is required). Sometimes sites are extended to include adjacent valuable habitats; sometimes parts of sites are removed.

Survey work is carried out by TVERC staff and experienced volunteers, with the aim of surveying sites every 10 years.

There are 20 Local Wildlife Sites (LWSs) in Reading, all but 3 of which (Cow Lane Depot, Meadway Fringe & Whitley Park Farm/St Patricks Hall Pond) are managed or part managed by The Council.

Local Authorities are required to report to DEFRA the proportion of LWS that are in "positive conservation management" each year. This is known as Single Data List (SDL) 160.

DEFRA consider those sites in "positive conservation management" to be those that:

1. have a Site Management Plan;
2. are under an Environmental Management Schemes (such as Higher Level Stewardship);
3. where there is a written record that conservation work has taken place, or
4. where a record was made where a landowner of a LWS had received management guidance or advice in the last 5 years and whether it was known if this was acted on.

TVERC assesses the LWS on behalf of Reading Borough Council and in 2019 in Reading 85% of LWS were assessed by TVERC as being in positive conservation management.

Green Links

On the Local Plan Proposals Map^{iv} there are a series of "Green Links". These were identified during a study of the borough by TVERC and either denote an existing link or illustrate an indicative location for where potential Green Links could be located to provide desired connectivity for wildlife between ecologically important areas. It should not necessarily be interpreted as a precise line, rather it may indicate an indicative potential connection between areas. In practice, most Green Links shown on the map are a mixture of existing and potential links, i.e. whilst there are existing aspects that contribute to the Network there is also significant potential for development to make a further contribution to improve the Network.

Green Infrastructure

A commonly used term is "green infrastructure". Natural England define this as:

"A network of multi-functional green space, both new and existing, both rural and urban, which supports the natural and ecological processes and is integral to the health and quality of life of sustainable communities".

In Reading, the parks, rivers, woodlands, grasslands, gardens, street trees and road verges, all make form part of this green infrastructure.

Species

TVERC hold records of 274 protected, priority, and or notable species that have been recorded within the borough¹. This includes 8 reptile & amphibian species, 109 bird species, 18 terrestrial mammals, 7 fish, 59 plant and 70 invertebrates (see Appendix 2).

Priority species - as with habitats, the secretary of state, under section 41 of the NERC ACT, is required to periodically publish (via the JNCC) a list of species that are of principal importance for the conservation of biodiversity in England. The list evolved from the UK BAP that was first published in 1994. They are routinely referred to as Species of Principal Importance (SPI), Section 41 (S41) Species, UK BAP Species and Priority Species. In the NPPF they are referred to as “priority species” which is how they are referred to here.

Protected species- Reading also hosts a number of protected species such as badgers, bats and otters. Some of these are protected under EU Legislation (transposed into UK Law via the Habitat Regulations) and other under UK legislation such as the water vole. Most are also priority species.

Notable and red list species - Notable lists have been published by conservation organisations such as the of Birds of Conservation Concern (BoCC). Species are classified according to set criteria set out in the lists. Those on the “red list” are the most under threat, whilst those on the amber and green are less so.

Not all those species recorded are resident, some may have been seen on just a few occasions, and some, such as the water vole, may no longer be found in the borough.

¹ Since:

- 1980 for more frequently recorded taxonomic groups e.g. plants, mammals, butterflies, reptiles and amphibians [this date will be changing to 1995 in March 2020]

The Hazel Dormouse, a European Protected Species, that is found in the Chiterns and could be present in the Reading’s woodlands particularly those at the north of the borough (photo courtesy of Eric Palmer)



- 1960 for less frequently recorded groups such as more obscure invertebrate groups and lower plant groups.

7. Stakeholders

Who owns and manages land in Reading?

To effect change in the way that land is managed we first need to understand who owns and manages it.

Private landowners

Being an urban borough, most of Reading's outdoor space is in private gardens. There are a great variety of shapes and sizes. Some gardens, particularly when taken with the adjacent areas, can be large areas of wildlife rich space with a mosaic of habitats and a diversity of species. It is estimated that approximately 1,300 hectares of the borough, or 33%, is within the curtilage of residential gardens.

There are also numerous privately owned industrial and retail areas such as the Oracle in central Reading.

Reading Borough Council

The council owns approximately 1,000ha of land (including buildings). Of this approximately 420 hectares, excluding highways land, is fully accessible to the public and managed by the parks department. This includes 24 allotments, 9 cemeteries and churchyards and 70 parks and gardens.

Of particular value to wildlife are the council's woodlands and grasslands.

The highways department manages much of the remainder along with the property, housing and education departments.

The University and private schools

Reading University owns the campus, a large area of land in the east of the borough that crosses into Wokingham, with approximately 1/3rd of the campus (35 hectares) being within Reading Borough.

There are also several other education institutions that own land in Reading such as Queen Anne's School, Leighton Park School and The Abbey School.

Farmers

Much of the land to the west, along the Kennet valley floodplain, is owned by a local farming family. It is managed as low intensity grazing and provides some of Berkshire's best wetland habitats.

Little John's Farm, adjacent to the Thames and used by Reading Festival, is the other area of Farmland in Reading.

Network Rail

Network rail own and manage the land adjacent to the railway tracks. These act as important corridors for wildlife.

The Environment Agency

The Environment Agency carry out maintenance work primarily for flood risk purposes, on main rivers including the River Thames and River Kennet. They also control invasive, non-native species including floating pennywort and Japanese knotweed.

Canals and Rivers Trust

The Canals and River Trust is responsible for managing the Kennet and Avon Canal and the vegetation along its banks.

Other stakeholders

There are also numerous volunteer, local wildlife groups and amateur naturalist societies in Reading, including:

- The Conservation Volunteers
- Caversham Globe
- Tilehurst Globe
- ECONET (an umbrella group that encompasses several "Friends Of" groups and Reading Urban Wildlife Group)
- Reading Friends of the Earth.
- Berkshire Ornithological Club
- Reading and District Natural History Society
- Berkshire Mammal Group,
- Berkshire & South Bucks Bat Group

- Reading Tree Wardens

Berkshire's Local Nature Partnership

According to the www.gov.uk website, “Local Nature Partnerships (LNPs) are partnerships of a broad range of local organisations, businesses and people who aim to help bring about improvements in their local natural environment.”

Local Nature Partnerships originated in a vision set out in the UK government's 2011 'Natural Environment White Paper', which identified the need to take greater account of the value of the environment when strategic decisions are made that affect people and the local economy. 48 LNPs in England received approval from DEFRA, including the BLNP.

The BLNP outlook is currently uncertain, attendance at LNP meetings has dwindled and the chair has recently resigned. There is no funding for the LNP and to date it has no permanent staff member.

Neighbouring authorities

Nature crosses boundaries (particularly along rivers, rail and road verges) and it will be important to ensure that there is coordinated action with neighbouring authorities including Wokingham, South Oxfordshire and West Berkshire Council.

Biodiversity Opportunity Areas and the Nature Recovery Network and the LWS system are all examples of cross boundary working.

8. Themes for action

This section details the objectives of the BAP and the actions that will be taken to achieve them. It is intended to be iterative, whereby actions lead to further actions, with actions and progress towards them regularly updated.

Descriptive text in this section is limited to text that has not been covered in the sections above.

A) Legislation

As we exit the EU, the environmental protections that the EU's Directives provide may no longer apply. Conversely it may be that new laws and or strengthened protections are brought in by the UK government. It will be important therefore to ensure that the council's policies are updated to take account of any new laws, and wherever possible existing environmental protections are upheld.

Objective	Actions	Responsibility	Timeframe
The council will ensure that its policies and plans are up to date with wildlife and biodiversity legislation.	Review and update policy as new legislation comes into force.	RBC - all	Ongoing
	Uphold existing environmental protections	RBC - all	Ongoing

B) Designated Sites

In Berkshire there is a comprehensive system for designating LWSs and other than the four LNRs (which are all also LWSs) there are no statutory sites within the borough. There are no plans to comprehensively change this system.

It would be useful to have a system for determining whether a site had reached "favourable condition" rather than simply measuring whether it is being managed (as is currently the case). The council will work with TVERC and the LWS Selection Panel to see if such a system can be developed, possibly when each site is surveyed.

[When assessing Sites of Special Scientific Interest, Natural England refer to sites being in "Favourable Condition" but it may be that a different terminology is used.]

OBJECTIVES	Actions	Responsibility	Timeframe
To ensure that all LWS have reached "Favourable Condition" by 2030	To review and update management plans for all RBC managed sites	RBC Parks	Rolling programme
	To implement the management plans	RBC Parks	Ongoing
	To engage with the owners of LWS not managed by the council to encourage them to manage the LWS for wildlife	RBC Parks & Planning	Ongoing
	To work with TVERC and the LWSSP to draw up a system for defining and measuring the "Condition" of LWSs	RBC Planning	2022
To regularly survey, designate and de-designate LWSs in	To continue to fund TVERC to	RBC Planning	Ongoing

OBJECTIVES	Actions	Responsibility	Timeframe
accordance with the LWS Selection Criteria	carry out these works		

C) Planning and building control

The conservation and enhancement of biodiversity is a material consideration in, and an integral part of, the planning system. The council, as the local planning authority, needs to be satisfied that a development proposal complies with planning policy before it grants planning permission. Planning permission is set out at the national level through the National Planning Policy Framework (NPPF) and at a local level through Reading Borough's Local Plan. Planning Policy evolves as government policy and priorities change and through case law.

Appendix 3 includes key paragraphs from the NPPF and The Local Plan also includes policies to protect and enhance biodiversity.

Applicants need to demonstrate, through the provision of ecology surveys and reports, how their proposals comply with planning policy. The council can refuse planning applications that adversely affect biodiversity and can also set planning conditions and planning obligations to ensure that any effects are minimised, and biodiversity is enhanced.

Biodiversity net gain

One of the key drivers for biodiversity improvements over the coming years is likely to be the policy, as set out in the Government's 25 Year Environment White Paper, to:

“Embedding an ‘environmental net gain’ principle for development, including housing and infrastructure”.

This is in accordance with paragraph 174b of the NPPF and Reading's Local Plan which states (Policy EN12) that:

“In exceptional circumstances where the need for development clearly outweighs the need to protect the value of the site, and it is demonstrated that the impacts cannot be: 1) avoided; 2) mitigated or; 3) compensated for on-site; then new development will provide off-site compensation to ensure that there is “no net loss” of biodiversity. Provision of off-site compensation shall be calculated in accordance with nationally or locally recognised guidance and metrics. It should not replace existing alternative habitats, and should be provided prior to development.”

This is sometimes referred to as biodiversity offsetting or biodiversity net gain.

The idea behind this is that when a new development comes forward the developer will need to demonstrate that there will be a net gain for biodiversity. This is expressed in terms of biodiversity habitat units before and after the development. The units are a factor of habitat type, condition, area, time, anticipated time to target condition etc. If the calculation shows that there will not be a gain (the Environment White paper suggests that this should be 10%) then the developer needs to offset any losses by creating or enhancing habitats elsewhere.

Government Guidance on this matter is evolving but DEFRA have produced a calculator to calculate these impacts. However, a key decision that the council will need to make is where it is acceptable to offset biodiversity losses as there may only be limited opportunities within the borough. It may be, for example, that the council would accept an offsetting scheme within a set distance of the borough, or perhaps within a BOA.

Where Priority Habitats are to be affected the policy does not normally apply as these are protected from development through the planning process.

Ecological enhancements within development sites

In addition to Biodiversity Net Gain Calculations there are other opportunities to incorporate biodiversity improvements in and around developments. For example, planning conditions can be imposed to secure

the provision of swift bricks, bird and bat boxes and native and wildlife friendly landscaping schemes (including green roofs and walls), and requirements for 'hedgehog holes' in new fences.

The council at present seeks ecological enhancements on most non householder developments. However, there is no system in place to record when, or whether, ecological enhancements are secured, and very little enforcement action when they are not. We also do not know whether and to what extent the enhancement measures are successful.

Objectives	Actions	Responsibility	Timeframe
To continue to assess all planning applications for their ecological impacts	To assess planning applications for their impact on protected, priority and notable species, and priority habitats, ancient woodland and protected sites	RBC planning	Ongoing
	To require developers to provide on-site ecological enhancements	RBC planning	Ongoing
To ensure that new development results in measurable net gain in biodiversity units.	To produce a supplementary planning document, possibly in conjunction with neighbouring authorities, that sets out the council's approach to Biodiversity Net Gain.	RBC planning	2021
To monitor landscaping and the provision of ecological enhancements	To investigate new ways to monitor schemes	RBC planning	2021

Objectives	Actions	Responsibility	Timeframe
	To design and implement an internal RBC system for recording ecological enhancements that have been provided in development sites.	RBC planning	2021
	To work with TVERC to develop ways of capturing habitat creation data	RBC planning, TVERC	Ongoing

D) Woodlands, trees & hedgerows

The BAP should result in existing woodland being better managed and new woodlands, trees and hedgerows being planted.

OBJECTIVES	ACTIONS	RESPONSIBILITY	TIMEFRAME
To manage Reading's woodlands for wildlife	To review RBC woodland management plans	RBC parks	By 2023
	To implement woodland management plans	RBC parks	Ongoing
	To identify funding opportunities for woodland management such as through the Forestry Commission	RBC parks	By 2023
	To engage with private woodland owners and to encourage them to manage their woodland for wildlife	RBC planning & RBC Parks	Ongoing

OBJECTIVES	ACTIONS	RESPONSIBILITY	TIMEFRAME
To retain woodlands in public ownership	Not to sell council owned woodlands other than where suitable compensatory environmental measures are implemented	RBC property	Ongoing
	Where new woodland habitat is created as part of planning applications to adopt this as publicly owned land securing its management through planning obligations as appropriate	RBC planning, property & parks	Ongoing
To identify suitable areas for new woodland creation	To assess parks and highways land and, other council owned and private land to identify and map those areas where new woodland could be created	RBC highways, parks, planning & property	By 2023
	To agree targets for new woodland creation in accordance with the tree strategy and CCAP	RBC highways, parks, planning & sustainability	By 2023
	Create new woodland areas within development sites (or as part of offsetting schemes - see separate theme)	RBC planning	Ongoing
To review Reading's Ancient	To review the ancient woodland inventory, including smaller woodlands (less than	RBC and volunteer groups such as Caversham	By 2022

OBJECTIVES	ACTIONS	RESPONSIBILITY	TIMEFRAME
Woodland Inventory	2ha.), in line with DEFRA guidance	Globe and Reading's Tree Wardens	

E) Grasslands and road verges

Reading's grasslands and road verges have significant potential as a wildlife resource, particularly for pollinators, and if they are managed as less frequently cut grass they will host a greater diversity and abundance of wildflowers. Recent research has shown that the part of the verge closest to the road contains fewer pollinators which is often the part that needs to be cut to maintain a tidy appearance. It also suggests that the later in the year that the grass is cut the better it is for pollinators^v.

The council will be trialling systems for cutting road verges less frequently and will be producing a highways grassland management policy shortly. It will also be looking to identify areas within parks that could be managed as less frequently cut grassland.

Objectives	Actions	Responsibility	Timeframe
To manage Reading's wildflower meadows for wildlife and look for opportunities to increase the extent of this habitat	To cut the grass annually as a hay cut	RBC parks	Ongoing
	To identify the resources to manage these areas after the current HLS funding runs out	RBC parks	By end of 2021
To identify and then manage road verges for wildflowers and pollinators	To identify road verges which could be sustainably managed as	RBC parks & highways	2020

Objectives	Actions	Responsibility	Timeframe
	longer grass and or pollinator strips		
	To test different road verge management regimes and draw up a road verge management policy	RBC parks & highways	To commence in 2020 then ongoing & iterative
To identify and then manage areas of amenity grassland for wildflowers and pollinators	To identify areas of RBC managed land that could be managed as less frequently cut long grass or wildflower meadow	RBC parks	2020
	To manage those areas as long grass	RBC parks	2021

F) The two rivers, their floodplains and other watercourses

Reading's watercourses are a major part of the Borough's Green Infrastructure. The council does not directly own the rivers but does manage the paths next to them in some locations. It also manages some of their floodplains such as Christchurch, Hills and Kings Meadows adjacent to the Thames, and Fobney Island, Waterloo Meadow and some of the farmland adjacent to the Kennet.

Development and urbanisation

The council is also responsible for determining planning applications and those that could affect Reading's watercourses must comply with policy EN11 in the Local Plan.

Development proposals next to a watercourse can enhance its environment. They can result in new wildlife friendly planting, the re-naturalisation of the watercourse banks, and new habitats features such as otter holts and sand martin nesting sites. Conversely, they can adversely affect it by overshadowing it and introducing light pollution and hard surfaces.

Urbanisation around watercourses, especially in and around the town centre, has resulted in artificial, hard river banks such as steel sheet piling, concrete or brick. Wherever possible these will be reinstated to natural banks and with a more natural profile, to restore river and riparian habitats.

Even if it's not possible to remove hard banks, there are still opportunities to establish marginal vegetation as has been done in Christchurch Meadow.

Some of the smaller watercourses do have natural banks but have been altered in other ways such as straightening, e.g. the Christchurch Ditch. Opportunities will be sought to re-naturalise these channels by re-meandering or introducing gravels and woody debris to enhance the in-channel habitats.

Lighting

Rivers are some of the most sensitive habitats for lighting as they are used by invertebrates, bats, birds and mammals, all of which are sensitive to artificial light.

Riverflies, for example, are a vital part of a River's ecosystem and are an important food source for birds, fish and other animals. It is likely that the increasing intensity and distribution of lights across Britain is affecting riverfly breeding and survival as many species depend on specific environmental cues for certain stages in their life cycle. The larvae are generally repelled by light but the adults are attracted to artificial night lights and could become disoriented around them. There are recorded incidents of high mortality of riverflies around light sources close to riverbanks. Such incidents have the potential to lure sufficient numbers of adult riverflies away from the water to cause population declines.^{vi}

Lighting alongside rivers should be kept to the minimum that is required and the council will explore options to reduce light levels as it replaces its streetlamps in these locations. Measures will include the use of baffles and shields, the use of lights of an appropriate frequency (research indicates that while lower UV components attract fewer invertebrates, warmer colour temperatures with peak wavelengths greater than 550nm cause less impacts on bats^{vii}).

In addition, where development proposals are adjacent to the river it should, as a minimum, not increase existing light levels and ideally should reduce them, this includes light from new windows.

Polarised light is also attractive to invertebrates, including beetles, dragonflies and adult riverflies. Polarised light pollution is the process whereby light reflects off smooth surfaces and is then scattered in the atmosphere or under water. Artificial lights are not necessarily part of this form of light pollution, but artificial lighting can make the situation worse. Adult mayflies are attracted to sources of polarised light as in nature they indicate a water surface on which the insects can breed and lay eggs. Artificial sources of polarised light such as dark building and smooth road surfaces can attract mayflies in the same way; however, any eggs laid on such surfaces will not develop. There are a total of 278 species of mayfly, stonefly and caddisfly in Britain, eight of which are Priority Species. All but the most polluted rivers in Britain support mayfly populations, therefore

artificial lighting and sources of polarised light pollution around all rivers should be minimised.

Management of parks

A number of Reading's parks have watercourses running through them. The watercourse and its banks do or could provide valuable habitat for wildlife. It will be important that these areas be managed sympathetically for wildlife, for example by allowing emergent vegetation and scrubby banks to develop and avoiding clearance where it is not needed.

Fish passages

There are salmonid fish passes on Caversham weir on the Thames and Blakes weir on the Kennet, but improvements for multi-fish species passage including eels are still required. Some of the smaller weirs, for instance at County Lock, are impassable to fish at low flows.

The EA and the council will seek ways to improve fish movement along Reading's watercourses

Light pollution over the Fobney Island Nature Reserve from the Thames Water treatment plant



Invasive, non-native species

Invasive, non-native species are a major cause of biodiversity decline as they outcompete local species. Due to their dynamic nature, rivers often support invasive species which can easily be transported long distances along them. Examples of invasive species found along Reading's rivers include:

- Floating pennywort
- Japanese knotweed
- Himalayan balsam
- Mink

Litter

Litter, in particular plastic, is a significant driver of biodiversity loss. It ends up in the river where it can harm fish and water birds, and gets washed downstream to the seas. Despite limited efforts at a national level, it is estimated that there will be a 20% increase in plastic waste by 2030^{viii} and much of this will end up in the oceans.

Reading has a number of riverside parks which are well used by the public. Many of the bins in these parks have open tops which means that litter can blow out and end up in the rivers; there are also too few bins in some parks for the litter generated.

The council will replace the open top bins and provide more bins where these are required.

Overflowing litter bin adjacent to the Kennet & Avon Canal



Other pollution

As well as light, litter and plastic pollution, other sources of pollution that can affect the rivers include sewage and foul water, runoff from farms, roads and factories, and microplastic pollution such as that from artificial sports pitches. This is exacerbated during large rainfall events when

pollution is rapidly washed into the drainage system and does not have time to settle out.

Sustainable drainage systems (SuDS), which aim to replicate natural drainage as closely as possible, can reduce this pollution by slowing runoff rates and holding water on land so that polluting materials can settle out. They can also provide valuable wildlife habitats and reduce flood risk.

All new major developments must incorporate SuDS in their schemes in accordance with Policy EN18 in Reading's Local Plan and national planning policy.

The Highways Department is responsible for much of the borough's drainage systems including approximately 18,000 road drains. There are opportunities to incorporate SuDS elements on highways land and parks such as the flood attenuation basin at The Cowsey and by replacing hard surfaces with swales and tree planting.

The council will explore ways that this can be done.

The Kennet floodplain & its management

Fobney Meadow, at the eastern end of the Kennet Meadows and west of the A33 (a LWS and part of the East Kennet BOA), is a valuable wetland with breeding birds including Water Rail, Gadwall, Lapwing, Redshank (attempted), Little Ringed Plover (attempted), Barn and Little Owl (possibly), Grasshopper Warbler and Stonechat. It carries good numbers of Gadwall, Teal, Wigeon, Snipe in winter and is used by several wader species on migration.

However, it sometimes dries out with devastating effects on the breeding wetland species. The council, in partnership with the EA is assessing ways to stabilise this habitat by reducing water flows out of the meadow.

The Proposed Caversham & Reading Flood Alleviation Scheme

The Environment Agency is proposing a Flood Alleviation Scheme (FAS) that aims to address flood risk in the Reading suburb of Caversham on the north bank of the Thames and in Abbey ward on the south bank linked to the increased risk of flooding caused by climate change. The scheme would

reduce the risk of flooding to approximately 740 residential properties, as well as several roads and transport links, linked to the increased risk of flooding caused by climate change.

There are plans for a new Flood Alleviation Scheme (FAS) at Christchurch Meadow. This is to reduce the risk of flooding to properties in Caversham linked to the increased risk of flooding caused by climate change.

The council, as the local planning authority, will assess the scheme if and when a planning application is submitted and it will be important to ensure that, if the scheme goes ahead, it is designed to maximise its value for wildlife in line with adopted policies.

OBJECTIVES	ACTIONS	RESPONSIBILITY	TIMEFRAME
To ensure that Reading's rivers reach good ecological and chemical status by 2025.	To work with the EA and others to identify potential pollution hotspots	RBC - all departments, EA	Ongoing
	All actions below		
To reduce light pollution on and adjacent to the rivers, minimising the effects it has on wildlife	To assess the council's riverside lighting schemes, to define excessive light pollution, and to identify areas where such pollution occurs and where improvements can be made	RBC highways	2021

OBJECTIVES	ACTIONS	RESPONSIBILITY	TIMEFRAME
	(this could be Reading University student project)		
	To implement the improvements identified above	RBC highways	2024
To manage bankside vegetation sympathetically for wildlife	Allow emergent vegetation and scrubby banks to develop by avoiding clearance where it is not needed.	RBC - Parks	Ongoing
To halt the spread of invasive species along the rivers	To work with partners to manage invasive species such as floating pennywort, Japanese knotweed, mink	RBC- all departments	Ongoing
To halt plastic pollution into rivers, particularly from parks and open spaces	To replace all open topped bins in parks with closed top bins to	RBC Parks & Highways	2021

OBJECTIVES	ACTIONS	RESPONSIBILITY	TIMEFRAME
	stop wind-blown litter		
	To install new bins adjacent to Rivers and to empty them regularly	RBC Parks & Highways	2021
To maximise the wildlife value of the Kennet Valley East BOA	To raise the water levels in Fobney Meadow	RBC, EA, Friends of Fobney Island, Berkshire Ornithological Club and Local Residents	2023
	To reduce light pollution from the Thames water treatment works	RBC, EA, Thames Water	Ongoing
To ensure that the proposed Caversham & Reading FAS at Christchurch Meadow (if it is built) is designed to maximise its value for wildlife	To assess any scheme submitted by the EA.	RBC - Planning	Ongoing
To ensure that new development maximises the opportunities to conserve and enhance the biodiversity of Rivers	Ensure that, as a minimum, new development does not increase light spillage over rivers	RBC - Planning	Ongoing

OBJECTIVES	ACTIONS	RESPONSIBILITY	TIMEFRAME
	To seek opportunities to de-culvert watercourses	RBC -- Planning & Highways	Ongoing
	To ensure that any new landscaping adjacent to watercourses is predominantly native and wildlife friendly.	RBC - Planning	Ongoing
	To require the re-naturalisation of the river bank when new development is adjacent to it	RBC - Planning	Ongoing
To improve fish movement along Reading's watercourses	To improve existing and create new fish passes	EA and RBC	Ongoing

G) Management of council projects and the sale of land

The council is partly or fully responsible for numerous projects such as the south Reading MRT, the Fobney Island Nature Reserve, the new swimming pool at Palmer Park and The Green park Station. If Reading is to halt biodiversity loss and wildlife is to be restored it will be essential that all council projects are designed from the outset with the conservation and enhancement of biodiversity as an integral component.

The council also has a diverse property portfolio and landholding, some of which will be sold in the future. Other than in certain parks, no audit of this landholding's biodiversity has been carried out. Where land is sold it will be important to ensure that its future biodiversity value is realised by for example setting clear parameters for new development such as setting aside areas that are to be retained and enhanced for wildlife. At present there is no formal policy to safeguard the biodiversity of land that is disposed of.

OBJECTIVES	ACTIONS	RESPONSIBILITY	TIMEFRAME
To understand the ecological value of council owned land	To carry out a biodiversity audit of council owned land	RBC - Property	2022
To retain land of high ecological value in council ownership	Not to sell land that hosts priority habitats or species without appropriate measures of relocation or protection.	RBC - Property	Ongoing
To ensure that there is a net gain for biodiversity when RBC land is sold	To formally set out development parameters, as required under prevailing planning policy, to include ecological constraints and opportunities, when any land is sold and to ensure that legal agreements reflect this	RBC - Property	Ongoing

OBJECTIVES	ACTIONS	RESPONSIBILITY	TIMEFRAME
To ensure that SUDS systems are designed to maximise their wildlife value	To produce a guidance document (supplementary planning document or equivalent) on SuDS standards for new development to include a requirement for native aquatic and marginal species	RBC - Policy	2022

H) Education, access to nature, public engagement & volunteering

There are 64 schools in Reading and the University of Reading and Reading College have campuses in the borough. Many of these have grounds that include semi-natural habitats which could be managed better for wildlife.

In addition, there are opportunities to involve students and staff in education, research and volunteering activities.

RBC have been running one such scheme, Reading Outdoor Classrooms for the past 10 years with 25 primary school classes per year being offered a free outdoor education session.

Nature Nurture, a Reading based, award winning Community Interest Company, runs events across the borough.

The University runs a variety of courses, including in ecology and wildlife conservation, and there are opportunities for students and staff to work with the council on specific projects such as the Tree Strategy and a lighting assessment of Reading's rivers.

The hedge at Fobney Island laid by volunteers



There are also a number of volunteer groups, in particular the Conservation Volunteers based on London Street, who run volunteering events across the borough. Such events don't only provide wildlife benefits but also help to maintain physical and mental health.

Reading is fortunate to have numerous other environmental groups such as Caversham and Tilehurst Globe, Econet² and Reading Friends of the Earth.

There are also numerous specialist wildlife groups based in and around Reading such as Berkshire Ornithological Club, Reading and District Natural History Society, Berkshire Mammal Group, Reading and Berkshire & South Bucks Bat Group. Many BBOWT members live in Reading.

Other groups such as the scouts, youth clubs and U3A³ may want to use the council's green spaces to access and learn about nature.

The council can help by providing this biodiversity action plan (a coordinated framework for action) and access to its open spaces for classes and work parties. It can also facilitate events where resources are available and engage with the public about the management of its estate, such as the management of road verges and street trees.

Objectives	Actions	Responsibility	Timeframe
Encourage Reading University and schools to manage their estate for wildlife	Ensure that planning proposals are designed to maximise wildlife value	RBC planning	Ongoing
To work with the university to undertake that could benefit wildlife in Reading	To produce a list of student projects and to share these with the university	RBC - All	Ongoing
Encourage schools to teach children about wildlife	Provide access to volunteer and educational	RBC parks	Ongoing

² Econet includes Friends of Clayfield Copse (FoCC), Friends of Mapledurham Playing Fields (FoMP), Friends of McIlroys Park (FoMP), Friends of Cemetery Junction (FoCJ), Conserve Reading on Wednesdays (CROW) and Reading Urban Wildlife Group

Objectives	Actions	Responsibility	Timeframe
	groups to RBC land		
	Facilitate programmes such as Reading's Outdoor Classrooms where resources allow	RBC - all	Ongoing
Facilitate volunteer groups	Provide access to volunteer and educational groups to RBC land	RBC parks	Ongoing
RBC engagement with the public about biodiversity and the management of its estate.	Production of online and published materials including a dedicated webpage for the BAP	RBC parks & planning	Ongoing

³ The University of the Third Age (U3A) is an international movement whose aims are the education and stimulation of mainly retired members of the community—those in their third 'age' of life. It is commonly referred to as U3A

I) Ecological records

It is vital that accurate ecological records are held and available to the council and others. Without this information it is not possible to determine whether actions to conserve biodiversity are succeeding or failing.

TVERC maintain databases of protected species, habitats and sites. RBC is a partner and will continue to fund TVERC, sitting on its steering group as appropriate. The council will also provide records to TVERC, encourage others to contact TVERC when they need ecological data and to submit their records to TVERC.

Objectives	Actions	Responsibility	Timeframe
To continue to support TVERC and their work	Continue with the TVERC SLA	RBC planning	Ongoing
	Submit records from planning applications to TVERC	RBC planning	Ongoing
	Encourage individuals and local wildlife groups to submit records to TVERC and access their data when needed	RBC all	Ongoing

J) Species and habitat specific actions

TVERC hold records of 274, priority, protected and or notable species that have been recorded within the borough since 1970. This includes 8 reptile and amphibian, 109 bird, 18 terrestrial mammal, 7 fish, 59 plant and 70 invertebrate species.

Not all of these species are resident, and some may have been seen on just a few occasions, however populations of many species will be declining. For example, anecdotal evidence suggests that the number of swifts in the borough, as with populations elsewhere, is declining.

Appendix 2 lists the priority, protected and or notable species that have been recorded in Reading and their likely status (as assessed by local experts).

The BAP does not include specific actions for species and the council will not have the resources to monitor such species, but many species will benefit from the actions set out in this BAP. There are however a number of species-specific actions that can be taken and, where resources are available, the council will undertake these works or encourage others to do so. Examples include the provision of swift bricks in new developments, the provision of peregrine platforms on new buildings, surveys for glow worms, and surveys for water voles.

There are also other Priority Habitats, such as ponds and brown field sites, within the borough. Again, the BAP does not have specific actions for these habitats but wherever possible the council will encourage the conservation and enhancement of these habitats.

It is anticipated that the list will evolve over time as the need for actions becomes apparent. The current list is provided in Appendix 4.

Objectives	Actions	Responsibility	Timeframe
To undertake works to benefit priority species	To maintain an up to date list of species and habitat specific actions that will benefit individual species and priority habitats	RBC planning	Ongoing

K) Connectivity

In his review of nature conservation, Making Space for Nature, in 2010, Sir John Lawton wrote:

“The essence of what needs to be done to enhance the resilience and coherence of England’s ecological network can be summarised in four words: more, bigger, better and joined.^{ix}”

Reading’s BAP should achieve all these aims, with the creation of more wildlife habitat, better management of existing sites, and improved connectivity through the urban environment as additional trees and wildlife friendly landscaping are provided reducing the barrier that an urban area can create for wildlife.

L) Coordinated approach across council departments and within policy documents

The council has numerous policy documents, across its various departments, all of which can affect biodiversity. It will be vital to ensure that biodiversity, and the actions within the BAP, are integral to these documents as they are conceived, developed, revised and published. Some of the relevant policy documents are listed below

- - Reading’s Tree Strategy
- - Local Transport Plan
- - Reading Climate Change Strategy (RCCS)
- - Open Spaces Strategy
- - Thames Parks Plan
- - Local Plan (Planning)
- - Reading Borough Council Corporate Plan
- - Highway Asset Management Plan
- - Air Quality Action Plan
- - Reading 2050 Vision

Objectives	Actions	Responsibility	Timeframe
To ensure that all other policy documents consider biodiversity	Coordinate approach across council departments and other national agencies	RBC - all, EA, Thames Water, Network Rail	Ongoing

M) Global biodiversity - what can the council do?

What we buy and where we buy it can have significant impacts on biodiversity. For example, timber from virgin forests results in those forests being lost and fish from unsustainable fisheries can kill our oceans. Investments in fossil fuel companies drive global warming which exacerbates biodiversity loss.

Green Public Procurement is a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life-cycle when compared to goods, services and works with the same primary function that would otherwise be procured.

Objectives	Actions	Responsibility	Timeframe
To ensure that RBC’s actions (and inactions) do not contribute to global biodiversity decline and increase biodiversity where possible.	To ensure that global biodiversity is considered as part of the Council’s procurement	RBC policy	Ongoing

N) Ongoing review

It will be important to regularly review the BAP to ensure that its actions are being implemented and, if they are not, to identify the reasons why.

As the BAP is intended as an iterative process, the annual review will include space on its agenda for new ideas, and a mechanism whereby those ideas can be gathered and monitored during the course of the year will also be devised. This process might initially be open to council staff only, but could potentially be widened out in order to enable partner organisations, other stakeholders, and the general public to put forward ideas. As such, the BAP would adopt a fairly flexible and expansive character, open to public engagement.

Objectives	Actions	Responsibility	Timeframe
To Regularly review the BAP and its actions	To hold a meeting annually to assess the actions that have been undertaken and update the BAP as appropriate	RBC policy	Once per year in March

Appendix 1 - Figures

DRAFT

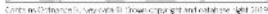


Figure 2 - Designated sites, priority habitats and ancient woodland

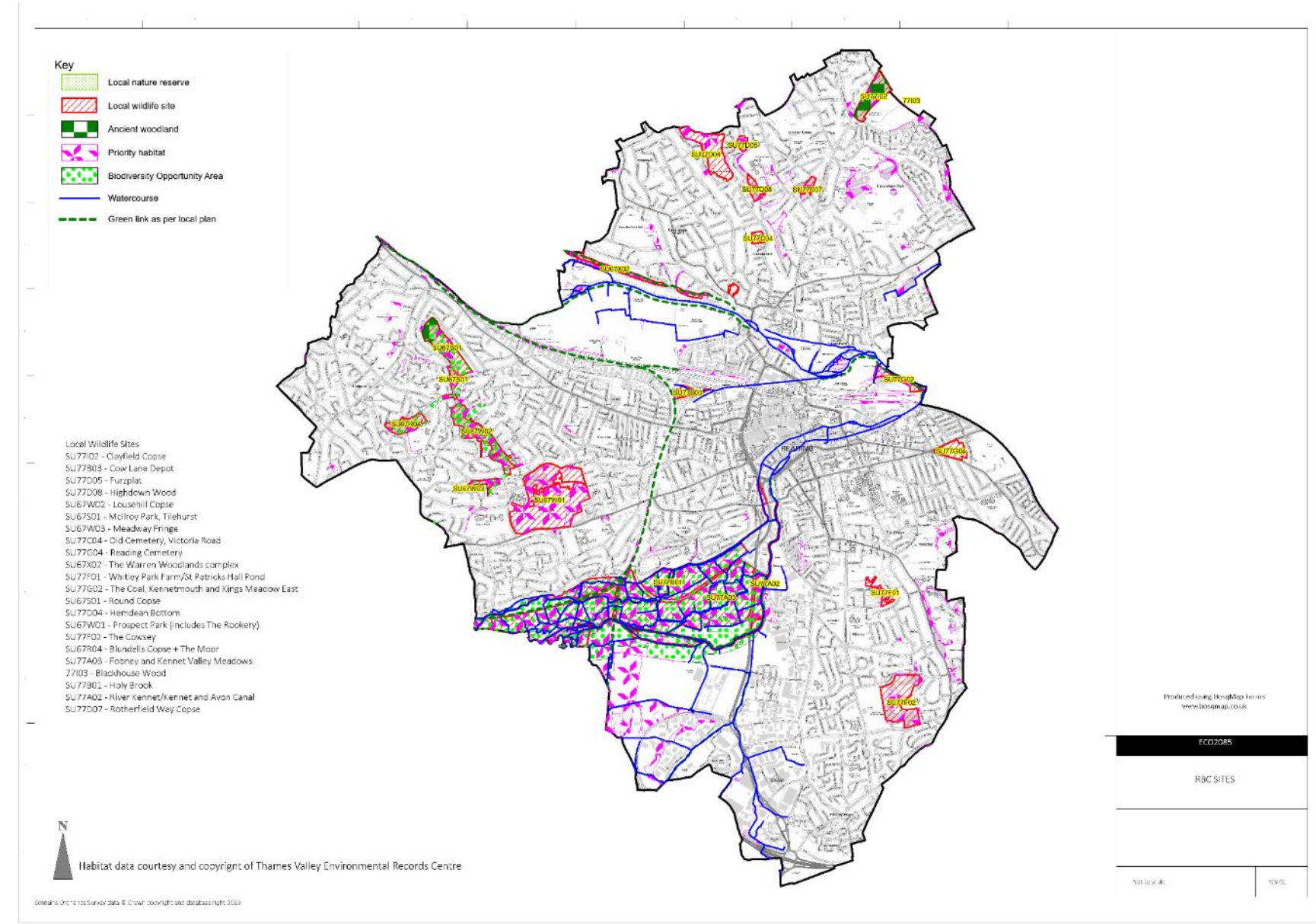


Figure 3 - Rivers

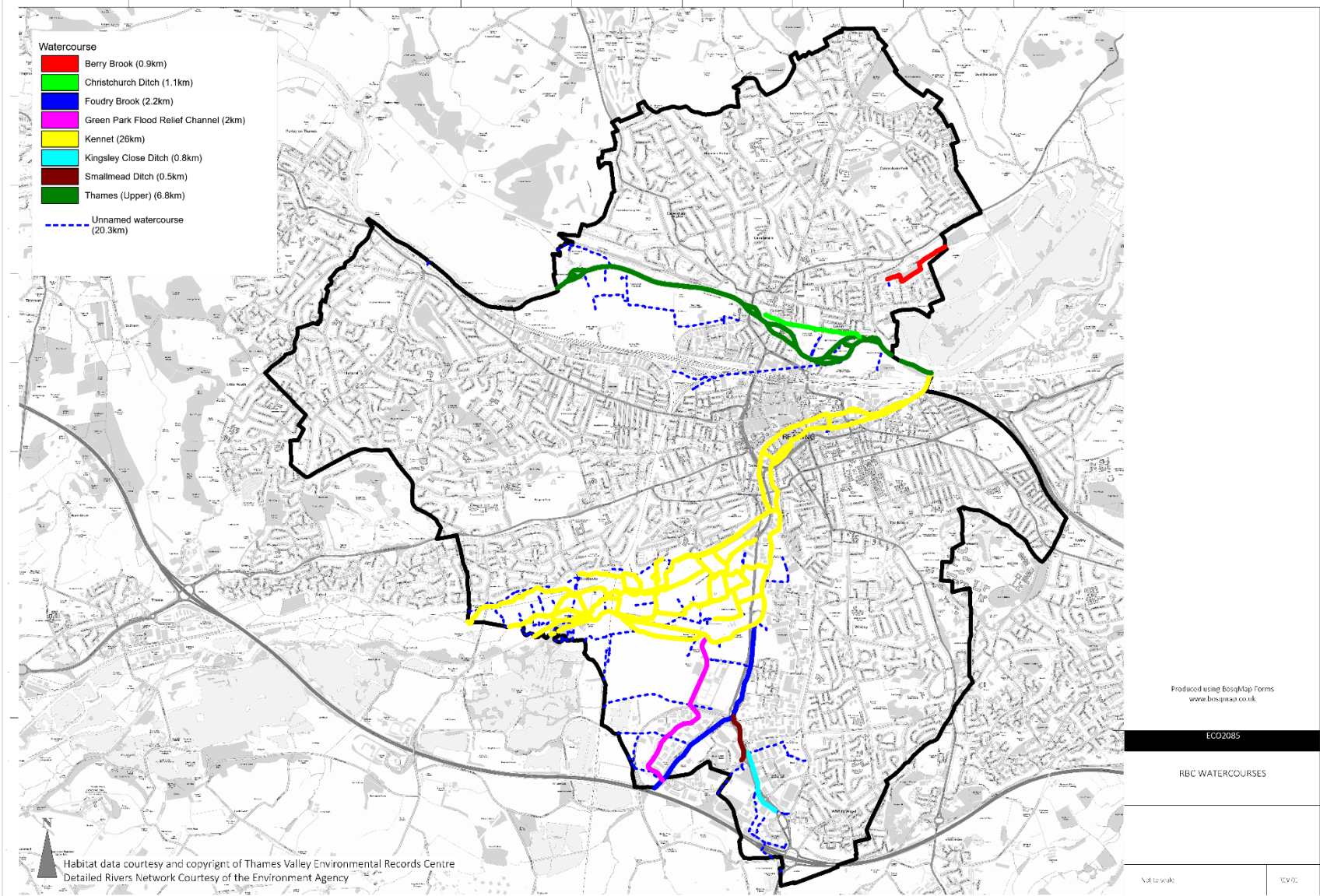


Figure 4 - woodland ownership in Reading

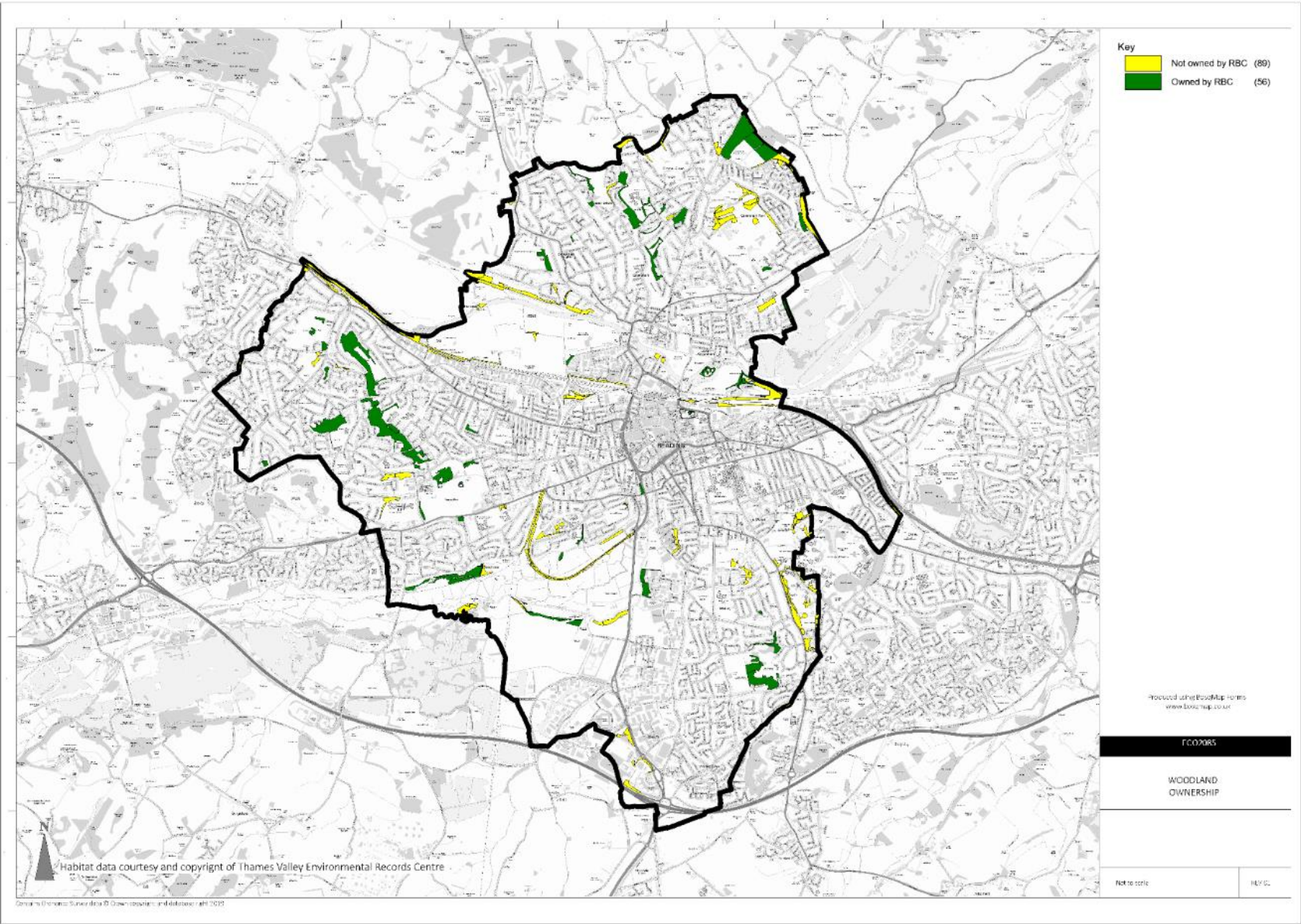
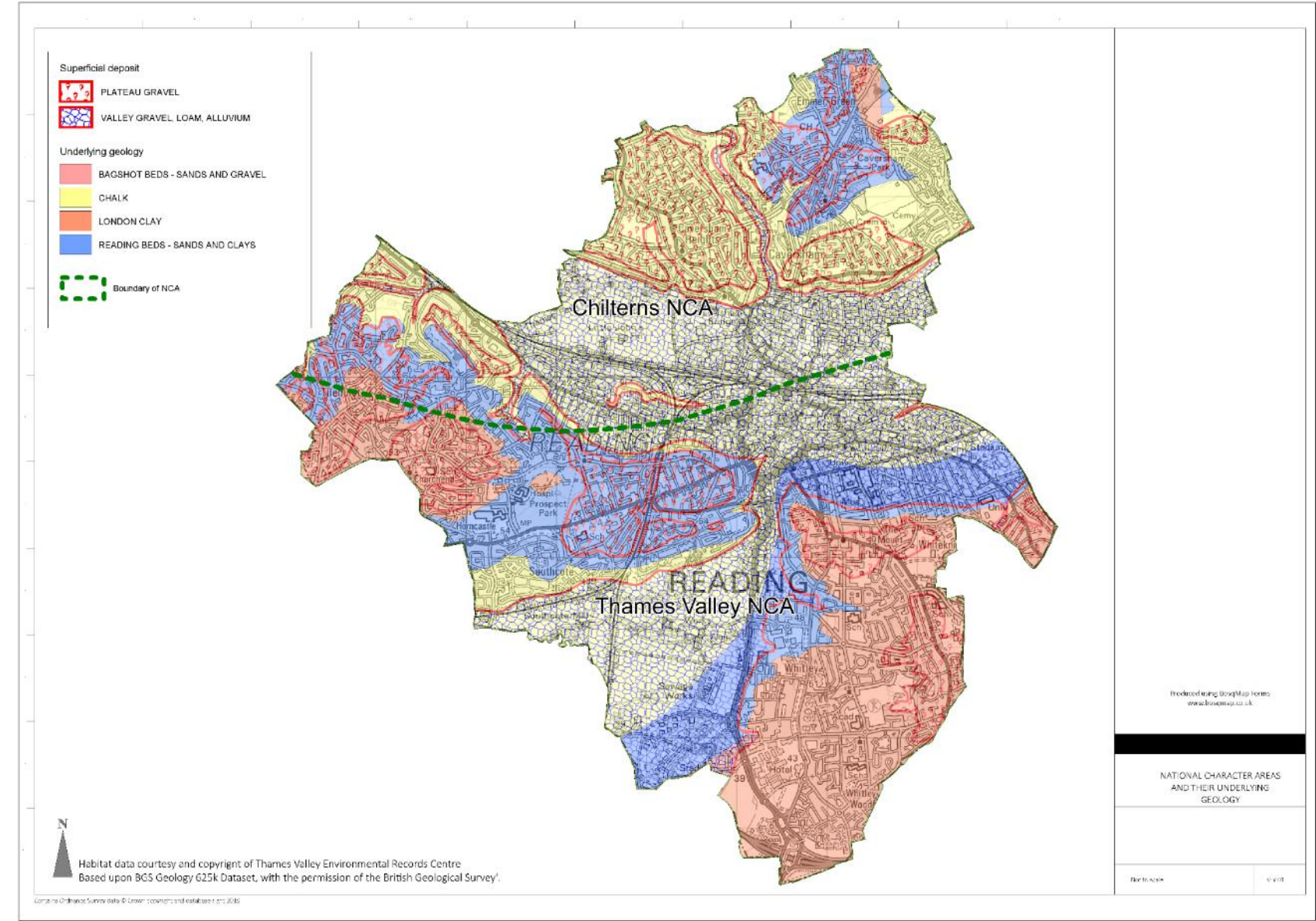


Figure 5 - Geology and National Character Areas



Appendix 2 - Rare and notable species records held by TVERC

Taxon group	Common name	Scientific name	Count of records	Most recent year recorded	European protected status	UK protected status	NERC Act Status	Conservation list status	Note on local status by Berks Ornithological Club (Coloured text = species where targeted conservation action may help the species)	Notes from local entomologist and herpetofauna expert (Mike Turton)
Amphibians	Common Frog	<i>Rana temporaria</i>	74	2016		WACA-Sch5-s9.5a				
Amphibians	Common Toad	<i>Bufo bufo</i>	31	2014		WACA-Sch5-s9.5a	NERC-S41			
Amphibians	Great Crested Newt	<i>Triturus cristatus</i>	2	2017	HabDir-A2np, HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a	NERC-S41			
Amphibians	Smooth Newt	<i>Lissotriton vulgaris</i>	16	2016		WACA-Sch5-s9.5a				
Birds	Avocet	<i>Recurvirostra avosetta</i>	2	2012	BirdsDir-A1	WACA-Sch1-p1		Bird-Amber	VAGRANT	
Birds	Bar-tailed Godwit	<i>Limosa lapponica</i>	2	2012	BirdsDir-A1			Bird-Amber	VAGRANT	
Birds	Barn Owl	<i>Tyto alba</i>	5	2010		WACA-Sch1-p1			RESIDENT	
Birds	Bewick's Swan	<i>Cygnus columbianus</i>	2	2010	BirdsDir-A1	WACA-Sch1-p1	NERC-S41	Bird-Amber	VAGRANT	
Birds	Black Redstart	<i>Phoenicurus ochruros</i>	31	2015		WACA-Sch1-p1		Bird-Red	SUMMER VISITOR (LIKELY TO BE BREEDING)	
Birds	Black-headed Gull	<i>Chroicocephalus ridibundus</i>	21	2015				Bird-Amber	RESIDENT	
Birds	Black-tailed Godwit	<i>Limosa limosa</i>	1	2003		WACA-Sch1-p1	NERC-S41	Bird-Red, RL-Global-post2001-NT	MIGRANT	
Birds	Black-throated Diver	<i>Gavia arctica</i>	1	2010	BirdsDir-A1	WACA-Sch1-p1		Bird-Amber	VAGRANT	
Birds	Brambling	<i>Fringilla montifringilla</i>	18	2006		WACA-Sch1-p1			WINTER VISITOR	
Birds	Bullfinch	<i>Pyrrhula pyrrhula</i>	41	2012			NERC-S41	Bird-Amber	RESIDENT	
Birds	Caspian Tern	<i>Hydroprogne caspia</i>	1	2010	BirdsDir-A1				VAGRANT	
Birds	Cetti's Warbler	<i>Cettia cetti</i>	12	2011		WACA-Sch1-p1			RESIDENT	
Birds	Common (Mealy) Redpoll	<i>Acanthis flammea</i>	4	1997				Bird-Amber	WINTER VISITOR	
Birds	Common Crossbill	<i>Loxia curvirostra</i>	1	2005		WACA-Sch1-p1			VAGRANT	

Taxon group	Common name	Scientific name	Count of records	Most recent year recorded	European protected status	UK protected status	NERC Act Status	Conservation list status	Note on local status by Berks Ornithological Club (Coloured text = species where targeted conservation action may help the species)	Notes from local entomologist and herpetofauna expert (Mike Turton)
Birds	Common Gull	Larus canus	4	2012				Bird-Amber	WINTER VISITOR	
Birds	Common Sandpiper	Actitis hypoleucos	6	2012				Bird-Amber	MIGRANT	
Birds	Common Scoter	Melanitta nigra	1	1994		WACA-Sch1-p1	NERC-S41	Bird-Red	VAGRANT	
Birds	Common Tern	Sterna hirundo	24	2013	BirdsDir-A1			Bird-Amber	SUMMER VISITOR (LIKELY TO BE BREEDING)	
Birds	Crane	Grus grus	1	2012	BirdsDir-A1			Bird-Amber	VAGRANT	
Birds	Cuckoo	Cuculus canorus	11	2011			NERC-S41	Bird-Red	SUMMER VISITOR (BREEDS ON THE KENNET MEADOWS)	
Birds	Curlew	Numenius arquata	1	1994			NERC-S41	Bird-Red, RL-Global-post2001-NT	VAGRANT	
Birds	Dunlin	Calidris alpina	1	2005				Bird-Amber	MIGRANT	
Birds	Dunnock	Prunella modularis	51	2018			NERC-S41	Bird-Amber	RESIDENT	
Birds	Fieldfare	Turdus pilaris	15	2012		WACA-Sch1-p1		Bird-Red	WINTER VISITOR	
Birds	Firecrest	Regulus ignicapilla	1	1994		WACA-Sch1-p1			RESIDENT	
Birds	Gadwall	Anas strepera	8	2012				Bird-Amber	PREDOMINANTLY WINTER VISITOR BUT DOES BREED IN LOW NUMBERS	
Birds	Glaucous Gull	Larus hyperboreus	1	2005				Bird-Amber	VAGRANT	
Birds	Golden Plover	Pluvialis apricaria	3	2005	BirdsDir-A1				VAGRANT	
Birds	Goldeneye	Bucephala clangula	1	1994		WACA-Sch1-p2		Bird-Amber	WINTER VISITOR	
Birds	Goshawk	Accipiter gentilis	2	2005		WACA-Sch1-p1			MIGRANT	
Birds	Grasshopper Warbler	Locustella naevia	3	1994			NERC-S41	Bird-Red	SUMMER VISITOR (LIKELY TO BE BREEDING)	
Birds	Great Black-backed Gull	Larus marinus	6	2007				Bird-Amber	WINTER VISITOR	
Birds	Green Sandpiper	Tringa ochropus	18	2012		WACA-Sch1-p1		Bird-Amber	WINTER VISITOR	
Birds	Greenshank	Tringa nebularia	3	2007		WACA-Sch1-p1		Bird-Amber	MIGRANT	
Birds	Grey Partridge	Perdix perdix	2	2005			NERC-S41	Bird-Red	VAGRANT	

Taxon group	Common name	Scientific name	Count of records	Most recent year recorded	European protected status	UK protected status	NERC Act Status	Conservation list status	Note on local status by Berks Ornithological Club (Coloured text = species where targeted conservation action may help the species)	Notes from local entomologist and herpetofauna expert (Mike Turton)
Birds	Grey Plover	Pluvialis squatarola	1	2012				Bird-Amber	VAGRANT	
Birds	Grey Wagtail	Motacilla cinerea	41	2015				Bird-Red	RESIDENT	
Birds	Greylag Goose	Anser anser	10	2013				Bird-Amber	RESIDENT	
Birds	Hawfinch	Coccothraustes coccothraustes	2	2005			NERC-S41	Bird-Red	VAGRANT	
Birds	Herring Gull	Larus argentatus	6	2007			NERC-S41	Bird-Red	RESIDENT	
Birds	Hobby	Falco subbuteo	21	2012		WACA-Sch1-p1			SUMMER VISITOR (LIKELY TO BE BREEDING)	
Birds	Honey-buzzard	Pernis apivorus	3	2000	BirdsDir-A1	WACA-Sch1-p1		Bird-Amber	VAGRANT	
Birds	Hoopoe	Upupa epops	8	2005		WACA-Sch1-p1			VAGRANT	
Birds	House Martin	Delichon urbicum	26	2013				Bird-Amber	SUMMER VISITOR BREEDS IN SEVERAL PLACES SUCH AS CRESCENT ROAD	
Birds	House Sparrow	Passer domesticus	45	2017			NERC-S41	Bird-Red	RESIDENT	
Birds	Iceland Gull	Larus glaucoideus	3	2004				Bird-Amber	VAGRANT	
Birds	Kestrel	Falco tinnunculus	30	2012				Bird-Amber	RESIDENT	
Birds	Kingfisher	Alcedo atthis	37	2019	BirdsDir-A1	WACA-Sch1-p1		Bird-Amber	RESIDENT	
Birds	Knot	Calidris canutus	1	2004				Bird-Amber	VAGRANT	
Birds	Lapwing	Vanellus vanellus	11	2012			NERC-S41	Bird-Red	RESIDENT	
Birds	Lesser Black-backed Gull	Larus fuscus	4	2012				Bird-Amber	RESIDENT	
Birds	Lesser Redpoll	Acanthis cabaret	7	2004			NERC-S41	Bird-Red	WINTER VISITOR	
Birds	Lesser Spotted Woodpecker	Dendrocopos minor	11	2012			NERC-S41	Bird-Red	RESIDENT	
Birds	Linnet	Linaria cannabina	8	2007			NERC-S41	Bird-Red	RESIDENT	
Birds	Little Egret	Egretta garzetta	35	2012	BirdsDir-A1				RESIDENT	
Birds	Little Ringed Plover	Charadrius dubius	16	2012		WACA-Sch1-p1			SUMMER VISITOR (LIKELY TO BE BREEDING)	
Birds	Little owl	Athene noctua							BREEDS IN OR AROUND WHITEKNIGHTS CAMPUS AND FOBNEY ISLAND.	

Taxon group	Common name	Scientific name	Count of records	Most recent year recorded	European protected status	UK protected status	NERC Act Status	Conservation list status	Note on local status by Berks Ornithological Club (Coloured text = species where targeted conservation action may help the species)	Notes from local entomologist and herpetofauna expert (Mike Turton)
									RECORD FROM BOC. NOT YET REPORTED TO TVERC.	
Birds	Mallard	Anas platyrhynchos	57	2015				Bird-Amber	RESIDENT	
Birds	Marsh Harrier	Circus aeruginosus	1	2011	BirdsDir-A1	WACA-Sch1-p1		Bird-Red, Bird-Amber	VAGRANT	
Birds	Marsh Tit	Poecile palustris	11	2012			NERC-S41	Bird-Red	RESIDENT	
Birds	Meadow Pipit	Anthus pratensis	5	2012				Bird-Amber	WINTER VISITOR	
Birds	Mediterranean Gull	Larus melanocephalus	6	2004	BirdsDir-A1	WACA-Sch1-p1		Bird-Amber	RESIDENT (RARE)	
Birds	Merlin	Falco columbarius	4	2005	BirdsDir-A1	WACA-Sch1-p1		Bird-Red	VAGRANT	
Birds	Mistle Thrush	Turdus viscivorus	36	2016				Bird-Red	RESIDENT	
Birds	Montagu's Harrier	Circus pygargus	1	2004	BirdsDir-A1	WACA-Sch1-p1		Bird-Amber	VAGRANT	
Birds	Mute Swan	Cygnus olor	29	2017				Bird-Amber	RESIDENT	
Birds	Nightingale	Luscinia megarhynchos	6	2005				Bird-Red	SUMMER VISITOR (LIKELY TO BE BREEDING)	
Birds	Osprey	Pandion haliaetus	5	2011	BirdsDir-A1	WACA-Sch1-p1		Bird-Amber	VAGRANT	
Birds	Oystercatcher	Haematopus ostralegus	2	2010				Bird-Amber	SUMMER VISITOR (LIKELY TO BE BREEDING)	
Birds	Peregrine	Falco peregrinus	34	2019	BirdsDir-A1	WACA-Sch1-p1			RESIDENT	
Birds	Pied Flycatcher	Ficedula hypoleuca	5	2004				Bird-Red	VAGRANT	
Birds	Pintail	Anas acuta	31	2005		WACA-Sch1-p2		Bird-Amber	WINTER VISITOR	
Birds	Pochard	Aythya ferina	2	2007				Bird-Red	WINTER VISITOR	
Birds	Red Kite	Milvus milvus	132	2017	BirdsDir-A1	WACA-Sch1-p1		RL-Global-post2001-NT	RESIDENT	
Birds	Redshank	Tringa totanus	3	2012				Bird-Amber	SUMMER VISITOR (HAS BRED IN THE PAST MAY BREED AGAIN WHEN FOBNEY MEADOW IS RE-WETTED)	
Birds	Redstart	Phoenicurus phoenicurus	17	2012				Bird-Amber	MIGRANT	
Birds	Redwing	Turdus iliacus	32	2012		WACA-Sch1-p1		Bird-Red	WINTER VISITOR	

Taxon group	Common name	Scientific name	Count of records	Most recent year recorded	European protected status	UK protected status	NERC Act Status	Conservation list status	Note on local status by Berks Ornithological Club (Coloured text = species where targeted conservation action may help the species)	Notes from local entomologist and herpetofauna expert (Mike Turton)
Birds	Reed Bunting	<i>Emberiza schoeniclus</i>	15	2012			NERC-S41	Bird-Amber	RESIDENT	
Birds	Ringed Plover	<i>Charadrius hiaticula</i>	1	2004				Bird-Red, Bird-Amber	SUMMER VISITOR (HAS BRED WHEN SUITABLE HABITAT IS AVAILABLE. THERE IS NO SUITABLE HABITAT AT PRESENT)	
Birds	Ruff	<i>Calidris pugnax</i>	3	2010	BirdsDir-A1	WACA-Sch1-p1		Bird-Red	MIGRANT	
Birds	Sanderling	<i>Calidris alba</i>	1	2012				Bird-Amber	MIGRANT	
Birds	Sandwich Tern	<i>Sterna sandvicensis</i>	1	2003	BirdsDir-A1			Bird-Amber	MIGRANT	
Birds	Scaup	<i>Aythya marila</i>	11	2010		WACA-Sch1-p1	NERC-S41	Bird-Red	VAGRANT	
Birds	Shag	<i>Phalacrocorax aristotelis</i>	2	2003				Bird-Red	VAGRANT	
Birds	Shelduck	<i>Tadorna tadorna</i>	2	2011				Bird-Amber	RESIDENT	
Birds	Short-eared Owl	<i>Asio flammeus</i>	2	2010	BirdsDir-A1			Bird-Amber	WINTER VISITOR	
Birds	Shoveler	<i>Anas clypeata</i>	5	2003				Bird-Amber	WINTER VISITOR	
Birds	Skylark	<i>Alauda arvensis</i>	12	2012			NERC-S41	Bird-Red	RESIDENT	
Birds	Snipe	<i>Gallinago gallinago</i>	12	2014				Bird-Amber	WINTER VISITOR	
Birds	Song Thrush	<i>Turdus philomelos</i>	123	2016			NERC-S41	Bird-Red	RESIDENT	
Birds	Spotted Flycatcher	<i>Muscicapa striata</i>	8	2005			NERC-S41	Bird-Red	SUMMER VISITOR	
Birds	Spotted Redshank	<i>Tringa erythropus</i>	1	1994				Bird-Amber	VAGRANT	
Birds	Starling	<i>Sturnus vulgaris</i>	50	2015			NERC-S41	Bird-Red	RESIDENT	
Birds	Stock Dove	<i>Columba oenas</i>	13	2012				Bird-Amber	RESIDENT	
Birds	Swift	<i>Apus apus</i>	249	2018				Bird-Amber	SUMMER VISITOR. BREEDS AT MANY SITES BUT NUMBERS APPEAR TO BE DECLINING	
Birds	Tawny Owl	<i>Strix aluco</i>	9	2009				Bird-Amber	RESIDENT	
Birds	Teal	<i>Anas crecca</i>	9	2012				Bird-Amber	WINTER VISITOR	
Birds	Tree Sparrow	<i>Passer montanus</i>	1	1994			NERC-S41	Bird-Red	EXTINCT	
Birds	Turtle Dove	<i>Streptopelia turtur</i>	2	2011			NERC-S41	Bird-Red	EXTINCT	

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Birds	Whimbrel	Numenius phaeopus	3	2010		WACA-Sch1-p1		Bird-Red	MIGRANT	
Birds	Whinchat	Saxicola rubetra	4	2011				Bird-Red	MIGRANT	
Birds	White-fronted Goose	Anser albifrons	2	2011				Bird-Red	VAGRANT	
Birds	Wigeon	Anas penelope	3	2010				Bird-Amber	WINTER VISITOR	
Birds	Willow Warbler	Phylloscopus trochilus	35	2009				Bird-Amber	MIGRANT	
Birds	Wood Sandpiper	Tringa glareola	2	2010	BirdsDir-A1	WACA-Sch1-p1		Bird-Amber	MIGRANT	
Birds	Wood Warbler	Phylloscopus sibilatrix	2	2009			NERC-S41	Bird-Red	MIGRANT	
Birds	Woodcock	Scolopax rusticola	3	2012				Bird-Red	WINTER VISITOR	
Birds	Yellow Wagtail	Motacilla flava	5	2005			NERC-S41	Bird-Red	MIGRANT	
Birds	Yellow-legged Gull	Larus michahellis	5	2010				Bird-Amber	WINTER VISITOR	
Birds	Yellowhammer	Emberiza citrinella	6	2005			NERC-S41	Bird-Red	VAGRANT	
Fish - Bony	Atlantic Salmon	Salmo salar	5	2004	HabDir-A2np, HabDir-A5	HabReg-Sch4	NERC-S41			
Fish - Bony	Barbel	Barbus barbus	35	2016	HabDir-A5	HabReg-Sch4				
Fish - Bony	Brown Trout	Salmo trutta subsp. fario	5	2014			NERC-S41			
Fish - Bony	Brown/Sea Trout	Salmo trutta	3	2016			NERC-S41			
Fish - Bony	Bullhead	Cottus gobio	7	2011	HabDir-A2np					
Fish - Bony	European Eel	Anguilla anguilla	59	2016			NERC-S41	RL-Global-post2001-CR		
Fish - Jawless	Brook Lamprey	Lampetra planeri	1	1994	HabDir-A2np					
Higher Plants - Ferns	Maidenhair Fern	Adiantum capillus-veneris	1	1970				Status-NS		
Higher Plants - Flowering Plants	Alexanders	Smyrnum olusatrum	1	2015				Oxon-Scarce		
Higher Plants - Flowering Plants	Annual Beard-grass	Polypogon monspeliensis	1	2007				Status-NS		
Higher Plants - Flowering Plants	Bitter-vetch	Lathyrus linifolius	1	1982				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Bluebell	Hyacinthoides non-scripta	86	2018		WACA-Sch8				

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Higher Plants - Flowering Plants	Bur Medick	<i>Medicago minima</i>	1	1994				Status-NS, RL-Eng-post2001-VU, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Butcher's-broom	<i>Ruscus aculeatus</i>	10	2010	HabDir-A5					
Higher Plants - Flowering Plants	Carlina Thistle	<i>Carlina vulgaris</i>	1	1986				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Cat-mint	<i>Nepeta cataria</i>	1	1997				RL-Eng-post2001-VU, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Chamomile	<i>Chamaemelum nobile</i>	1	1982			NERC-S41	RL-Eng-post2001-VU, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Chicory	<i>Cichorium intybus</i>	8	2017				RL-Eng-post2001-VU		
Higher Plants - Flowering Plants	Chives	<i>Allium schoenoprasum</i>	3	1986				Status-NS		
Higher Plants - Flowering Plants	Common Cudweed	<i>Filago vulgaris</i>	1	1986				RL-Eng-post2001-NT, RL-GB-post2001-NT		
Higher Plants - Flowering Plants	Common Rock-rose	<i>Helianthemum nummularium</i>	1	1986				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Common Valerian	<i>Valeriana officinalis</i>	11	2013				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Corn Marigold	<i>Glebionis segetum</i>	1	2008				RL-Eng-post2001-VU, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Corn Mint	<i>Mentha arvensis</i>	5	2015				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Crosswort	<i>Cruciata laevipes</i>	2	2009				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Dittander	<i>Lepidium latifolium</i>	1	1994				Status-NS		
Higher Plants - Flowering Plants	Dwarf Spurge	<i>Euphorbia exigua</i>	1	2004				RL-Eng-post2001-VU, RL-GB-post2001-NT		
Higher Plants - Flowering Plants	English Whitebeam	<i>Sorbus anglica</i>	2	2018				Status-NR, RL-Eng-post2001-		

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								VU, RL-GB-post2001-NT, RL-Global-post94-VU		
Higher Plants - Flowering Plants	Field Mouse-ear	<i>Cerastium arvense</i>	1	1986				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Field Scabious	<i>Knautia arvensis</i>	9	2011				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Fritillary	<i>Fritillaria meleagris</i>	1	2016				Status-NS		
Higher Plants - Flowering Plants	Frogbit	<i>Hydrocharis morsus-ranae</i>	1	1986				RL-Eng-post2001-VU, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Galingale	<i>Cyperus longus</i>	1	2009				Status-NS, RL-Eng-post2001-NT, RL-GB-post2001-NT		
Higher Plants - Flowering Plants	Goldenrod	<i>Solidago virgaurea</i>	5	2012				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Good-King-Henry	<i>Chenopodium bonus-henricus</i>	3	1998				RL-Eng-post2001-VU, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Grape-hyacinth	<i>Muscari neglectum</i>	3	2014			NERC-S41	Status-NR, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Heath Cudweed	<i>Gnaphalium sylvaticum</i>	1	1984				RL-Eng-post2001-EN, RL-GB-post2001-EN		
Higher Plants - Flowering Plants	Heath Speedwell	<i>Veronica officinalis</i>	4	1998				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Heather	<i>Calluna vulgaris</i>	1	1998				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Hoary Plantain	<i>Plantago media</i>	8	2004				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Hound's-tongue	<i>Cynoglossum officinale</i>	1	2015				RL-Eng-post2001-NT, RL-GB-post2001-NT		
Higher Plants - Flowering Plants	Lesser Spearwort	<i>Ranunculus flammula</i>	6	2006				RL-Eng-post2001-VU		

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Higher Plants - Flowering Plants	Marsh Arrowgrass	Triglochin palustre	1	1986				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Marsh Cinquefoil	Potentilla palustris	1	1982				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Marsh Ragwort	Senecio aquaticus	6	2005				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Marsh Speedwell	Veronica scutellata	1	2005				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Marsh Valerian	Valeriana dioica	5	2006				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Mountain Currant	Ribes alpinum	1	2004				Status-NS		
Higher Plants - Flowering Plants	Narrow-leaved Bitter-cress	Cardamine impatiens	1	1986				Status-NS, RL-GB-post2001-NT		
Higher Plants - Flowering Plants	Quaking-grass	Briza media	3	2010				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Ragged-Robin	Silene flos-cuculi	13	2017				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Sainfoin	Onobrychis viciifolia	1	1986				RL-Eng-post2001-VU, RL-GB-post2001-NT		
Higher Plants - Flowering Plants	Sanicle	Sanicula europaea	21	2018				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Slender Parsley-piert	Aphanes australis	1	2015				Oxon-Scarce		
Higher Plants - Flowering Plants	Stinking Chamomile	Anthemis cotula	1	2007				RL-Eng-post2001-VU, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Stinking Hellebore	Helleborus foetidus	3	2008				Status-NS		
Higher Plants - Flowering Plants	Summer Snowflake	Leucojum aestivum subsp. aestivum	7	2019				Status-NS		
Higher Plants - Flowering Plants	Tormentil	Potentilla erecta	3	2008				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Treacle-mustard	Erysimum cheiranthoides	1	1994				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Velvet Bent	Agrostis canina	2	1986				Oxon-Scarce		
Higher Plants - Flowering Plants	Water-violet	Hottonia palustris	2	1986				RL-Eng-post2001-VU		

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Higher Plants - Flowering Plants	White Helleborine	Cephalanthera damasonium	1	2004			NERC-S41	RL-Eng-post2001-VU, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Whorled Water-milfoil	Myriophyllum verticillatum	1	1985				RL-Eng-post2001-NT, RL-GB-post2001-VU		
Higher Plants - Flowering Plants	Wild Pansy	Viola tricolor	1	1985				RL-Eng-post2001-NT, RL-GB-post2001-NT		
Higher Plants - Flowering Plants	Wild Strawberry	Fragaria vesca	21	2018				RL-Eng-post2001-NT		
Higher Plants - Flowering Plants	Wood-sorrel	Oxalis acetosella	8	2018				RL-Eng-post2001-NT		
Invertebrates - Ants, Bees, Sawflies & Wasps	An Ant, Bee, Sawfly or Wasp	Dolichovespula (Dolichovespula) media	1	1993				Notable-A		
Invertebrates - Ants, Bees, Sawflies & Wasps	Brown Tree Ant	Lasius brunneus	4	1993				Notable-A		Unconfirmed record. Nearest confirmed record on iRecord is Winnersh
Invertebrates - Ants, Bees, Sawflies & Wasps	Meadow Ant	Formica pratensis	1	1998			NERC-S41	RL-GB-pre94-EX, RL-Global-post94-NT		Unconfirmed record. Nearest confirmed record on iRecord is Winnersh
Invertebrates - Ants, Bees, Sawflies & Wasps	Red-girdled Mining Bee	Andrena (Poecilandrena) labiata	1	1997				Notable-A		Possible misidentification as this species is probably now extinct on the UK mainland.

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Invertebrates - Ants, Bees, Sawflies & Wasps	Red-shanked Carder-bee	Bombus (Thoracobombus) ruderarius	4	1997			NERC-S41			More recent records on iRecord - 2016 & 2019
Invertebrates - Ants, Bees, Sawflies & Wasps	Red-tailed (Hill) Cuckoo Bee	Bombus (Psithyrus) rupestris	1	2013				Notable-B		Unconfirmed - possible but very similar to red-tailed bumble bee
Invertebrates - Ants, Bees, Sawflies & Wasps	Sharp-collared Furrow Bee	Lasioglossum (Evylla) malachurum	1	2013				Notable-B		ID confirmed
Invertebrates - Beetles	A Beetle	Tachyporus formosus	23	2015				Notable-A		Record from experienced recorder and accepted, so this is a valid record.
Invertebrates - Beetles	Adonis' Ladybird	Hippodamia (Adonia) variegata	1	2013				Notable-B		Unconfirmed record. Nearest confirmed record on iRecord is Winnersh
Invertebrates - Beetles	Large Fruit Bark Beetle	Scolytus mali	1	2003				Notable-B		Record from experienced recorder and accepted, so this is a valid record.
Invertebrates - Beetles	Stag Beetle	Lucanus cervus	742	2017	HabDir-A2np	WACA-Sch5-s9.5a	NERC-S41	Notable-B		Very difficult to split out except by dissection. The only Berks record on NBN is from Wokingham
Invertebrates - Butterflies	Chalk Hill Blue	Polyommatus coridon	1	1992		WACA-Sch5-s9.5a		RL-GB-post2001-NT		
Invertebrates - Butterflies	Purple Emperor	Apatura iris	1	1991		WACA-Sch5-s9.5a		RL-GB-post2001-NT		Unconfirmed record. There

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										are a few records from the Oxfordshire side of the Thames between Mapledurham and Pangbourne
Invertebrates - Butterflies	Small Blue	Cupido minimus	1	1995		WACA-Sch5-s9.5a	NERC-S41	RL-GB-post2001-NT		Several records on NBN just outside Reading BC in Earley.
Invertebrates - Butterflies	Small Heath	Coenonympha pamphilus	7	2014			NERC-S41	RL-GB-post2001-NT		UKBMS records adjacent to RBC area
Invertebrates - Butterflies	Wall	Lasiommata megera	4	1992			NERC-S41	RL-GB-post2001-NT		NBN rec for 2014. UKBMS record
Invertebrates - Butterflies	White-letter Hairstreak	Satyrrium w-album	2	1993		WACA-Sch5-s9.5a	NERC-S41	RL-GB-post2001-EN		No records from RBC area. 1 from Hurst
Invertebrates - Caddis Flies	A Caddis Fly	Leptocerus lusitanicus	3	2014				RL-GB-pre94-VU		1 record from university campus. Possibly include planting of disease-resistant elms to encourage this species.
Invertebrates - Dragonflies & Damselflies	Common Club-tail	Gomphus vulgatissimus	24	2017				RL-GB-post2001-NT		NBN 1984. Records from Pangbourne are nearest on iRecord

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Invertebrates - Dragonflies & Damselflies	Variable Damselfly	Coenagrion pulchellum	1	2017				RL-GB-post2001-NT		Declining on the River Thames and elsewhere. Needs banks and riverside walls to climb up and emerge. Need to bear this in mind with Thames FAS.
Invertebrates - Mayflies	Southern Iron Blue	Baetis niger	1	1994			NERC-S41			All records close to the population in Burghfield, so probably wanderers from there.
Invertebrates - Molluscs	Depressed (or Compressed) River Mussel	Pseudanodonta complanata	1	2013			NERC-S41	RL-Global-post2001-VU		Unconfirmed record.
Invertebrates - Molluscs	Fine-lined Pea Mussel	Pisidium tenuilineatum	1	2006			NERC-S41			NBN 2013
Invertebrates - Molluscs	Freshwater Pearl Mussel	Margaritifera (Margaritifera) margaritifera	1	1985	HabDir-A2np, HabDir-A5	WACA-Sch5-s9.1k/s9.1t/s9.2/s9.4a/s9.4b/s9.4c/s9.5a	NERC-S41	RL-GB-post2001-CR, RL-Global-post94-EN		NBN 2006.
Invertebrates - Molluscs	Thames Ramshorn	Gyraulus (Gyraulus) acronicus	2	1994			NERC-S41	RL-GB-post2001-VU		
Invertebrates - Moths	A Moth	Mecyna flavalis subsp. flaviculalis	3	1993				RL-GB-pre94-VU		NBN 1995
Invertebrates - Moths	Beaded Chestnut	Agrochola lychnidis	8	2009			NERC-S41			
Invertebrates - Moths	Blood-vein	Timandra comae	14	2018			NERC-S41			
Invertebrates - Moths	Brindled Beauty	Lycia hirtaria	32	2007			NERC-S41			
Invertebrates - Moths	Brown-spot Pinion	Agrochola litura	1	1996			NERC-S41			
Invertebrates - Moths	Buff Ermine	Spilosoma lutea	45	2018			NERC-S41			

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Invertebrates - Moths	Bulrush Veneer	Calamotropha paludella	1	1996				Notable-B		
Invertebrates - Moths	Centre-barred Sallow	Atethmia centrargo	6	2008			NERC-S41			Unconfirmed. No Reading records - nearest records Mere oak Park and Winnersh.
Invertebrates - Moths	Cinnabar	Tyria jacobaeae	43	2018			NERC-S41			
Invertebrates - Moths	Dark-barred Twin-spot Carpet	Xanthorhoe ferrugata	6	2004			NERC-S41			
Invertebrates - Moths	Deep-brown Dart	Aporophyla lutulenta	1	2005			NERC-S41			
Invertebrates - Moths	Dot Moth	Melanchra persicariae	34	2009			NERC-S41			
Invertebrates - Moths	Dusky Brocade	Apamea remissa	8	2005			NERC-S41			
Invertebrates - Moths	Dusky Thorn	Ennomos fuscantaria	6	2008			NERC-S41			
Invertebrates - Moths	Garden Tiger	Arctia caja	3	2008			NERC-S41			
Invertebrates - Moths	Ghost Moth	Hepialus humuli	1	1981			NERC-S41			
Invertebrates - Moths	Green-brindled Crescent	Allophyas oxyacanthae	1	2009			NERC-S41			
Invertebrates - Moths	Grey Dagger	Acronicta psi	33	1996			NERC-S41			
Invertebrates - Moths	Knot Grass	Acronicta rumicis	8	2009			NERC-S41			
Invertebrates - Moths	Lackey	Malacosoma neustria	4	2004			NERC-S41			
Invertebrates - Moths	Large Nutmeg	Apamea anceps	10	2004			NERC-S41			
Invertebrates - Moths	Minor Shoulder-knot	Brachylomia viminalis	1	2004			NERC-S41			
Invertebrates - Moths	Mottled Rustic	Caradrina morpheus	47	2009			NERC-S41			
Invertebrates - Moths	Mouse Moth	Amphipyra tragopoginis	2	2004			NERC-S41			

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Invertebrates - Moths	Mullein Wave	Scopula marginepunctata	1	2009			NERC-S41			
Invertebrates - Moths	Oak Hook-tip	Watsonalla binaria	5	2005			NERC-S41			
Invertebrates - Moths	Olive Crescent	Trisateles emortualis	1	1987			NERC-S41	RL-GB-pre94-R		
Invertebrates - Moths	Powdered Quaker	Orthosia gracilis	11	2009			NERC-S41			
Invertebrates - Moths	Rosy Minor	Litoligia literosa	3	1981			NERC-S41			
Invertebrates - Moths	Rosy Rustic	Hydraecia micacea	2	2004			NERC-S41			
Invertebrates - Moths	Rustic	Hoplodrina blanda	32	2009			NERC-S41			
Invertebrates - Moths	Sallow	Cirrhia icteritia	1	1997			NERC-S41			
Invertebrates - Moths	September Thorn	Ennomos erosaria	2	2008			NERC-S41			
Invertebrates - Moths	Shaded Broad-bar	Scotopteryx chenopodiata	3	1997			NERC-S41			
Invertebrates - Moths	Shoulder-striped Wainscot	Leucania comma	6	2009			NERC-S41			
Invertebrates - Moths	Small Emerald	Hemistola chrysoprasaria	3	2004			NERC-S41			
Invertebrates - Moths	Small Phoenix	Ecliptopera silaceata	1	1981			NERC-S41			
Invertebrates - Moths	Small Square-spot	Diarsia rubi	31	2008			NERC-S41			
Invertebrates - Moths	Spinach	Eulithis mellinata	6	1996			NERC-S41			
Invertebrates - Moths	Sprawler	Asteroscopus sphinx	1	2011			NERC-S41			
Invertebrates - Moths	V-Moth	Macaria wauaria	6	1981			NERC-S41			
Invertebrates - Moths	White Ermine	Spilosoma lubricipeda	18	2018			NERC-S41			
Invertebrates - True Bugs	A True Bug	Aquarius paludum	4	2007				Notable-B		
Invertebrates - True Flies	A True Fly	Helina parcepilosa	3	2013				RL-GB-pre94-VU		Unconfirmed
Invertebrates - True Flies	Hornet Robberfly	Asilus crabroniformis	2	1999			NERC-S41	Notable		Valid record.

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Mammals - Terrestrial (bats)	Brown Long-eared Bat	Plecotus auritus	61	2017	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41			Unconfirmed. Possible - nearest confirmed iRecord records are in Sonning.
Mammals - Terrestrial (bats)	Common Pipistrelle	Pipistrellus pipistrellus	391	2018	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b				
Mammals - Terrestrial (bats)	Daubenton's Bat	Myotis daubentonii	43	2016	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b				
Mammals - Terrestrial (bats)	Lesser Noctule	Nyctalus leisleri	7	2017	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b				
Mammals - Terrestrial (bats)	Long-eared Bat species	Plecotus	29	2018	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41			
Mammals - Terrestrial (bats)	Nathusius's Pipistrelle	Pipistrellus nathusii	7	2018	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b				
Mammals - Terrestrial (bats)	Natterer's Bat	Myotis nattereri	4	2017	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b				
Mammals - Terrestrial (bats)	Noctule Bat	Nyctalus noctula	166	2018	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41			
Mammals - Terrestrial (bats)	Nyctalus Bat species	Nyctalus	2	2013	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41			
Mammals - Terrestrial (bats)	Serotine	Eptesicus serotinus	13	2018	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b				

Taxon group	Common name	Scientific name	Count of records	Most recent year recorded	European protected status	UK protected status	NERC Act Status	Conservation list status	Note on local status by Berks Ornithological Club (Coloured text = species where targeted conservation action may help the species)	Notes from local entomologist and herpetofauna expert (Mike Turton)
Mammals - Terrestrial (bats)	Soprano Pipistrelle	Pipistrellus pygmaeus	292	2018	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b	NERC-S41			
Mammals - Terrestrial (bats)	Whiskered Bat	Myotis mystacinus	1	2011	HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b				
Mammals - Terrestrial (excl. bats)	Brown Hare	Lepus europaeus	3	1999			NERC-S41			
Mammals - Terrestrial (excl. bats)	Eurasian Badger	Meles meles	87	2018		Badgers-1992				
Mammals - Terrestrial (excl. bats)	European Otter	Lutra lutra	8	2018	HabDir-A2np, HabDir-A4	HabReg-Sch2, WACA-Sch5-s9.4b/s9.4c/s9.5a	NERC-S41	RL-Global-post2001-NT		
Mammals - Terrestrial (excl. bats)	European Water Vole	Arvicola amphibius	21	2009		WACA-Sch5-s9.4a/s9.4b/s9.4c	NERC-S41			
Mammals - Terrestrial (excl. bats)	Polecat	Mustela putorius	2	2005	HabDir-A5	HabReg-Sch4	NERC-S41			
Mammals - Terrestrial (excl. bats)	West European Hedgehog	Erinaceus europaeus	76	2019			NERC-S41			
Reptiles	Adder	Vipera berus	1	2008		WACA-Sch5-s9.1k/s9.5a	NERC-S41			
Reptiles	Common Lizard	Zootoca vivipara	1	2010		WACA-Sch5-s9.1k/s9.5a	NERC-S41			This is a possible misidentification as the species is now very rare in Berkshire and Oxfordshire
Reptiles	Grass Snake	Natrix helvetica	33	2016		WACA-Sch5-s9.1k/s9.5a	NERC-S41			
Reptiles	Slow-worm	Anguis fragilis	80	2016		WACA-Sch5-s9.1k/s9.5a	NERC-S41			

Appendix 3 - Policy and legislation

A summary of key policy and legislation is provided below.

The Rio Convention (Convention on Biological Diversity).

In 1992, at the Earth Summit in Rio de Janeiro, Brazil, the UK, along with 168 other countries made a formal commitment to work together to protect the environment. Amongst other treaties the Convention on Biological Diversity (CBD) was signed. This had three main goals: the conservation of biodiversity; the sustainable use of its components; and the equitable sharing of benefits arising from genetic resources.

For the first time in international law the treaty recognised that the conservation of biological diversity is 'a common concern of humankind'. The CBD is one of the key drivers of biodiversity conservation worldwide.

In 2010, in Nagoya, Aichi Province, Japan, the signatories to the CBD published a Strategic Plan for Biodiversity for the years 2011-2020. This included five strategic goals and 20 targets referred to as the 'Aichi Targets'.

The next conference will be held in 2020 in Italy.

The 2001 European Union Summit

At the 2001 European Union Summit in Gothenburg, European leaders made a commitment to halt biodiversity loss by 2010.

The 2010 target was not met. In March 2010 the EU made a new commitment to

"Halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restore them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss."

The last review, in 2015, concluded that:

"Overall, biodiversity loss and the degradation of ecosystem services in the EU have continued since the EU 2010 biodiversity baseline, as confirmed by the 2015 European environment - state and outlook report. This is consistent with global trends and has serious implications for the capacity of biodiversity to meet human needs in the future. While many local successes demonstrate that action on the ground delivers positive outcomes, these examples need to be scaled up to have a measurable impact on the overall negative trends."

The strategy will be reviewed again in 2020.

Key directives

There are three EU Directives that are key to the conservation of biodiversity in Europe. As with all EU directives, have been transposed into national law. After the UK leaves the EU it is likely that in the UK the directives will continue to apply unless or until the acts which have transposed them have been revoked.

The Birds Directive

First adopted in 1979 The Birds Directive aims to protect all of the 500 wild bird species naturally occurring in the European Union. Member states have a duty to maintain populations of all wild birds species, designate Special Protection Areas (SPAs) for the rarest and most vulnerable species, restrict the sale and keeping of wild birds, and restrict the hunting and killing of wild birds.

The Habitats Directive

The Habitats Directive promotes the maintenance of biodiversity. Member states are required to:

- Maintain or restore European protected habitats and species listed in the directive at a favourable conservation status
- Contribute to a coherent European ecological network of protected sites by designating Special Areas of Conservation (SACs) for habitats listed on Annex I and for species listed on Annex II of the directive.
- Ensure conservation measures are in place to appropriately manage SACs and ensure appropriate assessment of plans and projects likely to have a significant effect on the integrity of an SAC. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest.
- Undertake surveillance of habitats and species
- Ensure strict protection of species listed on Annex IV
- Report on the implementation of the Directive every six years, including assessing the conservation status of species and habitats listed on the Annexes to the Directive.

The NATURA 2000 Network

This is a coherent European ecological network of protected sites and is made up of SACs and SPAs make up the Natura 2000 network.

Water Framework Directive

The Water Framework Directive 2000/60/EC is an EU directive which commits European Union member states to achieve good ecological and chemical status of all water bodies (including marine waters up to one nautical mile from shore) by 2015. Most waterbodies did not meet the target and the deadline for achieving it has been extended.

The EIA Directive

The Environmental Impact Assessment (EIA) Directive (2014/52/EU), ensure that all projects, above a certain threshold, are assessed for their potential impacts on the environment, through a process known as Environmental Impact Assessment. It is transposed into UK law through regulations such as The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the '2017 Regulations').

United Kingdom

The UK Biodiversity Action Plan, first published in 1994, was the UK Government's response to signing the Convention on Biological Diversity.

The plan set out a programme for conserving the UK's biodiversity and led to the production of 436 action plans for many of the UK's most threatened species and habitats. The UK BAP was superseded by the 'UK Post-2010 Biodiversity Framework' in July 2012 to reflect the devolution in the UK.

The UK BAP priority list was last reviewed in 2007 and includes 1,150 species and 65 habitats that are a priority for conservation actions. It has not been reviewed again since but the habitats are the “priority habitats” referred to in planning policy.

25 Year Environment Plan

In 2018 the government published its 25 year Environment Plan. It has 19 policies as follows (those most relevant to the Reading BAP are highlighted in **bold**):

1. **Embedding an ‘environmental net gain’ principle for development, including housing and infrastructure**
2. Improving how we manage and incentivise land management
3. Improving soil health and restoring and protecting our peatlands
4. **Focusing on woodland to maximise its many benefits**
5. Reducing risks from flooding and coastal erosion
6. **Protecting and recovering nature:**
 - i. **Publishing a strategy for nature**
 - ii. **Developing a Nature Recovery Network**
 - iii. **Providing opportunities for the reintroduction of native species**
 - iv. **Exploring how to give individuals the chance to deliver lasting conservation**
 - v. **Improving biosecurity to protect and conserve nature**
7. Conserving and enhancing natural beauty
8. Respecting nature in how we use water
9. **Helping people improve their health and wellbeing by using green spaces**
10. **Encouraging children to be close to nature, in and out of school**
11. **Greening our towns and cities**
12. Making 2019 a Year of Action for the environment
13. Maximising resource efficiency and minimising environmental impacts at end of life.
14. Reducing pollution
15. Introducing a sustainable fisheries policy as we leave the Common Fisheries Policy
16. Achieving good environmental status in our seas while allowing marine industries to thrive
17. Providing international leadership and leading by example
18. Helping developing nations protect and improve the environment
19. **Leaving a lighter footprint on the global environment**

England

The most up to date strategy for England is “Biodiversity 2020: A strategy for England’s wildlife”. It was published in 2011. It describes what is needed to halt overall biodiversity loss by 2020 and sets ambitious goals for:

- better wildlife habitats - quality goals for priority habitat and Sites of Special Scientific Interest (SSSIs)
- more, bigger and less fragmented areas for wildlife - an increase in priority habitats by at least 200,000ha
- the restoration of 15% of degraded ecosystems - as a contribution to climate change mitigation and adaptation
- establishing a Marine Protected Area network
- managing and harvesting fish sustainably
- marine plans in place by 2022
- an overall improvement in status of our wildlife and prevention of further human induced extinctions of known threatened species
- significantly more people engaged in biodiversity issues, aware of its value and taking positive action

In line with the 25 year Environment Plan it will soon be replaced by a new strategy for nature.

Key legislation

The National Parks and Access to the Countryside Act 1949

This act provides mechanisms to designate National Nature Reserves and Local Nature Reserves (of which there are two in Reading).

The 1981 Wildlife and Countryside Act(as amended).

This act:

- Protects wild birds and their nests, including special penalties for rare or vulnerable species (such as the black redstart) as listed on Schedule 1 of the act
- Protects animal listed on Schedule 5 (such as water voles, reptiles and amphibians) and plants listed on Schedule 8 from (depending on the species) disturbance, killing, injury, taking, uprooting or sale.
- Contains measures to prevent the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting of plants listed on Schedule 9.
- Provides for the notification (designation) of Sites of Special Scientific Interest which are the best examples of different habitat types.

The Habitats Regulations 2017

These regulations transpose the Habitats Directive into UK law and gives strict protection to our rarest species (known as European protected species) such as bats, great crested newts, otters and dormouse. It also

The NERC Act

This created a biodiversity duty for all public bodies, including local authorities. Section 40 reads:

“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.”

It also created a duty for the government to:

“publish a list of the living organisms and types of habitat which in the Secretary of State’s opinion are of principal importance for the purpose of conserving biodiversity. “

These are the “priority habitats” and the “priority species” referred to in the NPPF

The Environment Bill

The Environment Bill (likely to soon become The Environment Act) if adopted will put the government’s 25 Year Environment Plan on a statutory footing and set out:

- a. Provisions for the Office for Environmental Protection;
- b. Provision about waste and resource efficiency;
- c. Provisions about air quality;
- d. Provision for the recall of products that fail to meet environmental standards;
- e. Provisions about water;
- f. Provisions about nature and biodiversity;
- g. Provision for conservation covenants;
- h. Provisions about the regulation of chemicals; and for connected purposes.

Key paragraphs from the NPPF

The NPPF states that there are three overarching objectives of sustainable development: an economic objective; a social objective and an environmental objective (including helping to improve biodiversity). At paragraph 170 the NPPF reads:

“170. 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);
- b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services - including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
- c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

- 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.”

And at paragraph 174 and 175 it reads:

“174. 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.

175. 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;
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- 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 in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.”

Appendix 4 - List of species and habitat specific actions

This section is to be discussed and expanded on in the next meeting.

Ecological enhancements within and adjacent to development sites

Hedgehog gaps under new fencing

Swift bricks

Sand martin nesting tubes

Bat boxes

Stag beetle loggeries

Peregrine platforms

Black redstart nesting sites and habitats

House sparrow terraces and planting to provide invertebrates and seeds

Surveys

Amphibian surveys for palmate newt, great crested newts and toads

Glow worm surveys

Water vole surveys

Loddon lilly

Barn owl

Pollinators

Other

Otter holts in parks

Planting rarer native trees such as black poplar, wild service and wild pear.

Appendix 5 - Acknowledgements

[List of individuals and organisations who contributed to the BAP]

DRAFT

Appendix 6 - References

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