Bromley Biodiversity Plan 2021-2026

Promoting Biodiversity Management at a Local Level

Authors:

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The country is extraordinarily rural and quiet with narrow lanes and high hedges and hardly any ruts. It is really surprising to think London is only sixteen miles off…

Charles Darwin to his sister Catherine, July 1842 after first viewing Down House, in the village of Downe.

1. Mission Statement

The Bromley Biodiversity Plan endeavours to promote coordinated action for biodiversity at the local level. This document describes Bromley's Priority Habitats and Species and recommends best practice guidance for protecting and enhancing biodiversity in the Borough. The guidelines are aimed at planners and developers, land owners and contractors, volunteers and Friends Groups, schools and the general public. The biodiversity surrounding us in Bromley was an inspiration for Charles Darwin and his work on the natural world and his theory of natural selection. This plan aims to sustain our local species and habitats for future generations, ensuring that a long-term strategy for conserving, protecting and enhancing biodiversity is in place.

2. Introduction

2. INTRODUCTION

Purpose of this document

This Biodiversity Plan (adopted on 31st March 2021) replaces an older version adopted by the borough in 2015. According to the UK State of Nature Report 2019, 41% of UK native species are in decline and most of the 2020 Aichi targets the UK Government committed to at the Convention on Biological Diversity 2011 will not be met. The Bromley Biodiversity Plan details the priority habitats and species in the borough and through providing information and guidance on best practice for biodiversity in Bromley aims to improve biodiversity at a local level. It is meant to be read in conjunction with *i*dverde Bromley Biodiversity Action Plan (*i*BBAP) written by *i*dverde who manage Bromley owned land and which provides more detailed actions and targets for Bromley owned land which are also generally applicable to habitats under different ownership. Publishing the *i*BBAP document on the web means that it can be updated on a yearly basis or more often as required. Whilst the previous Bromley Biodiversity Plan has provided useful guidance over the past five years, it requires updating to take account of recent changes to National, regional and local legislation and policies relating to biodiversity and the development of land.

The Bromley Biodiversity Plan includes the following aims and objectives:

Aims

- To maintain and increase biodiversity in LBB through improved management of existing greenspaces which is guided by evidence.
- To increase the area of habitat managed for biodiversity in the London Borough of Bromley (LBB) including improving links between greenspaces.
- To engage the local community in biodiversity issues affecting greenspace in LBB.
- To reduce changing climate impacts on people and wildlife through biodiversity enhancements.

Objectives

- It identifies a number of priority habitats and species for the borough and outlines a set of realistic aims and objectives for what will need to be done to ensure these habitats and species are conserved and improved over the Bromley Biodiversity Plan's lifetime.
- It includes generic best practice guidance for management of Bromley's priority habitats.
- It sets out the legislative and policy framework governing how biodiversity must be considered in the planning process.
- It provides guidance for developers on the need for consideration of the ecological value of development sites and details of the ecological information required to accompany planning applications. This includes

an overview of the ecological issues and mitigation measures along with information about carbon storage in different habitats, mitigation for carbon neutrality by 2050 and information on related planning conditions that may be imposed by the Council.

- It provides guidance to landowners and developers of land on the various types of enhancements for biodiversity that will be expected of them on land they currently own or on any proposed new developments in order to achieve biodiversity net gain.
- It recommends biodiversity enhancements which contribute to urban cooling, pollution reduction and carbon sequestration.
- The document will be used by the London Borough of Bromley planning officers as supplementary guidance in support of the Local Plan when considering planning applications and development proposals.

The Plan has been produced by the London Borough of Bromley and the Bromley Biodiversity Partnership to support the delivery of the Bromley Local Plan 2019 and the green infrastructure and biodiversity obligations introduced by the London Plan (2021). The guidance includes details on the approach that developers will be expected to adopt to take in avoiding, mitigating and compensating for biodiversity impacts.

The Plan also provides guidance for developers and planners on how to enhance and make space for nature within new developments.

What is Biodiversity?

Biodiversity simply means the variety of life on earth in all its various forms. This includes animals from vertebrates (mammals, birds, fish, reptiles and amphibians) to invertebrates (e.g. insects, spiders, worms and crustaceans), plants (higher plants, ferns, bryophytes and algae), fungi (and lichens), bacteria and viruses.

Biodiversity also encompasses the complex relationships between living things and their physical surroundings. No organism can exist in isolation and each contributes to the balance of nature and the survival of life on earth.

Why does biodiversity matter?

Biodiversity provides us with a wide range of vital ecosystem services, including healthy soil, pollinators, food, purification of water, clean air, climate regulation, flood management, carbon storage, shelter, medicines, and mental and physical health. Many human activities directly affect species and habitats; alteration of ecosystems is happening at an ever-increasing rate, and in many cases has led to extinctions.

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) 2019 reported, '*The health of ecosystems on*

which we and all other species depend is deteriorating more rapidly than ever. We are eroding the very foundations of our economies, livelihoods, food security, health and quality of life worldwide…..1 million species are threatened with extinction and 16 out of 20 Aichi Biodiversity targets for 2020 [agreed at the Convention on Biological Diversity (CBD) at Nagoya in 2011 and listed in the CBD Strategic Plan 2011-2020] *are likely to be missed*'

Biodiversity and Climate Change

According to the Convention on Biological Diversity, '*It is now widely recognized that climate change and biodiversity are interconnected. Biodiversity is affected by climate change, with negative consequences for human well-being, but biodiversity, through the ecosystem services it supports, also makes an important contribution to both climate-change mitigation and adaptation. Consequently, conserving and sustainably managing biodiversity is critical to addressing climate change*.' In addition to providing information regarding how to maintain and improve biodiversity in the London Borough of Bromley a short paragraph has also been included in most of the habitat sections regarding carbon storage within the habitat and how good management for biodiversity maintains and/or improves carbon storage.

Examples of biodiversity enhancements which can help mitigate the impacts of climate change in Bromley include:

- Increasing the number of ponds and improving wetland management for wildlife: contributes to air temperature reduction in summer, improves water quality by filtering pollutants and can aid flood risk management.
- Planting native trees of local provenance (better adapted to local soil and weather conditions) as street trees and in areas where they cause no damage to other habitats provides shade, contributes to urban cooling through transpiration and removes some pollutants.
- Managing more grassland as hay meadow, i.e., allowing it to grow long in spring and summer then cutting annually in autumn: reduces soil moisture loss, can link habitats along verges and supports pollinators in larval and adult stages.
- Installing green roofs and walls planted with native species intercepts rainfall and slows water loss, supports pollinators (and therefore birds and bats), contributes to urban cooling in summer, insulation in winter and by linking habitats in parks and gardens, reduces habitat fragmentation.

For more information see Natural England and RSPB, 2019. Climate Change Adaptation Manual - Evidence to support nature conservation in a changing climate, 2nd Edition. Natural England, York, UK and Sections 3 and 4 of this plan.

Biodiversity in Bromley

The London Borough of Bromley is important for a wide range of wildlife, having species and habitats in common with both Kent and London. It contains

London's largest area of countryside, stretching south to the crest of the North Downs, and including a good proportion of London's semi-natural habitats. In order to protect these habitats, many areas of the borough are designated in Bromley Local Plan as Sites of Importance for Nature Conservation (SINCs). These include sites important within London (Sites of Metropolitan Importance) as well as those of Borough and Local importance. In addition, Bromley's designated Local Green Spaces, (green and/or open spaces of particular value and significance to the local community) are also of biodiversity value. Some sites hold other designations at the local level: Local Nature Reserves (LNRs), or are of national importance: Sites of Special Scientific Interest (SSSIs). Wildlife is not restricted to open countryside, but thrives in urban areas too and in a wide range of situations. Urban habitats make a significant contribution to the biodiversity of Bromley and are residents' first and most frequent points of contact with the natural world (See **Appendices A** and **B**, for more information and Map of Bromley SINCs).

The Geology of Bromley

The north and western half of the Borough is capped with London Clay and Blackheath Beds. The Clay produces damp, heavy soils supporting oak dominated woodland. Where this has been cleared, some of the few examples of species-rich neutral grassland occur. The Blackheath Beds form plateaus with thin, nutrient-poor acid soils. Where woodland is absent on these soils heathland developed, of which only small remnants remain.

The Ravensbourne and Cray rivers start with springs where the Cretaceous Chalk aquifer which underlies the whole area is sealed by overlying impervious rocks of the Woolwich and Reading Beds (now often termed the Lambeth Formation) and Thanet Sands of Tertiary age. Chalk itself is also exposed in the southern and eastern half of the borough where it is usually capped by Clay-with-Flints which are weathering products of the Pleistocene Ice Age, but the river valley bottoms are often lined with alluvial deposits of more recent age. Patches of alder woodland have survived in the damper valleys, and the thin chalk soils host species-rich grassland, often without trees. Ancient hedgerows delineate field boundaries, some of which date from the Iron Age, and ancient woodlands are found on the Clay-with-Flints.

Bromley in the wider landscape

Bromley's position between Kent, Surrey and London means that it is an important bridge between the habitats of the North Downs and those of the London basin. The chalk grassland of the southern and eastern half of the borough link Bromley with London's other downland habitats in Surrey and Croydon and with the North Downs Area of Outstanding Natural Beauty (AONB). Bromley's remaining heathland links the borough to the heathland areas of Croydon, Mitcham and beyond. The Thames tributaries of the Cray, Ravensbourne and Beck rivers extend beyond Bromley's boundaries and link Bromley with the heart of London.

Bromley's Biodiversity Heritage: Darwin and Lubbock.

Charles Darwin moved to Bromley in 1842. For many years, he studied the plants and animals around his home in Downe. He walked in the surrounding countryside, observing, taking specimens and carrying out experiments in many of the habitats and landscapes that remain to this day in the Downe and Cudham Valleys, at High Elms, Keston and Holwood. There are many references to the local area in his published works, including in *On the Origin of Species*, published in 1859.

High Elms Country Park was once the home of Sir John Lubbock, the first Lord Avebury whose interest in natural history as a child was encouraged by Darwin. John Lubbock grew up to be a Victorian polymath. He was a banker, politician and social reformer, a respected archaeologist and entomologist who, like Darwin, was inspired by his surroundings. His book *Ants, Bees and Wasps*, published in 1884 was a keystone text in the study of hymenoptera.

The works of both Darwin and Lubbock created a foundation of scientific observation and understanding of Bromley's biodiversity. Their legacy continues in the many volunteers, land owners, teachers, gardeners and many more Bromley residents who care about the borough's ecology.

Much of the borough's natural heritage is closely linked to its historical heritage, from the Wilberforce Oak near Holwood House to the Prehistoric Monsters at Crystal Palace Park; an idea of Professor Richard Owen who first introduced the term 'dinosaur'.

Biodiversity Action Plans in Bromley

Bromley's first Biodiversity Action Plan (BBAP) was published in 1999. It was London's first BAP and followed establishment of the Bromley Biodiversity Partnership and widespread consultation. Since then there have been five editions of the BBAP each of which reviewed, extended and/or refined targets. The BBAP has been an effective way of promoting, protecting and enhancing biodiversity in the borough with widespread community involvement and has achieved a great deal for biodiversity, including practical projects with many different partners and many well attended public walks, talks and events aimed at a wide range of age groups, interests and socio- economic groups.

Bromley Biodiversity Partnership supports and promotes the Bromley Biodiversity Plan It is a partnership of land owners and managers, key

organisations, planners, friends groups, volunteers, residents and individuals with expertise in specific groups of plants and animals. The Partnership provides a forum where these groups meet and aims to facilitate the co-ordinated action necessary to maintain and enhance Bromley's biodiversity. Its aims are:

- To identify and address strategic biodiversity issues in the London Borough of Bromley.
- To protect the species and habitats within the borough for future generations.
- To provide a link between local groups and national biodiversity strategies, action plans and reporting procedures.
- To raise awareness and promote biodiversity issues.
- To review and monitor biodiversity management in the borough and to promote the aims and objectives of the Bromley Biodiversity Plan, providing guidance and support to those in the borough who are concerned with or have influence on Bromley's biodiversity.

Issues the Bromley Biodiversity Plan Needs to Address

In 1992, the UK government signed the Rio Convention and committed to halting biodiversity loss through the UK Biodiversity Action Plan. Subsequently a London Biodiversity Action Plan was written for important habitats and species in Greater London. In the UK patterns of loss for some habitats and species have slowed or reversed, but a general decline in the quality and variety of England's natural environment has continued (see the State of Nature Report 2019).

The Lawton Report, Making Space for Nature (Lawton, 2010), summarised what needs to be done in England to halt and reverse biodiversity losses in four words: '*more, bigger, better* and *joined*'.

This call for a larger network with **more** areas rich in wildlife, **bigger** sites, **better** managed sites, and more **inter-connected** sites was recognised in the Natural Environment White Paper, '*The Natural Choice: securing the value of nature' (*2011). It was this White Paper that drove previous iterations of the Bromley Biodiversity Action Plan.

Although much has been achieved for biodiversity in Bromley, some species were lost and habitats reduced between 1999 and 2020. The decline of species and habitats within the UK continues at a concerning rate.

Key issues influencing biodiversity include:

- habitat loss and fragmentation
- changing climate. Average UK temperatures have increased by nearly 1°C since the 1980s*
- Invasive Non-Native Species (INNS) On average 10–12 new non-native species become established in the UK annually, and 10–20%

of these cause serious adverse impacts*
- Urbanisation: 8% increase in proportion of UK population living in urban areas between 1970 and 2018*
- Pollution: The area of crops treated with pesticides increased by 53% between 1990 and 2010*
- Hydrological change: 1,000 hectares (ha) of UK wetlands were converted to artificial surfaces 2006–2012*. Rivers and streams have historically been modified for historic mills and enhanced conveyance. Problems include drainage, pollution, canalization. 90% of UK lowland ponds were lost in the 20th century
- Agricultural Management: intensification of land management, impacting farmland wildlife on 75% of the UK's land area*
- legislation, policy and planning
- Fragmented habitat restoration and creation
- Volunteer effort to maintain & restore habitats

*From the State of Nature Report 2019

Since the UK's departure from the European Union, the Environment Bill is progressing through the Commons, providing an obligation for local authorities to plan for the improvement of the natural environment. The Act will allow the Local Planning Authority (LPA) to mandate biodiversity net gain to ensure that all new developments enhance biodiversity and help deliver thriving natural spaces for communities. The London Plan (2021) requires Local Authorities to plan and manage their green infrastructure, promote urban greening and aim to secure biodiversity net gain when considering new development. A section listing the legislation and LBB Policy regarding wildlife and biodiversity, (together with ways in which biodiversity net gain can be increased by residents, community groups and through the planning process) has therefore been included in the Plan.

The Bromley Biodiversity Plan 2021 – 2026

The new Bromley Biodiversity Plan translates national and regional strategies, priorities and targets into local action on the ground (see Table 2).

The Bromley Biodiversity Plan is critical to the delivery of LBB's biodiversity duty as outlined in The Environment Act (which includes establishment of Local Nature Recovery Strategies), the new London Plan and the Natural Environment and Rural Communities Act (NERC) 2006, section 40 of which requires that '*Every public body 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'*.

Habitats and species in the Bromley Biodiversity Plan are a material consideration in the determination of planning applications.

The new Bromley Biodiversity Plan has been written by members of Bromley Biodiversity Partnership: a partnership of organisations and groups led by the London Borough of Bromley. Working in partnership helps more to be achieved

for biodiversity within the borough with limited resources. A list of partners can be found in Table 2.

The Bromley Biodiversity Partnership recommends the following principals for the management of the borough's biodiversity:

General Principles for Biodiversity Management in Bromley

- Maintain, enhance and restore Sites of Importance for Nature Conservation (SINCs) and other green spaces for biodiversity.
- Follow existing site Management Plans, updating as necessary.
- For sites lacking appropriate Management Plans, follow generic management guidance for Land Managers, Friends and Volunteers, and Schools (**Section 6**).
- Safeguard Bromley's protected, rare or threatened species and monitor all wildlife in the borough to inform appropriate management and planning practices. (**Section 5** and **Appendix C**)
- Promote a landscape scale approach to biodiversity management through partnership working and the planning system.
- Promote wildlife corridors between existing habitats, for example along rivers (Rivers Ravensbourne, River Cray and their tributaries) and walking routes (London LOOP, Green Chain) and road verges managed for wildlife.
- Promote the Catchment Based Approach (CaBA) and support the Thames River Basin Management Plan and Catchment Action Plans for the Rivers Ravensbourne, Cray and their tributaries through partnership working (for more info, see Catchment Based Approach).
- Reduce the use of pesticides (including herbicides and fungicides) in all habitat types so that they are only used in exceptional circumstances e.g. To control invasive species such as Japanese knotweed.
- Encourage and support actions to promote biodiversity by residents.
- Protect, enhance and promote the public's access to nature for example through environmental education and walks, talks and events.

The following sections of the plan list the habitats and species of note in the borough, along with detailed guidance for, planners and developers, land

managers, Friends groups, volunteers and schools on how best to maintain and enhance them for the benefit of people and wildlife.

Table I: Bromley Biodiversity Partnership List of Partners

Name of Organisation
Bromley Allotments and Leisure Gardens Associations Limited
Bromley Countryside Volunteers
Bromley Friends Forum
Bromley Friends of the Earth
Bromley RSPB (Local Group)
City of London Corporation
Environment Action at Coney Hall (EACH)
English Heritage Trust (formerly English Heritage)
Federation of Bromley Residents Associations
Forestry Commission
Friends of Bromley Town Parks and Gardens
Friends of Darrick and Newstead Woods
Friends of High Elms Country Park
Friends of Jubilee Country Park
Friends of Keston Common
Friends of Scadbury Park
Friends of Whitehall and Havelock Recreation Grounds and Norman Park/Elmfield Community Woodland
GiGL – Bromley has a Service Level Agreement for use of GiGL data
Greener and Cleaner Bromley and Beyond
Holwood Trust
*i*dverde
Kent Mammal Group
Kent Reptile and Amphibian Group
Kent Wildlife Trust
London Borough of Bromley
London Wildlife Trust
National Trust
Natural England
Orpington Bee Keepers
Orpington Field Club
Ravensbourne Catchment Improvement Group
RSPB
Thames 21
Trustees of Chislehurst Common
West Kent Badger Group
Individual experts: some but not all belong to above groups

3. Legislation and Policy

Key Acts and Regulations

When determining planning applications Local Planning Authorities must take into account the requirements of all relevant wildlife legislation. The key legislation which collectively provide protection for habitat and species in England are as follows:

- Wildlife and Countryside Act 1981 (as amended) – (WCA)
- Natural Environment and Rural Communities Act 2006 (NERC)
- Protection of Badgers Act 1992
- Hedgerow Regulations 1997
- The Conservation of Habitats and Species Regulations 2017
- The Town and Country Planning Environmental Impact Assessment Regulations 2017
- Countryside and Rights of Way Act 2000
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
- The Environment Bill (2020)

Following the UK's exit from the European Union, The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 retain and transpose the legislation from the 2017 Regulations and this will be consolidated at a later date into a new Act of Parliament.

Until the UK introduces its own legislation, those species listed under Annex IV(a) of the European Communities Habitats Directive and which receive protection in the UK under the Conservation of Habitats and Species Regulations 2017 Schedule 2 (as amended) will retain the name European Protected Species (EPS) in this document.

EPS that may be encountered in Bromley include, but are not limited to: all bats, Hazel Dormouse, Great Crested Newt.

Under the legislation it is an offence to:

- Deliberately capture, injure or kill an EPS;
- Intentionally or recklessly disturb an EPS in its place of rest or breeding site;
- Intentionally or recklessly damage, destroy or obstruct access to an EPS place of rest or breeding site (even if the EPS is not occupying the site at the time); or
- Possess or sell or exchange an EPS (dead or alive).

If a development affects a European Protected Species, it will likely be necessary to obtain a European Protected Species Mitigation Licence from Natural England in order for the works to proceed. Planning permission must be granted prior to submitting an application to Natural England. Surveys for many protected species can only be carried out at certain times of year, therefore early consideration of the potential presence of European Protected Species is required to avoid unnecessary delays. Further details on the preparation of ecological surveys can be found in **Section 6.1 – Best Practice Guidelines for Planners and Developers**.

For species protected by law in LBB (other than badgers), see Protected Species, Section 5

Habitats and Species of Principle Importance

Under Section 41 of the Natural Environment and Rural Communities Act 2006, the Secretary of State is obliged to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. This list guides decision makers including Local Planning Authorities as to their duty to have regard to the conservation of biodiversity in decision making.

There are currently 56 Habitats of Principal Importance in England (previously called and still described under UKBAP priority habitats) on the Section 41 list, of which the following are present within Bromley:

- Lowland Beech and Yew Woodland
- Lowland Mixed Deciduous Woodland
- Wet Woodland
- Wood-pasture and Parkland
- Traditional Orchards
- Hedgerows
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland meadows
- Lowland heathland
- Ponds
- Rivers

Other important habitats in Bromley are:

- Ancient and Veteran Trees
- Scrub
- Gardens and Allotments
- Churchyards and Cemeteries

Further detail on Bromley's important habitats can be found in **Section 4 – Habitats in Bromley.**

The NERC Act 2006, section 41 lists 943 Species of Principal Importance in England. Some of these are present in LBB and can be seen in Appendix C, Priority Species in Bromley, which lists rare or threatened higher plants, birds, butterflies, moths, fungi and lichen species within LBB. The NERC S41 LBB Priority species include Hedgehog (*Erinaceus europaeus)*, Man Orchid (*Orchis anthropophora*) and Olive earthtongue fungus (*Microglossum olivaceum*) while other Bromley Priorities include species red and amber listed in England, Kent and/or Greater London such as Swift (*Apus apus*), Upright Chickweed (*Moenchia erecta*) and White Admiral Butterfly (*Limenitis camilla*).

Invasive Species

The Wildlife and Countryside Act 1981 is the key piece of legislation in respect of invasive non-native species. All invasive species are listed under Schedule 9 of the Act. It is illegal to plant or otherwise cause any invasive species to grow or spread into the wild. When encountered on a development site an Invasive Species Management Plan will be required.

Invasive species known to be present within Bromley include Japanese Knotweed (*Fallopia japonica)*, Himalayan Balsam (*Impatiens glandulifera)*, Signal (*North American*) Crayfish (*Pacifastacus leniusculus)* and Mink (*Neovision vision)*. For more information on invasive species see **Appendix D: Invasive Non-Native Species in Bromley.**

Commons

Commons within LBB are protected by the following Acts:

- The Commons Act 2006
- The Metropolitan Commons Supplemental Act (1888): Chislehurst and St. Paul's Cray Commons
- The Corporation of London (Open Spaces) Act 1878: West Wickham Common.

For more information see Sections 4.6 and 4.7, Habitats: Grasslands and Lowland Heathlands.

Planning Policy and Guidance

National Planning Policy Framework (NPPF) (2019)

The National Planning Policy Framework (NPPF) sets out Government planning policy for England. A key aim of the NPPF is to ensure sustainable development, meaning development must be carefully planned to protect future generations. The NPPF is supplemented by information set out in Planning Practice Guidance. Of particular relevance to biodiversity is Chapter 15 of the

NPPF (Conserving and Enhancing the Natural Environment). Paragraph 170 states that planning policies and decisions should contribute to and enhance the natural and local environment and that when determining planning applications local planning authorities should apply opportunities to incorporate biodiversity improvements in and around developments. Planning policies should minimise impacts and provide net gains.

Government Circular 06/2005 (Biodiversity and Geological Conservation) places statutory obligations on Local Planning Authorities in respect of how ecological assessments must be considered within the planning process. Paragraph 99 in particular sets out how the presence or otherwise of protected species must be established before planning permission is granted, unless there are exceptional circumstances (see British Standard BS42020:2013 below).

Environment Bill (2019-2021)

The Environment Bill sets out a clear strategy for tackling biodiversity loss, climate change and reducing environmental risk to public health. The Bill provides a key vehicle for delivering the bold vision set out in the 25 Year Environment Plan and will manage the environment in the following ways:

- Environmental Governance – a tailored new system specifically to the UK, obliging policy-makers to integrate environmental protection and reduction in environmental harm.
- A New Direction for Resources and Waste Management – encouraging more efficient use of resources and support for sustainable products.
- Improving Air Quality – setting targets for reduction in pollutants and strengthening the powers of local authorities to improve air quality.
- Deliver Sustainable Water Resources – to secure long-term, resilient, cleaner and greener water and wastewater services.
- Restoring and Enhancing Nature and Green Spaces – setting legally binding targets for biodiversity and laying the foundation for Nature Recovery Strategies to improve networks to map and enhance existing nature assets. Developments will be required by law to provide a mandatory measurable 10% biodiversity net gain and enter into Conservation Covenants to secure long-term (30 year) biodiversity gain (see Natural England Biodiversity Metric guidance).
- Chemical Regulations – amending legislation for the UK.
- Delivering Environmental Ambition at a Local Level – improved and increased powers to take more effective action to address local priorities.

London Plan (2021)

The Greater London Authority (GLA) published the new London Plan in March 2021 and this forms the strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years.

Along with its target for a carbon neutral city by 2050, The London Plan sets out policies for green infrastructure and the natural environment (Chapter 8) and sustainable infrastructure (Chapter 9). Of particular relevance are the following:

Green Infrastructure (Policy G1)

London's network of green and open spaces, and green features in the built environment should be protected and enhanced. Green infrastructure should be planned, designed and managed in an integrated way to achieve multiple benefits.

Boroughs should prepare green infrastructure strategies that identify opportunities for cross-borough collaboration, ensure green infrastructure is optimised and consider green infrastructure in an integrated way as part of a network. Bromley will be preparing a Green Infrastructure Strategy in accordance with the policy and in order to establish a Local Nature Recovery Strategy in line with the guidance within the Environment Act.

Development Plans and area-based strategies should use evidence, including green infrastructure strategies, to identify key green infrastructure assets, their function and their potential function and to identify opportunities for addressing environmental and social challenges through strategic green infrastructure interventions.

Development proposals should incorporate appropriate elements of green infrastructure that are integrated into London's wider green infrastructure network.

Open Space (Policy G4)

Local Authority Development Plan should undertake a needs assessment of all open space to inform policy. Assessments should identify areas of public open space deficiency, taking into account the quality, quantity and accessibility of open space.

Local Authorities are expected to include appropriate designations and policies for the protection of open space to meet needs and address deficiencies, promoting the creation of new areas of publicly-accessible open space, particularly green space, ensuring that future open space needs are planned for, especially in areas with the potential for substantial change. Open space, particularly open green space, included as part of development should remain publicly accessible.

Development proposals should not result in the loss of protected open space and where possible create areas of publicly accessible open space, particularly in areas of deficiency.

Urban Greening Factor (Policy G5)

Urban Greening is the greening of London's streets, buildings and other public spaces. This can be achieved with roofs and walls covered in plants, street trees and small pocket parks in between buildings. These measures can make the city a better place to live, work and invest. Urban Greening features act as part of London's green infrastructure network to help clean the air, reduce the risk of flooding and keep the city cool.

Major development proposals should contribute to the greening of London by including urban greening as a fundamental element of site and building design, and by incorporating measures such as high-quality landscaping (including trees), green roofs, green walls and nature-based sustainable drainage.

Boroughs should develop an Urban Greening Factor (UGF) to identify the appropriate amount of urban greening required in new developments, tailored to local circumstances. Bromley will be preparing its own Urban Greening Factor calculator specific to the greening requirements of the Borough.

Biodiversity Net Gain (Policy G6)

Sites of Importance for Nature Conservation (SINCs) should be protected and planned for by Local Authorities. Where harm is unavoidable, and where the benefits of the development proposal clearly outweigh the impacts on biodiversity, the following mitigation hierarchy should be applied to minimise development impacts:

1) avoid damaging the significant ecological features of the site
2) minimise the overall spatial impact and mitigate it by improving the quality or management of the rest of the site
3) deliver off-site compensation of better biodiversity value.

Development proposals should manage impacts on biodiversity and aim to secure net biodiversity gain. This should be informed by the best available ecological information and addressed from the start of the development process. Proposals which reduce deficiencies in access to nature should be considered positively.

Trees and Woodlands (Policy G7)

London's urban forest and woodlands should be protected and maintained, and new trees and woodlands should be planted in appropriate locations in order to increase the extent of London's urban forest – the area of London under the canopy of trees.

In their Development Plans, boroughs should:

1) protect 'veteran' trees and ancient woodland where these are not already part of a protected site143
2) identify opportunities for tree planting in strategic locations.

Development proposals should ensure that, wherever possible, existing trees of value are retained. Removed trees should be adequately replaced based on

the existing value of the benefits of the trees removed, using the CAVAT or i-tree valuation system.

Improving Air Quality (Policy SI 1)

Local Authorities should seek opportunities to identify and deliver further improvements to air quality. Development proposals should not lead to further deterioration of existing poor air quality and must be at least Air Quality Neutral.

Carbon Neutrality (Policy GG6)

In order to help London become a more efficient and resilient city, those involved in planning and development must seek to improve energy efficiency and support the move towards a low carbon circular economy, contributing towards London becoming a zero-carbon city by 2050.

Bromley Local Plan (2019)

Bromley's Local Plan was adopted on 16 January 2019 and, in conjunction with the London Plan is used to determine planning applications. The Local Plan replaces The Bromley Unitary Development Plan (UDP).

Section 5.3 of the Local Plan (Nature Conservation and Development) sets out the Council's policies for nature conservation sites, wildlife features, protected species, trees and woodlands, general biodiversity and access to nature.

Permitted Development

Permitted development refers to development which can be undertaken without the need for planning permission. Permitted development rights do not, however, override protected species and habitats legislation. Permitted development could for example impact on a protected species and although a Local Planning Authority may grant such consent, an applicant should be aware of the ecological impacts of such development and the assessments that would be required under the above legislation.

The duty to protect species and habitats subject to permitted development lies with the landowner and The Conservation of Habitats and Species Regulations 2017 are referred to within the Introductory Text (Permitted development) of The Town and Country Planning (General Permitted Development) (England) Order 2015.

Further summary information on relevant legislation and local policy can be found in Table II below:

Table II: Biodiversity Legislation, Policies and Strategies

National Legislation and Guidance	• National Environment and Rural Communities Act 2006 • Wildlife and Countryside Act 1981 as amended by the CROW Act 2000 • Wild Mammals (Protection) Act (1996) • Protection of Badgers Act 1992 • Hedgerow Regulations 1997 • The Conservation of Habitats and Species Regulations 2017 • The Town and Country Planning Environmental Impact Assessment Regulations 2017 • Countryside and Rights of Way Act 2000 • The National Planning Policy Framework 2019: Section 15: Conserving and enhancing the natural environment & Planning Practice Guidance 2019 • Environment Bill (2019-21) including Local Nature Recovery Strategies • Biodiversity 2020: A strategy for England's wildlife and ecosystem services • Royal Town Planning Institute - Biodiversity in Planning 2019 • A Green Future: Our 25 Year Plan to Improve the Environment (2018) • Planning Practice Guidance – Natural Environment • The Natural Environment White Paper 2011 • ODPM Circular 06/2005. Biodiversity and Geological Conservation- statutory obligations and their impact within the Planning System • The National Pollinator Strategy: for bees and other pollinators in England 2014 • The British Standard on Biodiversity (BS8683) Process for designing and implementing Biodiversity Net Gain – Specification
Regional Policies	• London Plan (2021) including Green Infrastructure Strategy, Urban Greening Factor (UGF) and carbon policy • GLA Biodiversity Net Gain Guidance • London Environment Strategy • London Biodiversity Action Plan including Habitats and Species Action Plans • All London Green Grid • North Kent Downs AONB Management Plan
Local Policies	• Bromley Local Plan (2019) Policies: 24, 25, 37, 43,

45, 49, 50, 53-65, 67-79, 112-124.

- LBB Tree Management Strategy
- LBB Regeneration Strategy 2020-2030
- LBB Open Space Strategy 2021-2031
- *i*dverde Bromley Biodiversity Action Plan
- Net Zero Carbon Strategy 2029

4. Habitats in Bromley

4.1 WOODLAND

Woodlands are an important element in the natural environment of the Borough. They provide an essential habitat for wildlife and a valuable component of the landscape. They are important for physical and mental wellbeing, sustainable fuel and fencing and provide opportunities for employment and recreation. In addition they have a vital role in reducing the effects of climate change through taking in carbon dioxide from the air and converting it to carbon which is stored as wood, in leaf litter and in woodland soil[1]. The importance of trees for carbon sequestration varies according to species and management[2]. The large mature trees found in woodland are able to remove more carbon dioxide from the atmosphere than small young trees (see below).

Although some coniferous plantations exist in the Borough, the majority of Bromley's woods are comprised of broad-leaved species classified under Priority Habitats in the NERC Act 2006, Section 41 as Lowland Mixed Deciduous Woodland. There are also small amounts of Wet Woodland, Lowland Beech and Yew Woodland and Wood-pasture and Parkland. Many of Bromley's woodlands are 'ancient' which means they have been in existence since at least 1600 and are described as `semi-natural' because they received past management. They are the most important woodland habitats for wildlife, sometimes containing species of national rarity. The soil in these woodlands is of prime importance because although the trees were regularly harvested, the ground was relatively undisturbed for hundreds of years and therefore supports a very complex community of interdependent organisms including fungi, very many tiny animals and plants. Many of them are not found away from this habitat and support special invertebrates. This habitat is irreplaceable, a fact acknowledged in the NPPF, Paragraph 175c.

The Great Storm of 1987 had a widespread impact on trees and woodlands throughout the Borough, shaping the landscape and bringing benefits, including a profusion of deadwood habitat. Deadwood is an integral part of all woodland, and together with leaf litter, supports diverse fungi and invertebrates which recycle nutrients.
Another group of fungi in woodland soil, mycorrhizal fungi, help trees and some other woodland plants survive by supplying them with water and some nutrients (including phosphates). These fungi are in turn supplied with sugars by the trees.

Carbon Storage

After trees have become established carbon sequestration increases with growth rate but slows as the trees mature. However, large numbers of leaves mean that mature trees can absorb more carbon dioxide than smaller, younger ones and in woodlands the build up of leaf litter and dead wood increases carbon storage in the soil,[1] improving soil quality and biodiversity. According to

the Countryside Survey 2007[3] the average amount of carbon in the top 15cms Broadleaved, Mixed and Yew Woodland soils is 66.3 tonnes/ha., varying according to many factors including management.

The use of wood as a building material, for furniture and other uses can lock up carbon stored by trees for hundreds of years. Increased use of wood instead of materials which result in high carbon emissions such as cement and plastics would help reduce carbon emissions. Wood from the UK can also be used as a sustainable fuel source through reducing the use and transport of fossil fuels, as long as trees are replaced. Wood used as fuel (for example in domestic wood burners), must have a moisture content below 20% to prevent air pollution by PM2.5 (particulate matter that has an aerodynamic diameter no greater than 2.5 μm). This can be achieved by kiln drying or only using very well seasoned wood.

Planting trees in the wrong place on other valuable habitats can, however, lead to net carbon loss because other habitats and the soil beneath them are often a rich carbon sink in addition to their importance for biodiversity. For information about carbon storage in other habitats within Bromley see later sections in this document. For information about trees (rather than woodland) and the ecosystem services they provide including carbon storage, pollution reduction and cooling effects see 'Valuing London's Urban Forest'[2] and 'Trees and Sustainable Urban Air Quality'[4].

1. Area and Distribution

The UK is one of the least wooded countries in Europe, with 3.19 million hectares (ha) of woodland representing 13% of the total land area (10% in England)[5], of which only 1.2% is classified as ancient semi-natural woodland.[1] 44% of the UK's woodlands are 'certified woodlands' and have been independently audited against UKWAS, the UK Woodland Assurance Standard (Forestry Statistics published by Forestry Commission 2019)[5].

According to London Plan Habitat Targets (2017)[6], woodland, including ancient semi-natural woodland, new plantations, carr (wet woodland), secondary woodland and mature scrub[7] is estimated at covering 7477ha (about 4.5%) of Greater London. The range of vegetation found in London's woodland is influenced by soil type and climate. The designation of 3700ha of woodland as Sites of Metropolitan Importance in London[7], indicates the high wildlife value and regard in which woodland is held.

2,181ha of Bromley is woodland of which 744.4ha is managed[8]. Nearly a quarter of Bromley's Green Belt is wooded and the borough supports one third of London's ancient woodlands.

The estimated total of wet woodland in the UK is 50,000-70 000ha[9]. In Bromley, narrow strips of wet woodland or `carr' exist mainly along rivers retaining semi-natural features, where the soil remains waterlogged for much

of the year, for example at Crofton Woods, High Broom Wood, Scadbury Park and Chislehurst Common (south-east of Rush Pond, bordering stream). Wet woodland has a dense structure with fallen trees and difficult ground conditions. The clearance of river embankments and the loss of natural landform have led to a reduction in the abundance of wet woodland (carr). The species composition of wet woodland communities is dependent on high humidity and a high water table. They are threatened by changes in water regime, succession to drier habitat, poor water quality, including toxic water pollutants, traditional clearance of ponds to prevent succession and drainage works to improve public access.

There are fragments of Wood-pasture and Parkland habitat at Holwood and West Wickham Common (see ancient and veteran trees Section 4.5) and small amounts of Lowland Beech and Yew Woodland on the chalk in the southern part of the borough, for example at High Elms.

Woodland in Bromley is managed as high forest or coppiced. High forest habitat consists of large, tall mature trees with a one or more canopy layers beneath and can include a few or many species of similar or different ages. It can be open or dense. Compared with coppiced woodland where most trees reproduce vegetatively, many trees of high forest grow from seed and so are more genetically diverse. Bromley examples include parts of Crofton Woods, parts of Darrick Wood and some woodlands in the Downe Valley.

Coppiced woodlands are common in Bromley borough and provide many opportunities for wildlife when actively managed**.** Up until the 20th Century, they were some of the most productive of Bromley's broad-leaved woodlands. Coppice stools were cut on a regular rotation to near ground level so the shoots would regrow to provide long straight poles. Commonly the coppiced trees were sweet chestnut and hazel but sometimes included ash, hornbeam, alder, beech, field maple, birch and oak. 3% (17 ha) are sweet chestnut coppice coupes. Sweet chestnut coppice was traditionally harvested for hop poles, and is still used for post and rail fencing which provides an important habitat for lichen and moss species. Coppiced hazel is used for hedge laying. Overstood coppiced wood (not of saw mill quality and therefore unsuitable for other markets such as fencing) has recently been harvested and used to generate electricity at a biomass-fired combined-heat-and-power (CHP) plant opened in 2018 at Sandwich. There are many examples of coppiced woodland in Bromley, including Padmall Wood and Well Wood.

Pollarding of trees e.g. hornbeam, is another traditional method of management, which comprises the regular cutting of the branches back to the trunk of the tree, at a height of about 1 to 1.5m above ground level. This was usually done on a regular cycle of about 15 years.

2. Historical Management

In the Doomsday Book it was recorded that about 15% of England was covered in woodland. Since then human interference has developed the wooded

landscape we see today. Undoubtedly there has been significant, accelerated loss in recent centuries but when given the opportunity woodland develops relatively quickly.

Many of Bromley's woodlands have ancient origins, being remnants of old landscapes. Other woodlands were created or adapted to satisfy the formal landscaping desired by large estates or houses on the outskirts of London (e.g. High Elms, Scadbury Park and South Hill Wood). These are often characterised by large ornamental trees such as Cedars, Giant Sequoia and London Plane. Some commercial coniferous plantations exist and these mostly date from just after World War II when developing a strategic reserve of timber was a national priority of the Forestry Commission although some are more recent (e.g. Ruxley Woods). These conifers often replaced broadleaved woodland and the woodland floor and woodbanks can retain the original ground flora, which can sometimes recover when the conifers are felled.

New woodland grows up alongside railways and trees regenerate on cleared land through natural succession. Some areas of chalk grassland have become scrubbed over since World War II. These new secondary woodlands are often dominated by ash and maple (including Norway maple and sycamore) and now make a significant impact on the Borough's landscape. In other areas, where acidic soils on sands and gravels dominate, such as Chislehurst and St Paul's Cray Commons, the secondary woodland comprises birch and oak.

Increased threats from pests and diseases imported on plants and timber and also arriving in the UK due to changes in the climate are likely to bring about a shift in the species composition of woodland and put some species in isolated woodlands at particular risk.

3. Current Status

Several woods are of particularly high wildlife interest and designated as Sites of Special Scientific Interest by Natural England e.g. Crofton Woods and parts of High Elms. Many others are designated as Local Nature Reserves e.g. Scadbury Park, Darrick and Newstead Woods, or Sites of Importance for Nature Conservation e.g. Well Wood, Rushmore Hill Woodlands and woods and copses which provide vital linked landscapes such as Ravensbourne Valley Woodlands and Norstead Valley Woodlands.

Many woodland sites are covered by Tree Preservation Orders. Felling licence regulations provide the Forestry Commission with some control.

It could be argued that woodlands are better protected than a number of other habitats, through felling licences and the planning system. However, secondary woodland remains the most susceptible to loss. The natural and cultural heritage associated with woodlands means that their loss generates significant interest from people. Their popularity is evident where trees or woodland are perceived to be threatened, even when sympathetic

conservation management is taking place.

Demand for woodland products has always had a major influence on the nature and management of woodland. During the Second World War many of the woodlands in Bromley were systematically worked for any usable timber to create a strategic timber reserve. The Timber Price Indices, 2019 (Forestry Commission) show that after a long period of decline there has been an overall increase in average prices for coniferous timber over the past 15 years. This presents an opportunity for thinning and coppicing in woodlands not only improving biodiversity, but also generating revenue through timber sales to invest back into future woodland management. There remains a need for woodland owners to plan for and manage woodlands in the long-term. Landowners are strongly encouraged to deliver multi-forestry objectives influenced by national policy, grant funding and forest certification.

Some Bromley owned woods: Padmall Wood, Crofton Woods, Scadbury and High Elms have been entered into the new Woodland Support Grant (2020). These are higher tier Countryside Stewardship schemes administrated by Forestry Commission with Natural England input where required, such as on SSSIs.

Around urban areas, such as Bromley, trees and woodlands are becoming increasingly important for their contribution to urban cooling, water retention and pollution reduction.

3.1 Policies

The Government forestry policy is set out in Defra's and Forestry Commission England's forestry and woodland policy statement (2013). It sets out clear priorities for future policy-making, focused on protecting, improving and expanding our public and private woodlands. It also incorporates the Government's Response to the Independent Panel on Forestry's Final Report. This follows the public outcry after the government launched proposals in 2011 to change the way the public forest estate might be managed. Public response strongly demonstrated the importance and value placed on woodlands for the benefit of people, nature and the economy. According to The Forestry Commission/Forest Research Survey Report (Sept 2019)[10] public support for woodland remains high, 94% of respondents in England agreed that forests and woodlands are important to the public because they are important places for wildlife, 93% agreed that forests and woodlands are important to them because they provide a space to relax and de-stress. The English Woodland Grant Scheme (EWGS) has until recently run two funding streams, the Woodland Improvement Grant (WIG) and the Woodfuel Grant Scheme (WGS), which supported the sustainable production of woodfuel and other timber products. These have now been incorporated into the new Countryside Stewardship scheme with Natural England. In addition the Government launched the Woodland Carbon Fund in 2018 and the Woodland Carbon Guarantee scheme in 2019 to encourage tree planting as a method of carbon capture. There are also small grants specific to London for community projects and street tree projects – The London RELEAF Grant. The Environment Act

2020 commits the UK Government to increasing woodland cover in England from 10% to 12% by 2060 and a new England Tree Strategy is to be launched to accelerate tree planting in appropriate locations and improve the management of existing trees and woodlands.

3.2 Factors Affecting the Habitat

Adverse Factors

a) Fragmentation of woodland, leaving isolated remnants.
b) Inappropriate management, e.g. poor timing of forestry operations.
c) Compression and damage to woodland soils and ancient woodbanks and their associated ground flora and fauna by heavy machinery.
d) Lack of active management.
e) Loss of woodland to development or conversion of wood and scrub to other land uses.
f) Woodland burial sites in inappropriate areas e.g.in ancient woodland (due to disturbance of ground flora and fauna).
g) Replacement with non-native trees.
h) Invasion of non-native species (e.g. rhododendron, sycamore, Norway maple, cherry laurel).
i) Planting bulbs etc. rather than waiting for natural regeneration.
j) Illegal picking of fungi and flora.
k) A changing climate.
l) Tree pests and diseases e.g. Ash dieback (*Chalara fraxinea*), Oak Processionary Moth (OPM), Acute Oak Decline.
m) Grazing and browsing damage (e.g. deer, squirrels) including encroachment of livestock.
n) Fly tipping, vandalism and arson.
o) Loss of deadwood through felling and `tidying-up'
p) Lack of money, resources and desire to manage woodlands.
q) Pollution from traffic, industry, agricultural chemicals affecting ground flora and epiphytes.
r) Overuse and unofficial paths leading to soil erosion and loss of ground flora.

Positive Factors

a) Public support for woodlands.
b) Government scheme to increase England's tree cover by 2% to mitigate climate change
c) Desire for more trees, new woodland planting and better woodland management.
d) Sympathetic recreational opportunities.
e) Increase in average timber and wood fuel prices.
f) Increased use of wood as a substitute for fossil fuels and in construction.

4. Future Management

Aims:

- To protect and enhance Bromley's woodlands and link together wherever possible to improve biodiversity.
- Promote planting of native trees in suitable locations for biodiversity, carbon sequestration and to mitigate the effects of climate change.
- Promote access, information and quiet enjoyment of woodlands.

Objectives:

1. Continue to maintain and enhance woodlands as per Management Plans. For woodlands without a specific Management Plan follow generic woodland plan for Land Managers and/or Friends and Volunteers.
2. For London Borough of Bromley owned woodlands follow Forestry Commission guidelines to meet targets agreed and funded by the Forestry Commission under the Woodland Support Grant.
3. Survey and monitor woodlands and use data to inform management.
4. Work with partners and the planning system to link woodlands wherever possible providing a corridor for movement of wildlife between sites and bringing the countryside into urban areas to improve access to nature for people.
5. Encourage planting of native tree species in streets and amenity areas where they will not damage existing habitats but will help to mitigate the urban heat island effect, absorb CO^2 and reduce atmospheric pollution[2,4].
6. Promote woodlands through walks, talks and events e.g. bat walks, wildflower walks, surveying etc.

5. Woodland Management Guidelines

The majority of woodlands in the Borough are privately owned. Few are managed purely for their commercial value. Most are managed on an estate woodland basis, although some are small farm woodlands.

1) Good woodland management will protect and enhance woodlands and help to fulfil the aims and objectives of the Bromley Biodiversity Plan. For detailed woodland management guidance, see **Section 6.2: Best Practice Guidelines for Land Managers.**
2) For more information about many aspects of tree management within the borough see London Borough of Bromley Tree Management Strategy 2016 – 2020

6. Key Species (not exclusive)

Flagship Species:

Flora: Trees e.g. alder, aspen*, beech, field maple, hazel, hornbeam*, pedunculate oak, sessile oak*, small-leaved lime*, wild service tree*.
Ground flora e.g. bluebell*(native), early-purple orchid*, goldilocks buttercup*, moschatel* opposite-leaved golden-saxifrage*, ramsons*, wood anemone*, wood melick*, wood sorrel*, yellow archangel*, yellow bird's-nest*. Ferns: hard fern*, hart's-tongue fern*.
*Semi-natural ancient woodland indicator species for SE England (Rose, F. 2006)
Epiphytes: mosses, liverworts and lichens.
Standing and fallen deadwood and ancient trees.
Fungi: Bearded tooth fungus
Lichens: Lirellate species (*Opegrapha, Phaeophyscia* and *Graphis*), *Arthonia cinnabarina, Normandina pulchella, Chaenotheca ferruginea*
Fauna.
Invertebrates: speckled wood, white admiral, purple emperor, purple hairstreak and silver-washed fritillary butterflies, elephant hawkmoth, privet hawkmoth, rhinoceros beetle, stag beetle.
Birds: great spotted woodpecker, green woodpecker, lesser spotted woodpecker, marsh tit, nuthatch, song thrush, spotted flycatcher, tawny owl, tree creeper.
Mammals: bats, hazel dormouse, yellow-necked mouse.

Negative Indicators

Cherry laurel, hybrid bluebell, Japanese knotweed, Norway maple, Portugal laurel, rhododendron, snowberry, Spanish bluebell, spotted-laurel, variegated yellow archangel.

Case Study: Crofton Woods

Situated in Petts Wood, Crofton Woods forms an extensive area of ancient woodland on London Clay. Notified as a Site of Special Scientific Interest in 1975, it is amongst the largest woods of its kind in Greater London. Part of the site is owned by the London Borough of Bromley and part is in private ownership. The SSSI is currently in favourable condition.

Crofton Woods is a remnant of a much larger area and includes wet alder carr, mature oak forest with hazel coppice, as well as areas of secondary woodland and wood pasture. The secondary woodland has reverted to woodland within living memory and work has begun to improve the structure of these areas through thinning and woodland glade creation. Over 300 species of vascular plants have been

recorded in the woodlands, including ancient woodland indicator species such as bluebell, wood anemone and wild garlic.

Crofton Woods holds a diverse community of typical woodland bird species. Many of these are associated with mature tree habitats. These include great spotted and green woodpeckers, nuthatch, tree creeper, chiff-chaff and blackcap.

Challenges at this site include encroachment by non-native species such as rhododendron and cherry laurel and limited access. There are also issues surrounding public engagement; the site can suffer from anti-social behaviour such as vandalism and fly-tipping. Since 2011, the Bromley Countryside Volunteers have reintroduced a hazel coppice regime to the woodland, and have improved visitor access through footpath enhancements. Work is carried out to improve the structure of the woodland in line with management targets approved by both Natural England and the Forestry Commission. Due to the site's SSSI status Natural England have the final say in management as the responsible body for SSSIs.

A Friends Group was set up in 2019/2020 and is active in the Woods and they, as well as the Bromley Countryside Volunteers carry out work to improve the habitats on site and to develop links with the community to combat anti-social behaviour.

7.0 Responsible Bodies

All woodland owners, Bromley Biodiversity Partnership, Bromley Countryside Volunteers, Bromley Friends of the Earth, City of London Corporation, English Heritage Trust, Forestry Commission, Friends Groups, Greater London Authority, Holwood Trust, *i*dverde, Kent Wildlife Trust, London Borough of Bromley, London Wildlife Trust, National Trust, Natural England, Orpington Field Club, Trees for Cities, Trustees of Chislehurst Common, Woodland Trust.

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4.2 TRADITIONAL ORCHARDS

A traditional orchard is made up of many different habitats. The fruit cultivars set in grassland are a valuable repository of a vanishing diversity in today's era of intensive agriculture; in addition scrub, hedgerow, hedgerow trees, fallen and standing deadwood, and in some cases walls and aquatic habitats may also be present. Traditional orchards are defined, for priority habitat purposes, as groups of fruit and nut trees planted on vigorous rootstocks at low densities in permanent grassland and managed in a low intensity way. Cobnut plats are included. According to the rules adopted for the Natural England Orchard Project, the minimum size of a traditional orchard is defined as five trees with crown edges less than 20m apart.

Orchards are hotspots for biodiversity, capable of supporting a wide range of wildlife, including NERC S41 priority habitats and species as well as an array of nationally rare and scarce species. The wildlife (including butterflies, bumblebees, birds, bats, beetles, wild flowers, bryophytes, fungi and lichens) of orchard sites depends on the mosaic of habitats they encompass. The unique way fruit trees age creates an indispensable habitat for a wide range of rare and interesting species. In the 2004 Biodiversity study of six traditional orchards in England carried out by Natural England prior to Traditional Orchards becoming a UK Priority Habitat, 131 epiphytic lichens, 50 epiphytic bryophytes, 175 fungi and 522 invertebrate species were found[1]. Orchards, like wood pasture, are dynamic habitats. Continuity of habitat for long-term conservation requires trees at all stages of growth, either within one orchard or a series of orchards in a landscape.

Carbon Storage

In traditional orchards carbon is stored in both wood and the soil. Carbon storage in orchard trees is usually less than in trees of woodland because of their generally smaller size. Studies have shown that most of the carbon in this habitat is stored in the undisturbed meadow habitat beneath the trees[2]. It is important not to use pesticides, including herbicides and fungicides around the trees as these reduce the abundance and diversity of soil organisms. These organisms include mycorrhizal fungi, microscopic animals and larger fauna such as earthworms and springtails. When in balance they contribute to the ability of soil to store carbon (soil organic carbon), as well as maintaining fertility, soil structure and water storage[3].

1. Area and distribution

The Ordnance Survey data, which does not distinguish traditional and intensive orchards, show that orchards are dispersed throughout the lowlands of Britain, although there are concentrations in some areas particularly Kent, Cambridgeshire, Somerset and the three counties of Herefordshire, Worcestershire and Gloucestershire. The bulk (78%) of the commercial fruit production in England occurs in these areas, which implies that traditional orchards comprise the majority of the orchards elsewhere. In 2011, the total

area of orchards in England was estimated to be 47,000ha with the area of traditional orchards being 28,000ha[4].

Since 2007, the Peoples Trust for Endangered Species (PTES), with the help of over 700 volunteers and about 1500 orchard owners, has identified over 35,000 individual orchards in England and over 7000 in Wales. It has revealed that 90% of traditional orchards have been lost since the 1950s from neglect, development or conversion to intensive commercial orchards. About 45% of the remaining orchards surveyed were in poor condition as a habitat due to lack of replacement tree planting[5,6].

Kent has 1,676ha of traditional orchards, which includes less intensively managed fruit orchards and traditional cobnut plats. These habitats are around 10% of the traditional orchard priority habitat for England. Traditional orchards have experienced dramatic losses in Kent according to the Landcover change analysis carried out during the Kent Habitat Survey (2013)[7], which estimated losses since 1961 at over 60%. A total loss of 309ha is recorded for the period 2003 to 2012, representing 40.5% of the total loss of BAP habitat in Kent during this period. The field survey encountered many orchards that were no longer managed and becoming derelict, being grubbed up or incorporated into gardens and developments[8].

The Natural England Project[9] found 282 traditional orchards in London with a total area of 116.3ha. There is no data available on losses as a base line had not been established.

In Bromley, the main council owned traditional orchards are the community orchard at Downe, two orchards at High Elms – Clockhouse and BEECHE and the recently planted orchard at Coney Hall Recreation Ground. Scadbury has a linear orchard. Privately owned orchards include the orchard at Down House and 2 orchards at Bethlem Hospital. None of these are larger than one hectare. The privately owned Ruxley Park Golf Course Orchard (3.6ha) has 300 dwarf rootstock vintage pear trees (*Pyrus communis*) and 30 apple trees, many of which are lichen encrusted. There are other sites in the Borough as displayed on the MAGIC Natural England database[10]. More sites may exist where the owner has not applied for grant aid or Natural England has not ground proofed [ie made a visit for verification].

2. Historical Management

Orchards were once a significant part of our landscape and Britain was a major apple, pear and plum growing country. Almost every farm, country and suburban house had its own fruit trees. There were a significant number of orchards on the margins of towns and cities, producing juice, ciders and perrys, and fruit for people and animals to eat. Apples are by far the most popular of UK fruit. There are now well over 1000 types of apple known in Britain.

Orchard work is highly seasonal – pruning in the winter, hay cutting in late summer which overlaps with fruit picking and processing from early autumn to mid-December. It could be combined with other agricultural and estate work.

From the 1920s onwards fruit began to be imported – increasingly standardised in terms of taste and appearance. In reaction, British growers intensified production methods using fewer varieties, dwarf trees packed close together, piece work payment systems for seasonal labourers and extensive use of chemicals. British commercial growers were still unable to compete, with 67% of commercial orchards (by area) stopping production between 1980 and 2010. Over the last few years the rate of decline has slowed and more proactive management of remaining orchards has attracted support from e.g. the Heritage Lottery Fund, supporting education and the provision of tools.

London has a rich orchard-growing heritage and orchards have played an important economic and social role in the capital, testified by place names such as Perivale ("pear tree valley") in the west and Plumstead ("place of plum trees") in the east. Merton was a major centre for developing apple varieties and rootstocks e.g. Merton Joy. Historical maps show orchards all over the city, even in the centre, providing food for the capital's growing population. But the need to house London's growing population meant homes eventually replaced market gardens, pushing fruit and vegetable growing further out of the city. Heathrow airport's runways have replaced orchard nurseries, just a few metres away from the cemetery where Richard Cox, the gardener who developed the Cox Orange Pippin, is buried. Echoes of the existence of old orchards can be found in road names across Bromley borough and on older maps (e.g the 2 large 17th century orchards at Hoblingwell). Many remnants of this market garden heritage remain though, in private back gardens, parks and public squares.

3. Current Status

The two orchards at High Elms Country Park are included in High Elms Site of Importance for Nature Conservation (SINC) of Metropolitan Importance and High Elms Local Nature Reserve (LNR)
Scadbury linear orchard is within the LNR and SINC of Metropolitan Importance
Ruxley Park Golf Course Orchard is a Borough Grade 1 SINC
The two Bethlem orchards are included in a Borough Grade I SINC
Downe Orchard is a Borough Grade II SINC

3.1 *Policies*
A biodiversity survey of six traditional orchards was undertaken by Natural England in 2004[1] to address the lack of knowledge about the importance and biodiverse nature of traditional orchards which had received relatively little attention from naturalists and conservationists in the past. This review acted as a baseline from which to assess traditional orchards when they were designated as a priority habitat in the UK Biodiversity Action Plan in 2007[4].

Since traditional orchards became a Priority Habitat in 2007, a UK Traditional Orchards Habitat Action Plan (HAP) Group has been established and an Action Plan produced[9]. Natural England and the National Trust are leading this work, with the support of the PTES and organisations such as Common Ground, the Tree Council, the Royal Society for the Protection of Birds and the other UK NGOs and statutory conservation agencies. The traditional orchard inventory

in England is available to download via the publications, maps and data page on the Natural England website[10]. The methodology used in this project has identified 16,990ha of traditional orchard habitat in England.

Recently, increased interest in orchards has been boosted by several initiatives, for example The Orchard Project – Finding London's Hidden Orchards[11] and the Kent Orchard Project – Orchards for Everyone[12]. Both are funded by Heritage Lottery Fund, PTES and other organisations.

Traditional orchards are a UK[4] and London[13] Biodiversity Action Plan Priority habitat.

Factors affecting the Habitat

Adverse factors

- Neglect due to lack of time, knowledge and expertise in management
- Loss of aged trees and lack of appropriate replacement trees
- Loss of production due to no or poor pruning
- Pests and diseases

Positive factors

- Renewed interest in community orchards
- Grant support
- Renewed interest in community/self sufficiency

4. Future Management

Aim:

To protect the borough's orchard stock and promote the importance of orchards as a biodiversity resource.

Objectives:

To maintain orchards in good condition through appropriate management. This should include monitoring the health of the trees, tree planting to replace lost trees, maintaining a diverse sward, and scrub and hedgerow management.

To provide workshops on appropriate pruning of the fruit trees and other traditional skills (cider-making, juicing).

To protect and monitor wildlife in orchards so as to inform management.

5. Orchards Management Guidelines

For management guidelines specific to orchards and orchard trees see under Traditional Orchards in **Appendix E: Best Practice Guidelines for Land Managers.** For associated habitats such as grassland, scrub and hedgerows follow the Best Practice Guidelines for Land Managers under the relevant headings.

- grassland management: grazing or hay cut;
- dead and dying trees – leave if safe to do so
- hedge and scrub management

6. Key Species

Flora: Veteran trees, old fruit varieties (e.g. Apples: Kentish Fillbasket, Beauty of Bath, Gladstone, Colonel Vaughan, Flower of Kent, Mabbotts Permain, Pears: Beurre Bosc, Medlar), primroses, cowslips, grass vetchling, orchids, mistletoe, mosses and liverworts.
Fauna:
Invertebrates including beetles, solitary and bumblebees, butterflies, e.g. marbled white, red admiral, small skipper.
Amphibians and reptiles: slow worm, toad
Birds: brambling, bullfinch, fieldfare, redwing, blackcap, mistle thrush, starling, dunnock
Mammals: bank and field voles, shrews, (and therefore predatory birds e.g. tawny owl), hedgehog
Fungi: Waxcaps
Lichens: *Lecidia exigua*

Negative Indicators:
Excessive growth of bramble, nettle, creeping thistle, coarse grasses

Case Studies: Downe Community Orchard

Near to the centre of Downe village, between North end Lane and Rookery road is Downe Community Orchard. The Orchard contains over 80 fruit trees, including 11 traditional Kent apple varieties, pears, sloes and a variety of plum trees. The trees are 4 metres apart [at trunk level. The orchard is oblong in shape. At its 2 narrow ends are laid hedges a public footpath runs through the orchard between the two hedges. Fruit harvested from the orchard provides some income to the friends group that maintains it, which is invested into the orchard or the local village community.

The space was initially donated to the people of the village by Lord Lubbock during the 1880s agricultural depression – so that they would have allotments upon which to grow their own food. By the time of the late 1980s only one allotment holder was working at the site. Bromley council obtained the site and planted the orchard in 1992/3. After that date the orchard was largely left to its

own devices, becoming increasingly overgrown with bramble and with trees in its boundaries encroaching on the meadow and losing a number of the planted trees to disease. Most of what fruit appeared was left to rot as windfall. In 2014 Bromley Conservation Volunteers started a programme of work to rejuvenate the orchard, initially by managing the hedge line, rescuing the apple trees choked in scrub and starting to prune the trees - which had not taken place since their planting.

It has taken annual pruning until 2020 to produce the best shape in the trees for their health and to produce a larger crop – now some 1000kg a year. The vacant spaces in the orchard have been filled with pear trees or plums. The circular path that used to run around the orchard and from which people could pick blackberries and sloes is progressively being restored. A hay cut takes place in the Autumn and this has helped lead to the appearance of pyramidal orchids and a number of ancient woodland indicator plants at the orchard boundaries, alongside a rich field of cowslips, primroses and bluebells in the spring. The site is home to a population of voles and a nesting/feeding site for some 20 species of birds, attracts a variety of insects including butterflies and provides a platform for mistletoe, fungi, uncommon and locally rare lichens. Toad and badger have also been recorded.

The key to all of this has been local energy and enthusiasm. A local Friends group – supported and trained as necessary by BCV and *idverde* complete the majority of the work on site, organise the events [Wassail, annual apple day] and raise funds [calendar, cake and juice sales] ensuring that the orchard is seen as a feature of the local community.

Clockhouse Orchard (High Elms)

Clockhouse Orchard May 2018

Clockhouse Orchard was once part of the kitchen gardens of High Elms Estate and until very recently still contained two original, now veteran apple trees planted well over 100 years ago. The orchard has suffered the same fate as the majority of those existent across the UK that have not been lost to urban expansion and intensification. It was simply forgotten. In 1997 new trees were planted in an attempt to restore it, but like many such attempts across the country, fruit trees were planted and left to get on with life. The orchard remained neglected without the regular attention it needed. In 2016 the Friends of High Elms and *i*dverde who manage the site on behalf of LBB began a restoration project which is still ongoing. The volunteers secured a grant with The Orchard Project which translated into training in the proper care and maintenance of traditional orchards. This included pruning workshops, management classes and community events. Little by little the scrub has been pushed back, the autumnal grass cut and raked annually lowering the sward, missing trees have been replaced with traditional cultivars and an ongoing battle is being waged against the aggressive snowberry which threatens to overtake the grassland flora.

If you walk through the orchard in summer you will find flowering chalk grassland with common spotted orchids beneath 3 rows of trees, butterflies fluttering past including marbled white and brown argus. Slow Worms also bask under a survey tin tucked away in the corner, sometimes with the occasional Shrew.

This site will continue to be cared for long into the future for the benefit of wildlife and the pleasure of those that pass by.

7. Responsible Bodies

Bromley Countryside Volunteers, Community Orchard Project, Downe Residents and Friends of Downe Orchard, Environmental Action at Coney Hall, Friends of High Elms, Friends of Scadbury, idverde, Landowners, LBB Tree Team

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4.3 SCRUB

Scrub habitats are of vital importance to a wide variety of wildlife, providing nesting sites, food and protection to many birds and invertebrates, mammals, reptiles and amphibians. In the UK over 450 rare and threatened species of plant, insect and bird are associated with this habitat[1]. Scrub can be very diverse, being composed of different shrubs and smaller plants according to soil type, drainage, nutrient status, aspect and other factors. Of particular importance to animals are the scrubby margins between woodland and grassland (known as the ecotone) and scrub present as part of a mosaic of habitats especially when it includes areas of different maturity. For example, birds such as nightingale nest in dense thickets while whitethroat, linnet and yellowhammer prefer low, open scrub and turtle dove, the most rapidly declining (globally vulnerable to extinction according to the IUCN) depends on scrub mosaics. Reptiles such as slow worm bask in warm sunny scrub edges, using nearby cover for protection from predators. Hundreds of different invertebrates live in and on scrub including the rare brown hairstreak butterfly whose caterpillars feed on blackthorn, and numerous species which feed on bramble pollen, nectar and fruit. Despite this, scrub habitat and its biodiversity value are often overlooked. In the eyes of many, scrub is associated with derelict land and unmanaged habitats.

Scrub is included within the London Priority HAP: Woodland[2].

Carbon Storage

Carbon is sequestered in the plants of scrub and the soil and leaf litter beneath. However, when scrub is removed, some of the captured carbon will be returned to the atmosphere unless the wood is harvested and used. Many components of scrub were important in the past as food, to make wine, country furniture, utensils, hurdles, walking sticks, basketry, and in construction involving wattle and daub.

1. Area and Distribution

In the UK, scrub only exists as the climax vegetation where there are extremes of climate or physical processes that halt succession; such as those on coastal dunes, eroding cliffs, or land exposed to strong winds, salt spray zones or cold temperatures. Most scrub is a transitional and dynamic habitat seen, for example, as grassland, heathland or wetland develops into woodland. It is therefore difficult to accurately assess the area of scrub, but within Greater London it has been estimated to cover about 1600 hectares[2].

Scrub in Bromley is generally in a transitional stage, and as such is common at woodland/grassland and woodland/heathland margins or on unmanaged or derelict sites, particularly those that have been previously cleared. Occasionally scrub can be considered as a habitat in its own right, such as a shaw or wide hedgerow. Scrub can also be an important part of a habitat mosaic, for example, scrub on grassland edges can provide protection for

grass species intolerant of grazing.

Scrub boundaries can be difficult to measure, for obvious reasons. However most, if not all, of the SINC sites in the borough will contain areas of scrub. Within the London Borough of Bromley's Countryside Stewardship agreements as of 2019, in excess of 4 hectares of land is funded for restoration or maintenance of scrub habitat. This may be subject to change over the life of this document.

2. Historical Management

Scrub communities have been present in the UK since the last ice age, replacing tundra as the climate warmed and before succession led to woodland. Initially large herbivores prevented succession to woodland in some areas, then later human settlement and development led to woodland clearances. Mobile scrub mosaics developed, as scrub would take over whenever grazing pressure or human intervention reduced.

During the 20th century, there was a large expansion of scrub between the World Wars when large areas of agricultural land were abandoned. This trend was reversed during the Second World War and in the following decades of agricultural intensification.

In the lowlands, changes in agricultural practices and the decline of chalk grassland and heathland grazing led to scrub colonisation on many sites. Likewise, scrub expansion occurred on wetlands as traditional management such as reed and turf cutting declined from the end of the 19th century.

At the turn of the 21st century, landscape-scale conservation projects aimed at restoring lost grassland and heathland habitats are likely to have reduced overall scrub coverage.

In these projects and in general habitat management, scrub has often been regarded as a problem, with little consideration given to its wildlife value. However, the importance of scrub communities is becoming increasingly recognized, see JNCC report, Nature Conservation Value of Scrub in Britain[3] and The Scrub Management Handbook published by English Nature[4].

3. Current Status

Although most if not all the borough's Sites of Scientific Interest and SINCs will contain scrub, no sites are designated primarily for their scrub habitats.

Scrub is often associated with unmanaged sites, for example derelict or unregistered land, and so can be seen by the public as untidy or a target for anti-social behaviour.

3.1 Policies

Some scrub habitat is included within the UK Biodiversity Action Plan, such as

Mountain Heaths and Willow Scrub. Most is managed as part of other habitats.

3.2 Factors Affecting the Habitat

Adverse Factors

- Direct loss of habitat – many development sites contain large areas of scrub.
- Lack of protection - scrub is not directly listed in SSSI guidelines.
- Negative attitudes of the public towards 'untidy' habitat.
- Lack of management. Often lost if not part of a balanced active management plan to maintain proportions whilst also preventing invasion of open habitats.

Positive Factors

- Increased interest in 'foraging' and often valued by local people for blackberry picking, collecting sloes, plums etc.
- Increased public interest in pollinators.
- Public concern regarding the decline of many native birds which use scrub of various types for nesting and foraging.
- Concern about falling numbers of hedgehogs which forage and hibernate in scrub.

4. Future Management

Aim:

- To promote the importance of scrub for wildlife.

Objectives:

1. Seek to expand the extent of quality scrub without impacting on other priority habitats.
2. Maintain scrub habitat of different ages where possible and control habitat as required.
3. Manage woodland habitats to enable the development of scrub edge habitats (ecotone) rather than an abrupt change i.e. allow woodland to grade gently to shrubs, then long grass and herbs, and finally short grass.
4. Survey and monitor scrub and use data to inform management.
5. Promote the importance of scrub through wildlife walks, talks and events and educational activities.

5. Management Guidelines

Landowners are responsible for the management of scrub on their land. Good management will allow controlled scrub development.

For detailed scrub management guidance, see **Section 6.2: Best Practice Guidelines for Land Managers.**

6. Key Species (not exclusive)

Flora: blackthorn, bramble, dogwood, elder, European gorse, hawthorn, hazel, spindle, willow, Mosses and Liverworts
Fauna.
Invertebrates: Jersey Tiger Moth, Orange-Tip, White Admiral and Brown Hairstreak Butterflies. Shield Bugs
Amphibians and Reptiles: slow worm, common lizard
Birds: bullfinch, house sparrow, lesser whitethroat, nightingale, whitethroat, wren.
Small Mammals: bank vole (and therefore predator species such as owls), Hedgehog
Fungi
Lichens: *Xanthoria polycarpa*

Case Study: Hoblingwell Wood

Hoblingwell Wood is a small Site of Importance for Nature Conservation situated in St Pauls Cray close to Scadbury Park Local Nature Reserve and owned by the London Borough of Bromley. It includes woodland, a natural spring fed pond with a scrubby edge and a wide range of planted and naturally-colonised tree and shrub species including orchard varieties, thick blackthorn scrub, broom and bramble margins. The area also incorporates grassy paths, rides and newly restored glade areas.

The site has a dedicated Friends Group, The Friends of Hoblingwell, who have grown from a small group running modest annual events to a hardworking and biodiversity focused group. They work under guidance from local ecologists, environmental groups such as Kent Reptile and Amphibian Group, London Wildlife Trust, RSPB and many others. The site is managed by *i*dverde's Countryside Team who regularly complete Team Building Days doing habitat management and surveying, sometimes alongside the Friends Group.

The site is managed for biodiversity with its scrubland habitat benefitting many different species. The scrub is managed in

different ways to make sure there is suitable habitat for particular wildlife species. Scallop cutting creates a varied, zoned edge structure to the scrub which increases the boundary for nectaring species and reduces shading for the benefit of small insects, reptiles and butterflies. Ecotones where two different habitats meet are beneficial to wildlife. At Hoblingwell there is a gradual change from short grassland to longer grass and herbs, a scrub/ shrub zone and then taller woodland.

Many different species of birds use the scrub including robins, song thrush and long-tailed tit. The scrub also provides great habitat for small mammals and many invertebrates including common blue damselflies, migrant hawker dragonfly and butterflies: small tortoiseshell, meadow brown and painted lady butterflies nectar on the bramble. With appropriate management scrub can be very important for reptile and amphibian species due to their need to regulate their body temperature. It provides sunny, sheltered spaces with nearby cover from predatory species such as birds, small mammals and in Hoblingwell's case, local cats. Common lizard and slow worms have both been recorded. Wood piles and hibernacula offer additional protection and hibernation sites for both reptiles and amphibians. Varied management of the grass/scrub interface has proved beneficial to both common lizard and slow worm.

7. Responsible Bodies

Bromley Allotments and Leisure Gardens Associations Limited, Bromley Biodiversity Partnership, Bromley Countryside Volunteers, Bromley Friends of the Earth, Bromley RSPB, City of London Corporation, English Heritage Trust, Environment Action at Coney Hall, Forestry Commission, Friends Groups, Greater London Authority, Holwood Trust, *idverde*, Kent Reptile & Amphibian Group, Kent Wildlife Trust, London Biodiversity Partnership, London Borough of Bromley, London Wildlife Trust, National Trust, Natural England, Orpington Field Club, Private Landowners, Residents, Trustees of Chislehurst Commons, Woodland Trust.

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4.4 HEDGEROWS

A hedgerow is defined as a line or narrow belt of closely spaced woody shrubs, retained or managed to form a more or less continuous barrier. Hedges make a significant contribution to the Borough's landscape and biodiversity. Some were formed when fields were carved out of woodland in medieval times and are refuges for plants which are associated with ancient woodland such as bluebells and wood anemones. Others were wide shelter belts for sheep and cattle (known in Kent as shaws). Some were planted in the 18th and 19th centuries as part of the enclosures of land which took place at that time. These were often planted originally with hawthorn but have since become species rich. The wide variety of hedgerow types in Bromley also reflect differences in geology. Hedgerows shape the pattern of Bromley's countryside and form a network of corridors for wildlife that provide links with other semi-natural habitats. More than 125 UK Priority species are closely associated with hedgerows including declining farmland birds, dormice, bats, great crested newts and rare bumblebees and moths[1]. Hedgerows capture eroding soil, can help with flood alleviation and regulate air and water quality by intercepting pollutants. They are also important for carbon storage[2,3], see below.

Native hedgerows are an England NERC Section 41 Priority Habitat and must be protected.

Carbon Storage

New UK and Bromley climate change targets mean that hedgerows are now valued because of their ability to sequester CO_2. It has been estimated that new hedgerows may store 600 – 800 kg of CO_2 equivalent per year per km, for up to 20 years[1]. Within native mixed-species hedgerows it is stored in woody biomass, roots and as soil organic carbon in undisturbed soil beneath and adjacent to hedgerows. Net soil carbon accumulation appears to continue until hedges are hundreds of years old[4].

According to Axe *et.al.* (2017)[5] carbon stocks above and below ground are similar and are greater in wide hedgerows. When hedges are removed and hedge plants burnt, carbon dioxide is released. When soil beneath and adjacent to hedgerows is disturbed or damaged (e.g. when hedge bases are treated with pesticide, including herbicides and fungicides) the soil fauna is damaged which is implicated in the loss of soil organic carbon[6]. The harvesting of fruit from hedgerows by people and other animals and the harvesting of some of the wood and its long term use in country furniture, utensils, baskets, hurdles, walking sticks etc., as occurred in the past provides a longer term carbon sink. Coppicing of hedgerows on a regular basis can also provide a sustainable fuel source.

The report of the Climate Change Committee, *Net Zero: The UK's Contribution to Stopping Global Warming* (2019), advocated a 40% increase in hedgerows (200,000kms) to help reach the Government's target of net-zero carbon by 2050[3].

Area and Distribution

According to the Countryside Survey 2007, the total length of hedgerows decreased by 1.7% in Great Britain between 1998 and 2007 to 547,000kms. This appears to be due mainly to lack of management resulting in hedges turning into lines of trees or relict hedgerows. Species richness also decreased by 4% during this time with competitive species becoming more prominent[7].

It is estimated that 42% of British hedges (154,000km) are ancient and/or species rich. The majority are concentrated in southern England and south Wales [8].

Bromley has over 300kms of hedgerows in the Green Belt[9]. Hedges occur in greatest profusion in the fields of the Downs and often enclose a network of ancient rights of way and rural sunken lanes. To the east of the Borough, particularly on the ridge between the Cray and the Darenth Valleys, remnant field boundary systems persist as lines of old pollarded trees. An almost uninterrupted system of roadside hedges remains.

The Bromley Countryside Volunteers (formerly the Countryside Management Service) conducted a Hedgerow Survey of the Green Belt in 1995[10] and found the following patterns of distribution:

- *Elm hedges* – in the area to the east of St. Paul's Cray, elm constitutes over 90% of the species present.
- *Mixed hedges* – found frequently on the Downs and on the ridge between the Cray and the Darenth; these hedges are made up of at least three of the following species: hawthorn, hazel, field maple, holly and blackthorn.
- *Hawthorn hedges* – tend to occur where fields were enclosed or divided in the 18th,19th and 20th centuries.
- *Boundary hedges* – found on old boundaries where tree species are particularly evident and often pollarded; examples are in the Norsted valley and the boundary between Bromley and Crockenhill.

2. Historical Management

Since 1945 there has been a drastic loss of hedgerows throughout the UK through removal and neglect. Traditional management has declined, primarily due to the change from mixed farming to arable, which does not require stock proofing. Decline in livestock has been particularly pronounced since the 1970s. This led to hedgerows with gaps and a lack of continuity. There have been losses of hedgerows due to Dutch elm disease. The demand for land, intensification of agriculture, high labour costs and loss of traditional skills,

larger farm equipment needing larger fields, heavy snow fall, urbanisation and the expansion of the road network since the late 1800s have all contributed to hedgerow loss. The total length of hedge in England in 1984 was estimated at over 200,000 miles. Between 1984-90 two miles of hedge were grubbed-up for every one mile planted (Department of Environment, 1990). However, the UK remains the most significant country in Europe for hedgerows. Of particular importance are ancient hedgerows (those which predate the period of the Enclosure Acts 1720 – 1840) and species-rich hedgerows.

Within Bromley, hedgerow loss has been most pronounced on the ridge between the rivers Cray and Darenth. Fewer hedgerows have been removed from the Downland areas[10].

Bromley's hedgerows are rich in shrub and tree species; 34 species were identified in the 1995 Hedgerow Survey[10]. The most diverse hedgerows are found in the downland areas, with an average of 9 woody species, compared with the Cray valley with 7 species and the Ridge between the Rivers Cray and Darenth with 5 species. In the Downs it may be that as woodland was removed, strips or shaws were left to form hedges; or saplings from the locality may have been uprooted and planted as hedgerows.

The 1995 survey revealed that the vast majority of hedgerows (85%) are connected either to other hedgerows or to woodland. This high degree of connectivity is favourable to wildlife movement and hedges are thought to act as wildlife corridors for many species, including reptiles, amphibians, small mammals and bats. There are relatively few large gaps in Bromley's hedges and in 1995 only 5% of hedges had gaps which formed more than 40% of the hedge length. Over half the hedges had either few or no gaps. The optimum structure is seen as a tall, dense hedge with a broad base, with standard trees, which are particularly good for nesting birds, and a margin of grasses and wildflowers. Bats and dormice prefer overgrown hedges, cut on a 2-3 year cycle. Ancient hedgerows tend to be those that support the greatest diversity of plants and animals. Banks, verges and ditches associated with hedgerows further contribute to their wildlife value. Some historic hedgerows may still remain within existing urban areas.

The 1995 survey indicated that 40% of Bromley's hedgerows were unmanaged. In the short term this can often benefit wildlife, but where lack of management continues, gaps develop and hedges change into lines of trees, become useless for containing livestock and are eventually removed. 56% of hedgerows were trimmed, clipped or flailed. This can eventually open up gaps in the lower part of the hedge. 2% of hedgerows are laid and 2% coppiced and although initially an apparently drastic approach, recolonisation is quick and longevity of a thick, dense and potentially diverse hedge is ensured.

Appropriate management has been encouraged by the fact that provision of grants for the removal of hedgerows has been replaced by incentives for their management and creation (e.g. DEFRA Schemes). The 2004/5 linking of agricultural payments with appropriate timing of hedgerow trimming, the retention of field margins and the prevention of pesticides and fertilisers close

to the base of hedgerows on arable land has benefitted hedgerow species. It is uncertain whether this will be continued in the new Countryside Stewardship Scheme. Too frequent and badly timed cutting of hedges, lead to poor habitat conditions, the development of gaps and species change affecting, for example, nesting birds, insects, small mammals, reptiles and climbing plants. Trimming of hedgerows at inappropriate times of the year is of concern on some sites. Flailing has caused problems for many species including brown hairstreak butterflies which lay their eggs on blackthorn where new growth meets old and are therefore badly affected by annual trimming.

Traditional management is costly and is aimed at hedgerows of high value. There has been an increase in interest in the traditional skill of hedge laying, with examples being set by the Council at sites such as Scadbury Park (2013/14) and Norman Park (2019/20).

Lack of protection from the browsing effects of stock, including horses, continues to have a detrimental impact on hedgerows and their ground flora. Some landowners have begun to construct fence-lines away from hedgerows. It is particularly important to protect new hedges from grazing animals.

Increased use of rural lanes by vehicles has led to the undercutting and erosion of roadside hedge banks. Banks become unstable, flora associated with the hedgerow bottoms is lost and exposure of root systems can lead to loss of woody species. Bromley Council has taken steps to protect hedgerow bottoms, by the installation of sympathetic wooden revetments.

In urban areas hedgerows can also contribute to sustainable urban drainage and in school grounds species rich native hedgerows can be an important resource which can be used to fulfill aspects of the National Curriculum.

An increase in hedge planting in recent years is sometimes also associated with worries about pollution, particularly around schools, because hedgerows can reduce airborne particulates and atmospheric pollution. Any thick hedgerow about 2 metres high will act as a barrier to pollution immediately behind it[11].The efficiency of pollutant uptake varies according to various factors including species, size, age, amount of leaves, leaf surface and condition. According to a CEH/Lancaster University report[12] of the native hedgerow species important for biodiversity, hawthorn (*Crataegus monogyna*), field maple (*Acer campestris*), hazel (*Corylus avellana*) and elder (*Sambucus nigra*) have the greatest capacity to improve air quality (using ozone to represent all pollutants) while based on their growth rates, goat willow (*Salix capraea*), hawthorn and elder were considered as important for carbon sequestration. Ash (*Fraxinus excelsior*) and silver birch (*Betula pendula*), which can be hedgerow trees, perform well in both categories. Other reports suggest the use of evergreen species with waxy cuticles eg yew, holly and ivy for removing particulate matter, or trees with hairy leaves such as whitebeam[11]. Using a good mix of native species is likely to be key as there will be other local considerations such as root spread and distance to buildings which also need to be considered.

3. Current Status

3.1 Policies

The Local Plan includes policies to encourage positive management of hedgerows, replacement of native hedgerows lost through development and the planting of new ones.

The Hedgerow Regulations 1997 require owners to notify the Local Planning authority before removing any stretch of hedgerow which is more than 30 years old and over 20 metres in length, or under 20 metres in length and meeting another hedgerow at each end. Owners who fail to do this will be guilty of an offence. Important hedgerows are assessed according to criteria in the Regulations.

3.2 Factors Affecting the Habitat

Adverse factors

- Lack of management.
- Too frequent and badly timed cutting of hedges.
- Overstocking leading to over-browsing of hedgerows or hedgerow ground flora.
- Prevalence of cherry laurel
- Landowners are sometimes reluctant to gap up existing hedgerows or create new hedgerows due to cost of plants and protective shelters/fencing.
- Increased use of rural lanes by vehicles leading to undercutting and erosion of roadside hedge banks.
- The use of pesticides (herbicides, fungicides & insecticides) and fertilisers at the base of hedgerows and through spray drift in agricultural fields.
- Mowing up to the edge of hedge bases.
- The cost of management favouring a mechanical approach.
- Road widening and dumping of planings on to hedgerow banks.
- Loss of hedgerow trees through senescence and felling, without replacements being made.
- Loss of hedgerows through development and landscaping works, including around gardens.

Positive factors

- An increase in interest in the traditional skill of hedge laying.
- An increase in native hedgerow planting for wildlife.
- Free native hedge plants available to community groups from the Woodland Trust
- An increase in desire to reduce pollution in urban areas, especially near schools.
- Countryside Stewardship: Hedgerows and Boundaries Grant
- Availability of ‘tree poppers’ which has enabled recycling of small native species removed during scrub control and their reuse for

gapping up other hedgerows.
- Under the Wildlife and Countryside Act 1981 Schedule 1, all birds, their nests and eggs are protected by law (with minor exceptions).

4. Future Management

Aims:
- To protect and enhance Bromley's hedgerows.
- Promote their wildlife and heritage value and the ecosysyem services they provide
- encourage hedgerow restoration

Objectives:
1. Continue to maintain and enhance existing hedgerows as per Management Plans. For hedgerows on sites without a specific management plan, follow generic hedgerow management guidance in Appendix E.
2. Promote the planting of new hedgerows using native hedge plants of local provenance.
3. Survey and monitor hedgerows and use data to inform management.
4. Promote hedgerows through walks, talks and events.

5. Hedgerow Management Guidelines

Landowners are responsible for the management of hedgerows on their land. Good hedgerow management will protect and enhance this habitat and help to fulfil the aims and objectives of the Bromley Biodiversity Plan. For detailed hedgerow management guidance see **Section 6.2: Best Practice Guidelines for Land Managers**

6. Key Species (not exclusive)

Flagship Species
Flora: bluebell (native), butcher's-broom, common hawthorn, dog's mercury, English elm (mature), field maple, guelder-rose, goldilocks buttercup, greater stitchwort, hazel, honeysuckle, primrose, spindle, traveller's-joy, wood anemone, wood sorrel. **Ancient trees**
Lichens: *Physcia, Phaeophyscia* species, and *Xanthoria polycarpa*
Fauna.
Invertebrates: gatekeeper and brown hairstreak butterflies, bees.
Amphibians and Reptiles: slow worm, toads.
Birds: bullfinch, dunnock, house sparrow, lesser whitethroat, linnet, song thrush, whitethroat, yellowhammer.
Small mammals: bats, hazel dormouse, hedgehog, shrews.

Negative indicators: cherry laurel, Japanese knotweed, aggressive weed species e.g. cleavers, docks and nettle, gaps in hedgerows, dead shrubs and trees, tarmac, litter, pesticide use, lack of vegetation at hedge base.

Retrievables: Whole hedges, white-letter hairstreak, brown hairstreak
Case History: Hedgelaying - Jubilee Country Park

Hedge laying is a traditional hedgerow management practice historically designed to provide a natural barrier to stock-proof grazing pastures. Wildlife also benefits due to the increased density of hedge that the laying technique creates. The stems are partially cut (pleached) from the base and carefully laid down to form a thick barrier, providing protection from predators and shelter from the weather. Cutting the hedge in this way also rejuvenates it, bringing about new growth, which attracts insects and in turn birds and small mammals. Nowadays it is a dying practice which Friends and Volunteer groups across the borough like to preserve, so have learnt and developed this technical skill using the traditional tools and methods. Jubilee Country Park boasts several examples of laid hedges with the most recent addition being undertaken around a woodland-edge pond, which was until then very accessible to dogs. By laying the sparse, old hedge and adding stakes and binders to strengthen it, a barrier has been formed that will restrict access to the pond, while also providing an enhanced habitat, in particular for hibernating amphibians. Laying the trees also lowered the height of the hedge, allowing more light to access the important ground flora and ancient woodland indicator species, betony and common cow-wheat, which are known to grow only in this region of the park.

7. Responsible Bodies

Bromley Allotments and Leisure Gardens Associations, Bromley Biodiversity Partnership, Bromley Countryside Volunteers, Bromley RSPB, City of London Corporation, Department of Food and Rural Affairs, English Heritage Trust, Environment Action at Coney Hall, farmers and landowners, Friends Groups, garden associations, garden centres, Greater London Authority, Historic England, Holwood Trust, Idverde, Kent Wildlife Trust, London Borough of Bromley, London Wildlife Trust, National Trust, Natural England, Orpington Field Club, Residents, Trustees of Chislehurst Commons, Woodland Trust.

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8. Ancient and Species-rich Hedgerows
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11. Using Green Infrastructure to Protect People from Air Pollution April 2019 Mayor of London GLA
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4.5 ANCIENT AND VETERAN TREES

The term ‘ancient trees’ encompasses trees that are in their third and final stage of life, trees that are of interest biologically, culturally or aesthetically because of their age and trees that are old relative to others of the same species. Ancient trees are often very short and with a large girth and hollow trunk. Veteran trees are often included under the term ‘ancient’ but technically are usually trees in the second or mature phase of life. They can be of any age but have some of the characteristics of ancient trees. Ancient trees are all veterans, but not all veterans are ancient. A notable tree is a tree with the potential to become a next generation veteran or ancient tree.

The age of ancient trees means they have been providing a stable habitat for hundreds of years. According to the Ancient Tree Forum[1] an oak tree is not considered ancient until it is 400 years old, while yew trees have to reach 800 years to be classed as ancient. They can also continue for many years dying or dead. Ancient trees provide many different niches (mini-habitats) for plants and animals including dead wood, lifting bark, crevices, fissured bark, sap runs, rot holes, sunny, shady, damp and dry areas. Amongst the many organisms they support are rare lichens, mosses and liverworts and their associated invertebrates and many species which depend on dead wood including fungi, some very rare. Many invertebrates such as beetle larvae feed on the diverse fungi associated with different levels of decay, while flies including rare hoverflies are associated with rot holes. Small mammals, bats and birds often use the holes and slits in trunks and boughs for nesting and roosting. Because veteran trees have some of the features of ancient trees such as dead wood, rot holes and sap runs (though these may be due to damage, management, or the tree’s environment) they provide some of the niches required by the plants and animals that live on and in ancient trees, thereby helping the survival of these organisms.

Ancient trees are important as part of our cultural and historical landscape as well as being of vital importance as wildlife habitat. It is amazing to think that in some places only 3 generations of ancient trees would link back to the first tree colonists at the end of the Ice Age. People often greatly value ancient and veteran trees as landmarks and a characteristic part of the local landscape. They are direct connections to older landscapes and have survived as mementos. For example, ancient yew trees may mark sites of pagan or Christian worship, while the remnants of the Wilberforce Oak on the Keston Ridge and its connection with William Pitt, William Wilberforce and anti-slavery legislation provided an example of the cultural relevance of ancient trees which is still celebrated on the nearby Stanhope Seat. The large girth of ancient and veteran trees and the frequently strange, contorted shapes into which they grow also fascinate people. It is in these ways, rather than their direct value for wildlife, that they have sometimes been most appreciated.

1. Area and Distribution

Britain is considered to have more ancient trees than most of the rest of Europe because the practice of pollarding trees and the establishment of deer parks was less common elsewhere. Ancient trees can be found almost anywhere in the country, in parkland, pasture woodland, old hedgerows, wooded commons, ancient woodland, as marker trees for parish boundaries, along roads and trackways, in gardens and churchyards.

Ancient and veteran trees are widely distributed across Bromley and fairly numerous Comprehensive records of the locations of these trees are not yet available, highlighting the need for further survey work. Many of them are found on boundaries as at Keston where they mark the boundary between the Common and Ravensbourne Open Space or in Churchyards e.g. ancient yew trees in Cudham, Downe and Hayes Churchyards. There is some Wood Pasture and Parkland habitat at Holwood and West Wickham Common, but many ancient and veteran trees which once grew in parkland are now surrounded by woodland, as at Scadbury Park. Other examples of ancient trees are found in Downe village (ash), and off Botany Bay Lane in the National Trust Hawkwood Estate Chislehurst (English oak). Veteran trees include English oaks at Holwood, Ravensbourne Open Space and Crystal Palace, field maple (Sundridge Park Golf Course) and small leaved lime (Spring Park). One the many notable trees in the borough is wych elm at Burwood School boundary off Avalon Road Orpington.

2. Historical Management

Many ancient trees are still around because of traditional management practices that have helped them to survive the centuries. Pollarding and coppicing are traditional methods of harvesting wood that allow trees to survive longer whilst still providing timber. These traditional management methods often had other purposes, for example, a line of pollarded trees might be used to mark property boundaries.

Ancient trees have often been removed as being dangerous or unsightly. The Ancient Tree Forum has led the way in seeking a more balanced approach to ancient tree management. Local authorities now remove hazardous limbs rather than whole trees by footpaths, for example. More effort is being placed into uncovering the success of different management approaches and monitoring their associated species. The Bromley Oak, beside the Pavilion Leisure Centre, was highlighted as one of the `Great Trees of London' in 1997. A leaflet was produced by the London Tree Forum to encourage the public to help find and watch-out for these trees.

Awareness of the importance of ancient and veteran trees for wildlife has become more widely recognised through high-profile sites such as Richmond Park and Windsor Great Park and through national campaigns. A greater effort is now made to assess the importance of their wildlife value. Difficulty arises in that many of the species that benefit from the presence of older trees are obscure and difficult to identify; many of the species do not appeal to most and

surveyors are difficult to source.

3. Current Status

Since 1999, some effort has been placed into revealing the presence of many ancient trees within the Borough. About 132 ancient/veteran trees have been mapped on the Ancient Tree Inventory while a Veteran Tree Survey carried out at Scadbury Park in 2008 identified an additional 123 ancient/veteran trees including 71 pedunculate oak, 18 sweet chestnut, 11 ash, 8 field maple and 126 veteran hawthorn. To see the ancient, veteran and notable trees recorded in LBB so far, or to add a tree, see the Ancient Tree Inventory[2].

On council-owned woodlands, conservation of ancient trees and standing dead wood is ensured through management plans with sympathetic management. Encouraging maiden trees has also been important.

The 2019 National Planning Policy Framework (NPPF) recognised that '*ancient woodland, ancient trees and veteran trees are irreplaceable*', see Policy 175c

3.1 Policies

Some ancient trees have Tree Preservation Orders (TPOs). The main purpose of TPOs is to protect trees of high amenity value. This designation enables some ancient trees that are also important for wildlife to enjoy protection and sympathetic management. Individual trees are protected as important parts of woodland or area TPOs.

LBB's Tree Management Strategy[3] sets out Policies which include some regarding ancient and veteran trees, including those on both public and private land subject to TPOs. If any work (e.g. pruning or removal) on a tree with a TPO or within a conservation area is proposed, notification must be sent to the Council 6 weeks before commencement. During this time the application will be assessed and can be modified or refused. Land owners who carry out unauthorised work on TPO'd trees, including works within the root protection area can be prosecuted.

Even if the tree itself is not protected, it may still have legal protection if it provides a home to another species, such as bats, which are protected under the Wildlife and Countryside Act (1981 as amended). See **Section 5: Protected Species**.

3.2 Factors Affecting Ancient Trees

Adverse Factors

- Removal of trees as unsightly or dangerous.
- Tarmac/concrete around the base kills trees.
- Footpaths and tracks very close to ancient trees leading to soil compaction and/or removal of limbs for health and safety.
- Cutting roots when work is undertaken close to the tree.

- Loss through development.
- Neglect and inappropriate management.
- Lack of future-generation trees due to grazing, cutting and intensive landscaping.
- Removing deadwood which naturally collects around ancient trees and provides continuity of habitat for some of the many organisms which live in or on ancient trees.

Positive Factors

- Increased awareness of the value of ancient trees.
- Historical appreciation e.g. Bromley Oak
- Greater protection under the NPPF
- Efforts to place TPOs on ancient and veteran trees, which gives them some protection from inappropriate cutting, root disturbance and felling.

4. Future Management

Aims

To protect Bromley's ancient trees, promote their historical and biological importance and provide a continuity of veteran and ancient trees into the future.

Objectives:

To survey and record the borough's ancient and veteran trees.
To encourage appropriate management of ancient and veteran trees.
To promote the importance and value of ancient trees through walks, talks and events.
To provide for future ancient/veteran trees for example by pollarding younger trees

5. Ancient and Veteran Tree Management Guidelines

Many of the borough's ancient and veteran trees are privately owned. Good management practice will help to protect and preserve them.

Ancient and veteran trees and the communities they support can obviously not be replaced easily or quickly. A combination of their conservation and encouraging the growth of the next generation is vital especially near to those already existing to provide continuity of habitat for species associated with ancient trees.

These guidelines are echoed in of Bromley's Tree Management Strategy, Policy 23 of which sets out the aim to record and protect veteran and ancient trees in the Borough and instigate a programme of management and succession planting.

Most management of Veteran /ancient trees must be carried out by experts, but for background information and advice see Read, H. (2000) Veteran Trees: A Guide to Good Management[4] and **Section 6.2: Best Practice Guidelines for Land Managers.**

6. Key Species

Flora: ash, English elm, hornbeam, field maple, pedunculate oak, sessile oak, sweet chestnut, yew, ferns, mosses.
Fungi: Bearded tooth fungus
Lichens: *Cresponea premnea*, *Chaenotheca trichialis, Chaenothecopsis species.*
Fauna: Invertebrates belonging to many groups including numerous species of beetle e.g. stag beetles, ants: brown tree ant (*Lasius brunneus*) and jet ant (*Lasius fuliginosus*)**,** flies such as moth flies, wood gnats and hoverflies
Birds and bats.

Case Study: Ancient and Veteran Trees at Scadbury Park

Scadbury Nature Park has over 100 ancient trees, an indicator of its long history. These are predominantly English oak and sweet chestnut, but there are also other species, including yew, ash and shorter lived fruit trees. Some of the older oaks may date back to the Tudor period when the estate belonged to the Walsingham family. The ancient trees are an important part of the historical landscape of the site, defining old boundaries and trackways and also indicating its previous uses, with many of the ancient oaks being remnants of the old deer park and veteran fruit trees remaining from commercial orchards. These ancient trees are a key component of Scadbury Park's character. They demonstrate a continuity of habitat and contribute to the designation of areas of woodland within Scadbury as Semi-Ancient Natural Woodland.

In 2008 a survey of Scadbury Park's ancient and veteran trees highlighted the work required to maintain these biodiversity havens in good health. In recent years, efforts have been made to 'halo' around some trees, removing competing saplings and vegetation from within their 'drip line'. In some cases, paths have been re-routed around ancient trees in order to alleviate the effects of soil compaction on their roots. Future activities may involve 'air-spading' these roots in order to reinvigorate them after many years of heavy footfall. The 'end weight' on selected limbs of some trees will also be reduced to limit the chance of these limbs breaking and splitting the trunk. However, with 100+ trees identified, there remains much work to do.

A number of fungus have been recorded on Scadbury's ancient trees, including beefsteak and chicken of the woods, and in 2019, *Hericium erinaceus, the* Bearded Tooth Fungus. This rare species was recently found on one of the ancient oaks. It is one of only four species of fungi that are listed under Schedule 8 of the Wildlife and Countryside Act 1981.

7. Responsible Bodies

Aboricultural organisations and contractors, Bromley Biodiversity Partnership, City of London Corporation, English Heritage Trust, Forestry Commission, Friends Groups, Greater London Authority, Holwood Trust, *idverde*, Kent Wildlife Trust, London Borough of Bromley, including Tree Team, London Wildlife Trust, National Trust, Natural England, Orpington Field Club, private landowners, Residents, Trustees of Chislehurst Commons, Woodland Trust.

References

1. To find out more about ancient trees including their importance for biodiversity see the Ancient Tree Forum website.
2. Ancient Tree Inventory
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4. For information about management of ancient/veteran trees see Read, H. (2000) Veteran Trees: A Guide to Good Management 2000), English Nature.

   For information about ancient trees and planning see Natural England's standing advice: Ancient Woodland, Ancient Trees and Veteran Trees: protecting them from development and Planning for Ancient Woodland: Planners' Manual for Ancient Woodland and Veteran Trees October 2017, The Woodland Trust.

4.6 GRASSLANDS

Chalk, Neutral and Acid

The common link between these grasslands is that they have been 'unimproved', by fertilisers, herbicides, fungicides and pesticides and therefore support a rich variety of less common grasses, broad-leaved herbs and sometimes grassland fungi such as waxcaps and *Enteloma* species which are declining in Europe and have become increasingly rare in England. Sometimes referred to as semi-natural, all 'unimproved' grasslands survive due to sensitive cutting or grazing, which prevents trees and shrubs from colonising. They differ in that they occur on different soils with varying pH and mineral balances, but all soils are nutrient poor. Bromley has some areas that support Lowland Calcareous Grassland, Lowland Meadows (Neutral Grassland) and Lowland Dry Acid Grassland. These are all England NERC Section 41 Priority Habitats.

Lowland Calcareous Grassland develops on shallow, lime-rich soils, derived in Bromley from chalk bedrock. They contain an exceptional diversity of wild flowers and other plants, many of which are restricted to lime-rich soils. Consequently the invertebrate fauna is also very rich. Downe Bank, a Kent Wildlife Trust nature reserve in the Cudham Valley, is internationally known for its association with Charles Darwin.

Species-rich neutral grasslands (Lowland Meadows), unaffected by agricultural improvement, are a rare and threatened habitat in the UK. These grasslands are mainly managed as hay meadows or pasture and are colourful because they contain a high proportion of broad-leaved herbs relative to grasses. In Bromley, they tend to be found on soils over London Clay or clay with flints in pockets of small fields with hedgerows.

Acid grassland occurs on nutrient poor, generally free draining soil. It is characterised by fine-leaved grasses such as common bent and fescues, with typical herbs such as sheep's sorrel, tormentil and heath bedstraw. In Bromley they are generally found on the gravels and sands of the Blackheath Pebble Beds and Woolwich Beds. In the UK lowlands, acid grasslands are now rare and those of Bromley are limited in extent and much fragmented. Acid grassland tends to be restricted to open areas of the remaining commons, sometimes associated with lowland heath and mire communities.

Each grassland habitat supports different plants and therefore different plant eating invertebrates and their predators.

Semi-improved grassland is more common in Bromley's parks, open spaces and road verges than the Priority Grassland habitats above but can become much more species rich with appropriate management, and provides important habitat for a number of invertebrates.

Carbon Storage

Based upon the UK National Ecosystem Assessment 2011, Alonso et al[1] stated that grassland soils (0-15cms depth) have the highest carbon stock of any UK broad habitat. The Countryside Survey 2007[2] showed that, within the top 15 cm of soil, acid grassland has the highest carbon stock of any UK NEA broad habitat (82.3 tonnes/hectare) though this was a decrease compared to 1998. The carbon stock for neutral grassland was 62.4 t/ha. No figures were given for calcareous grassland. Factors relating to carbon loss include soil disturbance, drainage and management.

1. Area and Distribution

Chalk Grassland

The total area of lowland calcareous grassland in England is about 38,687 ha[3]. There are about 336 hectares of chalk grassland in London[4]. Most occurs on the northern parts of the North Downs, especially along the slopes of a number of dry valleys in Bromley and Croydon with some in Sutton, and a small amount in Hillingdon and Lewisham[5].

Bromley supports around 92 hectares (227 acres) of chalk grassland, nearly 30% of Greater London's resource[6]. Although Bromley's chalk grassland is important in the London context, it is less so when compared to Kent's which contains around 5% of the UK's resource[7].

The majority of existing chalk grassland in Bromley is restricted to the dry valley sides of the North Downs, south of a line drawn east/west through Farnborough. It includes quite large areas of Cudham, Downe and Biggin Hill valleys. For more information regarding chalk grassland in the Cudham Valley see case study below. In the Downe Valley chalk grassland includes part of the West Kent Golf Course and in Biggin Hill Valley, Saltbox Hill SSSI, both managed by London Wildlife Trust. Outliers occur in the Green Belt to the east of the Borough, at Hewitt's Chalk Bank (owned and managed by KWT), Glentrammon Recreation Ground and as far north as Goddington Park and Blenheim School Meadow.

Bromley's chalk grasslands support a number of nationally rare species. Many of these are continental in their distribution and only occur in Britain in the extreme south-east (notably on the North Downs) where climatic conditions closely approach those of mainland Europe. The Greater London area also harbours some of the eastern-most populations of rare species with a more Atlantic tendency.

Case Study, Chalk Grassland: Cudham Valley

Cudham Valley: Hangrove and Musk Orchid Bank (S Lofting)

Chalk grassland along the Cudham Valley includes High Elms Country Park (in part), Hangrove and Musk Orchid banks, Downe Bank, Strawberry Bank (all managed by idverde), Bottom Barn Farm, parts of Blackbush Shaw (Woodland Trust) and other neighbouring land including the Shaw's Girl Guide site. Collectively the management of these sites have created a landscape scale approach to chalk grassland conservation along the Cudham Valley joining together sites managed by a variety of owners. Some of the chalk grassland falls within the High Elms and Downe Bank SSSI, this and other areas form part of Cudham Valley South and Downe Bank and Cudham Valley North Sites of Importance for Nature Conservation (Metropolitan Importance).

The majority of sites are managed under Countryside Stewardship schemes, which fund a range of work including conservation grazing, scrub control, annual hay cuts where needed and invasive species control of, for example, sycamore and snowberry. Much of this work has high volunteer input.

Sheep grazing Musk Orchid Bank, October 2019- S Lofting

Bromley's chalk grassland contains a range of rare flora including 9 species of orchid which include greater butterfly and man orchid. Also found is a wide range of notably rare invertebrates including roman snail, small blue butterfly and dark green fritillary.

Left: Bee Orchid, (*Orphys apifera)*. Right Man orchid, (*Orphys anthropophora).* (S. Lofting)

Neutral Grassland

England has an estimated 7282 ha of unimproved species-rich, neutral grassland (Lowland Hay Meadows)[3], of which 707.7ha[4] are in Greater London. Although neutral grasslands are relatively common in Bromley, **unimproved** species-rich neutral grasslands are rare, especially those of damper soils. This grassland type is also considered to be of county importance in Kent. The accurate area of unimproved neutral grassland in Bromley remains to be determined.

Good quality neutral grassland can be found in very few areas, notable amongst these are Jubilee Country Park, High Elms Country Park and Holwood with some at Darrick and Newstead Woods Local Nature Reserve. Some churchyards, golf course roughs and old lawns contain fragments of unimproved neutral grassland e.g. Down House lawn which supports a fungal population of national importance. Two of the fields at Ravensbourne Open Space are good examples of wet neutral grassland.

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Case Study, Neutral Grassland: Jubilee Country Park

Jubilee Country Park is a Local Nature Reserve between Petts Wood and Bickley owned by the London Borough of Bromley. Historically a grazing pasture, some areas were part of the former West Kent Golf Course (1916-1940) and others were utilised as a gun emplacement during the Second World War. The site became a country park in 1981, following which, it was declared a Local Nature Reserve (LNR) in 1996 in part due to the dominant population of the locally scarce corky fruited water-dropwort. Presently it contains 8 neutral grassland meadows, all of which are species rich and managed under a Countryside Stewardship agreement with Natural England. Due to its underlying geology of the notoriously impermeable London Clay, the site is seasonally wet. Current management consists of an annual hay cut and removal of the arisings in late August-early September, allowing the majority of seeds to drop into the sward. This type of management discourages scrub encroachment but promotes wildflower diversity through the removal of the cuttings, which would otherwise fertilise the soil. A rotating 20% of each meadow is left uncut each year to provide an "insect bank", which acts as an overwinter refuge for invertebrates and other species. Regular surveys undertaken by the Friends of Jubilee Country Park and Orpington Field Club consistently find a wide variety of plants including chicory, devil's-bit scabious, betony, bee orchid and zig-zag clover, along with invertebrates including large, small and Essex skipper butterflies. The site also boasts a healthy population of slow worm.

Left: Small Skipper Butterfly Jubilee Country Park (S.Lofting)

Acid Grassland

Lowland dry acid grassland habitat is estimated to cover 20,142 ha of England[3]. In Greater London it is widespread in London, occurring in 26 of the London Boroughs and estimated at 1,522.6 ha[4]. However, it is often in small patches, overlooked and likely to be under reported.

Acid grassland in Bromley tends to be fragmented into small patches isolated by roads and surrounding development or in a mosaic with heathland. Bromley supports a significant proportion of London's acid grassland, which is an important reservoir of rare or scarce species. The accurate area of acid grassland in Bromley remains to be determined. As it is strongly associated

with the Blackheath Pebble Beds most of it is found in the central and northern parts of the Borough. Hayes, Keston, Farnborough, Chislehurst and St. Paul's Cray Commons all have areas of acid grassland, as do open spaces such as Sundridge Golf Course and Martin's Hill. Other examples may be found at Hoblingwell and Poverest Recreation Grounds, St Nicholas Churchyard in Chislehurst and verges in Keston Park Estate.

Case Study, Acid Grassland: Keston Common

Keston is a small village located in the south of the borough, situated on the free draining Blackheath pebble beds. The majority of the surrounding land is registered common (the majority owned by London Borough of Bromley) which includes a range of habitats including woodland, bog/valley mire, heathland and acid grassland, grading to neutral grassland near the River Ravensbourne. Some of the area has high recreational pressure. Most of the acid grassland adjoins heathland habitat, some is in a large open field. Keston's acid grassland is managed by once per year cuts in September, with the arisings removed. Additionally volunteers such as the friends of Keston Common help to cut back encroaching scrub. Smaller fragments of acid grassland can also be found throughout the village on roadside verges, most notably alongside Heathfield Road and around Keston War Memorial in which rare highlights include the meadow saxifrage which is on the Kent Rare Plant Register alongside a whole assemblage of plants which is difficult to find elsewhere in Bromley.

Above: Meadow Saxifrage (*Saxifraga granulata*), Keston Common. (S.Lofting)

Case Study, Acid Grassland: Martins Hill

(Photo: S. Lofting)

Martin's Hill is an urban park in Bromley town centre (owned by the London Borough of Bromley). It contains a mixture of amenity grassland & secondary woodland whilst retaining remnants of acid grassland meadow. The area also supports typical heathland shrub species such as gorse and broom, after which Bromley is named. The acid grassland areas are currently managed under a Countryside Stewardship agreement with Natural England. Scrub encroachment is controlled with help from local volunteers and the Friends of Bromley Town Parks and Gardens. Grass is cut and cleared mechanically once a year. The grassland contains species such as sheep's sorrel, mouse-ear hawkweed, buck's horn plantain and common stork's bill. On-going work is needed to balance the protection of the acid grassland species with the needs and requirements of the site as a local amenity.

2. Historical Management

According to Plantlife, '*The UK's remaining species-rich grasslands now cover a minute fraction of the area they once covered, even relatively recently in the early 20th Century. There were once natural wildflower meadows in every parish – today only 2% of the meadows that existed in the 1930's remain. Nearly 7.5 million acres of wildflower meadow have been lost so far and they are still being destroyed. Of those that do survive, around 75% occur in small fragments and remain vulnerable to destruction*'[8]. This is reiterated in UK NEA Report 2011[3]. Agricultural intensification since the 1940s including the use of pesticides and fertilisers has been a major cause of grassland biodiversity loss. According to The State of Nature Report 2019 agri-environment schemes started in the 1990s may have helped to slow the biodiversity decline, but have been unable to stop it[9].

There has been some recent progress in generating interest in grassland amongst the public nationally, led by Plantlife, with its Save our Magnificent Meadows and Road Verge Campaigns and the Wildlife Trusts who have been promoting Roadside Nature Reserves. However, the majority of the public, including landowners, are likely to be unaware of the key differences between grassland types and their significance. As such, sites supporting these grasslands are often managed with little understanding of the requirements of the plant species they support. The value of woody scrub and uncut vegetation for species, including butterflies and reptiles, is still sometimes thought of as untidy and not always appreciated.

Management, including grazing, is extremely influential in determining the range of species which predominate within a sward. Sheep and cattle grazing in urban-fringe areas like Bromley has declined for a number of reasons, amongst these are lack of profitability, distance to slaughter houses, vandalism, theft and animal health issues. The small and often isolated areas of semi-natural grassland can deter contract graziers.

Much of the semi-improved grassland in Bromley' s parks, open spaces and

road verges has historically been managed as amenity grassland and frequently mown without removal of arisings. This has led to species poor sward, though some species may remain in the seed bank.

Chalk Grassland

There is no comprehensive data concerning rates of chalk grassland loss nationally or locally. However, the ploughing of land for arable use, 'improvement' of swards through the sowing of high-yielding pasture grasses, afforestation and the increase in the use of pesticides and fertilisers over the last 100 years have all taken their toll on the North Downs. Since the demise of sheep pasturing and the decline of the rabbit population after myxomatosis, much grassland succumbed to invasion by scrub then woodland (the process of natural succession). Rabbit numbers have once again increased. The most common management approach is to produce a mosaic of different habitats so as to support as wide a range of species as possible.

Coordinated grazing of important chalk downland sites in the valleys either side of Cudham plateau over the last 10 years has greatly improved the connectivity and appropriate management of grasslands. Some sites are managed with specific species in mind; for example, efforts are being made to promote kidney vetch at Hangrove and Burnt Gorse (High Elms) for the small blue butterfly.

Neutral Grassland

The extent and quality of unimproved neutral grasslands in Bromley have no doubt shown a similar decline. As with chalk grassland, loss of habitat through development; heavy grazing by horses; re-seeding, pesticides and fertiliser use; scrub and woodland encroachment are likely to have had significant impacts on Bromley's unimproved neutral grasslands.

Acid Grassland

Lowland acid grassland is declining in extent nationally. It is likely that the habitat has declined greatly with the loss of open healthy habitat on the various commons in Bromley, as traditional management practices were abandoned. This grassland type suffers more than the others from lack of clear identity. Many of its wildflowers are quite low growing and less showy than those of chalk and neutral meadows so it is often perceived as wasteland and built on or converted to sports pitches or fertilised and used as amenity grassland. The majority of the resource is also subject to heavy amenity use.

3. Current Status

The Council, sympathetic landowners and groups, such as Kent Wildlife Trust (KWT), London Wildlife Trust (LWT) and the Woodland Trust (WT) now manage some important chalk grassland sites for their nature conservation value e.g. Blackbush Shaw (WT) chalk grassland slope and Salt Box Hill SSSI

(LWT). KWT owns and manages Hewitts Chalk Bank and Downe Bank, the latter of great inspiration to Charles Darwin, and the Council owns most of the remainder of the Downe Bank and High Elms Site of Special Scientific Interest. Relict chalk grassland communities have been found at Goddington Park and Glentrammon Recreation Ground and are now managed under Countryside Stewardship Schemes.

Management includes scrub clearance, grass cutting, baling and grazing. Scrub removal and grazing with nature conservation in mind has been implemented in some areas.

Significant areas of scrub have been removed from a number of chalk downland sites over many years. Arable reversion areas have included Bottom Barn Farm, Charmwood Farm, Hangrove and fields off Cockmannings Lane and Avalon Road (Blenheim School Meadow SINC).

With the help of local fundraising, the Woodland Trust purchased Blackbush Shaw in 1997, including a small but important area of chalk grassland. In 1999, London Wildlife Trust purchased 7 hectares of chalk grassland and woodland at Salt Box Hill SSSI, with the help of the public and sponsors.

There is regular monitoring of plants (e.g. orchids) and butterflies on some key sites, usually as species lists. Student projects have been undertaken. Glow-worm surveys are also undertaken on selected sites.

Approximately 55 hectares of Bromley-owned grassland meadows are currently managed through Countryside Stewardship schemes with Natural England. As well as maintaining and enhancing Priority Grasslands,some semi-improved grassland is also increasing in diversity under these schemes, e.g. Poverest Recreation Ground. Along road verges, wildlife friendly management can provide important corridors for species moving between sites of greater interest.

3.1 Policies

There are two SSSIs in the Borough notified for their chalk grassland communities; Downe Bank and High Elms SSSI (also a LNR) and Saltbox Hill SSSI. A number of other chalk grassland sites are SINCs and have some protection under the Local Plan. Others currently have no protection.

Significant areas of neutral grassland fall under Council ownership; meadows in Ravensbourne Open Space form part of Hayes and Keston Common SSSI. Scadbury Park and Jubilee Country Park have been declared Local Nature Reserves and are managed for nature conservation; they are also designated as SINCs of Metropolitan Importance.

Keston Common and a small area of Hayes Common have been designated as SSSIs for their acid grasslands. Significant fragments of acid grassland are found on Hayes Common, Sundridge Golf Course, Hoblingwell Wood and Chislehurst and St. Paul’s Cray Commons - areas all designated as SINCs.

Acid grassland on Common land is protected under The Commons Act 2006 and Acquisition of Land Act 1981, see Policies section under Heathland for more information.

3.2 Factors Affecting Habitat

Adverse Factors

- Loss of habitat through lack of traditional management, especially grazing, causing encroachment by rank grasses, scrub and trees.
- Over grazing by horses or change from hay cutting to spring and summer grazing.
- Fragmentation and isolation of remaining habitat.
- The selling and fencing of small plots of land preventing landscape scale management.
- Damage to the habitat by ploughing and from pesticide use, application of fertilisers or lime (on non-chalk grasslands), reseeding, over- cutting, irrigation.
- Pressure to plant trees to reduce carbon dioxide in the atmosphere combined with a lack of recognition of important grassland types and their importance for carbon storage and biodiversity.
- Damage and erosion caused by increased recreational pressure (e.g. thin turf of chalk and acid grassland).
- Pollution and a changing climate.
- Direct loss of habitat through development.
- Genetic variation of `imported' seeds.
- Lack of awareness leading to inappropriate mowing of grass preventing development and seeding of wildflowers.
- Increased use of artificial grass.
- Recreational pressures and high footfall

Positive factors

- Creation of new wildflower meadows.
- Desire of Friends Groups to create wildflower meadow areas on areas of amenity grassland in their parks not used for sport.
- Nationwide promotion of wildflower meadows to help pollinating insects
- Popularity and appreciation of orchid walks by the public.
- Funding from Countryside Stewardship schemes.
- Increased interest in gardening for wildlife.
- Help in identifying grassland types is now available: see Magnificent Meadows website, under, Advice[8].
- Increased desire to change verge cutting regimes (where safe to do so) to improve wildflower numbers for pollinators.
- Production of Verge Management Plans by Plantlife[10].

4. Future Management

Aims:

- To protect important grassland habitat and seek establishment and good management of semi-natural grasslands, including through the planning process.
- Allow wildflower meadow habitat to evolve on all soil types.
- Increase areas of amenity grassland managed as hay meadow habitat where surveying shows species diversity or there is potential for greater species diversity to develop through change of management.
- Improve management of road verges so that they support wildlife and link greenspaces.
- Promote longer grass in amenity areas and on road verges to help reduce the soil moisture loss associated with the decreased summer rainfall resulting from climate change.
- Where grassland fungi present maintain grassland according to their requirements.

Objectives:

1. Continue to maintain and enhance existing grassland habitat as per management plans. For sites without specific management plans, follow generic grassland plan in Appendix E.
2. For grasslands under Countryside Stewardship agreements follow and meet targets agreed and funded by Natural England.
3. Survey and monitor grasslands and use data to inform management.
4. Create wildflower meadows through transfer of green hay or locally harvested seed.
5. Promote grasslands through walks, talks and events.
6. Encourage and support management of road verges for wildlife (where safe to do so), following Plantlife Road Verge Management Guidelines[10].

5. Grassland Management Guidelines

Landowners and contractors are responsible for the management of grasslands in open spaces. Good grassland management will protect and enhance this habitat and help to fulfil the aims and objectives of the Bromley Biodiversity Plan.
For detailed management guidance see: **Section 6.2: Best Practice Guidelines for Land Managers**

6 Key Species (not exclusive)
Chalk grassland
Flagship Species
Flora. Adder's-tongue fern, carline thistle, chalk milkwort, common rock-rose, cowslip, fly orchid, fragrant orchid, greater knapweed, hairy violet, kidney vetch, marjoram, man orchid, pyramidal orchid, quaking grass, small scabious, sheep's fescue, wild basil, wild thyme, yellow-rattle, yellow-wort, mosses.
Fungi. Waxcap grassland fungi including waxcaps and *Enteloma* species
Fauna.
Invertebrates: bees, chalk hill blue butterfly, dark green fritillary butterfly, glow-worm, hoverflies, narrow-bordered five-spot burnet moth, Roman snail, small blue butterfly, yellow meadow-ant.
Amphibians and Reptiles: adder, common lizard, slow-worm.

Birds: barn owl, green woodpecker, house martin, kestrel, linnet, meadow pipit, skylark, song thrush.
Small mammals: field vole, harvest mouse.

Negative Indicators: cock's-foot, false oat-grass, excessive invasive scrub.
Retrievables: kidney vetch, chalk hill blue and small blue butterflies.

Neutral Grassland
Flagship Species & Retrievables
Flora: Adder's-tongue fern, bird's-foot-trefoil, common sorrel, common spotted- orchid, corky-fruited water-dropwort, cuckooflower, lesser stitchwort, pepper- saxifrage, ragged-robin, sneezewort, yellow-rattle, mosses.
Fungi. Waxcap grassland fungi including waxcaps and *Enteloma* species
Fauna.
Invertebrates: bees, six-spot burnet moth, yellow meadow ant
Amphibians and Reptiles: slow worm
Birds: barn owl, green woodpecker, house martin, kestrel, linnet, meadow pipit, skylark, song thrush, swallow.
Small Mammals: field vole, harvest mouse, serotine bat.

Negative Indicators: coarse grasses and scrub.

Acid Grassland
Flagship Species:
Flora: bird's-foot-trefoil, blinks, heath bedstraw, sheep's sorrel, upright chickweed, wavy hair-grass.
Fungi. Waxcap grassland fungi including waxcaps and *Enteloma* species lichens e.g. *Cladonia* spp
Fauna
Invertebrates: green hairstreak and small copper butterflies, solitary/burrowing bees and wasps, anthills.
Amphibians and Reptiles: adder, common lizard
Birds: barn owl, green woodpecker, house martin, kestrel, linnet, meadow pipit, skylark, song thrush, swallows.
Small Mammals: harvest mouse.

Negative indicators: birch and other trees, bracken, coarse grasses (high percentage of perennial rye grass).
Retrievables: All flagship species above.

7. Responsible Bodies

Bromley Allotments and Leisure Gardens Associations Limited, Bromley Biodiversity Partnership, Bromley Countryside Volunteers, Bromley RSPB, City of London Corporation, Department of Food and Rural Affairs, Environment Action at Coney Hall, Friends Groups, Girl Guiding UK, Greater London Authority, Historic England Trust, Holwood Trust, *I*dverde, Kent Wildlife Trust, London Borough of Bromley, London Wildlife Trust, National Trust, Natural England, Orpington Field Club, Private Landowners, Residents,

Trustees of Chislehurst Commons, Woodland Trust.

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4.7 LOWLAND HEATHLAND (INCLUDING VALLEY MIRE)

Lowland heathland is usually found on acid, free-draining, nutrient poor soils. It is characterised by the presence of plants such as heather, purple bell heather, dwarf gorse and cross-leaved heath, and is generally found below 300m in altitude. Areas of good quality heathland consist of an ericaceous layer of varying ages, heights and structures in a mosaic with acid grassland, scattered trees and scrub including gorse, bare ground, wet heath, bogs and open water. This habitat is very important for invertebrate and reptile species.

Lowland Valley Mire develops above areas of impermeable clay or iron pans in podzolic soils. Bromley has one of only six valley mires in Greater London (Keston Bog) and it is the most species rich. Charles Darwin visited the bog on Keston Common especially to study sundew plants.

Lowland heathland is a NERC Section 41 Priority Habitat in England. For information about this habitat see UK Biodiversity Action Plan Priority Habitat[1].

Carbon Storage

Most of the CO2 stored in this habitat is in the soil. According to the Countryside Survey 2007[2], the average carbon store in 0-15cms soil beneath heathland was 81.6 tonnes /ha, but this would be increased in peat bogs where soil is generally much deeper than 15cms. Soil carbon storage also varies according to the growth stage of the vegetation, management, nitrogen deposition and other factors. For a detailed discussion, including the effect of different management see Alonso et al. 2011[3].

1. Area and Distribution

Heathlands characterised by heather (*Calluna vulgaris*) are only present in Western-Atlantic Europe and of this, 20% is found in the UK: 60,000 hectares in England and a further c20-30,000ha estimated for Wales and Scotland[4]. A small amount is found in Kent. Estimates for the area of heathland in Greater London vary between 55.5-80 ha[5].

In Bromley there is an estimated 11.5 hectares of heathland remaining. The largest areas of lowland heathland in LBB are on Hayes and Keston Commons (7.68ha) and include a valley mire of approximately 1ha. Heathland on St. Paul's Cray Common, together with small patches on Chislehurst Common covers about 1ha. West Wickham Common supports 1.5ha heathland, Petts Wood 0.95ha. A small patch of heathland also remains on Farnborough Common. There are isolated patches on most of these sites under woodland or where disturbance of the soil and gaps in the tree canopy coincide (e.g. bridleway margins). The restoration of small areas historically supporting

heathland species and further linkage between existing relics of heathland over the period of the BBAPs has led to changes in heathland areas on individual sites.

Heathland in Bromley no longer supports the range of rare species found in larger tracts. However, many of the species present are regionally rare or notable, including those of the valley mire which is the most species rich within the Greater London boundary, despite its size and long-term isolation. The varied topography and terrain of many heathland sites makes them especially attractive to a range of specialised invertebrates; local information is limited to Odonata.

2. Historical Management

Lowland heathland vegetation and fauna is found on impoverished, nutrient-poor acidic, sandy or peaty soils and where the harsh environmental conditions prevent tree growth e.g. in some coastal areas[4]. Long ago large herbivores controlled the growth of tree saplings. Around 8,000 to 6,000 BC Mesolithic people began to herd animals, clearing forest, probably by burning it, to provide pasture[4]. As the Mesolithic Period merged into the Neolithic, agriculture became increasingly settled, domesticated grazing animals prevented tree cover becoming re-established and on nutrient poor soils this allowed the area of heathland to increase. During the Bronze Age, about 2500-800BC, the first field systems were established[6] and heathlands were by then well-established over large areas of England[7].

On the nutrient poor soils of Bromley heathlands, a ditch and bank feature thought to have been constructed in the Iron Age crosses Keston Common from east to west[8] and a bronze age farmstead dating back to 1400-50OBC has been excavated on Hayes Common[9]. There are also ancient earthworks on West Wickham Common.

Heathland areas continued to develop due to the clearance of trees for agriculture and timber, reaching a peak in the mid-18th century. Heathland areas were prevented from reverting back to mature woodland through grazing, and coppicing wood for fuel. However, increasing industrialisation in the late 18th and 19th centuries led to a decline in lowland heathland so that the UK now only supports about 16% of the area that existed in 1800[4].

At the beginning of the 20th century, maps show much of Keston, Hayes and West Wickham Commons as open heathland; scattered trees were indicated on the margins of the commons in the 1930s. Heathland here has declined by over 90% in the last 100 years. A similar history can be traced for Chislehurst and St Paul's Cray Commons and parts of Petts Wood.

After World War I, pine plantations were established on large areas of lowland heathland and during World War II much heathland was converted to farmland. Since the wars, the increased expansion of urban areas, and the need for sand and gravels for building have contributed to the further reduction of heathland

habitats. The remaining fragments of heathland continued to decline as grazing practices stopped, resulting in woodland encroachment.

In the last 20 years, efforts have been made on commons in Bromley to halt the spread of woodland on to the borough's remaining heathland fragments.

Greater promotion of the value and complex nature of this habitat has been undertaken nationally over the last few decades, Significant progress was made on a London-wide basis in sharing information, seeking funding and promoting heathlands, through the London Biodiversity Partnership's Heathland Working Group and the 'London's Heathland Heritage' project (2004-2007) which facilitated heathland restoration at sites within Greater London including on Hayes Common and promoted the value of heathland through interpretation, walks, talks and events.

On St Paul's Cray Common relict heather areas were expanded by volunteers 1993-1996. Further restoration was carried out in 1997 and 2004 funded by Natural England increasing the heathland habitat here to 1 ha. Heathland restoration took place 2002/3 in Petts Wood mainly funded by a Woodland Improvement Grant from the Forestry Commission. The area of heathland here now stands at 0.95ha and is dominated by Heather (*Calluna vulgaris*). On West Wickham Common soil scraping and some scrub removal from the earthworks in 2004 and 2007 increased heathland habitat to 1.5ha.

In 2011 Hayes and Keston Commons (already part-SSSIs) were declared a Local Nature Reserve by the London Borough of Bromley.

3. Current Status

Hayes and Keston Commons and Farnborough Common are owned and managed by LBB, West Wickham Common is owned and managed by The City of London Corporation, The National Trust owns and manages heathland in Petts Wood. The Chislehurst Society own heathland on St. Paul's Cray Common with small patches on Chislehurst Common, both managed by the Trustees of Chislehurst Common-unpaid residents who oversee two full time keepers and volunteer work groups. Management here is funded partly by LBB but mainly by voluntary contributions.

Higher Level Stewardship funding for Hayes and Keston Commons supported heathland restoration here from 2010 to 2020. This changes to Countryside Stewardship in 2021. Site Managers and volunteers continue to work on heathland in the borough to maintain and improve existing lowland heathland and try to link areas where possible, for example The City of London Corporation are proposing to restore 1ha. of heath at the far eastern corner of West Wickham Common 2020-2030. This will act as a stepping-stone for wildlife linking to heaths on Hayes and Keston Common as well as providing a refuge for heath species in case of fire.

The smaller fragments of heathland which currently exist in London are more vulnerable to unsympathetic works. It is important to maintain the distribution

of lowland heathland across its range in order to minimise the risk of species extinction. A number of these sites are particularly vulnerable to rubbish dumping and fires.

3.1 Policies

The Commons Act 2006

Common land is protected by the Commons Act 2006 against abuse, encroachment and unauthorised development. If you wish to work on Common Land you need to apply to the Planning Inspectorate. This includes making new tracks across common land. See: https://www.gov.uk/guidance/carrying-out-works-on-common-land#works-you-need-consent-for
West Wickham Common has separate legislation, see below.

The Metropolitan Commons (Chislehurst and St. Paul's Cray) Supplemental Act (1888). This set up a Management Scheme and a Board to administer it Chislehurst and St Paul's Cray Common, while ownership remained with the Lord of the Manor, now the Chislehurst Society.

The Corporation of London (Open Spaces) Act 1878 protects West Wickham Common.

Acquisition of Land Act 1981

Under section 19 of this act '*an appropriation or compulsory purchase of certain types of land, including common land or town or village green, must be subject to special parliamentary procedure unless a certificate is obtained from the Secretary of State Department for Environment Food and Rural Affairs (Defra) confirming that suitable exchange land is to be given for the land taken, or that the giving of exchange land is unnecessary*'.

Policies concerning SSSIs, Local Nature Reserves (LNRs) and SINCs give varying amounts of protection to most of Bromley's heathland. Keston Common and a small area of Hayes Common forms a Site of Special Scientific Interest (SSSI). The remainder of the site is a SINC of Metropolitan Importance and the whole area is a Local Nature Reserve. West Wickham Common is protected under the same SINC of Metropolitan Importance as Keston. St Paul's Cray Common and Petts Wood are also protected within SINCs of Metropolitan Importance. Chislehurst and Farnborough Commons are SINCs.

As a S41 habitat, highway and other statutory agencies have a duty to have regard for the value of local heathland sites, but greater recognition this would be beneficial.

3.2 Factors Affecting Habitat

Negative Factors

- Loss of habitat through lack of traditional management, especially grazing and cutting, causing encroachment by trees and scrub.

- Intensive or inappropriate management through fertiliser application or tree planting.
- Lack of understanding of the need for habitat mosaics including some bare ground.
- Fragmentation and disturbance from development such as road construction.
- Inappropriate surfacing of paths and tracks
- Nutrient enrichment (eutrophication), particularly dog fouling and deposition of nitrogen compounds emitted from car exhausts.
- Management constraints e.g. stock availability, public access.
- Limited opportunity for expansion of habitat.
- Increasing recreational pressure and illegal parking leading to soil compaction and disturbance as well as disturbing fragile flora and fauna.
- Decline in the quantity and quality of water.
- Climate change- long hot, dry summers making vegetation inflammable.
- Use of barbecues
- Arson and accidental fires.

Positive Factors

- Increasing awareness of heathland ecology amongst the public.
- Gradual extension of fringes of heathland through scrub and woodland clearance and re-establishment through re-seeding.
- Support for restoration from Countryside Stewardship funding

4. Future Management

Aims:

- To protect and enhance Bromley's heathland habitats.
- To link areas of lowland heath wherever possible
- Continue to promote the importance of heathland and valley mire for wildlife and its historic importance for Darwin's studies at Keston and Hayes Commons.

Objectives:

1. Survey and monitor heathlands and use data to inform management.
2. Maintain and enhance existing or restored heathland areas, as per Management Plans. For small areas of heather not covered by a Management Plan, follow generic heathland management advice (**Section 6.2**).
3. Continue heathland restoration work.
4. Promote heathlands through walks, talks and events e.g. bat walks, wildflower walks, surveying etc.

5. Work towards the reintroduction of traditional management methods such as grazing.

5. Heathland Management Guidelines

Good heathland management will protect and enhance Bromley's heathlands and help to fulfil the aims and objectives of the Bromley Biodiversity Plan.

For detailed heathland management guidelines, see **Section 6.2: Best Practice Guidelines for Land Managers**

6. Key Species (not exclusive)

Flagship Species
Flora: bell heather, bilberry, bog asphodel, bog-moss species, common cottongrass, common cow-wheat, cross-leaved heath, dwarf gorse, green-ribbed sedge, harebell, heath bedstraw, heather, heath rush, lousewort, wild onion, wood sage. Heathland grasses such as fine-leaved sheep's fescue.
Lichens e.g. *Cladonia* spp.
Fauna.
Invertebrates: green tiger beetle, solitary bees & wasps.
Amphibians and Reptiles: adder, common lizard, slow worm
Birds: stonechat
Mammals: bats: pipistrelle and serotine

Negative indicators: scrub encroachment- birch and other trees, excessive European gorse, excessive bracken, coarse grasses.

Case Study: Keston Bog

Flowering Bog Asphodel and Cotton Grass, June 2018 (Photo S. Lofting)

Left: Leaky Dams installed to slow water flow winter 2018, right: the results October 2019

Keston Bog is a valley mire habitat within Keston Common and is part of the Hayes and Keston SSSI owned by the London Borough of Bromley. The valley mire at Keston is the largest of the six remaining bogs in Greater London and contains many species that are rare in the region. For many years, it decreased in size due to a combination of woodland encroachment and reduction of the local drainage area both of which contributed to decreased water availability. Several bog species were lost as a result, including round-leaved sundew, once studied by Charles Darwin at Keston, which became extinct here in 1986. Recently, large scale restoration works have been undertaken at the bog, supported by Natural England funding: a Higher Level Stewardship grant 2010-2020 which funded a range of restoration works and now a Countryside Stewardship grant due to expire in 2026. Work to restore the area has included tree felling, and installation of dams to slow water drainage. Smaller scrub has been removed by volunteers including the Orpington Field Club and the Friends of Keston Common. As a result of the restoration works, the bog flora has started to recover; sphagnum species (including *Sphagnum magellanicum,* rare in Greater London), bog asphodel, common cottongrass and cross-leaved heath are increasing in extent. In 2014, the area was assessed as being in favourable condition by Natural England. Careful ongoing management is required in order to maintain the site's current status.

Case Study: Heathland Restoration at Hayes Common

The heathland at Hayes Common is part of the Hayes and Keston Local Nature Reserve, owned by the London Borough of Bromley. The northern part of the site is designated as SSSI for the lowland heath and acid grassland communities that are present on the site. The southern part of the site contains much secondary woodland but also areas of heathland that are being restored and enlarged.

Since the 1930s, when open grazing on the common ceased, the heathland areas have been decreasing and secondary woodland has developed in its place. The reduction and fragmentation of the heathland habitat has resulted in 16 heathland species historically recorded on Hayes and Keston becoming locally extinct.

Restoration works have continued since the publication of the last Bromley Biodiversity Plan and scrub management and thinning of secondary woodland have been undertaken at various places on the Common, as well as the clearance of large stands of invasive holly by the Friends of Hayes Common. Where heathland has been restored, ongoing management of heather, gorse and bracken is carried out. The work at Hayes Common since 2015 has increased the size of the existing heathland from approx. 12 acres to approaching 16 acres (6.5ha). The site supports a wide variety of species, including heather, bell heather and dwarf gorse and is an important reptile site. The dry heathland also supports an area of lichen heath containing 12 species of Cladonia.

7. Responsible Bodies

Bromley Biodiversity Partnership, Bromley RSPB, City of London Corporation, Department of Food and Rural Affairs, Friends Groups, Greater London Authority, *i*dverde, London Borough of Bromley, National Trust, Natural England, Orpington Field Club, The Trustees of Chislehurst Commons

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4.8 RIVERS, STREAMS AND WETLAND

Wetland habitats in the Borough include both flowing (lotic) and still (lentic) waters such as ponds, lakes, rivers, ditches and small areas of reedbed. A great variety of aquatic specialist plants grow in wetland, ranging from microscopic algae at the base of the food chain to floating plants in open water, emergent and marginal plants including reeds and rushes and other broadleaf flowering and aromatic species at the edges of fast or slow flowing water and in marshy areas and wet-woodland tree species such as alder and willow. The boundaries of wetlands represent a transitional zone between aquatic and terrestrial habitats and as such are often hard to define precisely as they will also change both seasonally and during wet and dry years. Some channels, especially those on chalk geology, may be ephemeral as spring lines change in relation to the ground water table. Factors which determine the range of species found include ground water level, flow and quality. Whilst the rivers and streams are essential for fish and invertebrate species, wetland habitats are especially important for amphibians, invertebrates and birds. Invertebrates are particularly indicative of aquatic habitat quality and type.

Internationally rare chalk streams originating in LB Bromley include the River Cray, and the headwaters of the Ravensbourne. (See The State of England's Chalk Streams, and The Ravensbourne River Valley).

Chalk stream habitats are protected under national and international law, due to their naturally high water quality arising from the chalk aquifer, and unique assemblage of sensitive plant and animal species.

Historic and recent pressures on chalk streams (and all rivers and streams) ranging from extensive channel modifications, to urbanisation and polluted run-off have led to widespread deterioration which the Thames River Basin Management Plan and new Planning regulations for Biodiversity Net Gain are seeking to redress and reverse.

Of the London Boroughs, Bromley has been one of the most highly valued for its great crested newt populations, a priority species in London and a Species of Principal Importance in England under the NERC Act Section 41. According to the Wildlife Trusts the UK's populations of the great crested newt are internationally important. For more information see great Crested Newt Species Action Plan.

Carbon Storage

According to the Freshwater Habitats Trust, high quality pond **creation** may benefit the global carbon budget, because the carbon rich sediments that accumulate in the ponds will lock up CO_2[1]. However, carbon storage and loss from wetlands can be extremely complex. Factors affecting it include wetland type, rate of flow, temperature, nitrogen enrichment, availability of oxygen (also temperature dependent) and management. When wetland habitat dries out or is disturbed, for example by pond dredging, carbon dioxide is released to the atmosphere[2]. However research shows that good management of wetlands can

avoid drying to prevent such losses and increase carbon sequestration (see Association of State Wetland Managers – Wetlands and Climate Change). Wetland habitats in Bromley are currently small and are probably unlikely to have any overall positive or negative significance regarding carbon storage, with the possible exception of the peat beneath Keston Bog (see heathland, Section 4.7).

For a good explanation of some of the factors involved see, *The Role of Wetlands in the Carbon Cycle*[2] and *Wetlands In a Changing Climate: Science, Policy and Management* [9].

1. Area & Distribution

There are 450kms of rivers and streams, including the Thames, in Greater London. Bromley's main rivers, the Ravensbourne and the Cray, rise from the chalk aquifer of the North Downs and run northward to the River Thames. There are 30kms of river courses, many of which are priority habitats as globally rare chalk streams, including tributaries, spread across the northern half of the Borough. The Ravensbourne originates at Holwood and Keston and leaves the Borough near Shortlands; the Cray originates in Orpington and leaves the Borough via the lakes at Ruxley. Tributaries of the Ravensbourne include the Beck and the Kyd Brook (later known as the River Quaggy). In 2005 200m of river was restored at Norman Park when the Environment Agency and LBB deculverted the River Ravensbourne and formed a new channel and landscaped floodplain. This created flood storage, reducing the risks of flooding further downstream. This work was accompanied by ecological enhancement along and adjacent to the river. River habitat enhancement has also been undertaken at Shaftesbury Park but decanalisation of the Ravensbourne through Queen's Mead in Shortlands has been under investigation since 1990s but has not yet been able to attract funding to deliver environmental and wider benefits.

Ponds are found throughout the Borough. Their full extent is unknown as only a proportion is actually mapped. There are an estimated 250 mapped ponds and the majority are under private ownership. Ponds tend to be concentrated in the semi-natural areas of the Green Belt, in open spaces such as parks and golf courses, and also in private gardens. There are relatively few ponds on the chalk. Garden ponds are thought to make a significant contribution to the overall pond resource.

Ponds can be permanent or seasonal (filled with water during the wettest parts of the year only); both can provide important habitat. Existing data suggests that as many as 15% of mapped ponds may be seasonal. Ponds can be of varying size, between 1m² and 2ha, and are filled with water for at least four months of the year. Bromley is likely to be important in London for its pond resource as it has the remnants of historic estates and traditional landscapes.

Lakes are areas of water greater than 2ha in size and tend to be located on the rivers. Lakes occupy around 24ha of the Borough. The most significant of these, Ruxley Lakes, were developed as a result of gravel extraction at Ruxley along

the River Cray, and are now managed for angling and nature conservation. Ruxley Lakes are of national importance, particularly for birds, and are designated as a SSSI. Other examples include the parkland lakes at Kelsey Park and the privately-owned Rookery Lake on Bromley Common. They can support a similar range of species to ponds, when management and fish stocking is not too intense. Once created, there is little threat of lakes being filled in. It is unlikely the lake resource in Bromley will increase significantly and therefore effort must be focused on enhancing the quality of existing sites.

Transition zones, swamp and fen, valley mire, wet grassland and carr woodland all contribute to the overall wetland habitat.

2. Historical Management

Rivers and wetlands can be fed surface-water or groundwater. Human activity has altered aquatic habitats through the development of drainage and irrigation systems, canalisation and the effects of pollution. In the 19th century the industrial revolution led to an increase in water pollution by both human and industrial waste. More recently pollution of groundwater and rivers from agricultural intensification and transport has become a major issue as has the increasing presence of invasive non-native species (INNS) such as New Zealand Pigmyweed (*Crassula helmsii*). According to the State of Nature Report 2019[3] '*only 35% of UK surface water bodies were classed as being in high or good status in 2018' (based on Water Framework Directive combination of biological, chemical and structural measures).*

The area of wetland habitat in England has continued to decline due to urban expansion.

Rivers

Historic modification of rivers and streams and overall land drainage across catchments have led to changes in both physical habitats and flow regimes.

In addition to pollution, rivers and streams have been damaged by building directly on floodplains, channel straightening and widening, culverting and narrowing of natural river corridors. Reduction of semi-natural features has contributed to flood risk as well as biodiversity loss. Multiple compounding factors typically result in poor physical habitat quality with low resilience and recovery potential for either water quality or species when pollution or other damaging events occur.

In London the London Rivers Action Plan[4] has provided a tool highlighting opportunities and providing practical guidance to local authorities, developers and others which has enabled the restoration or improvement of more than 17.5kms of rivers and their tributaries between 2008 and 2015[5].

In their upper reaches, Bromley's rivers mostly follow a natural course and predominantly occur within rural, semi-natural situations. With the headwater springs arising from the chalk aquifer, a naturally high level of water quality should

support a variety of macro-invertebrate species, which are otherwise rare in south London, and characteristically pollution sensitive. It is vital that the negative 'urbanisation' effects and agricultural and amenity operations close to the edge of the river system are limited so that the rivers and streams in these rural areas of Bromley can continue to support a good range of invertebrates including the less common pollution sensitive species. Opportunities for river corridor enhancement and restoration exist, and where perceived cost and impact on landholdings have in the past limited progress, new ways of working in partnership, following a 'Catchment Based Approach, and delivering new objectives for achieving Net Gain through the Biodiversity Metric (3.0, 2020), will all provide increasing incentives for investment in river and wetland restoration that will also deliver wider benefits to developers and landowners. River and stream networks provide vital connections and access for wildlife and people between otherwise isolated sites of nature conservation value and as such contribute considerable added value across a wide range of environmental and social objectives.

Thames Water will be carrying out biodiversity improvement works to about 850m of the Upper Cray as part of Biodiversity offsetting in 2020/2021. This will involve removal of existing wooden bank reinforcements, regrading of banks, insertion of brushwood berms and creation of riffles using imported gravels. Biodiversity enhancements for the water meadows area have been agreed with the Environment Agency. Invertebrate sampling using the Riverfly Monitoring Initiative (RMI) methodology, is also being carried out along the River Cray and also along the Ravensbourne catchment. RMI is an on-going citizen science activity carried out by dedicated volunteers who wish to monitor water quality and identify potential pollution incidents by sampling invertebrate life; their monthly data also provide a valuable record of species present at sample locations over time. The Zoological Society of London (ZSL) host the London RMI hub, providing training for volunteers while Thames21 provide support for surveyors in Bromley (and beyond) on the River Cray and the River Ravensbourne and its catchment (the River Pool and the River Quaggy).

Ponds

According to the Countryside Survey 2007 pond numbers in England and Wales decreased by about three quarters during the 20th century from a maximum of about 800,000 in the late 19th century to around 200,000 by the 1980s[6]. Numbers have increased slightly in recent years due, in part, to work by nature conservation organisations which have highlighted pond losses and the reduction in numbers of species once commonly seen such as toads and frogs (see the Million Ponds Project[1]). However, pond quality has become a major concern. The Freshwater Habitats Trust reported that between 1990 and 2014/15 ponds in protected landscapes lost 25% of their wetland plants including a disproportionate number of uncommon species. Surveys of ponds outside nature reserves generally supported less than half the number of wetland plants as those within nature reserves and less than 1% supported an uncommon plant species[7].

In Bromley, a 1997 Council survey revealed that around a quarter of mapped ponds no longer exist. Infilling of ponds for the purposes of development,

landscaping or cultivation is still occurring and INNS are now present in several ponds within areas managed for wildlife.

The density of ponds and lakes can influence their relative value for wildlife. Close proximity of these `stepping stones' in a `pondscape' can assist colonisation, breeding and feeding of associated wetland species; for example, a population of great crested newts needs a minimum of 3-4 ponds to remain viable.

Amphibian surveys of over 100 ponds in LBB (2002 and 2003) showed great crested newt populations to be small and vulnerable to change. Of the 7 areas in LBB where there were viable crested newt populations in 1980, only 2 are really viable (i.e. have several ponds) in 2020. Three other areas are still breeding sites but there is only one hosting pond, one site has had no records at all for 5 years and another is in poor condition with no known records since about 2003.

According to Froglife, toad populations in south-east England have fallen by more than 68% since 1986 and in LBB populations also appear to be declining.

A citizen science programme to locate ponds where toads are breeding in the borough is ongoing. As well as highlighting to local residents the diminishing toad population and how to look after garden ponds to support toads, it is hoped the results of this survey will pinpoint areas where building new ponds, for example through the planning system as part of biodiversity net gain, will help increase the number of ponds suitable for these animals to breed. Bromley's ponds also provide habitat for other amphibians including palmate newts (uncommon in Greater London), invertebrates (e.g. dragonflies and damselflies) and plants. Bats and birds visit ponds and other wetland habitats to feed and drink.

In LBB work on ponds and their surroundings is always ongoing, for example to control shading by surrounding vegetation. In addition, since the previous Bromley Biodiversity Plan the following ponds have been restored: Bassett's Pond in Orpington (as mitigation following a planning application) and the small pond in High Elms Nature Garden. A new seasonal pond has been created at Jubilee Country Park. Silt has been removed from Darrick Wood marsh (see case study at the end of this section). This work has been carried out very carefully by contractors and volunteers under supervision by countryside staff and local experts and following advice from Natural England. Biological physicochemical and water level studies are ongoing in the ponds on Chislehurst Commons with particular emphasis on informing the management of Prickend Pond.

3. Current Status

Sites within the borough which include wetland are protected by the following designations:
Site of Special Scientific Interest (SSSI): Ruxley Gravel Pits (managed by Kent Wildlife Trust), Crofton Wood: includes Kyd Brook and wet woodland,

Keston and Hayes Commons which includes 3 ponds and upper reaches of the River Ravensbourne.

Local Nature Reserves: a number of ponds occur within Scadbury Park, Jubilee Country Park and High Elms Local Nature Reserves, areas also designated as SINCs of Metropolitan Importance. Ponds and the beginning of the tributary of the Kyd Brook are protected within Darrick and Newstead Woods LNR, which is also a SINC.

SINCs of Metropolitan Importance: Much of the chalk stream and riverside habitat in the upper reaches of the Ravensbourne and Cray, a section of the River Beck (High Broom Wood), ponds within the Hawkwood Estate (National Trust), Spring Park (City of London Corporation) and Holwood are all within SINCs of Metropolitan Importance.

Other wetland SINCs include Bassett's Pond, Priory Gardens Lake and Oakley Road Pond. A number of ponds are important features within other SINCs such as Rush, Prickend and the Overflow Ponds on Chislehurst Common.

Garden ponds are becoming an increasingly important part of the wetland resource; it is estimated that 1 in 10 gardens in London has a pond. Though becoming increasingly popular, wildlife is not always a primary consideration. Intensive management of sites and a desire for a high proportion of open water; unusual, exotic plants and keeping fish, remains the norm. These have a significant impact on the range of species found.

Wetlands in urban areas often suffer from recreational pressure, including intensive angling (e.g. Keston) and excessive feeding of wildfowl, which also attracts rats.

A buffer zone around a wetland is an area of land that provides additional habitat for wetland species. It provides protection for animals emerging from water such as frogs, newts, toads, helps to intercept the worst of agricultural or urban pollutants and shields the wetland from disturbance. Buffer zones have come under increasing pressure for other land uses, although now their importance is being recognised. In most cases adequate buffer zones are little considered. Wildlife corridors linking wetlands would help reduce the effects of fragmentation.

Collection of ecological data in rivers and ponds in urban areas and on privately owned land is often difficult, as the majority of sites are not accessible and permission is often restricted, sometimes due to safety concerns. For river physical habitat, the MoRPh or Modular River Physical Survey provides a user-friendly bank top citizen science methodology of river habitat assessment in locations where access is possible (for more information see Modular River Survey). The MoRPh Pro survey method is also integral to the River Metric for assessments of Biodiversity Net Gain.

Succession is occurring in still water bodies such as Ruxley Lakes, where woodland is developing on marshy areas. The mid-successional stage remains the most represented phase in the Borough; the presence of a range of stages is important for biodiversity.
Wetland habitats in Bromley make a contribution to urban cooling, water quality and flood management which could be increased through improvements to biodiversity management of more of the rivers, ponds and wetlands.

3.1 Policies

Rivers and streams are protected from deterioration from development works under the UK Water Framework Regulations. Additional requirements for improvement as a part of Biodiversity Net Gain assessment will be coming forward as part of the 2020 Environment Bill. Defra's Biodiversity Metric (3.0, 2020) sets out the requirements for assessing habitat condition in order to measure and achieve at least 10% Net Gain.

There is no direct protection for ponds. Sites may be protected indirectly if protected species, such as the great-crested newt, occur. Planning permission is required for engineering operations and trees covered by TPOs around wetlands.

The Government's policy for improving water quality is set out in the Environment Bill (see Section 3).

The Environment Agency has a statutory responsibility to protect and manage some wetland and has the power to issue licences (e.g. abstraction, fishing), or to prosecute (e.g. pollution). The role of the Environment Agency is published in the Environment Agency: our ambition to 2020[8].

The National Planning Policy Framework has increased focus on achieving sustainable development by conserving and enhancing the natural environment, Nature Recovery Networks, Local Nature Partnerships, natural capital and natural flood management (NFM).

As priority habitats, chalk streams have additional protection by the Environment Agency through the reduction in abstraction and reversal of historic engineering to restore habitats (see Protecting Chalk Streams).

3.2 Factors Affecting the Habitat

Adverse Factors

- Water abstraction.
- Disturbance and damage of wetland habitat including banksides as a result of recreational use including disturbance by dogs.
- Eutrophication and diffuse pollution (e.g. sewage contamination, pesticides, herbicides, fungicides, fertilisers, dumping of rubbish, road run-off).
- Littering and fly-tipping along river and stream corridors.

- Climate change:
    1. More widely fluctuating annual rainfall, leading to more frequent extreme drought and flooding incidents.
    2. increased summer temperatures leading to warmer water in ponds and lakes which reduces levels of dissolved oxygen available aquatic animals.
    3. Increased summer temperatures combined with increased nutrient levels leading to toxic blooms of blue-green algae (cyanobacteria).
- The spread of invasive and non-native species, including New Zealand Pigmyweed (*Crassula helmsii*), Water fern (*Azolla filiculoides*), Lesser Duckweed (*Lemna minuta*), Parrot's-feather (*Myriophyllum aquaticum*), Floating Pennywort (*Hydrocotyle ranunculoides*), **Himalayan balsam** (*Impatiens glandulifera*), signal and Turkish crayfish and Canada geese.
- Viruses such as red leg disease of frogs (Ranavirus)
- *Phytophora* disease of alder trees.
- Filling in of ponds.
- Introduction of fish to wildlife ponds, use of ponds for ornamental fish including carp.
- Fisheries: overuse of bait.
- Over-feeding of ducks.
- Flood lighting of habitat including lighting along river corridors (detrimental to insects, birds and bats).
- Discarded fishing lines (detrimental to birds and bats).

Positive Factors

- Increasing range of dragonfly species.
- Advice and support for wildlife pond creation and management (Freshwater Habitats Trust, Heritage Lottery Fund and others).
- Creation of wetland habitats, including ponds, within gardens, school grounds and on farmland.
- Use of ponds as an educational resource.
- Promotion of wildlife gardening, including pond creation, on the media.
- Local interest in toad and great-crested newt populations.
- Recognition of the importance of open water and stream and pondside vegetation for urban cooling.
- London wide interest and volunteering along whole river systems.
- Increasing guidance and support for Natural Flood Management strategies, Nature Based Solutions and Sustainable (urban) Drainage Systems (SuDS)
- Nature Recovery Networks

4. Future Management

Aims:

1. To protect, enhance and increase Bromley's wetland habitat.
2. To promote the importance of rivers and streams, ponds and wetlands for wildlife and people, water retention and urban cooling.
3. Encourage restoration or enhancement of water courses, their habitat condition and resilience, particularly where they have been canalized or culverted. As well as improving opportunities for wildlife to thrive and

for people to benefit from time spent by healthy water environments, this will also contribute to urban cooling and carbon sequestration through increased streamside vegetation and enhance flood risk management.

Objectives:

1. Survey and monitor rivers (especially chalk streams) and wetland habitats and use data to inform management.
2. Maintain existing ponds.
3. Facilitate training of volunteers interested in monitoring aquatic species.
4. Continue citizen science survey of toads.
5. Promote wildlife gardening including pond creation.
6. Promote rivers/chalk streams and wetlands through walks, talks and events.
7. Seek out grant funding for the creation of new ponds and the restoration of badly silted ponds (where appropriate).
8. Encourage the Environment Agency to deculvert and restore or enhance rivers especially chalk streams rising in Bromley.

5. Wetland Management Guidelines

Good river and wetland management will protect and enhance priority river, chalk stream and wetland habitats, help mitigate climate change and help to fulfil the aims and objectives of the Bromley Biodiversity Plan.

For detailed wetland management guidelines for ponds, ditches and river banks see **Section 6.2: Best Practice Guidelines for Land Managers**

6. Key species (not exclusive) Flagship species

Flora: alder, common sedge (=black sedge), curled pondweed, ivy-leaved crowfoot, meadowsweet, nodding bur-marigold, purple-loosestrife, gipsywort.
Fauna:
Invertebrates: dragonflies and damselflies, *Goera pilosa* (a caddisfly), *Nemurella picteti* (a stonefly), *Isoperla grammatica* (a stonefly)
Amphibians and Reptiles; frog, grass snake, great-crested newt, palmate newt, smooth newt, toad.
Fish: minor fish species e.g. stickleback, minnows.
Birds: great crested grebe, grey wagtail, heron, kingfisher, little grebe, reed bunting, water rail.
Small mammals: bats, water shrew, water voles.

Negative indicators
Flora: Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*), Canadian pondweed (*Elodea canadensis*), New Zealand Pigmyweed (*Crassula helmsii*), Water fern (*Azolla filiculoides*), Least Duckweed (*Lemna minuta*), Parrot's-feather (*Myriophyllum aquaticum*), Floating Pennywort (*Hydrocotyle ranunculoides*).
Fauna: brown rat, Chinese mitten crab, red-eared terrapin, yellow bellied slider, map turtle, signal and Turkish crayfish.

Other: pollution, algal blooms
Retrievables
Fauna: water shrew, water vole, minor fish species (e.g. eel, gudgeon).

Case Study: Darrick & Newstead Woods – Wetlands

Darrick & Newstead Woods Local Nature Reserve is situated in Farnborough, Orpington. The site features three (often seasonal) ponds, shallow ditches and a marshy area with a 4th pond. Two ponds near the marsh were 1/3rd dredged 2006-2008 on rotation with part of the marsh. Dredged material was left at the pond edges to allow some invertebrates to return to the water. Friends of Darrick and Newstead Woods began digging out a ditch in the woodland in 2008 following complaints about a blocked drain adjacent to Newstead Meadow. The ditch led down into the woodland to a low lying area, presumed to have once been waterlogged. Work continued in 2009-2010 including digging a shallow scrape in the woodland floor which was dug out by contractors to create the woodland pond. The 1938 Ordnance Survey map shows another small, possibly spring fed, pond near what is now Broadwater Gardens which appeared to feed the small tributary of the Kyd Brook which feeds the marsh. The tributary of the Kyd Brook flows north along Darrick Wood School boundary. Building on the school site adjacent to this boundary circa 2008-2010 may have reduced water availability in the marsh. Siltation of the marsh regularly occurs leading to careful dredging of different areas in different years to retain habitat, e.g. 2008-2010. Most recently erosion around the water control structure led to formation of a channel around it. Following advice from Natural England and the RSPB, dredging works were undertaken early in winter 2019 to remove the build-up of silt, which was then used to fill the channel to reinstate the control feature. Excess silt and vegetation removed was left on the banks for invertebrates to return to the water. Leaky dams were installed along the length of the marsh by the Friends of Darrick and Newstead Woods. Constructed using coppiced elm, these natural structures slow the flow of the water, enabling the ground to saturate, creating a boggy habitat. Now maintaining a good water level throughout the year the marsh is once again a haven for wildlife. Amongst other higher plants of marshland it supports Large Bitter-cress (*Cardamine amara*) at the only known site in the borough and Water Plantain (*Alisma plantago-aquatica*). Sadly Short-leaved Water- starwort (*Callitrche truncata)*, recorded in the marsh pond in the 1980s has not been seen for some time. In summer 2019, Willow Emerald (*Chalcolestes viridis*) damselfly, a species now colonising south-east England, was spotted for the first time at the marsh.
Historically great-crested newts were recorded in Darrick Wood but these have not been seen since the 1980s. According to a local herpetologist the ponds at Darrick Wood and nearby Bassetts Pond together may have supported the great-crested newt population now confined to Bassett's Pond, though there were other historic ponds in the vicinity which have been lost.

7. Responsible bodies

Angling Clubs, Bromley Allotments and Leisure Gardens Associations Limited, Bromley Biodiversity Partnership, Bromley Countryside Volunteers, Bromley

RSPB, City of London Corporation, Department of Food and Rural Affairs, Environment Action at Coney Hall, Environment Agency, Friends Groups, Froglife, garden associations, garden centres, Greater London Authority, Holwood Trust, *id*verde, Kent Mammal Group, Kent Reptile & Amphibian Group, Kent Wildlife Trust, London Bat Group, London Borough of Bromley, London Water Vole Project, London Wildlife Trust, National Trust, Natural England, Orpington Field Club, Private Landowners, Residents, Thames 21, Trustees of Chislehurst Common

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4.9 GARDENS AND ALLOTMENTS

Gardens and allotments are oases of green space in our towns and cities and may contain remnant countryside. Together they form a mosaic of hedges, trees, shrubs and flowering plants that offer breeding sites, foraging areas and shelter for wildlife. They also provide many people with their most frequent contact with nature. To maintain viable species populations, links between areas managed for wildlife are vital. Gardens and allotments can provide these essential networks linking up otherwise isolated green spaces. Managing our gardens and allotments with wildlife in mind also helps connect where we live to the wider countryside. There is now increasing evidence showing how important gardens, gardening and allotments are for mental and physical health from childhood to old age[1].

Carbon Storage: See under other habitats

1. Area and Distribution

In the UK, 87% of UK households have gardens[1].

According to Greenspace Information for Greater London 2019, the most recent survey of the total area of private gardens in London (2008) was around 37,900 ha, (approximately 24% of Greater London's total area) of which 20,000 ha was vegetated. This was a decrease of 2000 ha compared to the previous survey in 1998-99[2]. The area of allotments (which included city farms and community gardens) was 1021ha[3].

Household gardens occur throughout Bromley but are of highest density in the urban areas. Larger gardens and those located in more rural areas near to nature conservation sites have the most potential for wildlife. Back alleys between rows of houses can form local 'green corridors'.

There are 52 allotment sites in Bromley, covering over 65 hectares. Most are distributed in central or northern parts of the borough, with one site, Biggin Hill Allotments, in the south.

2. Historical Management

New plants have been introduced into Europe by travellers and explorers for hundreds of years including apples, plums, roses and herbs. During the 19th century many estates in Bromley, including High Elms and Scadbury Park, were planted with beautiful non-native specimen trees which remain to this day and also plants such as rhododendron, cherry laurel and Japanese knotweed which have spread into the wider countryside and become highly invasive.
In 1908, the Small Holdings and Allotments Act came into force. The Act

placed a duty on local authorities to provide allotments based on demand. The Allotments Act of 1925 established statutory allotments which could not be sold off or converted without Ministerial consent. The Dig for Victory campaign during the 1940s and post war rationing saw a rise in people taking up allotments which was followed by a decline in uptake during the second half of the 20th century. In recent years this has been reversed: a survey by the National Allotment Society in 2013 found that in England there is an average of 52 people waiting for every existing 100 plots[4].

3. Current Status

Gardens and allotments often have great potential for increasing their biodiversity but the division of large gardens to provide several smaller housing plots (infill and back-land development) has caused considerable loss of habitat. There is an interest in wildlife amongst many gardeners and allotment holders, but sometimes a lack of understanding with regards to habitat management. Threats to wildlife in gardens and allotments include inappropriate management such as clearing shrubs, cutting or removing trees and shrubs during the bird nesting season, levelling ground and inappropriate application of pesticides, herbicides and fungicides.

Gardens and allotments provide a restful and pleasant environment for people, add to residents' quality of life, provide social, landscape and environmental benefits, keep city dwellers in contact with the seasonality of nature, increase public awareness of and interest in nature and provide an educational resource. They are very important for mental and physical wellbeing.[5]

Gardens and allotments are often green oases in built up areas, contributing to a localised cooling effect and improving air circulation. Through absorbing rainwater they help to reduce water run-off and therefore the risk of flooding. Trees and shrubs act as living air filters, decreasing carbon monoxide, nitrogen dioxide, ozone, particulates and sulphur dioxide in the atmosphere[6].

3.1 Policies

Local authorities have a statutory obligation to provide allotments as a result of a succession of parliamentary acts starting with the Small Holdings and Allotments Act 1908 which was followed by the Allotments Act 1925 and most recently the Localism Act 2011.

Many allotment sites are under Council ownership and protected as Urban Open Space or Metropolitan Open Land. In addition Dorset Road, Turpington Lane and Bull Lane Allotments have been designated as Local Green Space in Bromley Local Plan 2019. These designations mean that development that causes harm to the "special qualities" will be considered inappropriate. The London Plan stipulates there should be no overall loss of protected open space.

Tree preservation orders protect some trees in gardens and allotments, see

London Borough of Bromley Tree Management Strategy[7].

3.2 Factors Affecting the Habitat

Negative factors

- Direct loss of habitat e.g. redevelopment, excessive hard landscaping, lack of dead wood retention.
- Inappropriate management and damage to habitat from pesticide, herbicide, fungicide and fertiliser application.
- Pollution (e.g. rubbish, accumulation of chemicals including salt, illegal dumping of waste materials.)
- Pressure and disturbance from people and pets.
- Intensive management regimes.
- Intolerance of certain species in urban areas (e.g. foxes, nettles, scrub and weed species).
- Planting of invasive species e.g. cherry laurel.
- Box Moth: established and spreading has the potential to have a major impact on native box and box hedges in historic landscapes/gardens. For advice see here.

Positive Factors

- Greater appreciation of gardening and green space for mental and physical wellbeing.
- Promotion of gardening for wildlife by Royal Horticultural Society (RHS).
- Support for pollinators and National Pollinator Strategy.
- Better understanding of certain species inhabiting urban areas (e.g. badgers, stag beetles).
- Increasing popularity of habitat creation in urban areas, especially wildlife gardens.

4. Future Management

Aims:

1. To promote the importance of gardens and allotments for wildlife.

Objectives:

1. Manage garden and allotment habitats to allow areas for wildlife such as hedgerows, scrub edges and native wildflowers.
2. Survey and monitor gardens and allotments and use data to inform management.
3. Promote the importance of gardens and allotments through walks, talks, events and educational activities.
4. Encourage the participation of residents in local citizen science projects.

5. Gardens and Allotments Management Guidelines

It is difficult to gauge the full extent of management, but many residents and allotment holders actively encourage wildlife in gardens and allotments.

Gardening with wildlife in mind helps to fulfil the aims and objectives of the Bromley Biodiversity Plan. For practical advice on managing gardens and allotments for wildlife see **Sections 6.2 and 6.3: Best Practice Guidelines for Land Managers** and **Best Practice Guidelines for Friends Groups and Volunteers**.

6. Key Species (not exclusive)

Flora: native and non-native garden varieties of nectar-rich plants such as buddleia (excluding *Buddleia davidii*, which is an INNS species), lavender, marjoram, verbena, etc, 'wall plants' such as ivy, 'wall ferns' e.g. spleenworts, lichens.
Hedge plants e.g. garden privet, bramble, native hedge plants
Fauna:
Invertebrates: bees including solitary and bumblebees, hoverflies, butterflies e.g. comma, orange-tip, peacock, red admiral, small tortoiseshell, holly blue and white butterflies, moths, ladybirds, spiders, beetles including stag beetle.
Amphibians and Reptiles: common frog, common lizard, common toad, grass snake great crested newt, palmate and smooth newts, slow worm.
Birds: blackbird, blue tit, great tit, house sparrow, song thrush, starling
Mammals: badger, hedgehog, pipistrelle bats

Case Study: Winsford Gardens (Penge)

Winsford Gardens: Volunteers fixing natural seating

Winsford Gardens used to be private gardens before the area was bequeathed to the London Borough of Bromley in the 1970s/80s when it was then turned into a local park.

Over the years the park became neglected, and in 2011 Penge Green Gym was established by the Conservation Volunteers (TCV), with the support of Bromley Council: the aim being to improve the area for the community and to encourage native wildlife to thrive in this urban environment by involving the local community in the re-generation of the park and in the process improve the health and well-being of the local volunteers attending the gardening sessions. In 2013, the volunteer group became independent of TCV and is now known

as Penge Green Gym Community Group (also known as Friends of Winsford Garden). With a mix of local residents as well as young adults following life skill courses at Bromley College the group continue to meet on a weekly basis.

Since 2011 the group has successfully completed several projects and has been very successful in securing funding which has greatly benefitted the site both for the community and for biodiversity.

- Hedging whips have been planted around the perimeter and within the park, funded by the Greater London Authority, Mayor of London Capital clean up grant and the Conservation Volunteers/ Mayor of London Tree planting scheme. The ground preparation and the planting completed by the group involved over 500 hours of voluntary work. These whips have become well established hedgerows, providing nesting and feeding sites for small birds and their blossom attracting a variety of insects.
- A successful bid in 2014 for a Capital Clean-up grant from the Mayor of London enabled the group to transform a derelict, disused and hazardous pond system within the gardens into a general bog garden. Moisture loving flora such as marsh marigolds and loosestrife were planted to create a habitat to attract a range of insects (damselflies and dragonflies) and vertebrates (frogs and toads).
- With funding from Tesco Bags of Help Scheme 2017 a small pond was created to increase the diversity of insects as well as frogs and toads to provide natural predators to fend off the slugs and snails from the growing area.

Volunteers planting up border

Volunteers clipping box hedging

Features such as loggeries, wildflower meadows, ponds, hedges, compost/leaf mulch and growing areas together form a matrix of essential wildlife habitats for a variety of creatures- of which some are priority species/red listed such as the stag beetle and sparrow.

Such community-led activities sustaining open spaces such as Winsford Gardens within an urban setting, undoubtedly add to the green corridors across the Bromley borough and increase its biodiversity potential.

7. Responsible Bodies

Bromley Allotments and Leisure Gardens Associations Limited, Bromley Biodiversity Partnership, Bromley RSPB, Bromley Friends of the Earth, Developers, Environment Action at Coney Hall, Friends Groups, garden centres, gardeners, horticultural groups, Kent Wildlife Trust, London Borough of Bromley, London Wildlife Trust, Orpington Field Club, Residents.

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4.10 CHURCHYARDS AND CEMETERIES

The prime purpose of churchyards and cemeteries is for burial of the deceased and for remembrance. The needs of the families of those buried there must be of primary concern. However, churchyards and cemeteries contain a variety of wildlife habitats (church building, boundary wall and gravestones, grassland, trees and shrubs) supporting a large number of plants, animals and fungi and appropriate management can enhance this biodiversity. In urban areas these oases of 'countryside' provide places for quiet reflection and enjoyment of the wildlife they contain. They can be hotspots for biodiversity with their varying habitats being used by invertebrates including butterflies, bees and others which provide food for birds, slow worm, hedgehogs and bats. Grassland in graveyards is often an undisturbed 'relict' of the wider countryside of previous times and may be the best example of that habitat in the surrounding area. Flowers and wildlife abound in many churchyards and cemeteries, where different sward heights can be beneficial to a wide variety of flora and fauna. Long grass can provide a refuge for many creatures, including frogs and slow worms, while the undisturbed grassland around the church building can support important fungi species (eg Chelsfield). St Nicholas Chislehurst has species-rich acid grassland including harebell and heath bedstraw. Boundary walls can support plants and ferns (St Mary the Virgin, Hayes has harebell and rusty-back fern amongst other flora). The gravestones, in particular, are of supreme importance for lichens and bryophytes (mosses and liverworts); some churchyards have over 70 species of lichen and 30 species of bryophytes. Ancient yews are found in Downe and Cudham churchyards. Changes in style and fashion of architecture and monumental masonry illustrate the history of the community they serve and provide the starting point for local history/family history research.

1. Area & Distribution

It is, for the most part, the Church of England parish churches and their associated graveyards that provide the best opportunities for wildlife. Some of these are no longer available for burials and are 'closed' churchyards. Most churches of other denominations do not have associated graveyards, an exception being the Catholic church in Chislehurst. There are eight cemeteries which are owned by the borough.

2.Historical Management

Traditionally, churchyards were managed as meadows and after a hay cut they were grazed, usually by sheep. When grazing ceased the management of grassland became more time consuming and expensive and little used area of graveyards often reverted to brambles, scrub and eventually woodland. Yew

trees are a common sight in ancient churchyards and are symbolic in Christian and Pagan traditions.

3. Current status

If the graveyards are still available for burials, management is carried out under the auspices of the Diocese of Rochester. There are 10 closed churchyards in the borough managed by *i*dverde on behalf of LBB and there are 8 cemeteries, one, Beckenham, managed by Dignity UK; the other seven managed by *i*dverde on behalf of LBB. One church (Holy Trinity, Beckenham) has a Friends Group and one church (All Saints, Orpington) has an active group which helps manage the churchyard. Four churchyards are SINCs in their own right: St Mary Hayes, St Martin Chelsfield, All Saints Orpington, and Holy Trinity Bromley Common while St Nicholas, Chislehurst is part of the larger Chislehurst Common SINC.

3.1. Policies

Faculties from the Chancellor of the Diocese are still needed for works to church buildings and gravestones even in 'closed' churchyards.

The Ministry of Justice has issued guidelines relating to the safety of memorials 'Managing the Safety of Burial Ground Memorials' 2009[1] and these (and subsequent updates) should be followed by managers of graveyards.

Other initiatives: In 1985 the Living Churchyard and Cemetery Project was set up by English Nature and the Council for the Care of Churches, and this led to many Wildlife Trusts instigating their own God's Acre Projects some of which are still in existence today.

The ongoing Beautiful Burial Grounds project[2] is funded by Heritage Lottery money under the auspices of the charity Caring for God's Acre; volunteers are asked to record the monuments and species in burial grounds, to build up a map of the secrets that they hold.

In partnership with the Dioceses of Southwark, Chelmsford and Rochester, the Diocese of London is promoting Churchyards for London, a project to survey the fauna and flora, habitats and ecology of churchyards across Greater London. The first phase, the Churchyards Ecology Survey[3,4] has been completed and funds are being raised to continue the project.

3.2 Factors affecting the habitat

a) Health and safety issues and repairs to the built structures and gravestones,
b) Inappropriate mowing regimes.
c) Overzealous tidiness.
d) Inappropriate use of herbicides and algicides.

4. Future Management

Aim:
to protect and enhance the wildlife value of churchyards and cemeteries in a way which is sympathetic to the prime purpose of these areas as burial grounds and places of remembrance.

Objectives

- Encourage Parochial Church Councils or Friends Groups to survey the wildlife in their churchyard. Expert help can be given (contact *i*dverde for details).
- Survey to ascertain whether there is a bat roost in the church.
- Maintain the flora (lichens, mosses and ferns) on stonework (walls as well as gravestones) and enhance the habitat for these species by promoting the use of natural, unpolished stone for headstones and lime-based mortar for walls
- Maintain walls in good condition using lime-based mortar for repairs
- Maintain fungi-rich grassland by keeping lawns close-mown (remove the arisings) and free from fungicides, herbicides and pesticides.

5. Churchyards and Cemeteries Management Guidelines

For practical advice on biodiversity management in Churchyards and Cemeteries see **Section 6.2: Best Practice Guidelines for Land Managers**

6. Key Species

Flora: Several churchyards in the Borough have 'special' plants – these include wall bedstraw (St Martin of Tours, Chelsfield), meadow saxifrage (Keston Church and St Mary the Virgin, Hayes), rue-leaved saxifrage (All Saints, Orpington), and harebell (St Mary the Virgin, Hayes, St Nicholas, Chislehurst). Ferns are especially well represented at St Mary Hayes where they include rusty-back fern, and at Holy Trinity Bromley Common where black spleenwort is present as well as mosses and liverworts.

Fungi: waxcap fungi and fairy clubs e.g. St Giles, Farnborough, St Nicholas, Chislehurst. Lichens including communities on calcareous stone – *Caloplaca* and *Aspicilia* species, and those on acid stones – *Buellia*, *Rhizocarpon* and *Psilolechia* species).
Fauna: bats, bees, butterflies.

Case Study: All Saints Churchyard, Orpington

All Saints Churchyard is a closed graveyard in the centre of Orpington owned by the diocese of Rochester and managed by the London Borough of Bromley aided by an active volunteer group. The principal interest of this churchyard lies in the flora of the tombs and the old walls.

Rue-leaved saxifrage occurs at its only site in Bromley on the walls and also on a stony 'bank' in the car park adjacent to the church building. Common whitlow-grass and dark mullein are also found on the walls. The tombstones have an excellent lichen flora, with over 60 species recorded, including several uncommon ones.

The site lies on clay-with-flint soil and the neutral grassland between the graves supports a variety of common grasses and wild flowers. Shrubs and trees enhance the interest of the site, and several common butterflies have been noted. The bird fauna is diverse.

7. Responsible Bodies

Bromley Biodiversity Partnership, *i*dverde, London Bat Group, London Borough of Bromley, Orpington Field Club, Parochial Church Councils, Rochester Diocese.

References

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5. Protected Species in Bromley

5. Protected Species in Bromley

The wealth and variety of habitats in the borough mean that Bromley boasts an impressive diversity of wildlife. It can be difficult to single out individual species for attention, as the survival of any given species is intricately linked with the many other species with which they share a habitat. However, some species are more at risk than others of being lost. Because of this, UK legislation and international convention or directives provide legal protection to many plants and animals.

Species Protection through Site Designation

Sites of Special Scientific Interest (SSSI). Designated by Natural England under the National Parks and Access to the Countryside Act (1949), amended under Wildlife and Countryside Act (1981) and CRoW Act (2000).This statutory designation of protected areas for nature conservation protects habitats from operations notified as potentially damaging, thereby protecting species within them. It is worth noting however, that unless protected or priority species are listed in the citation then management may be counter to their needs.

Local Nature Reserves (LNRs) are designated by local authorities under the National Parks and Access to the Countryside Act (1949) and protect species through protection of their habitats under the planning system.

Sites of Importance for Nature Conservation (SINCs) are non-statutory wildlife sites identified and designated by the Greater London Authority (GLA) and are given some protection under the London Plan, in borough unitary development plans and local development frameworks.

Bromley currently has 109 Sites of Importance for Nature Conservation (SINCs) – see **Appendices A** and **B** for their names and distribution across the borough.

Local Green Spaces are green areas or open spaces of particular value to the local community. 25 Local Green Spaces have been designated in Bromley Local Plan (2019). These areas have protection under the plan from, '*Development which is likely to cause harm to the special qualities of sites will only be acceptable in very special circumstances which clearly outweigh the harm.*' All those sites put forward by the local community have some importance for wildlife as well as people.

- Alexandra Recreation Ground, Alexandra Road, Penge
- Beckenham Green, High Street, Albemarle Road and St. George's Road, Beckenham
- Bull Lane Allotments, Chislehurst
- Bromley Palace Park, Rochester Avenue, Bromley
- Cator Park, Aldersmead Road, New Beckenham
- Chislehurst Recreation Ground, Walden Recreation Ground, Whytes Wood and Walden Woods, Empress Drive/Victoria Road, Chislehurst
- College Green and Slip, West Street, Bromley

- Dorset Road Allotments, Dorset Road, Elmers End
- Downe Orchard, between Rookery Road and North End Lane, Downe
- Frankswood Amenity Green, Junction of Frankswood Avenue/Lakeswood Road/Crescent Drive, Petts Wood and Knoll
- Havelock Recreation Ground, Homesdale Road, Bromley
- High Broom Wood, South Eden Park Road, West Wickham
- Hoblingwell Wood and Recreation Ground, Leesons Way, St Paul's Cray
- Hollydale Open Space, Kemble Drive, Beverley Drive and Lakeside Drive, Bromley
- Kelsey Park, Manor Way, Beckenham
- Kingswood Glen, South Hill Road and Kingswood Avenue, Shortlands
- Library Green and Church House Gardens, Bromley High Street, Glassmill Lane and Church Road, Bromley
- Martins Hill, off Church Road, Bromley
- Queens Gardens, Kentish Way, Bromley
- Queens Mead Recreation Ground, Queens Mead Road and Glassmill Lane, Bromley
- Royston Field, Franklin Road, Penge
- South Hill Wood, Westmoreland Road and Tootswood Road, Bromley
- Tugmutton Common and Farnborough Recreation Ground, Starts Hill Walk, Farnborough
- Turpington Lane Allotments, Bromley Common
- Whitehall Recreation Ground, Southlands Road and Cowper Road, Bromley

Wildlife Legislation

There are several pieces of legislation that give protection to species found in Bromley. The base of all legal wildlife protection in the UK is the **Wildlife and Countryside Act 1981**. This has been amended several times, most significantly by the **Countryside and Rights of Way Act 2000**. Other significant legislation is the Conservation of Habitats and Species Regulations 2017 and the (draft) Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (see below) the **Protection of Badgers Act 1992** and the **Wild Mammals (Protection) Act 1996**.

In addition, the NERC Act 2006, section 40 states 'The 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….. the Secretary of State must—(a)take such steps as appear ……to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or (b)promote the taking by others of such steps. Section 41 continues, 'The Secretary of State must [...] publish a list of the living organisms and types of habitat which [...] are of principal importance for the purpose of conserving biodiversity.

In 2020, the UK formally left the European Union. Two key aspects of ecological safeguarding in UK planning and development, the protection of European Protected Species (EPS) and the assessment of effects on European sites (or 'Habitats Regulations Assessment') are derived from EC Directives which are currently transposed into domestic legislation via the Conservation of Habitats and Species Regulations 2017.

The UK government has published the draft Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The amended Regulations confirm that the provisions in EU law will be retained at any rate in the short term. The Environment Bill 2019-2021 is currently going through Parliament. It makes provision about targets, plans and policies for improving and protecting the natural environment and biodiversity, air quality and other environmental protections

Throughout the wildlife legislation, certain species are mentioned by name as species requiring special protection.

Through amendments, reviews and subsequent Acts, the list of protected species is continually updated depending on individual species status.

Not all of the species named in the legislation are present in Bromley. The following sections summarise the current named species that can be found in the borough.

5.1 Birds
5.2 Mammals
5.3 Reptiles, Amphibians & Fish
5.4 Invertebrates
5.5 Plants (including Bryophytes), Fungi (including Lichens)

Priority Species in Bromley

As stated in the General Principals for Biodiversity Management (**Section 1: Introduction**), this plan aims to safeguard all species in the borough through appropriate habitat management and the planning process. In addition to the following protected species, **Appendix C** lists mammal, bird, butterfly, moth higher plant, fungi and lichen species of rare or threatened status that can be found in the borough.

All species in Section 5 and **Appendix C** are considered priority species for Bromley. These species must be taken into special consideration with regards to land management or land use changes.

5.1 Birds

Under **Section 1 of the Wildlife and Countryside Act 1981** it is an offence to intentionally kill, injure or take (handle or remove) any wild bird (with the exception of a few pest species which may be controlled under licence), take or damage a nest whilst in use or being built, or take or destroy eggs. In addition some especially threatened species are named in the legislation; those present in Bromley are listed below. Further bird species with rare or threatened status in the borough are listed in **Appendix C**.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Barn Owl *Tyto alba*	Rare and vulnerable in Greater London, some breeding populations in the east. In Bromley, Barn Owls have been recorded on sites in the south of the borough, within the Cudham & Downe valleys.	A bird of prey, Barn Owls feed on small mammals of rough grassland **Factors Affecting Species**: - loss of roosting and nesting sites e.g. through development of old agricultural buildings. - loss of semi-natural grassland habitat - Use of rodenticides	Barn Owls are protected under **Schedule 1 of the Wildlife and Countryside Act (as Amended)**. It is an offence to take, injure or kill a Barn Owl, or to intentionally or recklessly disturb nesting pairs.
Cetti's Warbler *Cettia cetti*	A recent colonist in the UK. Gradually spreading northwards. Breeds at Ruxley Gravel Pits, and also recorded along the River Cray.	Prefers dense vegetation, usually near water.	Cetti's Warblers are protected under **Schedule 1 of the Wildlife and Countryside Act (as Amended)**. It is an offence to take, injure or kill a Cetti's Warbler, or to intentionally or recklessly disturb nesting pairs.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Firecrest *Regulus ignicapillus*	Only seen in Eastern and southern England, and a year-round resident only in the south-east. Rare & sporadic breeder in Greater London in outer boroughs. Very rare in Bromley, recorded at only a handful of sites including High Elms Country Park.	One of the UK's smallest birds, they can sometimes be seen within flocks of other small birds. Their preferred habitat is evergreen woodland. They eat small spiders and insects and other small items such as moths eggs. **Factors Affecting Species**: - loss/fragmentation of habitat	The Firecrest is protected under **Schedule 1 of the Wildlife and Countryside Act (as Amended)**. It is an offence to take, injure or kill a Firecrest, or to intentionally or recklessly disturb nesting pairs.
Hobby *Falco subbuteo*	A summer resident in the UK, Hobbys are widely distributed across England and south Wales though secretive, so may be under recorded. Rare in Greater London, but numbers are increasing in outer boroughs. In Bromley, sightings have been made in central and eastern areas, including Chislehurst/Hawkwood/Keston/Holwood/Downe.	A bird of prey, the Hobby feeds on insects and small birds, hunting over woodland edges and heathland or open areas such as gravel pits. **Factors Affecting Species**: - loss/fragmentation of habitat - reforestation of open habitat such as heathland.	The Hobby is protected under **Schedule 1 of the Wildlife and Countryside Act (as Amended)**. It is an offence to take, injure or kill a Hobby, or to intentionally or recklessly disturb nesting pairs.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Kingfisher *Alcedo atthis*	Widespread in Greater London along cleaner sections of the Thames and tributaries. Found in catchment areas and along the rivers Kyd Brook, Cray, Ravensbourne and the Beck.	Kingfishers are found by still or slow flowing water such as lakes or rivers. They may also visit larger garden ponds. They eat fish and aquatic insects. Kingfishers create burrows in which to nest in river banks. They breed in the spring and remain in the UK year round. **Factors Affecting Species** - water quality: contamination of food supply through pollution and agricultural run-off - loss of habitat and undisturbed nest banks, including through the mechanical grading of river banks. - severe winter weather - predation by cats and rats - disturbance	Kingfishers are protected under **Schedule 1 of the Wildlife and Countryside Act (as Amended)**. It is an offence to take, injure or kill a Kingfisher, or to intentionally or recklessly disturb nesting pairs.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Peregrine Falcon *Falco peregrinus*	Increasing in Greater London. Several nesting records in Bromley.	National population is recovering following the banning of certain pesticides that were causing the eggshells to be too thin. Increasingly adapting to tall buildings in urban and suburban areas which provide potential nest sites and vantage points for hunting, e.g., feral pigeons.	Peregrine falcons are protected under **Schedule 1 of the Wildlife and Countryside Act (as Amended)**. It is an offence to take, injure or kill a Peregrine Falcon, or to intentionally or recklessly disturb nesting pairs.
Red Kite *Milvus milvus*	Increasing in the UK generally due to successful re-introduction schemes. Now recorded increasingly in the borough, including suburban areas and Cudham.	- Opportunistic feeder. Mainly carrion and worms, but will occasionally take small mammals.	Red Kites are protected under **Schedule 1 of the Wildlife and Countryside Act (as Amended)**. It is an offence to take, injure or kill a Red Kite, or to intentionally or recklessly disturb nesting pairs.

5.2 Mammals

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Bats (all species) *Chiroptera*	Ten species of bat occur in Bromley, but only the Pipistrelle can be considered relatively common. **Daubenton's bat** (*Myotis daubentonii*) **Whiskered, Brandt's and Alcathoe's bats** (*Myotis mystacinus, M. brandtii, M. alcathoe*) Considered as one species. **Natterer's Bat** (*Myotis nattereri*) **Common Pipistrelle** (*Pipistrellus pipistrellus*) **Soprano Pipistrelle** (*P. pygmaeus)* **Nathusius Pipistrelle** (*P. nathusii*) **Serotine Bat** (*Eptesicus serotinus*) **Brown long-eared bat** (*Plecotus auritus*) **Noctule Bat** (*Nyctalus noctula*) **Leisler's bat** (*Nyctalus leisleri*)	Bats are the only flying mammal; that and their complex lifestyle means that they rely on many types of habitat. Woodland, hedgerows, grassland, lowland heath and mire, wetland, churchyards and cemeteries and other urban habitats are all important. **Factors Affecting Species** *Adverse Factors* - Ignorance or intolerance of the public to bats can affect numbers, particularly if it leads to inappropriate building works, or in concealing the presence of bats. - Loss, damage and disturbance of summer roost sites. -Loss of feeding areas - Loss of navigation landmarks/commuting routes e.g. hedgerows. - Cat kills in suburban areas - Disturbance to foraging areas and flight paths through inappropriate lighting e.g. of water corridors. - Loss or disturbance of winter hibernation sites. - - *Positive Factors*	All bats and their roosts are protected by **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended) and also under Conservation of Habitats and Species Regulations (2017) Schedule 2 (as amended). It is an offence intentionally or recklessly to disturb, damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection, to possess or advertise, sell or exchange a bat or part of a bat, and for any person intentionally to kill, injure or take any wild bat.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
		- Increasing awareness of bats and their protective status. - Increasing awareness of wildlife gardening for bats, including the use of bat boxes.	
Hazel Dormouse *Muscardinus avellanarius*	Dormice are rare in Greater London; Bromley and Croydon are the only London boroughs with dormice colonies. Bromley has four sites in Farnborough, Downe , Cudham and Biggin Hill which are monitored as part of the National Dormouse Monitoring Scheme. Dormice have been found in survey tubes at several sites in the Downe and Cudham Valleys.	Dormice live in broadleaved woodland habitat, nesting in hollow trees, brambles or coppice stools. They are arboreal and rarely venture to the ground. They require 20ha of suitable woodland habitat to support a viable population. They require a diverse woodland structure and range of food plants more typical in semi-natural ancient woodland. **Factors Affecting Species** -Loss or fragmentation of broadleaved woodland. - Inappropriate woodland management such as a decline in coppicing, intensive management or stock incursion into woodland. - Loss of hedgerows and other linear features, such as tree lines, removing essential links between small isolated woodland habitats. - Loss of suitable woodland habitat. - Under recording and incomplete knowledge of their distribution in Bromley.	Dormice are protected under **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended) and the Conservation of Habitats and Species Regulations (2017) Schedule 2 (as amended). It is an offence for any person intentionally to disturb, or obstruct access to any place that a dormouse uses for shelter or protection while a dormouse is occupying it or to hold, sell, advertise for sale, transport for sale, alive or dead, whole or in part.

Hedgehog *Erinaceus europaeus*	In London, hedgehogs were common and widespread in the urban fringe, including Bromley. But it is thought in the last 30 years that numbers have declined.	Hedgehogs are characteristic of surburban gardens, woodland edges, hedgerows and similar habitats. An individual hedgehog's home range is around 20 hectares. **Factors Affecting Species** - Decline and loss of suitable habitat - lack of nesting sites and foraging areas due to insensitive habitat management (excessive tidiness) - increasing road traffic - presence of dogs - feeding of hedgehogs in gardens - use of slug pellets - direct hazards or barriers e.g. bonfires, high walls and fences. - steep-sided garden ponds	Hedgehogs are protected under **Schedule 6 of the Wildlife and Countryside Act (as amended)** It is an offence to kill or take hedgehogs by certain methods.
Shrews (all species)	Three species of shrew occur in Bromley; **Pygmy Shrew** (*Sorex minutus*), **Water Shrew** (*Neomys fodiens*), **Common Shrew** (*Sorex araneus*).	Shrews are typical of woodland and grassland habitats. Water shrews are found near water bodies such as rivers and valley mires. **Factors Affecting Species** - fragmentation of habitat - habitat loss - insecticides	Shrews are protected under **Schedule 6 of the Wildlife and Countryside Act (as amended)**. It is an offence to kill or take shrews by certain methods.

Water Vole *Arvicola terrestris*	Water voles are rare in the borough but they have been recorded at one site in the Cray Valley.	Water voles occur along well vegetated banks of slow flowing rivers, ditches, dykes and lakes. They eat grasses and other waterside vegetation. Water voles excavate extensive burrow systems into the banks of waterways or within dense reed beds. **Factors Affecting Species** -habitat loss - predation by North American Mink	Water voles are protected under **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended). It is an offence for any person intentionally to kill, injure, take, sell, advertise for sale or possess a water vole or intentionally disturb, damage, destroy or obstruct access to any place that a water vole uses for shelter or protection whether or not the animal is present.

5.3 Amphibians and Reptiles

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Adder *Vipera berus*	Only a few populations remain in London. They are known to be present at one site in Bromley.	Adders are restricted to specific habitats, including heathland, chalk grassland, scrub, woodland edges and rail and road embankments. **Factors Affecting Species** - Loss of habitat & habitat condition especially hibernacula condition - Lack of genetic diversity due to isolated populations - Persecution due to public misconceptions - Insensitive management e.g. intensive mowing, over- grazing, burning, intensive recreational use	Adders are protected by **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended). It is an offence to kill or injure an adder and the sale or trade of adders is prohibited.
Common Frog *Rana temporaria*	The common frog is London's most widespread amphibian, but numbers are generally thought to be in decline. Common and widespread within Bromley.	Frogs can be found in a wide range of damp habitats across woodlands, wetlands, grasslands and many urban environments too, particularly gardens. Early stages of development are confined to water bodies. Adults can be wide ranging in surrounding habitat. Log piles or stone walls can provide protection to adults and contain food. **Factors Affecting Species** - Tadpole predation from introduced animals e.g.fish, terrapins - Killing especially of juveniles, by cats and strimmers - Infectious disease such as red-leg. - use of fertilisers and pesticides in arable land & gardens.	Frogs are protected by **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended) whereby they cannot be removed for sale.

		- Infectious diseases such as Chytrid.	
Common lizard *Zootoca vivipara*	Common lizards are widespread in London, but concentrated in the outer boroughs. Generally widespread within Bromley.	Common lizards prefer open, dry, undisturbed habitats with good exposure to the sun such as chalk meadows, heaths, commons and railway and road embankments. **Factors Affecting Species** - lack of suitable basking sites - predation by introduced species e.g. cats - killing by strimmers	Common (or Viviparous) lizards are protected by **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended) in regard to killing or injuring or taking for the purpose of sale only.
Common toad *Bufo bufo*	Less common than frogs across London. Generally widespread and common in Bromley.	Toads can be found in a wide range of habitats, and are more tolerant of dry conditions than frogs or newts. Unlike frogs, toads will co-exist with fish. Like frogs, early stages of development are confined to water bodies. Toads are loyal to their preferred breeding sites, and often follow migration routes to their spawning ponds each spring. **Factors Affecting Species** - Use of fertilisers and pesticides in arable land. - development along migration routes - Infectious diseases such as Chytrid. - Tadpole predation from introduced animals e.g.fish, terrapins - Killing especially of juveniles, by cats and strimmers	Common toads are protected by **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended) whereby they cannot be removed for sale.

Grass snake *Natrix natrix*	Grass snakes are widespread throughout London. They are found throughout Bromley, particularly within the Ravensbourne and Cray catchments.	Grass snakes often reside in open woodland, grassland and heathland. Regularly encountered within or nearby water due to their diet of amphibians and fish. They require warm, composting vegetation for egg-laying, and so are sometimes seen in gardens and allotments. **Factors Affecting Species** - Insensitive management e.g. intensive mowing, over-	Grass snakes are protected by **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended) in regard to killing, injuring or taking for sale or trade.

		grazing, burning, intensive recreational use and general disturbance - Isolated populations - persecution due to public misconceptions	
Great Crested Newt *Triturus cristatus*	Although widespread in the UK, it is more abundant in lowland England than elsewhere. However, numbers of Great Crested Newts in LBB have been greatly reduced in recent years so it is now only present in low numbers in central and north-eastern areas of the borough.	Great Crested Newts have a preference for larger ponds, although will occasionally breed in smaller, garden ponds where they co-exist with smooth newts. Ideally, they require a network of ponds that can act as transitional ponds. They do not require permanent ponds, but they must hold water until at least August to allow successful metamorphosis of young. Adults spend a lot of time on land. They hibernate through the winter in log piles, for example. **Factors Affecting Species** - Predation by introduced fish and other animals. - Disturbance by dogs in ponds - Poor management and damage/loss of surrounding terrestrial habitat - fragmentation of habitat and reduction of ponds - use of pesticides and herbicides in agriculture - lack of rainfall & changing climate resulting in early drying out of seasonal ponds.	Great Crested Newts are protected by **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended) and the Conservation of Habitats and Species Regulations (2017) Schedule 2 (as amended). It is an offence for any person to intentionally kill, injure or take (including for sale or trade) a great crested newt or to intentionally or recklessly damage, destroy or obstruct access to any place that a Great Crested Newt uses for shelter or protection.

Palmate Newt *Lissotriton helveticus*	Less common and less widespread in London than the smooth newt. Recorded at sites in central and northern Bromley.	Palmate newts have a greater tolerance for acidic ponds, so can be associated with woodland ponds, as well as heathland ponds. On land they are generally tolerant of dry conditions, and can range far from water. **Factors Affecting Species** - Predation by introduced fish and other animals - loss or destruction of habitat - Killing by cats and strimmers	Palmate newts are protected by **Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)** whereby their sale is prohibited.
Slow-worm *Anguis fragilis*	The most common reptile in London. Widespread in Bromley.	Slow-worms are found in a variety of habitats including urban habitats such as road and rail embankments, wastelands, gardens and allotments as well as grassland and scrub. **Factors Affecting Species** - Loss of habitat - Isolated populations - Persecution (mistaken for snakes) - Killing by cats and strimmers	Slow-worms are protected by **Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)** wherein is an offence to kill, injure or sell a slow-worm.
Smooth Newt *Triturus vulgaris*	A widespread species in London. Common and widespread in Bromley.	Smooth newts are often found in garden ponds, although have a preference for small, fish-free ponds and ditches. **Factors Affecting Species** - Predation by introduced fish and other animals - loss or destruction of habitat - killing by cats and strimmers	Smooth newts are protected by **Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)** wherein the sale of smooth newts is prohibited.

5.4 Invertebrates

Butterfly species with rare or threatened status in the borough are listed in **Appendix C**.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Adonis Blue *Polyommatus bellargus*	Biggin Hill Valley	Chalk grassland where its foodplant, Horseshoe Vetch, is present. **Factors Affecting Species** - loss or fragmentation of habitat changes in agricultural practices **Factors Affecting Species** Benefits from regular grazing by sheep (and rabbit).	Adonis Blue are protected by **Schedule 5 of the Wildlife and Countryside Act (as amended)** wherein their sale or other forms of trade are prohibited
Brown Hairstreak *Thecla betulae*	Keston/Nash, Spring Park	Woodland edge and hedgerow species. The adults feed on aphid honeydew in tree tops (eg ash) and nectar from brambles and other hedgerow plants. Eggs are laid on blackthorn **Factors Affecting Species** - inappropriate cutting/flailing of blackthorn hedgerows	Brown Hairstreaks are protected by **Schedule 5 of the Wildlife and Countryside Act (as amended)** wherein their sale or other forms of trade are prohibited.
Chalkhill Blue *Polyommatus coridon*	Still widespread in southern England but numbers have declined greatly. Recorded on one site in the Downe valley and one site in Biggin Hill valley.	Characteristic of chalk and limestone hillsides. **Factors Affecting Species** - loss or fragmentation of habitat - changes in agricultural practices	Chalkhill Blue butterflies are protected by **Schedule 5 of the Wildlife and Countryside Act (as amended)** wherein their sale or other forms of trade are prohibited.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Purple Emperor *Apatura iris*	Rare, numbers in steady decline. Distribution in the UK limited to deciduous woodland in central southern England. In Bromley, it has been recorded at High Elms Country Park.	Typical habitat is mature broadleaved forests. Woodland rides and clearings are important for providing food sources. Caterpillars feed on sallows. **Factors Affecting Species** - woodland quality including loss or fragmentation of ancient woodland habitat - availability of sallow in suitable light conditions. - Records may be unreliable due to difficulties observing and identifying. -	Purple Emperor Butterflies are protected by **Schedule 5 of the Wildlife and Countryside Act (as amended)** wherein their sale or other forms of trade are prohibited.
Small Blue Butterfly *Cupido minimus*	Numbers are in decline across the UK, although distribution is widespread. Recorded on some chalk grassland sites in the south of the borough.	The smallest butterfly in the UK, the small blue is typically found on chalk grassland habitats, as well as roadsides and railway embankments. Food plant is Kidney Vetch. **Factors Affecting Species** - loss of habitat - Condition of habitat, especially due to lack of grazing - availability of food plant	Small blues are protected by **Schedule 5 of the Wildlife and Countryside Act (as amended)** wherein their sale or other forms of trade are prohibited.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
White-letter Hairstreak *Satyrium w-album*	Widespread within England, particularly central regions. Recorded at High Elms.	A woodland species of butterfly. White- letter hairstreak caterpillars feed exclusively on elm trees. Butterflies feed on woodland nectar sources such as honeydew, thistles and bramble. **Factors Affecting Species** - drastic loss of food plant due to Dutch Elms Disease in the 1970s.	White-letter Hairstreaks are protected by **Schedule 5 of the Wildlife and Countryside Act (as amended)** wherein their sale or other forms of trade are prohibited.
Roman Snail *Helix pomatia*	UK distribution is limited to central and southern England particularly along the North Downs and the Chilterns. In Bromley, Roman Snails have strong local populations in the Cudham and Downe valleys.	Roman snails are the largest land snail in the UK. They prefer lime-rich free-draining soils and inhabit open woodland, rough and tussocky grassland, hedge banks, chalk grasslands and quarries. **Factors Affecting Species** - Also known as the 'edible snail', their numbers can be affected by illegal foraging. - loss and fragmentation of habitat. over-grazing of open habitat.	Roman Snails are protected by **Schedule 5 of the Wildlife and Countryside Act 1981** (as amended). It is an offence for any person to intentionally kill, injure or take possession of a roman snail and it is protected against sale.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Stag Beetle *Lucanus cervus*	Globally threatened. In the UK, stag beetles are no longer widespread, with populations concentrated in the south-east. In Bromley, stag beetles are still locally common, with highest recorded numbers in Beckenham.	Stag beetles are found in broad-leaved woodland, parks and many gardens in the borough. The stag beetle is Britain's largest beetle. The larvae live in the decaying wood of trees, such as roots & stumps or even rotting timber fence posts. **Factors Affecting Species** - Loss of sites through urban development, unsympathetic woodland management, and agriculture, 'tidiness'. - Removal of fallen timber and tree stumps. - substitution of wooden garden fence posts with concrete or metal. - Predation by cats, foxes, crows and magpies - Ignorance of the presence of stag beetles and larvae.	Stag beetles are protected by **Schedule 5 of the Wildlife and Countryside Act (as amended)** whereby sale or trade is prohibited.

5.5 Plants (including Bryophytes), Fungi (including Lichens)

Under the **Wildlife and Countryside Act 1981** (as amended) it is an offence to intentionally or recklessly uproot **any wild plant** if you do not have permission from the owner or occupier of the piece of land in question. In addition some especially threatened species are named in the legislation; those present in Bromley are listed below.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Bluebell *Hyacinthoides non-scripta*	The UK contains more than half of the global bluebell population. Widespread in the UK and common in many areas	Bluebells are found in shady woodland conditions, although can also grow along hedgerows, or in scrub or grassland. Bluebells are one of the indicators for ancient woodland habitat. **Factors Affecting Species** - loss or fragmentation of ancient woodland habitat - hybridisation with non-native bluebells - trampling people picking or digging up bluebells	Bluebells are protected under **Schedule 8 of the Wildlife and Countryside Act** (as amended) whereby they are protected against selling, offering or advertising for sale, possessing or transporting for the purpose of sale.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Greater Yellow Rattle *Rhinanthus serotinus*	Formerly widespread in the UK, now nationally rare, only found on the North Downs and mainly within Greater London. Local populations can be abundant.	Found in chalk grassland and open scrub on chalk soils. **Factors Affecting Species** - changes in agricultural practice	Greater Yellow Rattle is protected under **Schedule 8 of the Wildlife and Countryside Act (as amended)**. It is an offence to intentionally pick, collect seed, or possess for sale or trade.
Lizard Orchid *Himantoglossum hircinum*	This rare orchid is found in the southern part of the UK. Kent has several large colonies on calcareous soils and dunes.	The Lizard Orchid grows on calcareous soils and likes sunny positions on the edges of open woodland and on roadside verges. This orchid also grows in dry meadows, rocky areas, and open woods. It is pollinated by insects particularly bees. **Factors affecting species** - Inappropriate management of road verges - Drought conditions - Trampling and picking of flowers	Protected under **Schedule 8 of The Wildlife and Countryside Act (as amended)**.

Species	Distribution	Typical Habitat & Factors Affecting Species	Level of Protection
Bearded Tooth fungus *Hericium erinaceus*	The Bearded Tooth fungus is scattered and only local in southern England and very rare elsewhere in the British Isles.	The Bearded Tooth Fungus grows on heart wood of deciduous trees, usually oak or beech and can occur on wounds of old living trees or on ends of fallen trunks. **Factors affecting species** - Inappropriate clearing away of fallen old tree trunks and boughs	Protected under **Schedule 8 of The Wildlife and Countryside Act (as amended).**

Plants, Mosses, Fungi and Lichens of Local Importance

Few of the borough's plants, mosses, fungi and lichens are directly named in wildlife legislation. However, Bromley contains a great number of species that are of threatened status and are of either regional or national importance. The loss of these species from habitats within the borough would likely be an irreversible trend.

Plants

Appendix C lists rare and threatened plant species in Bromley.

Mosses

There are some sites in the borough that are worthy of special care due to their variety of moss species:

- Downe Bank
- Hayes Common
- High Elms
- Holwood House & Estate
- Keston Common (including Keston Bog), which includes species rare in Kent.
- Leasons Wood
- Musk Orchid Bank
- Petts Wood
- Ruxley Gravel Pits
- Shaws Guide Site

Fungi and Lichens

Appendix C lists rare and threatened fungi and lichen species in Bromley.

6. Biodiversity Best Practice Guidance

Best Practice Guidelines for Planners and Developers

Public and Local Authorities have a statutory obligation to conserve and enhance biodiversity under the Natural Environment and Rural Communities Act (NERC) 2006. This act extended the biodiversity duty set out in the Countryside and Rights of Way (CROW) Act to public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity.

"*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*" NERC Act (2006) Section 40 (1).

Planners and developers have the greatest potential to affect the borough's biodiversity, whether positively or negatively, in their approach to development. Whilst wildlife is present within statutorily protected sites, most often species are found outside these, and are therefore vulnerable to built developments and land use changes. Consideration for the natural history of a development plot and a sympathetic approach towards existing wildlife is fundamental to protecting Bromley's biodiversity.

The following guidance sets out the key considerations relating to wildlife and biodiversity that should be taken into account at all stages of a development proposal.

General Approach:

Development should not lead to a loss of biodiversity and ideally should enhance it. Biodiversity net gain is where development leaves biodiversity in a better state than it was before. Important habitats and species should be protected from harmful development. Any adverse effects should be avoided, minimised and/or compensated for, and every opportunity should also be taken to create improvements for biodiversity (see NERC Act 2006 Section 40 (3)).

Developers are expected to

i. Provide accurate information with the planning application on the existence of habitats or biodiversity features and species present on the proposed development site.
ii. Where it is known a protected species or priority habitat is present, they are to ensure assessments are undertaken to show the impact of the proposed development. Priority habitats highlighted in Bromley's Biodiversity Action Plans and the succeeding Bromley Biodiversity Plan are woodland, traditional orchards, scrub, hedgerows, veteran and ancient trees, chalk, acid and neutral grassland, lowland heath and valley mire, wetland (including ponds), churchyards and cemeteries, gardens and allotments. Priority Species are listed in Section 5 (all Protected Species are Bromley Priority Species) and Appendix C (Priority Species : other rare or threatened species in Bromley).

iii. When assessments indicate that species or habitats will be affected, the development proposal should be designed to minimise this impact.

Step 1: Gathering Information

Development proposals should manage impacts on biodiversity and aim to secure net biodiversity gain. This should be informed by the best available ecological information and addressed from the start of the development process.

Appropriate habitat and species surveying should therefore be included wherever possible at pre-application stage in order to encourage early engagement so that the full ecological impacts of a development proposal can be understood from the beginning of the development process.

Before undertaking design work or submission of a planning application, it is important for developers to be able to assess the biodiversity value of the site.

- **Are there any trees on or adjacent to the development site?** A topographical survey will show the location of existing trees. A tree survey (including information on any trees protected by Tree Preservation Orders) should take place on existing trees including ancient trees and notification of trees with holes or crevices which may be used by bats.
- **Are there any protected or priority plants, fungi, invertebrates, amphibians, reptiles, birds or mammals (including bats) using the development site? (See Section 5: Protected Species in Bromley and Appendix C Priority Species in Bromley).** It is advisable to contact Greenspace Information for Greater London (GiGL) for any existing site-specific species data, or you may need a survey by a qualified ecologist. The National Biodiversity Network (NBN) should also be checked for species records as some wildlife bodies send their survey data directly to the NBN, by-passing the local records centre. An ecological survey should identify the presence or potential presence of any protected or priority species on the development site.
- **Are there any priority habitats or biodiversity features or geological features on or next to the site?** Examples include:
  - **Ancient Semi-Natural Woodland (ASNW).** Check the Ancient Woodland Inventory for Greater London. Note that activities which damage the woodland floor such as paint balling and trail riding greatly reduce the biodiversity of this habitat. NB Some smaller areas of ASNW may not be on the inventory.
  - **Ancient/Veteran Trees:** Check the Ancient Tree Inventory Tree Map at https://ati.woodlandtrust.org.uk
    but note not all ancient or veteran trees are recorded on it at this time.
  - **Secondary Woodland**. All woodland may support rare and protected species including dormice, bats, stag beetles and birds.
  - **Hedgerows:** Many are an important part of Bromley's natural and historic heritage. Their importance for biodiversity and as part of the landscape is recognised in the Hedgerow Regulations 1997 and see Bromley Local Plan Policy 75 which states, '*In considering development proposals, the Council will normally expect the retention and beneficial*

management of any existing hedgerow; where a hedgerow is to be removed, the Council will, where appropriate, require its replacement with native hedgerow species.' Specific species surveys may also be required to accompany the planning application because:

a) Hedgerows are used by dormice (a current European Protected Species, see Section 3 - Legislation), which are quite widespread in the south of the borough. Dormice both live in species-rich hedgerows and use them for access between woodlands. During the winter months they hibernate in hedgebanks, coppice stools etc.
b) Hedgerows are important for bats, both as foraging areas and to navigate through the landscape – a 10m gap will prevent bats from reaching areas previously used for foraging.
c) Slow worms and lizards may both shelter in hedgerows and bask on open hedge banks.

- **Grassland and scrub.** Planning applications involving loss or damage to grassland and scrub may require an ecological survey since these habitats often support protected species such as great crested newts (these animals only visit ponds to breed), slow worm, common lizard, grass snake, adder and declining species such as hedgehogs and skylarks which were added to UK Priority List of Species & Habitats in 2007. Scrub is also important for nesting birds, and bats frequently forage above it.
- **Is there an old lawn present which has been untreated by fertilisers, pesticides, herbicides and fungicides for a long period of time?** If so the lawn should be surveyed for rare grassland fungi and should not be lost or damaged (e.g. by compaction from heavy machinery or stored materials). Surveying for grassland fungi needs to be carried out in October/November, though they can be found from July till the beginning of frosts if the ground is reasonably damp. These fungi are rare in Europe as well as the UK.
- **Wetland including ponds** has a high biodiversity value. Check for the presence of great crested newts, water vole (River Cray area) and grass snake.

An ecological survey by a qualified ecologist will assess the impact of the development on priority habitats.

- **Is the site adjacent to a Site of Special Scientific Interest (SSSI), Local Nature reserve (LNR) or Site of Importance for Nature Conservation (SINC)?** See Appendix B: Map of Bromley SINCs. An ecological survey must assess the impact of development on any adjacent SSSI, LNR or SINC. The layout and design of the development should avoid harm to wildlife and habitats where possible.
- **Is there a badger sett on site?** Badgers and their setts are protected under the Badgers Act 1992
- **Is there a bat roost on site?** This will require a Potential Roost Feature survey of trees and any built structure (house, barn, bridge or underground site).

Ecological Surveying

Preliminary Ecological Appraisal (PEA) should be completed in the early stages of a project, so that the information can be included in the pre-application. If necessary, changes guided by the appraisal should be incorporated into the design of the development. Following PEA, further surveys of particular species or habitats or a Phase 2 Ecological Impact Assessment (EcIA) with relevant species and habitat surveys are sometimes needed to accompany a formal planning application prior to the granting of planning permission. Planning applications can be delayed if the Local Planning Authority requires further surveys.

It is worth noting that any pre-existing species data is only useful in guiding the way. Existing data may be old, or there may be no existing records in the area. Many sites will never have been subject to ecological survey before, and **an absence of records does not mean an absence of species**.

Table III gives an outline of the type of ecological survey that may be required in a development proposal. Some developments may also require an Environmental Impact Assessment (EIA) under the Town and Country Planning Regulations 1999. A Phase 1 habitat survey can be used to identify the habitat types present on a development site and which species surveys may be required.

Table III: Development Proposals that will require an Ecological Survey

Development Details	Species Likely To Be Affected/Surveys Required
A development including the modification, conversion, demolition or removal of buildings or structures (especially roof voids) involving the following:	
• Agricultural buildings (particularly of brick or stone construction with wooden beams)	Bats, Barn Owls, Breeding Birds
• Roofs	Bats, Breeding Birds e.g.swifts
• Unused industrial chimneys which are unlined and of brick or stone construction.	Bats, swifts
• Tunnels, culverts, mines, kilns, ice-houses, air-raid shelters, cellars and similar underground ducts and structures.	Bats
• Bridges, aqueducts and viaducts	Bats
• Green Roofs	Breeding Birds, Wintering Birds, Plants, Invertebrates

Proposals for lighting of churches and listed buildings or flood lighting along river corridors, or of green space within 50m of woodland, water, hedgerows or lines of trees.	Bats, Breeding Birds, Invertebrates
Proposals affecting woodland or hedgerows and/or lines of trees with connectivity to woodland or water bodies.	Bats, Dormice, Breeding Birds, Badgers, Reptiles, Plants
Proposals affecting established grassland or scrubland including roadside verges.	Breeding Birds, Wintering Birds, Reptiles, Plants, Invertebrates, Grassland, Fungi
Proposed tree work (felling or lopping) and/or development affecting: • Veteran trees (ancient trees or those with features of ancient trees e.g. dead wood, crevices, lifting bark, rot holes, sap runs etc.) • Trees with cracks and cavities • Trees with substantial ivy cover • Trees with girth greater than 50cm at chest height.	 Bats, Barn Owls, Breeding Birds, Lichens Bats, Barn Owls, Breeding Birds Bats, Breeding Birds Bats, Barn Owl, Breeding Birds, Lichens
Proposals affecting gravel pits or quarries and natural cliff faces and rock outcrops with crevices or caves.	Bats, Breeding Birds, Amphibians, Reptiles
Proposals within 250m of a pond (500m of known Great Crested Newts).	Breeding Birds, Great Crested Newt.
Proposals affecting or within 200m of rivers, streams, canals, lakes or other aquatic habitats such as reed bed.	Bats, Breeding Birds, Wintering Birds, Great Crested Newt, Water Vole, Amphibians, Plants
Proposals affecting 'derelict' land (brownfield sites), allotments and railway land.	Breeding Birds, Wintering Birds, Great Crested Newt, Badger, Reptiles, Amphibians, Invertebrates.
Proposals affecting bare ground and/or sparsely vegetated sites in any location.	Breeding Birds, Wintering Birds, Reptiles, Invertebrates
Proposed development affecting any buildings, structures, feature or locations where protected and/or priority species	Bats, Barn Owls, Breeding Birds, Wintering Birds, Great Crested Newt, Water Vole,

are known to be present.	Badger, Reptiles, Amphibians, Plants, Invertebrates, Stag Beetle.
Proposed development involving old lawns attached to substantial houses	Grassland Fungi
Adapted from Table 5.1, Biodiversity Supplementary Planning Document, 2012, LB Barking & Dagenham.	

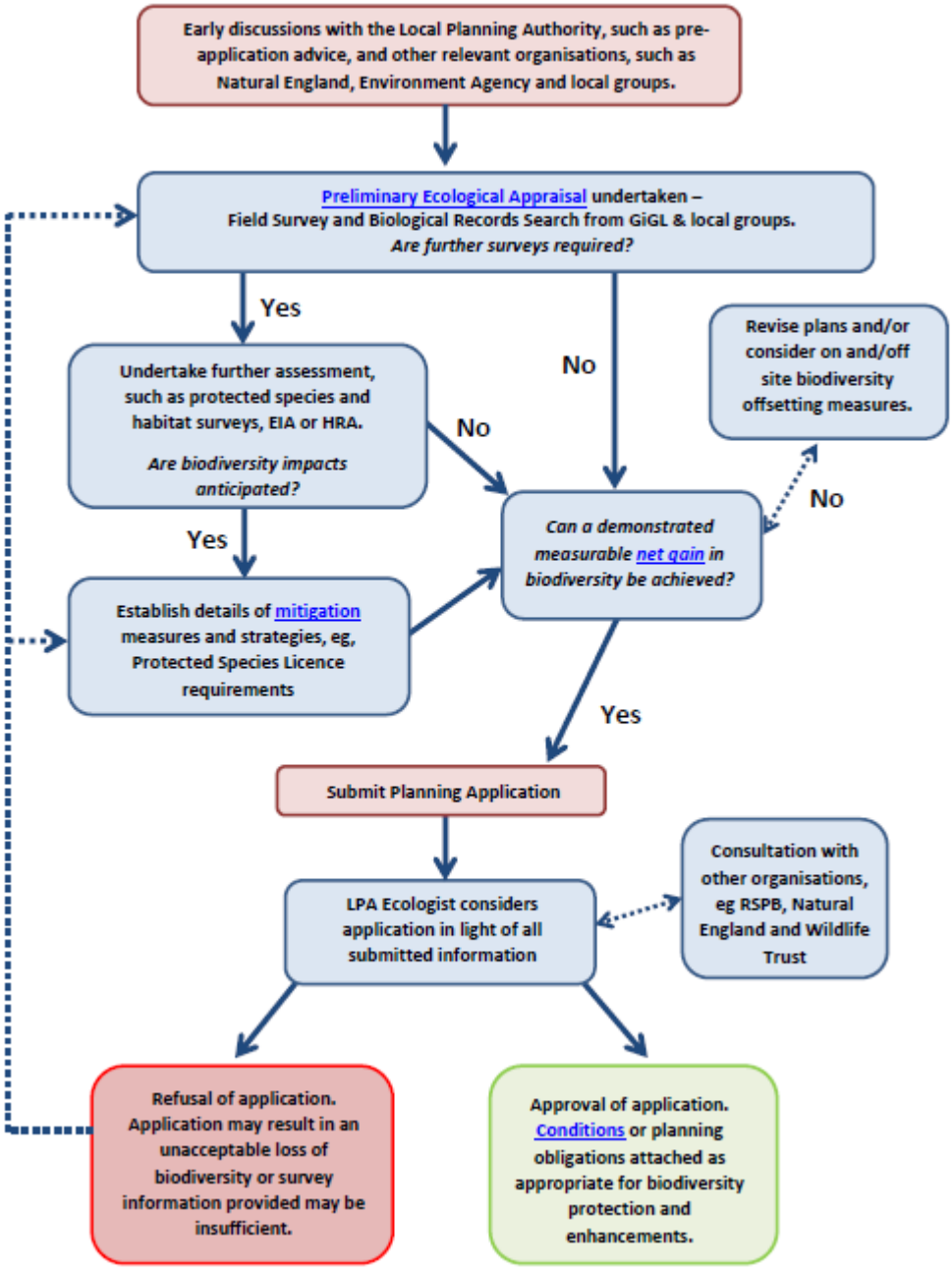
Surveys of particular species and habitats often need to take place at particular times of year. Surveys completed out of season will not provide accurate information and could cause delays in processing an application. Table IV indicates the optimal surveying times for typical species surveys.

Planning professionals should be aware that Natural England provides Standing Advice about species most often affected by development. Local planning authorities must take this advice into account if species are identified within or adjacent to the development site.

Environmental Impact Assessment (EIA)

Some developments will meet the necessary criteria to require an EIA be undertaken under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. For further information, please refer to the EIA Regulations (2017). Should there be doubt over the requirement for an EIA, it is recommended that the Local Planning Authority is consulted for a 'EIA screening opinion' so that the application may be screened to identify whether further assessment is required.

The following flowchart provides an overview on how biodiversity is considered in the planning process and at what stages supporting ecological information is required.



Flowchart adapted with permission from the Oxford City Council Biodiversity Technical Advice Note.

HRA – Habitats Regulations Assessment.

For more information on the preparation of Preliminary Ecological Appraisals, please see the CIEEM guidance and the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat Survey (2010).

For more information on the types of development likely to affect bats, please refer to Page 13 of the Bat Conservation Trust publication Bat Surveys for Professional Ecologists (Good Practice Guide)

Table IV: Timing of Field Surveys for Various Animals and Plants

Survey Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Phase 1 Habitat Survey	Surveys Possible				Optimal Survey Period				Surveys Possible			
Botanical Assessment	Lower Plants Only			Detailed Botanical Surveys					Lower Plants Only			
Bats – Roost Assessment	Assessment Possible All Year											
Bats – Nocturnal Surveys	Hibernation Surveys			Some Activity Surveys	Optimal Survey Period				Some Activity Surveys		Hibernation Surveys	
Badgers	Surveys Possible All Year – Summer Vegetation Can Obscure Evidence						Licensable Period For Disturbance					Surveys
Dormouse	Gnawed Nut Search			Net Tube Surveys April to November. Gnawed Nut Search September to December								
Great Crested Newt	Habitat Suitability Surveys Only		Pond Survey from mid-March to mid-June				Habitat Suitability Surveys Only					
Reptiles	Habitat Suitability Surveys Only		Surveys Possible	Optimal Survey Period			Surveys Possible		Optimal Month	Surveys Possible	Habitat Suitability Only	
Water Vole	Burrow Surveys	Habitat Suitability Surveys		Two Surveys Required – first April to June, second July to September						Habitat Suitability Only		Burrow Surveys
Breeding Birds	No Surveys		4 Surveys Ideally Covering All Months				Proof of Nesting/Fledgling Surveys		No Surveys			

Wintering Birds	**4 Surveys Ideally Covering All Months**	**No Surveys**						**4 Surveys Ideally Covering All Months**
Invertebrates	**Habitat Suitability Only**		**Some Possible**	**Surveys Will Vary Between Species**			**Habitat Suitability Only**	
Waxcap Fungi	**Habitat Suitability Only**				**Surveys possible if ground reasonably damp**		**Optimal Survey Period until 1st Frost**	**Habitat Suitability Only**

Optimal Survey Period
Surveys Possible (with some restrictions)
No Surveys. Habitat Suitability Assessment for Species Only

Step 2: Design Stage

The information provided in Step 1 should be incorporated into the development design applying the NPPF (Para 175), London Plan and Planning Practice Guidance mitigation hierarchy:

- Protection of significant ecological features of the site;
- Minimize the overall spatial impact and mitigate it by improving the quality of management of the rest of the site;
- Deliver off-site compensation of better biodiversity value.

A development should aim to secure biodiversity net gain with a priority for on-site gain wherever possible and appropriate off-site enhancements, and this should be considered at design stage through biodiversity enhancement measures on a site-by-site basis. Development should follow the Lawton principles of “more sites, that are bigger, better and joined-up”.

The Government will be publishing guidance on Biodiversity Net Gain through a Supplementary Planning guidance (SPG) document. In the meantime, developers and planning practitioners may refer to the published Natural England Biodiversity Metric and its use is recommended in the interim by the Planning Practice Guidance (PPG).

Protection

For sites with existing biodiversity value.

- Site layout and design should seek to retain existing habitats and features that benefit wildlife, giving priority to protected species and habitats included in the Bromley Biodiversity Plan.
- Consideration should be given to features adjacent to the development that may be affected by the scheme. For example when development is proposed adjacent to woodland, a buffer zone between the woodland and the development site should extend at least as far as the tree canopy to avoid loss of trees later following householder complaints regarding shading, leaf loss, subsidence etc. For semi-natural ancient woodland a buffer zone adjacent to the woodland of at least 15 metres is required to avoid root damage. Where assessment shows other impacts, such as air pollution resulting from increased traffic post development, a larger the buffer zone may be required. See Natural England Standing Advice. During development adjacent woodland will need to be protected by Root Protection Zones and other measures, for example to reduce dust/sediment drift, as outlined by associated Arboricultural Reports.
- When development is proposed near Ancient or Veteran trees, a buffer zone is required which is at least 15 times larger than the diameter of the tree or 5m from the edge of the tree's canopy if that area is larger. See Natural England Standing Advice. During development ancient and veteran trees will need to be protected by Root Protection Zones and

other measures for example to reduce dust/sediment drift as outlined by associated Arboricultural Reports

- When a site or surrounding area has clear biodiversity value and insufficient steps are taken to reasonably protect it, then planning permission may be refused on these grounds, once all other planning issues have been taken into account.
- Where a hedgerow is to be retained there should be sufficient distance between the hedgerow and any development to ensure that enough light reaches the hedgerow base to allow continued growth. Protection is afforded to significant hedgerows during and after development under Policy 75 (and 78) of Bromley Local Plan should include a minimum distance to prevent damage to the hedgerow shrub roots. A buffer zone of 1 metre natural vegetation should be retained adjacent to any hedgerow as this will increase its biodiversity value. During development it will need to be protected by Root Protection Zones and other measures for example to reduce dust/sediment drift as outlined in associated Arboricultural Reports. In the case of retention of an important species-rich or historic hedgerow alongside a new development, the developer should be encouraged to provide short leaflets for the new property owners explaining the importance of the hedgerow, how to look after it and where to seek advice. See http://www.hedgelink.org.uk/
- Trees and natural areas within a development site should be retained wherever possible, and the complete clearance of a development site should be avoided where biodiversity value exists.

Netting of trees and hedgerows

The use of netting to prevent birds nesting in trees and hedgerows may allow developers to reduce ecological constraints and to avoid the requirement to undertake construction works outside of nesting season. Netting is not illegal but is discouraged and if the installation of netting causes birds to be trapped, occurs during the breeding season, or prevents access to active nests, it is illegal under the Wildlife and Countryside Act 1981.

For further information please see The RSPB position on netting and guidance.

Mitigation of Harm

For sites where some damage to existing habitats and species will occur.

Species and habitat mitigation strategies may be required to demonstrate how the impacts of development will be minimised. In some cases, it may be possible to minimise the harm done to wildlife through the use of design measures such as:

- Timing the development of sites to avoid the breeding seasons of species present. For example, tree work and hedgerow removal, if agreed, should be carried out during the winter months.
- Creating buffer zones between sensitive areas and development areas

to reduce disturbance to habitats, see above.

- Ensuring that new infrastructure such as bridges are built to enable movement of wildlife to continue.
- Steps to ensure that the hydrological status of sensitive sites is maintained through the careful design of drainage infrastructure.
- Translocation of species from destroyed habitat (to be used as a last resort).
- A financial contribution to management of nearby existing wildlife sites, through a commuted sum, can be required where the development could lead to increased pressure on those sites (e.g. noise and disturbance through increased amenity use).
- Artificial lighting should avoid spill on to areas of greenspace, especially woodland and woodland edge, hedgerows, wildlife corridors (including waterways), ponds, trees and buildings that may support bat roosts and foraging areas or nesting birds. The Royal Commission on Environmental Pollution (2009) recommends that planning guidance includes a presumption against the provision of artificial light in areas where it may have a negative impact on species of concern (see, 'The Royal Commission on Environmental Pollution: Artificial Light in the Environment').
  Public bodies also have a 'biodiversity duty' under the NERC Act 2006 to consider the impact that lighting, polarisation and reflection will have on general biodiversity.
- For sites supporting badgers, construction work within 30m of an active sett can only be carried out between July and November and an exclusion zone must be fenced off as approved by the LPA. Work closer than 30m to the sett must be agreed with planning conditions approved by the LPA and only in cases where the impacts are acceptable or where acceptable mitigation is proposed.

N.B. Mitigation reduces the level of harm caused, but it must be remembered that harm will still be done. When the proposed mitigation steps are insufficient, then planning permission may be refused once all other planning issues have been taken into account.

Compensation for Loss

For sites where damage is unavoidable, in spite of mitigation.

Where appropriate, the developer should propose steps for compensating for any loss to biodiversity by creating new habitat in replacement either on site or off-site. However, compensation for lost habitat will not make an unacceptable development acceptable. There are only very limited circumstances where this loss is justified. As outlined in the mitigation hierarchy in Policy G6 of the London Plan, compensation should be of an overall greater biodiversity value than that which is lost.

Examples of compensating actions:

- Enhance existing water features or create a new one, including habitat

suitable for water voles (where appropriate), foraging bats and amphibians.

- Allow areas of undisturbed bank-side vegetation on riverside developments
- Incorporate barn owl or bat 'lofts', bat bricks or bird bricks/boxes within building conversions. Incorporate bat bricks when repairing bridges over rivers.
- Create swift and house martin boxes attached to buildings.
- Create an area of wildflower meadow (plant native species of local origin) and allow natural expansions/colonisation. Plan for longevity, management and maintenance
- Retain as many trees as possible. Ensure that the Root Protection Area (RPA) is taken into account.
- Plant new trees (native and of local provenance).
- Maintain existing mature trees, again ensuring that the RPA is taken into account.
- Plant hedgerows with native species of local provenance wherever appropriate to link areas of wildlife habitat or define boundaries. The planting area should include an un-mowed buffer zone of at least 1 metre adjacent to the new hedgerow.
- Create general undisturbed areas of habitat (woodland, scrubland or grassland) that are managed for wildlife.
- In some cases, a management plan for new habitats will be needed and associated funding/provision for long term upkeep, (e.g. wildflower meadows need an annual haycut and removal of arisings).

N.B. Artificially created habitat will be greatly inferior (from a biodiversity perspective) to established habitat. Wherever possible, it will be better to retain a remnant of an established habitat rather than to try and recreate it in another area.

Enhancement and Provision for Biodiversity in New Development

For sites which have limited biodiversity interest.

The London Plan principles of Biodiversity Net Gain and Urban Greening should be applied to the design of developments. Developers should look to design in opportunities to improve habitats for biodiversity conservation and to increase the overall quality of the development by enhancing existing habitats or creating new areas appropriate to the wider landscape context.

For example by:

- Better management of habitats that already exist.
- By restoring habitats that have been degraded or neglected by previous development.
- Creating areas of new habitat such as woodland, hedgerows, scrubland, wildflower meadow or ponds in landscaped areas or public open space.
- Siting open space and landscaping so that planting within them forms a

wildlife corridor and habitat link between adjacent green areas.

- Ensuring planting schemes use native species of local provenance unless there is a good reason why not (as might be the case within a garden). Any introduced plants should be locally grown from stock known to be disease free and in soil harbouring only native, and preferably local, fungi and soil animals. Otherwise there is a risk of spreading plant diseases e.g. problems caused by imported ash infected with the fungus (*Chalara fraxinea;* new name *Hymenoscyphus fraxineus)*, oak processionary moth and the fungi (*Phytophthora ramorum)* and *P. kernoviae* imported on rhododendron.
- Where horticultural planting is appropriate, invasive species such as cherry laurel (*Prunus laurocerasus*) should never be included near or adjacent to any green space or woodland.
- Making provision on new buildings for species such as bats, house martins, swallows, swifts, barn owls or other species that might live locally, e.g. by incorporating bat bricks, swift bricks, bird boxes etc wherever appropriate.
- Restoring landfill and mineral sites to heathland, grassland or reed bed.
- Using Sustainable Drainage Systems so that drainage infrastructure also acts as biodiversity habitat, such as swales.
- Consider using manageable green roofs/green walls in urban areas to mitigate excess heat as well as increasing biodiversity and urban greening.

Provision for Biodiversity in New Development

Practitioners should use the Natural England Biodiversity Metric to calculate net gain and submit this information as part of development proposal. Details of specific enhancements and net gain opportunities are outlined below.

Artificial Nest/Roost sites

New development will be expected to provide artificial nesting opportunities for birds and roosting/hibernating opportunities for bat species. Other measures to encourage and provide habitat for important pollinator species is also expected to be provided within new development. Table V below provides guidance on the number and location of integral swift nest bricks and bat boxes/bricks that are expected in suitable new developments.

Table V: Expected provision of artificial nesting features for different types of development

Type of development	Bird nest sites for building-dependent birds	Bat roost sites	Pollinator provision
Residential Housing	1 per house	1 per 5 houses	1 bug hotel per 5 houses plus 25% of soft landscaping designed to provide nectar sources
	1 per 2 flats	1 per 10 flats	1 bug hotel per 10 flats plus 25% of soft landscaping designed to provide nectar sources
All college and school buildings and student accommodation	1 per 250 m^2 floor space	1 per 500 m^2 floor space	1 bug hotel per 500m^2 floor space plus 25% of soft landscaping designed to provide nectar sources
Hotel	As student accommodation	As student accommodation	As student accommodation
Commercial / industrial / Other	1 per 1000m^2 floor space	1 per 2000m^2 floor space	1 bug hotel per 2000m^2 floor space plus 25% of soft landscaping designed to provide nectar sources

Bats

The Bat Conservation Trust has published guidance for providing net gain for bats. This includes guidance on Core Sustenance Zones and important habitats surrounding roost sites and how net gain can be achieved on a species level.

Bat-Safe Roofing

Where a development or refurbishment of a building requires work to be done on a roof/roof space known or suspected to be used by bats, the use of a bat-safe roofing membrane is mandatory. Until independent tests evaluating the snagging properties of the newer roofing membranes are completed and the results discussed with Natural England, the only bat-safe roofing membrane is bitumen 1F felt that is of a non-woven short fibred construction. Recent scientific research on this issue can be found here.

Other Opportunities

Incorporation of small ponds and nectar rich plants to encourage bat prey.

Encouragement of linear features tree and hedges. The Bat Conservation Trust website includes guidance on Enhancements for Bats and Gardening for Bats.

Badgers are protected species and therefore development should avoid harm to established badger setts and where necessary provide protective areas around setts for the protection of the occupying animals. Existing setts may be enhanced

by the retention and provision of wooded areas and accessible residential gardens to allow badgers to continue to forage within their territorial range.

Hedgehogs are in a significant decline in the UK, partly because of a reduction in suitable habitat including removal of linkages between residential gardens which restricts their movement. On all developments landscape scale connectivity should be considered so that the development fits into the wider landscape. Gardens designed with areas of long grass and log piles can provide hibernating and refuge areas and the provision of 13 x 13 cm gaps at the base of fencing panels to link gardens to each other and greenspaces reduces their use of roads.

Provision of purpose-built permanent hedgehog houses will also encourage hedgehogs into gardens and supply them with suitable diurnal and hibernation accommodation.

For more information about hedgehogs and hedgehog-friendly garden features, please see Hedgehog Species Action Plan and Hedgehog Street.

Reptile and Amphibian habitat may be enhanced by providing on site refuge areas in order to enable a site to sustain a larger population within a smaller area. Wildlife corridors can be used to create good quality habitat to facilitate the dispersal of reptiles and support the population. Types of enhancement work may include the retention of some scrub and adjacent long grass grading to short grass (ecotone) for basking. Other features such as wood piles or banked areas (including compost) to create hibernation sites should be considered. Site management plans secured by planning condition may be required in some cases to ensure the effective implementation and long-term retention of such habitat.

Invertebrates including many pollinating insect species are also in decline in the UK, with habitat loss contributing significantly to this. Developers are encouraged to provide suitable habitat for invertebrate species. This can be done in a variety of simple ways, the most important of which is retaining or planting native species wherever possible because native herbivorous invertebrates are adapted to eat them. Many pollinators for example, including butterflies and moths, eat native plants in their larval stage when they also provide food for the young of many birds. Nectar-rich flowering species should be provided throughout the summer months within wild growing areas. The provision of ‘bug hotels’ will provide homes for a range of insects including solitary bees. Provision of dead wood and wood piles will provide homes for important invertebrate species such as stag beetles and encourage growth of some saprophytic fungi. Post and rail fencing will provide a substrate for lichens.

Ponds and other standing water can provide excellent habitat within the grounds of a development for a range of aquatic species including amphibians, as well as providing attractive visual amenity features. The biodiversity benefits of ponds are significant and they can be incorporated into sustainable urban drainage systems. Consideration will need to be given to their ongoing maintenance however (see monitoring section below) and some fencing around them may be necessary for health and safety reasons.

Biodiversity Opportunities Within the Landscape

Landscaping and the provision of native plant species within new development is a key way to improve biodiversity. Developers often opt for cheap or readily available landscaping plants that offer little either in terms of variety or biodiversity enhancement. Planning conditions relating to landscaping in Bromley are likely to require a minimum of 30% native plant species of home grown stock and no invasive species. Developers should check the provenance of stocks from the nursery where it was grown as imports can contain INNS. UK grown stock should be raised from UK seed.

Native plants should be given primacy in terms of importance when considering planting schemes for new development, particularly those adjacent to areas of important habitat. Examples of native trees, hedge species and other plants are detailed below:

Hazel, Field Maple, Hawthorn, Alder Buckthorn, Birch, Blackthorn, Crab Apple, Rowan, Goat, Grey and other willows, Aspen, Wild Cherry, Bird Cherry, Whitebeam, Elder, Holly, Alder, Ash, Pedunculate and Sessile Oak, Wild Privet, Dog Rose, Dogwood, Wayfaring Tree, Guelder Rose.

Amenity grassland, verges and other grassland may sometimes be planted with wildflower, grass species and wildlife attracting bulbs in order to attract pollinating insects but ideally this should be avoided as it is better to encourage native plants already in the seed bank. A management plan setting out the grass cutting regime should be provided following Plantlife's Managing Grassland Road Verges document.

Verges and connecting lanes provide a rich diversity of wild flowering plants and grasses and should be retained, wherever possible when developing land. Verges may form wildlife corridors and important connective habitat between different open areas and play a similarly important role for wildlife as hedgerows.

The **Partnership for Biodiversity in Planning** aims to provide resources to help consider protected and priority species earlier in the UK planning process and encourage building projects to deliver a net gain in biodiversity. This includes an innovative web-based planning tool – the Wildlife Assessment Check – that offers householders and small to medium scale developers a simple check to see whether a potential development project requires expert ecological advice.

This advice is designed to provide greater certainty for developers and allow them to incorporate the appropriate wildlife features from an early stage in the building design process. It is also aimed to facilitate planners' review of planning applications on biodiversity aspects and avoid the need to use conditions where developers have complied with the guidance. However, conditions would still be needed where developers have not done so.

Planning Conditions and Planning Obligations

Planning conditions an obligations may be used to secure biodiversity gain and long-term management and monitoring of a site. Planning obligations may also be used in exceptional circumstances to secure off site compensation (offsetting) where a development results in unavoidable biodiversity impacts. Planning conditions may be imposed on any planning permission provided that they are necessary, reasonable, relevant to the development in question and enforceable.

Most aspects of ecological assessment, mitigation and enhancement will be addressed during the planning application stage, through the detailed design of the development and submission of all relevant appraisal information. However in some cases it will be necessary to secure further matters, such as delivery and working methods, through the use of planning conditions.

For the majority of developments, there may only be a small number of biodiversity related conditions, such as a Biodiversity Enhancement Plan, and possibly informatives to remind developers that vegetation clearance impacts on potential bird nesting sites should avoid the nesting season. Where possible, vegetation clearance should be minimised to accommodate development whilst retaining vegetation elsewhere on the site.

For more complex sites, there is likely be a requirement for more detailed assessment, such as a condition for a Construction Environmental Management Plan (CEMP), a Landscape Ecological Management Plan (LEMP), and a detailed lighting scheme to ensure no light-sensitive wildlife such as bats are harmed as a result of the development.

The use of planning conditions to request ecological surveys after planning has been granted will only be applied in exceptional circumstances, such as:

- Where ecological surveys may be out of date at the time of commencement of development, but where they were in date at the time of application.
- Where development is phased, therefore updated ecological surveys are required for later stages of the development.
- Where sufficient information has been provided such that additional information would not make a material difference to the decision maker, however further surveys will be required for example to secure mitigation licences for current European Protected Species which will be protected by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

Carbon Neutrality

Planning applications are expected to contribute towards the Mayor's target of a carbon neutral London by 2050 and Bromley's Net Zero Carbon strategy (2029). Alongside carbon offsetting technologies, natural processes remain a key contributor to the removal of carbon from the atmosphere and should be fully considered in the planning process. Tree removal should be minimised wherever

possible as large established trees often sequester more carbon than smaller replacement trees. However, planting new trees, particularly fast growing species such as silver birch and willows, hedgerows and wildflower meadow habitat in new developments will increase carbon storage as well as biodiversity. See habitat sections for more information.

Particularly in summer months, trees help to reduce air temperature as they release water vapour into the atmosphere through transpiration. Large and older trees are often preferable as they transpire more water and contribute to cooling. Species such as oak, ash, willow and sycamore are particularly good for storing carbon. More information can be found at Valuing London's Urban Forest.

Improving Air Quality

The London Plan outlines that development proposals should not lead to further deterioration of existing poor air quality and must be at least Air Quality Neutral. Biodiversity enhancements and planting in particular can have a positive impact on air quality. Not only do trees and plants store carbon both above and below ground, they also help to reduce pollution by removing particles from the air including nitrogen dioxide, ground-level ozone, ammonia and sulphur dioxide. It is estimated that 1.4 million kilograms of air pollutants including fine particles were removed by natural vegetation in 2015 – saving a potential £1 billion in avoided health costs. Species that have a particular capacity to improve air quality include ash, silver birch, common alder and field maple. More details on using trees to improve air quality in cities can be found here.

Invasive Non-native Species

The use of invasive non-native species (INNs) must be avoided when considering landscaping, biodiversity net gain and other enhancements within the preparation and submission of planning applications. Further information on invasive non-native species can be found at **Appendix D** and include Cherry Laurel (*Prunus laurocerasus*), Snowberry (*Symphoricarpos albus*), Rhododendron (*Rhododendron ponticum*) and some highly invasive aquatic plants.

The list for London invasive non-native species is considerably longer and can be found here.

Wildlife Corridors and Linking

Planning professionals are expected to consider wildlife linkage and this Biodiversity Plan encourages developers to improve existing links (e.g. along river corridors, woodland edges) and make new links between existing wildlife habitats whenever possible. For example, when developing sports grounds or building new schools native species rich hedgerows can be included along boundaries providing wildlife habitat, educational opportunities and linking green spaces without in any way impairing the sports facility or school grounds.

Wildlife corridors and linking are considered to be essential features of the Local Nature Recovery Strategy that Bromley will be producing in response to the

Environment Act. The Council has established a Woodlands Establishment Project Group to assist in providing linked habitats for biodiversity gain and carbon mitigation. The Council has also become a delivery partner of the Nature Recover Network being established by Natural England to provide a Local Nature Recovery Strategy for London as required by the Environment Act.

Access to wild spaces is important for Londoners and such linking is a key component in maintaining the London National Park City, providing access to wild spaces along routes from inner London to bring the countryside into the town.

Step 3: Monitoring and Management

For sites where planning permission has been agreed.

Developers granted planning permission need to ensure the success of biodiversity protection and enhancement measures through monitoring and management.

This may include:

- Monitoring of a site during and post construction to ascertain any effects on wildlife, especially protected species.
- Ensuring the development process complies with wildlife law.
- Monitoring retained features and new or enhanced habitats to gauge their success.
- Provision for the appropriate management of retained features and of new or enhanced habitats for as long as necessary; such as a 5-year management plan with the developer.
- Avoid the use of herbicides and pesticides within the management regime.
- Include management to prevent the spread of invasive species such as Japanese knotweed, Himalayan balsam, giant hogweed and the currently unregulated cherry laurel. In wetland areas these may include New Zealand pigmyweed (*Crassula helmsii*), parrot's feather (*Myriophyllum aquaticum*), floating pennywort (*Hydrocotyle ranunculoides*) and creeping water primrose (*Ludwigia grandiflora, L. hexapetala and L. peploides*). (See **Appendix D: Invasive Non-Native Species in Bromley**)
- Agreement with a local residents or Friends group to handover on-going management responsibility.
- A commuted sum for management secured through a planning obligation to cover long-term maintenance costs.

Biodiversity Advice for Permitted Development

Permitted development refers to improvements homeowners can make to their houses without the need for a planning application.

Although planning permission is not required, it is still necessary to ascertain the presence of protected species in order to comply with relevant wildlife legislation. More information about protected species in LBB can be found in Section 5, Protected Species.

Typically birds and bat species are most affected. Surveying for nesting birds or roosting bats is advisable before starting work. In the southern part of the borough surveying for dormice may be required and for work affecting ponds, a survey for great crested newts is also advisable. Bats, dormice and great crested newts are all Fully Protected under the Wildlife and Countryside Act 1981 (as amended), Schedule 5. The development of a site where Fully Protected Species occur can go ahead only if licensed by Natural England.

Birds – to avoid disturbing nesting birds, necessary work must be done outside the nesting season. All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended by the CROW Act 2000) whilst they are actively nesting or roosting.

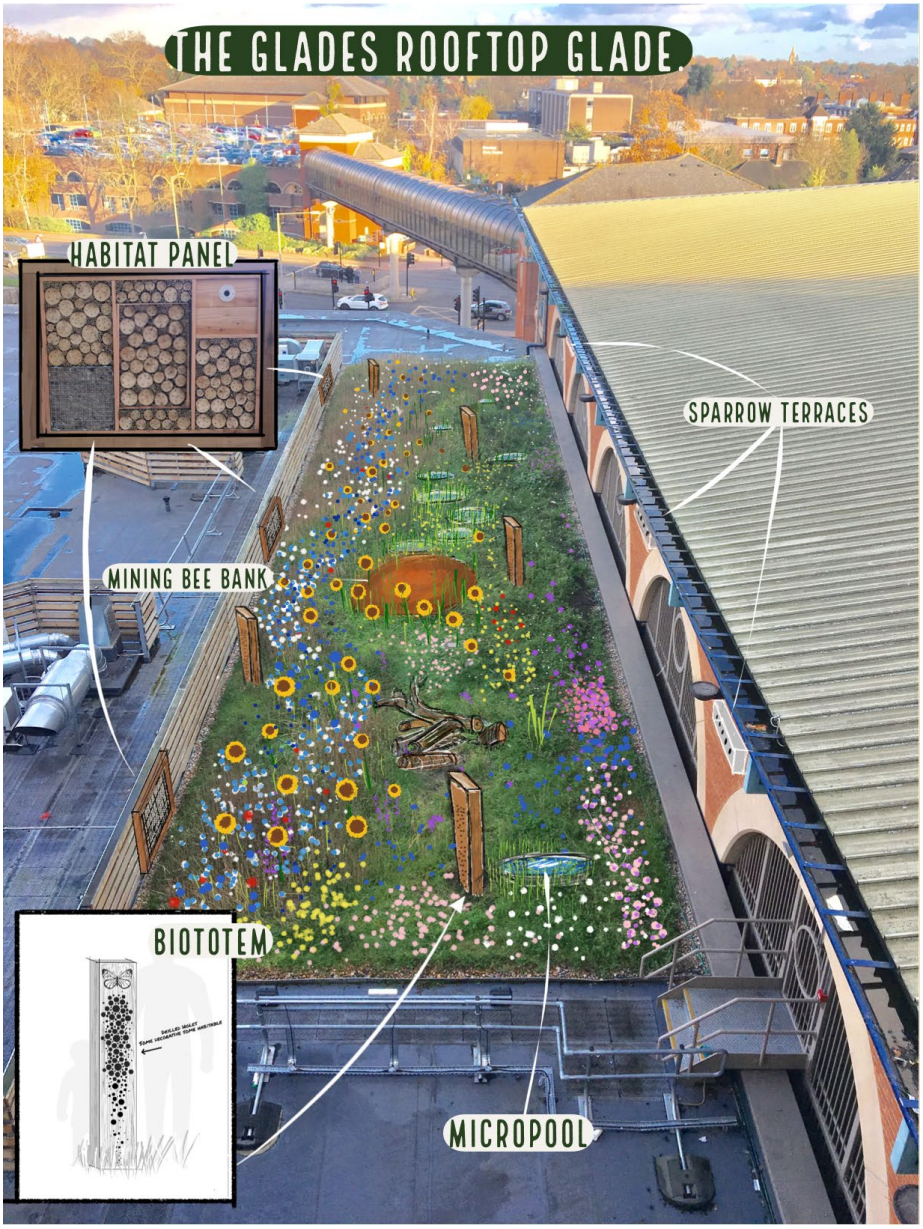
Bats, dormice and great crested newts – Under the Wildlife and Countryside Act 1981 (as amended) It is an offence to damage, destroy or disturb access to any structure or place that these animals use for shelter or protection, even when the animals are absent, and when bats, dormice or great crested newts are found to be present, undertaking works may require a licence from Natural England. It is recommended that householders consult a qualified ecologist.

Badgers and their setts are protected under the Badgers Act 1992

Reptiles: Slow worm, common viviparous lizard, adder and grass snake are protected from intentional killing or injuring under the Wildlife and Countryside Act 1981.

If nesting birds, dormice, great crested newts, bats or reptiles are discovered once works have started, the work must stop immediately and the home owner should contact Natural England for advice and the local planning authority should be informed.

CASE STUDY: THE GLADES GREEN ROOF



The Glades Shopping Centre has created a biodiversity green roof to provide a mix of habitats and a species-rich wildflower area. The green roof acts as an educational tool for passing shoppers and creates a habitat link with neighbouring habitat, particularly the Queens Gardens to the north. The Wild Glades project is a good example of how a range of biodiversity measures can be incorporated into design or in this case retrofitted to existing development.

Useful References

A Vascular Plant Red List for England 2014

Biodiversity in Bromley

Countryside and Rights of Way (CROW) Act 2000

Grassland Fungi

Hedgelink

Hedgerow Regulations 1997

Partnership for Biodiversity in Planning including links to partner websites

Biodiversity in Planning Wildlife Assessment Check

Natural England Standing Advice

Natural Environment and Rural Communities (NERC) Act 2006

Biodiversity in London – GLA

Protection of Badgers Act 1992

The Royal Commission on Environmental Pollution: Artificial Light in the Environment

JNCC UK BAP Priority Habitats

JNCC UK List of Priority Species 2007

CIEEM Guidelines for Preliminary Ecological Appraisal

CIEEM Biodiversity Net Gain – Principles and Guidance for UK Construction and Developments

Bat Surveys for Professional Ecologists: Good Practice Guidelines

Bat Conservation Trust Artificial Lighting Guidance

Wildlife and Countryside Act 1981 as amended

London Borough of Bromley Local Plan (2019)

Mayor's London Environment Strategy (2018)

Natural England Handbook on creating Nature Networks

The Royal Town Planning Institute (RTPI) Plan the World we Need

Urban Greening For Biodiversity Net Gain: A Design Guide

Best Practice Guidelines for Land Managers

Land managers have the responsibilities and costs associated with land management. They also have the most power to benefit wildlife through the way they maintain their sites.

Getting started

- **Survey your site**. Have an ecological survey done or search your local records office or the NBN Gateway for existing wildlife records. Contact local wildlife groups and encourage them to send you records and notify you of new findings. Any priority species and their requirements must be highlighted within a management plan. The presence of invasive non-native species indicates where specific management is required to remove them.
- **Control public access**. If your site is open to the public, decide how to guide access to minimise disturbance, protect sensitive habitats and maintain site security. Maintain official paths in good condition to deter the formation of unofficial paths and for site safety.
- **Know the law**. There is legislation in place regarding land management practices. Ensure you have up to date information relevant to issues on your site such as protected species, felling licenses, common land, pesticide use etc.
- **Follow a management plan and update as necessary**. For SSSIs the management plan must be agreed with Natural England. Most habitats develop over years or decades. A management plan allows the land manager to plan ahead and allows for continuity of management following a change of personnel. When priority plants or animals are found to be present, the plan **must be updated and followed accordingly**.
- **Tree safety.** Survey trees near official paths and boundaries at least once a year and maintain in a safe condition. For ancient and veteran trees see guidelines below.
- **Get advice**. If in doubt, seek further advice from the local authority, idverde Countryside Team, government organisations such as Natural England, the Forestry Commission, the Environment Agency and DEFRA, or third sector wildlife and conservation bodies, such as the RSPB and local Wildlife Trusts.

Woodland Management Guidelines

- All woodland work must take place outside the nesting/breeding bird season (October-end to February).
- Manage the woodland so as to ensure a mixed age structure, species diversity and valued wildlife habitat for example by coppicing, thinning and retaining dead wood.
- Retain high forest habitat as well as coppiced woodland.

- Aim for at least 10% scrub cover of species such as Hazel, Hawthorn, Blackthorn, Dog Rose, Wild Privet, Wayfaring Tree, Dogwood, Crab Apple, Elder, Goat Willow or Guelder Rose.
- Control the growth of non-native species or, if possible, remove them (e.g. Rhododenron: *Rhododendron ponticum,* Cherry laurel: *Prunus laurocerasus*).
- Do not introduce garden plants or non-native species into woodland.
- Maintain open features, such as rides, glades and scalloping of woodland edges.
- Unless a safety hazard, retain any standing or fallen dead wood as habitat for fungi, invertebrates, hole-dwelling birds, small mammals etc. Seek specialist advice with regards to veteran trees. According to UK Forestry Standards 20ton deadwood per ha. is required for sustainable woodland biodiversity.
- Where possible leave deadwood where it lies. If it has to be stacked make log piles in both shady and sunlit areas avoiding areas of important ground flora. Log piles provide refugia and hunting grounds for small mammals, reptiles and hibernating amphibians.
- Retain brash wherever possible e.g. as dead hedges to reduce use of desire lines or racks within woodland.
- Use fires only for **essential** burning of brash and cuttings, reusing existing fire sites wherever possible. Use raised structures to avoid burning directly on the ground (e.g. metal sheeting raised up by bricks or logs). Avoid locating fires within 10m of the canopy or near areas of woodland flora that indicate an ancient site.
- Do not add nutrients such as fertilisers or organic manure to woodland soil.
- Avoid disturbance or compression of woodland soils e.g. by heavy machinery.
- Maintain woodbanks, these old boundaries sometimes support species of ancient woodland lost from other woodland areas.
- All new tree plantings should be of native species of local provenance.
- Favour natural regeneration over restocking where possible (ground flora or trees).
- Retain mature growth of ivy on trees, except where it is causing problems for the tree, e.g. growing along large tree branches and causing them to become unsafe. Control young ivy growth on trees to allow colonization by bryophytes and lichens.
- Maintain or reinstate coppicing cycles where appropriate.
- Maintain paths and encourage people to keep to them – trampling on sensitive woodland flora will kill it.
- Promote buffer zones around semi-natural ancient woodland to protect from damage.
- Introduce protective measures where significant grazing or browsing occurs (e.g. deer) such as dead hedging around coppice coupes or laying of brash over newly coppiced stools.
- Identify opportunities for linking existing woodland areas and utilise. them, for example, through the planning system.
- When planting new woodland, take advice. Plant the right tree in the right place. Avoid planting on sensitive habitats such as acid, chalk or good

quality neutral grassland or heathland.

- Survey and monitor woodlands. Send records to GiGL, Kent and Medway Biological Records Centre (KMBRG) and /or Kent Botanical Recording Group. Make information available to Site Managers and Friends Groups, including protected species such as dormice, bats, great-crested newts etc.

Traditional Orchard Management Guidelines.

Maintaining an Established Orchard

1. Take stock of the current fruit trees in terms of health: pests, bacterial or fungal diseases and broken branches/trunk open to infection. This assessment can be at any time of year. Identify the variety/cultivar (to do so requires fruit from the tree so this work will take place late summer or autumn).The fruit id website is free to use and is comprehensive for identifying cultivars. It also contains cultivars of other fruit e.g.pear and plum.
2. Construct a map/inventory of the site identifying what tree is placed where and any special characteristics e.g. animal paths, rare lichens, mistletoe.
3. Determine a work plan; pruning will take place during the winter, planting will be in the spring, the meadow/grassland will be cut at least annually in autumn and the cuttings will require removal, harvesting will take place from late August to early November. Managing boundaries and any scrub will be determined by the state of the site and e.g. provision for nesting birds. Determine what you will do with the harvested fruit, how it will be done and who else might need to be involved.
4. Determine the required resources to fulfil the plan, both in terms of workload, skills and tools required.
5. Consider possible enhancements, for example blossom or fruit thinning and introduction of more pollinators and what will attract them.
6. Pest management: do not use pesticides but encourage insects and other invertebrates which predate on the pest species. For further advice see People's Trust for Endangered Species - Orchard Pests and Pest Control.

Management of meadows, hedges and other boundaries should be in line with the relevant guidelines. Long grass and wildflowers are important for pollinators and other invertebrates.

Restoring a Neglected Orchard

1. Ensure access to each of the fruit cultivars. Access must be sufficient to assess the health of the trees.
2. Resolve any conflict between replacing dead trees and leaving them standing Dead standing and fallen wood is a very important habitat and you may wish to have varying ages of fruit tree including old dead trees and new planting.
3. Conduct a flora, fungi, lichen, bird and invertebrate survey to provide a habitat baseline.

4. Check security, access and safety of the site.
5. Construct a pruning plan for each tree in line with RHS guidance on renovating old fruit trees. This plan may take a number of years as no more than 15% of tree *foliage* should be removed in any single year.
6. Progressively move to maintaining an established orchard [above].

Creating a New Orchard

1. Determine the size. Boundaries and other features e.g. pathways, water sources, hedge and tree line, orientation (e.g. faces south west), geology, soil, drainage and access to the site.
2. Determine whether other priorities, e.g. SSSI status, rule out the site.
3. Determine the number and type of cultivars to plant. These are normally ordered in the summer/autumn and delivered in the New Year. Most suppliers will provide 2 or 3 year old stock. Ensure the selected trees are able to pollinate each other. If you have walls, training fruit trees up them as espaliers is a productive and attractive option; half standard trees require to be at least 6 metres from other trees (in all directions) and full standards – particularly Bramleys- 8 metres.
4. Ensure the provenance of the trees is sound and the supplier is reputable. Try to source scarce local varieties if possible. Some potential choices are Colonel Vaughan, a Kent apple known from the 1660s, Gooseberry – from the early 1800s, Kentish Fillbasket known from before 1820 or Mabbotts Permain, dating from 1883. On a general basis, apples were bred over time to be both better fruit producers and disease resistant.
5. Stake and guard the newly planted trees if necessary. Newly planted trees will benefit from extra watering and cut a halo of competing vegetation around them for the first 2 years.

You should see fruit blossom no later than the second year after planting – and fruit no later than the year after that. A full-sized standard tree can, subject to being disease free, will live for a hundred years if pruned correctly.

Scrub Management Guidelines

- Be aware that scrub is a very important habitat for a wide variety of species including invertebrates, nesting birds and rare species e.g dormice, nightingale.
- Scrub should be considered as part of a mosaic with, for example, grassland or heathland. It is important the balance between these other habitats is maintained.
- Prepare a Scrub Management Plan based on the species present or retrievable in the habitat mosaic. Retain and manage scrub, reduce it or encourage scrub expansion according to species present.
- Follow a rotational scrub management programme. The length of the rotation cycle must be adjusted according to priority species present (e.g. nightingale requires 12 year rotation). Never manage more than 1/3rd of the site in any one year and never completely eradicate scrub from the site.
- Manage scrub so that you have a diverse age and height structure. No

more than 50% of the scrub should be mature, or over mature.

- Where scrub is invading a species rich hay meadow, scalloping (cutting a wavy edge) on rotation can allow scrub habitat to remain without encroaching the meadow.
- Scrub management should be carried out during winter, but must be timed and carried out carefully to cause minimal disturbance. Look out for hibernating animals such as hedgehogs and dormice, or eggs of rare butterflies such as brown hairstreak on 1-2 year old blackthorn twigs.
- Do not apply fertilisers, fungicides, pesticides, organic manures or waste materials.
- Avoid ploughing or other cultivation.
- Remove invasive, non-native species e.g. Japanese knotweed.

Hedgerow Management Guidelines

The following guidelines apply whether maintaining by hand or using flails/machinery:

- Allow hedges to reach and maintain a minimum height of 2m, and minimum width of 1.5m. A height of 3-5m is ideal for many species.
- Trim hedges between 31st November and 28th February only.
- Trim hedges no more than one year in three. Trimming of the hedge should be rotated to avoid cutting the whole length in the same year.
- Each time the top of the hedge is cut, raise the cutting line about 10cms to prevent a hard knuckle of wood forming at the trim line. The development of a trim line leads to mushroom shaped growth with gaps forming at ground level.
- Only if required, cut the herb layer adjacent to the hedge every other year in autumn/winter and remove dense cuttings. Leave herb layer at least 4cm high and do not expose bare soil.
- Do not use pesticides, fungicides or herbicides at hedge bases.
- Remove hardwood cuttings from the edge of the hedge after trimming.
- Retain standard trees within the hedge.
- Retain mature growth of ivy on trees where it is safe to do so.
- Retain standing deadwood unless it presents a safety hazard.
- Plant any gaps in the hedge with native species of local provenance.
- Use traditional management techniques such as hedge laying where possible; hedge laying can reduce the need for mechanical maintenance and provide additional benefits for wildlife.
- Protect newly-laid hedges from grazing animals.
- Reduce tree branches overhanging and shading the hedge if they are causing die back of hedge plants beneath.
- Remove dumped rubbish and garden waste from hedge bases.
- Survey regularly to inform management.
- Plant new hedgerows (of native species with local provenance) where appropriate to improve links between woodland copses or other hedgerows.
- Encourage public interest and involvement in traditional hedgerow management.

- Survey hedgerows and if rare species present take appropriate advice, e.g. if Brown Hairstreak present seek advice form Butterfly Conservation.
- It is illegal to grub out more than 20m of hedgerow without consent from the local planning authority (**Hedgerow Regulations Act 1997**). (This regulation does not apply to domestic gardens.)

More information on hedgerow management can be found on the Hedgelink website.

Management of Ancient and Veteran Trees

N.B. Management of ancient trees is very difficult and requires advice from highly skilled experts.

- Have trees assessed regularly and monitor their surroundings.
- Avoid cutting wherever possible. Use arborists or contractors experienced in ancient tree management for required works.
- Pollarding is a traditional method of tree management that may be suitable for ancient trees, but requires expertise to be carried out correctly.
- Make sure any ancient trees have been registered on the Woodland Trust's Ancient Tree Inventory.
- Re-route footpaths to prevent root compression, this also protects the public in case of branch loss and protects the tree from surgery for health and safety reasons. Tree roots extend a minimum of 1.5 times as far as the tree canopy reaches and may extend 3 times as far, depending on species. Consider fencing off this area around the tree if necessary.
- Try to germinate seeds/nuts/acorns from the ancient tree and plant any resulting saplings elsewhere on your site if there is an appropriate location away from any sensitive habitats. Note that oak saplings need to be planted in open situations but need to be protected from grazing.
- Clear encroaching scrub and trees growing in close proximity to ancient trees but note that sudden release from competing trees can shock and damage them so any works must be done **gradually**.
- Do not allow ivy to shade out lichens on bare trunks.

For more information about ancient trees, see the Ancient Tree Forum website.

Grassland Management Guidelines (for Hay Meadows)

- Cut grass in late-summer or early autumn; aim to achieve a sward height of 2- 10cm through the winter and early spring to reduce harm to invertebrates and their eggs at soil level and just above. Remove all cuttings .
- Take advice regarding priority species; micromanage specific areas where they are present and adjust timings as necessary.
- When grazing, ensure livestock breeds used are appropriate for the site, and stocking rates are correct for the area being grazed.
- Avoid summer grazing unless at very low stocking rates across large land

areas, and with advice from Natural England.

- Keep undesirable species under control (less than 5% of the area) e.g. Common Ragwort.
- Avoid ground disturbance of more than 30% of the total grassland area in one year. Small areas of disturbance can benefit specialist species such as kidney vetch and bee orchid.
- 10-20% of the hay meadow area should be left uncut each year. The area left uncut is known as an 'insect bank' and should be moved every year (there should be an overlap with the previously uncut area).
- Manage scrub boundaries on rotation. Note point 2 above.
- Before managing grassland as hay meadow, check if any rare plants or grassland fungi are present, some of which may prefer a shorter sward height.
- As far as possible do not allow soil to be compressed by machinery, trampling etc. If grassland fungi are present their mycelium is particularly susceptible to damage.
- Areas of bare soil within grassland are important, especially on south-facing slopes, because they provide nesting sites for solitary bees, many species of which are under threat.
- When creating new meadow habitat, survey first to establish soil type and if there are existing wildflower species present. Cutting and clearing arising from an area proposed as new meadow, either annually in autumn or in early spring and autumn will reduce soil nutrients encouraging growth of wildflowers from seeds already in the seedbank. If after 3-5 years there is a need to re-seed, use appropriate species, sourced locally (e.g. use hay collected from another local site of the same soil type).
- Do not apply organic manure, pesticides, fungicides or herbicides to the meadow area.
- Survey regularly to inform management.

Lowland Heath and Lowland Valley Mire Management Guidelines

General Guidelines

- Do not apply fertilisers, organic manures or waste materials.
- Control undesirable species e.g. excessive bracken (more than 10%), excessive gorse (more than 10%) and developing secondary woodland.
- Control bracken through long-term management rather than complete control. This could include cutting twice/season and /or pulling.
- Maintain a mosaic of dwarf shrubs, acid grassland and bare earth with small amounts of scrub, as appropriate for any rare or declining species on site.
- Expand small fragments of heath and rejoin fragments together where possible.
- Cover of dwarf shrubs should be between 25% and 90%.
- Populations of notable dwarf species such as *Erica sp*. or *Vaccinium myrtillus* should be maintained.

- Create a wide range of age classes of dwarf shrubs present through cutting and removing a number of small patches of vegetation each year (up to 5% of the land).
- Remove areas of trees and scrub from within the main heathland so that there is no more than 15% cover. Use tree poppers where possible, avoiding root pulling in areas where there may be a reptile hibernaculum. Only treat cut stumps with herbicide when there is no alternative. On SSSIs seek advice from Natural England.
- Control trees and scrub through rotational coppicing of permanent scrub, and cutting and removal of undesirable scrub and trees.
- Restrict the use of fires as far as possible. Re-use existing fire sites and use raised structures to avoid burning directly on the ground (e.g. metal sheeting raised up by bricks or logs.
- Graze in summer where practicable to control coarse grasses and encroaching birch scrub. Avoid winter grazing as this may lead to loss of heather.
- When grazing on heathland, ensure the livestock breed is appropriate for the site, and stocking rates are correct for the area being grazed.

Lowland Valley Mire

- Maintain water levels.
- Maintain areas of open water.
- Remove saplings.
- Prevent scrub development.
- Do not use pesticides, herbicides or fungicides of any kind.
- Control invasive plants such as purple moor grass (*Molinia purpurea*), preventing seeding wherever possible.
- Restrict public access but inform public of the sensitivity of this habitat.
- Survey and monitor. Use findings to inform management.

Pond & Wetland Management Guidelines

General Wetland Habitat Guidelines

- Do not use pesticides, fungicides or fertilisers within 6m of ponds, rivers, ditches or wet woodland. If Japanese Knotweed is present seek a licence to treat it from the Environment Agency.
- Promote scrub on selected parts of pond, river and ditch banks as it provides cover and protection for amphibians and small mammals.
- Maintain some long grass adjacent to ponds, rivers and ditches as it provides shelter and protection for amphibians and invertebrates.
- Do not intentionally introduce any plants or animals (including fish) to ponds, rivers or ditches.
- Manage any undesirable weed species present.
- Control the spread of invasive and non-native wetland species such as Himalayan Balsam, Japanese Knotweed, Floating Pennywort and New

Zealand Pigmy weed.

Pond Management

- Undertake management every two years between September and February to maintain a balance of submerged, floating and emergent vegetation and open water.
- If de-silting becomes necessary, it is best carried out in September or slightly later when many pond species have completed their life cycles. Only 1/3rd of the pond should have silt removed at any one time, care must be taken not to damage the pond liner and dredged material should be left at the side of the pond for about 2 days to allow some of the aquatic invertebrates in the silt to return to the pond.
- For major dredging works the Environment Agency must be contacted for guidance and licensing
- Silt is very expensive to remove from the site so it may need to be deposited locally, but away from plants of conservation interest and sufficiently far back from the pond to prevent it draining back in.
- After de-silting an overgrowth of algae and duckweed may occur in the pond until the system settles down, because disturbance releases nutrients in the silt into the water. Plants such as water lilies can reduce duckweed and algal growth by shading the water.
- Where a decision has been made to introduce plants such as water lilies, they should be native species of local provenance and must be very carefully checked to make **absolutely certain** that alien plants such as New Zealand pigmy weed (*Crassula helmsii*), parrot's feather (*Myriophyllum aquaticum*), floating pennywort (*Hydrocotyle ranunculoides*) or any other invasive water plants or animal eggs (e.g. signal crayfish) are not introduced.
- If great crested newts are known to be present, seek further advice from Natural England protected species team before undertaking works.
- Do not allow trees to shade more than 25% of the southern pond margins.
- Do not introduce or feed waterfowl on ponds.
- To benefit great crested newts, the land within 200m of a breeding pond must be managed and no new barriers such as buildings, walls, tracks, or footpaths created. Potential hibernation sites such as rabbit burrows, log piles, rocky areas or woodland should be retained.
- Prevent dogs, horses and other livestock from entering ponds.
- Discourage the excessive use of fish bait and food for wildfowl to reduce nutrient enrichment. Monitor nutrient enriched ponds and lakes for blooms of toxic blue-green algae (cyanobacteria) during hot summer months, report any such blooms to the Environment Agency and put up warning signs to prevent visitors allowing dogs or other animals from entering the water.

Ditch and River Bank Management

- Cut long grass on one side only of ditches each year in autumn, alternating the sides on a 2 year rotation.
- Clear ditches of debris and dead plant matter in winter. Leave dredged matter adjacent to ditches for 24-48 hours to allow any aquatic invertebrates to return to the ditch, then compost debris.
- Take care not to damage the roots of plants growing on ditch and river banks.

Gardens and Allotments Management Guidelines

- Retain natural features as far as is practicable e.g. ancient trees, ponds and watercourses, native hedgerows and scrub margins.
- Maintain a 'buffer zone' around such features by allowing grass to grow around them and avoid non-native planting in the vicinity.
- Avoid the use of pesticides, herbicides and fungicides e.g. slug pellets.
- Promote the use of natural predators (e.g. frogs, hedgehogs, ladybirds) and companion planting (the close planting of different plants that enhance each other's growth or protect each other from pests).
- Encourage gardeners and allotment holders to create habitat areas within their gardens or allotments, e.g. natural hedgerows, ponds, scrub corners, areas of long grass and patches of nettles since these will support predators which control garden pests.
- Encourage allotment holders to plant flowers as well as vegetables to attract more native pollinators (bees, hoverflies, butterflies, beetles).
- See Bromley Friends Forum website, biodiversity page, for wildlife gardening ideas including native hedge plant information, advice on pond creation and maintenance, mixed native hedge planting, hedgerow maintenance and creating a wildflower meadow.
- Limit the number of bonfires and try to dispose of green waste by composting or green waste bins, to prevent/reduce air pollution.

Churchyards and Cemeteries Management Guidelines

- Grassland – keep grass short where graves are visited and in areas where grassland fungi are present. More remote areas can be left to grow and set seed - 2 cuts a year (April and September) should be sufficient to maintain the open areas. A mown path through longer grassy areas will allow access without trampling the vegetation. To preserve the grassland fungi do not use herbicides or weed killers on the lawns.
- Walls – if rebuilding keep the stones in the same orientation, use lime mortar for repairs. If major repairs are needed do these in sections to allow time for colonisation of lichens, mosses and ferns in the new areas. Ivy can shade out wall plants, bryophytes and lichens so should be kept in check by cutting; do not weed kill or pull it out of mortar joints
- Gravestones – the lichens and bryophytes growing on gravestones are adapted to the prevailing conditions (sunlight/shade or degree of damp) so

do not re-site or re-orient gravestones unless absolutely necessary; do not clean with bleach or other chemicals nor use weed killer around the base of tombs.

- Grass cuttings should be removed from low curbs and ledgers.
- Avoid planting tall shrubs and trees next to the south-facing wall of the church; the shade they cause adversely affects the lichen community on the church wall.

Species-specific Management

- *Wall ferns and wall plants*: lime-based mortar should be used for repairs.
- *Bats*: roosts are protected by law so if a roost is present always seek advice from Natural England. This applies to works on the church and also to other actions e.g. floodlighting, tree work.
- *Fungi*: do not use chemicals on grassy areas.
- *Lichens and bryophytes*: do not remove these with chemicals or hard brushes when trying to read inscriptions. Use a soft brush and water, try an 'inscription rubbing', or use a viewing tube (a piece of plastic drainpipe or the cardboard tube from a kitchen roll) to look at the inscription (see advice from the Family History Society).

Best Practice Guidelines for Friends Groups & Volunteers

Friends groups and other volunteer organisations can make a real difference to the protection and preservation of local wildlife sites. However, it can often be confusing for newcomers to know how best to help wildlife. These guidelines aim to help volunteer groups find the best way to enhance Bromley's biodiversity through the work they do. They are not comprehensive and should be read in conjunction with the Bromley Friends Forum Biodiversity Page and Toolkit. Advice can also be obtained from idverde Countryside Team and Biodiversity Advisor.



Getting to Know Your Site

Any park or green space will have potential for wildlife but don't rush in to do things, research your site first.

- Find out all you can about the potential biodiversity of your site.
- Check with idverde (the local authority agent) or local biological records centre to see if there are any existing wildlife records for your site.
- Speak to the land manager to see if the site has an existing management plan before starting work.
- Check if the site you work on is already listed as a Site of Importance for Nature Conservation (SINC) – See current list of SINCs in **Appendix 1**.
- Check for Tree Preservation Orders (TPOs) that may have been put on significant trees both within parks and on private land.
- Some species are protected by law. If you find evidence of bats, great crested newts, adders or dormice please seek further advice. See more information in **Section 5: Protected Species in Bromley**.
- See if you can find any information about the site's history – was it always woodland or was it grazing land? Look for old boundary features. What type of soil does it have - chalky, acid, clay?

- Always get permission from the landowner or site manager before commencing any work.

Habitats with Particular Wildlife Value

- **Semi-natural Ancient Woodland -** This is woodland that has been in situ for 400 years or more. It supports a rich mixture of wildlife that takes many hundreds of years to develop. Although the trees were regularly harvested the ground was relatively undisturbed so the soil fungi and plants may be the oldest things in the wood. Many of them are not found away from this habitat and support special invertebrates. Bromley contains a third of Greater London's ancient woodland habitat.

Wood Anemones are an ancient woodland indicator

- **Secondary Woodland -** Not usually as species rich as ancient woodland, but it is also important for wildlife and may support rare and protected species including dormice, bats, stag beetles and birds.

- **Traditional Orchards –** Fruit and sometimes nut trees often heritage varieties usually in association with meadow habitat, often including dead wood and sometimes surrounded by native hedgerows. Orchards support a wide range of wildlife including bees, hoverflies, butterflies, beetles, lichens and wildflowers.

- **Scrub** – often undervalued, it provides food and protection for a wide variety of invertebrates, birds, mammals and other animals, some of which are rare or threatened.

- **Hedgerows** – a line or narrow belt of closely spaced scrubs which forms a barrier. Typical hedgerow species include hawthorn, field maple and blackthorn. Some hedgerows are very old, and may have historical significance. Hedgerows often act as 'corridors' for wildlife, linking habitats and providing protection from predators.

- **Ancient and Veteran Trees -** Because of their age and the different niches they provide, each one provides a stable habitat supporting

hundreds of species.

- **Meadows** – grassland that is allowed to grow long and is rich in wildflowers. Many 'improved' grassland areas such as playing fields will once have been wildflower meadows. In some of these areas, wildflowers will regenerate given the opportunity.

- **Heathland** – shrubland found on acid soils, with heather and gorse being typical species.
- **Wetland: Ditches, Ponds & Rivers** – support some of the hundreds of plants and animals which need freshwater or damp habitats.

For more detailed information on habitats, please see **Section 4: Habitats in Bromley.**

Managing Habitat for Wildlife

Regarding habitat management, only do tasks that you have been trained to do. Make sure that adequate risk assessments have been carried out for tasks in the field and that they are adhered to.

Ensure any planting you do is site suitable. Look after the native wild plants you have, they support more invertebrates than non-native species and therefore more birds and bats. If you have to buy native plants for planting make sure they are of local provenance, or at least from south-east England.

Remove plants that don't belong on your site, e.g. Spanish and hybrid bluebells. Garden plants may hybridise with or out-compete native species. Many are unsuitable for native invertebrates and therefore reduce site biodiversity e.g. cherry laurel.

Make sure any work you do is seasonally appropriate

- **Scrub clearance** - must only be done during the winter, approx. October to February (observe weather and act accordingly). This will ensure that birds are not disturbed during the nesting season. Note: it is against the law to disturb nesting birds.

- **Coppicing & felling** (under supervision only, or if trained) mid-winter, when leaves have dropped and trees are dormant and birds are not nesting.

- **Tree planting** approx. November to February

- **Pond/ditch work** September and October are the best months; most amphibians will have left ponds by then and they will not have started hibernating. If you have rare species on site, e.g. great crested newts, seek further advice.

- **Monitoring Ponds for Toxic Blue-green Algal (Cyanobacterial) Blooms** late July, August. Check ponds for pale blue/green emulsion paint like spots and patches on the surface during hot weather and report these to Site Manager.

- **Fires on site** October to March. Try not to have fires on site. If you have no alternative, re-use old fire sites whenever possible and remove the ash when cold. Always check piled up dead brash for hedgehogs, reptiles, amphibians and other animals before having a fire.

- **Hedge trimming** November to February. It is not necessary to cut hedges every year. Natural England recommends that hedges are cut only twice over a six year period. Consider cutting sides of a hedge on rotation. **Never** cut long grass at hedge bases. It is a very important part of hedgerow habitat and will be home to many invertebrates, e.g. butterfly caterpillars as well as larger animals such as toads, slow worms, shrews, voles and hedgehogs.

- **Grass cutting** September: leave till late summer to ensure the seed has set. Always remove any cuttings that you produce (you could either pile them up on site as a habitat pile or remove them off site and compost them).

As you can see from the above list – most habitat based work needs to be carried out during the winter (October to March), leaving you the summer months to concentrate on tasks such as footpath clearance and maintenance, furniture repair and installation and survey work.

Consider adding value to your site through…

- Bat boxes/bird boxes etc – but discuss how you will check, clean and record what is using them. Try to put up bird boxes suitable for LBB's priority species such as house sparrow, starling.
- Leave some wild areas as insect refugia
- Make log piles and/or stag beetle loggeries. Leave dead wood on site whenever it is safe to do so as it is important for invertebrates, fungi and creatures that eat them.
- Maintain main paths in good condition and discourage trampling elsewhere within your site as this will reduce biodiversity.
- Where appropriate, plant native hedgerow species of local provenance.
- Consider whether some of your amenity grassland could be managed as hay meadow to improve conditions for invertebrates including pollinators. The areas where there appear to be the greatest number of herbs present

in the sward is the best to choose, but other areas could be suitable and all would improve over time. Ask the site owner or manager if this could be done.

For more detailed habitat management guidance please see Section 6.2: Guidelines for Land Managers, Bromley Friends Forum Biodiversity Page and Toolkit or contact the *i*dverde Countryside Team, Bromley Biodiversity Partnership or local wildlife charities for further guidance or training.

Best Practice Guidelines for Schools

School grounds, teachers and pupils can make a very important contribution to Bromley's biodiversity. School grounds can provide habitats for wildlife which can become a teaching aide for inspiring a new generation as well as making an important contribution toward health and wellbeing of pupils, staff and local biodiversity. These guidelines aim to outline how schools can improve their grounds for wildlife and maximise their use as an education resource and inspire the next generation.

Why should schools improve their biodiversity management?

- Because it helps meet the objectives relating to the environment and sustainability as required by the National Curriculum.
- Because it gives pupils the opportunity to appreciate wildlife and better understand the world in which they live.
- Because it improves the environment of the school grounds and therefore the workplace.
- Because it improves biodiversity for everyone in the borough.
- Because it helps to protect the future of wildlife in the region.
- Because access to nature has been demonstrated to improve physiological and psychological wellbeing as well as improve behaviour

How to get started

The points below can be useful cross-curricular learning activities throughout the school.

- Get to know your site first. Any open space can have value for wildlife, it doesn't have to be green. You may already have features within your school grounds that are wildlife- friendly. Walk around the grounds and look at what you already have – any grassland, scrub, trees or a pond?
- See if you can find anything out about the land history and neighbouring land. This could tell you a lot about the sort of wildlife that would naturally occur nearby.
- What sort of soil do you have? Is it chalky, acid or clay?
- Check for any Tree Preservation Orders (TPOs) that may have been put on significant trees.
- Find out if your school grounds incorporate or are adjacent to a Site of Importance for Nature Conservation (SINC) – see **Appendices A & B.**
- Do you have any areas which provide a "blank canvas" which could be developed to be more nature friendly? Even if not green.
- Some species are protected by law. If you find evidence of bats, great crested newts,

adders or dormice, please seek further advice – see **Section 5. Protected Species** in Bromley.

- Most importantly don't give up. Trying to make a space more nature friendly may seem daunting and wildlife may not be immediately obvious. If you have the resources to invest in items such as bird feeders or a wildlife camera these can be utilized as excellent engagement tools.

Habitat Creation in School Grounds

One of the easiest ways to improve your school's biodiversity is to create areas for wildlife within your grounds. The work does not need to be expensive or complicated to add significant wildlife value.

Examples of the types of habitat you could create include:

Hedgerows Create a hedgerow by planting a line of sapling trees (known as whips). The trees should be of locally sourced native species such as hawthorn, dogwood, hazel, beech, alder, buckthorn and field maple. Hedgerows provide a habitat for many species.

For more information about hedgerows see **Section 4.4. Habitats; Hedgerows**

Ponds A pond should be at least 500mm in depth and have a staggered bank to allow wildlife to easily get in and out and to provide different depths of water for invertebrates. Ponds should **not** be stocked with fish. If you want to add plants to your pond, they must be native species that have been sourced locally. It is important to check to make **absolutely certain** that alien plants such as New Zealand pigmyweed (*Crassula helmsii*), Parrot's Feather (*Myriophyllum aquaticum*), water fern (A*zolla filiculoides*) or any other invasive water plant are not introduced since these are extremely difficult to eradicate once they are in your pond. Allow the pond to fill naturally with rain water – if a top up is required, try to collect rainwater rather than using artificial water sources. Do not attempt to bring in amphibians from garden ponds. Frogs and toads will colonise a new pond without help. Even the smallest of water features can provide habitat for nature. For more information see **Section 4.8 Habitats; Wetland**.

Wildflower Meadows To create a successful wildflower meadow, it is important that the soil is low in nutrients. This often means removing the top soil if you are using a unwanted corner of the school field. Wildflowers can be planted from seed, but if you are buying a meadow seed mix, ensure that it is appropriate for your soil type and locality. If possible, try to source wildflower seed locally, such as hay cropped from a nearby meadow (this will require permission from the landowner). For more information, see **Section 4.6 Habitats; Grasslands**.

Woodland or Scrub Corners If you only have a small corner of the playing field available, consider planting local native tree and shrub species of local provenance in it. Native plants support more invertebrates than non-native species, providing food for other invertebrates, birds and bats. Trees and shrubs also provide food and shelter for birds and small mammals. For more information, see **Section 4.3 Habitats; Scrub**.

Bees & Butterfly Gardens This can be done even in schools with very limited outside space. Plants which provide nectar and pollen for a wide range of bees, butterflies and other invertebrates can be planted in window boxes, hanging baskets plant pots or raised beds - wherever there is some space. Many of these plants would also be suitable for a sensory garden.

Stag Beetle Loggery Stag beetles are widespread in Bromley, although scarce elsewhere. Stag beetle larvae spend most of their lives underground eating rotten wood. To create habitat for stag beetles, 'plant' some old logs vertically into the ground, so that they are half-submerged. You can also bury piles of wood chippings. Log piles will provide a home for many other invertebrates as well as stag beetles.

Further reading:

Wildlife Trusts: Wildlife Gardening.

Bromley Friends Forum Biodiversity Page.

Managing School Grounds with Biodiversity in Mind

The way school grounds are maintained is often a limiting factor when it comes to biodiversity. Some simple changes to the way your grounds are managed could greatly improve your site for wildlife.

- Landscaping - try to set some areas aside for wildlife within the context of any landscaping. For example, leave a strip of grass to grow long, only cutting once a year. Leave an 'untidy' area of scrub. Include 'buffer zones' of long grass or scrub around habitat features such as ponds or trees.
- Create or maintain linear features within the landscape, e.g. hedgerows and strips of long grass. Use them to connect existing habitat areas. They will act as wildlife corridors.
- Planting – only use native species for planting that are locally sourced. Local wildlife will be adapted to these flowers and plants
- Incorporate wildlife-friendly features around the school buildings, such as bird and bat boxes.
- Avoid the use of pesticides.
- Use only peat-free composts.
- Think about drainage and water waste. Could sustainable drainage systems (SuDS) be used? This can be of a small scale such as using water butts to collect rainwater.

Further Reading: Learning through Landscapes

Using the Outdoor Environment as a Teaching Resource

There are many ways in which you can use the outdoor environment as a teaching resource. Habitats created for the benefit of wildlife can also be used for education

activities. These can be used to meet the requirements for curriculum topics such as working scientifically, food webs, classification, citizenship, English, physical education, history and the wider sciences.

- Hedgerows – bird watching, plant identification and bug hunts.
- Ponds – pond dipping
- Wildflower Meadows – plant identification, bug hunts.
- Bee & Butterfly Gardens – gardening, sensory trails, bug hunts.
- Woodland – bug hunts, bush crafts, den-building
- Forest Schools – Forest School is a popular initiative for outdoor learning. However, if you are considering setting up your own Forest School in your local area, consider carefully the site you choose to use. Forest School should not be carried out on ancient woodland or other sensitive habitats as trampling will cause a loss of ground flora that may not be recoverable.

- **Art, creativity & play** Combined, arts and nature are a powerful and important addition to all of our lives. STEAM (Science, Technology, Engineering, Arts, Maths) is now part of a global movement. Learning outside the classroom can complement a young persons knowledge, experience and enjoyment of the arts in many ways. It can offer a much greater range and depth of experience, stimulate cross curricular learning in areas such as PSHEe, citizenship and history, improve inclusion and offer the opportunities for creative role models from areas outside of the traditional arts. Creativity and play also presents a fantastic opportunity for engagement with the natural world and social development through interactions with other children and adults.

Further Reading:
Learning Together: Schools 76 The Natural Environment Sector. Nature Friendly Schools Project
National Trust: Natural Childhood Report
Council for Learning Outside the Classroom

BEECHE – Bromley's Environmental Education Centre at High Elms

BEECHE offers a wide range of outdoor learning sessions structured around the National Curriculum, CPD courses, run either at BEECHE or on-site at your school.

Courses aim to train (and encourage) teachers to use the outdoor environment as a teaching resource.

Although based at High Elms Country Park BEECHE offers outreach in schools and parks/greenspace and schools across the Borough of Bromley as well as a full educational programme for schools at Crystal Palace Park.

BEECHE can also offer further advice on setting up and maintaining a wildlife area in your school grounds.

BEECHE also provides curriculum-based environmental education activities for schools led by qualified teaching staff.

For current prices and bookings please visit the Bromley Parks website.

Appendices

Appendix A: List of Bromley Sites of Importance for Nature Conservation (SINCs)

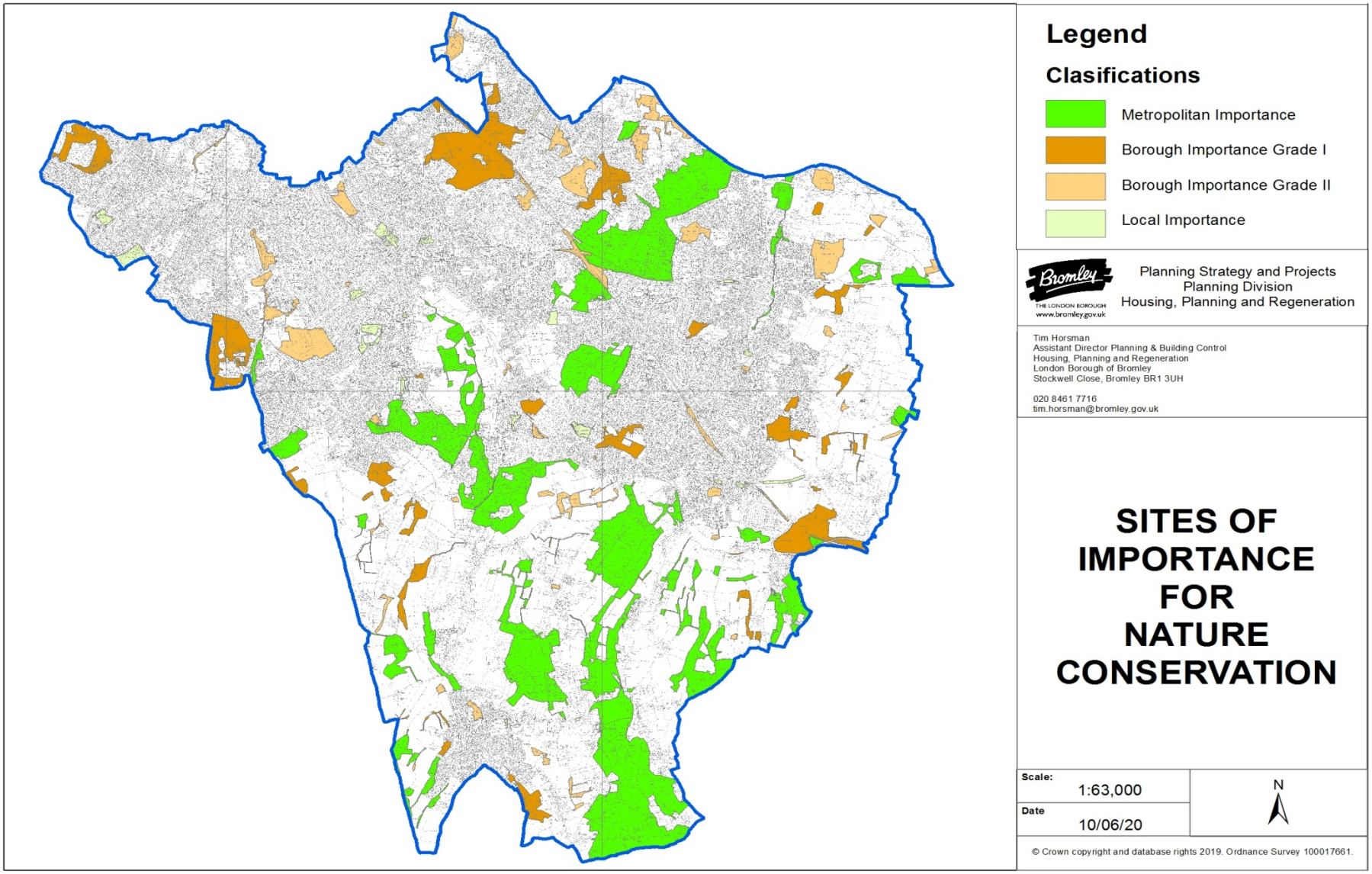
In addition to this list, there is a geological SSSI at Elmstead Pits.			
Site Name	**GLA Type**	**Other Designations**	**Site Area (ha)**
Belmont Pasture	Sites of Metropolitan Importance		9.09
Bourne Wood	Sites of Metropolitan Importance		17.66
Bradsmanshill Wood	Sites of Metropolitan Importance		4.38
Chelsfield Hill	Sites of Metropolitan Importance		10.20
Crofton Wood	Sites of Metropolitan Importance	SSSI	88.19
Crown Wood	Sites of Metropolitan Importance		11.66
Cudham Valley South	Sites of Metropolitan Importance		336.47
Downe Bank and Cudham Valley North (incl. Downe Valley in part, Down House and West Kent Golf Course)	Sites of Metropolitan Importance	Part SSSI	234.16
Hewitts Chalk Bank	Sites of Metropolitan Importance		3.32
High Broom Wood	Sites of Metropolitan Importance		7.92
High Elms	Sites of Metropolitan Importance	SSSI, LNR	170.12
Hockenden Wood	Sites of Metropolitan Importance		13.27
Jubilee Country Park	Sites of Metropolitan Importance	LNR	41.94
Mollards Wood & Jerry Reddings Shaw	Sites of Metropolitan Importance		33.58
Ninehams Wood, Lake Wood, South Park Paddocks and Holwood Estate	Sites of Metropolitan Importance		98.64
Norsted Valley Woods	Sites of Metropolitan Importance		105.78
R. Ravensbourne, Ravensbourne Valley Woodlands, Keston Common and Hayes Common	Sites of Metropolitan Importance	Part SSSI, LNR	215.61
River Cray	Sites of Metropolitan Importance		9.26
Rushmore Hill Woodlands	Sites of Metropolitan Importance		46.31
Ruxley Gravel Pits	Sites of Metropolitan Importance	SSSI	18.85
Saltbox Hill and Jewels Wood	Sites of Metropolitan Importance	Part SSSI	48.64
Scadbury Park, St Paul's Cray Common, Pett's Wood, and Hawkwood Estate	Sites of Metropolitan Importance	LNR	303.39
Shirley Heath, Spring Park and Threehalfpenny Wood	Sites of Metropolitan Importance		22.20
Biggin Hill South and Painter's Wood	Sites of Borough Grade I Importance		23.48
Bethlem Royal Hospital Grounds	Sites of Borough Grade I Importance		73.07

Blenheim School Meadow	Sites of Borough Grade I Importance		4.38
Bogey Lane, Farthing Street and Orange Court Lane	Sites of Borough Grade I Importance		1.39
Charm Wood and Lower Brooms Wood	Sites of Borough Grade I Importance		9.54
Chislehurst Common	Sites of Borough Grade I Importance		40.29
Covet Wood	Sites of Borough Grade I Importance		6.46
Crystal Palace Park	Sites of Borough Grade I Importance		44.50
Darrick Wood	Sites of Borough Grade I Importance	LNR	24.05
Fox Hill Shaw	Sites of Borough Grade I Importance		9.64
Fuller's Wood, James's Wood and Broomfieldbank Shaw	Sites of Borough Grade I Importance		12.42
Furze Bottom and Higham Hill	Sites of Borough Grade I Importance		20.01
Goddington Park	Sites of Borough Grade I Importance		24.64
Griff's Wood	Sites of Borough Grade I Importance		6.57
Hockenden Sand Pit	Sites of Borough Grade I Importance		1.87
Knockholt Station and Chelsfield Lakes Golf Course	Sites of Borough Grade I Importance		70.12
Knowlehill, Nobody's and Pokeridden Wood	Sites of Borough Grade I Importance		10.26
Lilly's Wood and Black Bush Wood	Sites of Borough Grade I Importance		9.71
Norheads Lane Woodlands	Sites of Borough Grade I Importance		6.36
Ruxley Park Golf Course Orchard	Sites of Borough Grade I Importance		3.60
Sevenoaks Road Chalk Bank	Sites of Borough Grade I Importance		0.49
St Martin's Churchyard, Chelsfield	Sites of Borough Grade I Importance		1.04
St. Mary the Virgin Churchyard, Hayes	Sites of Borough Grade I Importance		0.85
Sundridge Park Golf Course, Elmstead Wood and Lower Marvels Wood	Sites of Borough Grade I Importance		156.78
The Warren, St Mary Cray	Sites of Borough Grade I Importance		14.98
Well Wood, Long Shaw and Cooper's Wood	Sites of Borough Grade I Importance		21.85
All Saints Churchyard, Orpington	Sites of Borough Grade II Importance		1.45
Bassetts Pond	Sites of Borough Grade II Importance		0.25
Bullers Wood School and Yester Road Railway Embankment	Sites of Borough Grade II Importance		10.63
Camden Park Golf Course	Sites of Borough Grade II Importance		26.56
Chelsfield Railway Cutting	Sites of Borough Grade II Importance		2.68
Chislehurst Junction	Sites of Borough Grade II Importance		19.36
Downe Orchard	Sites of Borough Grade II Importance		1.10
Farnborough Common	Sites of Borough Grade II Importance		3.56
Foxhill Farm Pond	Sites of Borough Grade II Importance		1.15

Glentrammon Recreation Ground	Sites of Borough Grade II Importance		3.83
Hoblingwell Wood	Sites of Borough Grade II Importance		14.04
Holy Trinity Churchyard, Bromley Common	Sites of Borough Grade II Importance		0.62
Hoppershatch Shaw and Highams Farm Grassland	Sites of Borough Grade II Importance		4.32
Jugg Hill	Sites of Borough Grade II Importance		5.06
Kemnal Woodlands	Sites of Borough Grade II Importance		37.09
Kingswood Glen	Sites of Borough Grade II Importance		0.60
Kynaston Wood	Sites of Borough Grade II Importance		2.85
Langley Park Golf Course	Sites of Borough Grade II Importance		49.99
Lower Hockenden Farm Chalk Mound	Sites of Borough Grade II Importance		4.39
Mottingham Nature Reserve and River Quaggy	Sites of Borough Grade II Importance		18.24
Norheads Lane Woodlands	Sites of Borough Grade II Importance		0.65
Norsted Manor Farm Ponds	Sites of Borough Grade II Importance		1.06
Oaklands Lane Soakaway and Lord's Field	Sites of Borough Grade II Importance		1.98
Oakley Road Pond	Sites of Borough Grade II Importance		0.47
Orpington Railway Embankment	Sites of Borough Grade II Importance		7.43
Pauls Cray Hill Park	Sites of Borough Grade II Importance		33.75
Pimlico Wood	Sites of Borough Grade II Importance		3.78
River Beck including Langley Park Nature Reserve, Harvington Estate Woodland and Kelsey Park	Sites of Borough Grade II Importance		30.77
River Pool at New Beckenham	Sites of Borough Grade II Importance		2.98
Rounds Wood	Sites of Borough Grade II Importance		1.35
Rushfield Shaw and Baldwin Shaw	Sites of Borough Grade II Importance		3.44
Ruxley Wood	Sites of Borough Grade II Importance		13.64
Sage Wents	Sites of Borough Grade II Importance		1.38
Shaftsbury Park - river and pond	Sites of Borough Grade II Importance		1.18
Shortlands Golf Course and adjacent River Ravensbourne	Sites of Borough Grade II Importance		13.31
Skeet Hill Bank	Sites of Borough Grade II Importance		2.44
The Larches, Mill Hill and Broom Bank	Sites of Borough Grade II Importance		18.66
The Warren Sports Club	Sites of Borough Grade II Importance		2.67
Whyte's Woodland and Walden Recreation Ground	Sites of Borough Grade II Importance		11.83
Windmill Hill Wood	Sites of Borough Grade II Importance		5.51
Withins Wood	Sites of Borough Grade II Importance		5.47

Amherst Wood	Sites of Local Importance		1.24
Aspen Spring	Sites of Local Importance		1.85
Beckenham Crematorium and Cemetery	Sites of Local Importance		14.28
Betts Park	Sites of Local Importance		5.81
Bromley Civic Centre Grounds	Sites of Local Importance		2.65
Chelsfield Green	Sites of Local Importance		4.25
Fair Acres Gardens	Sites of Local Importance		0.67
Farnborough Recreation Ground	Sites of Local Importance		7.14
Foxbury Wood	Sites of Local Importance		0.88
Hollydale Recreation Ground	Sites of Local Importance		2.72
Jail Lane Orchard	Sites of Local Importance		0.40
Martins Hill and Church House Gardens	Sites of Local Importance		9.36
Old Tye Avenue Beechwood	Sites of Local Importance		0.62
Parkfield Recreation Ground Woodland	Sites of Local Importance		4.22
Pickhurst Green and Cupola Wood	Sites of Local Importance		10.11
Priory Gardens Lake	Sites of Local Importance		1.38
South Hill Wood	Sites of Local Importance		4.07
The Knoll	Sites of Local Importance		2.94
Wayside Grove	Sites of Local Importance		1.11

Appendix B: Map of Bromley Sites of Importance for Nature Conservation (SINCs)



Appendix C: Priority Species in Bromley

Table VI: Priority Mammal Species in Bromley. For Priority Bats see Protected Species, Section 5.2 and Species Action Plan

Species	Wildlife & Country-side Act 1981, Schedule 5 *(Note 1)*	NERC Act 2006, Section 41 (2014)	Mammal Society England Red List 2020	London Priority Species 2019	Location	Comments
Hazel Dormouse (*Muscardinus avellanarius*)	Yes	Yes	VU	Yes	Cudham Valley including 3 sites monitored under NDMP (ongoing) + one other whose most recent records are 2015, 2017). Downe Valley: records for 2007, 2009, 2011, 2013. Biggin Hill Valley NDMP site: records for 2016	May be in woodland or thick hedgerows in other rural areas but data deficient. See Species Action Plan
Harvest Mouse (*Micromys minutus*)	No	Yes	LC	Yes	Recorded from fields adjacent to Shire Lane and Biggin Hill	Data deficient
Hedgehog (*Erinaceus europaeus*)	No	Yes	VU	Yes	Ongoing citizen science survey has recorded low numbers in urban areas including West Wickham, Petts Wood, Bromley Common, Poverest.	See Species Action Plan
Water Shrew (*Neomys fodiens*)	No	No	LC	No	River Ravensbourne in Ravensbourne Valley Woodlands SINC	Data deficient
Water Vole (*Arvicola terrestris*)	Yes	Yes	EN	Yes	Known along River Cray in Bexley. 500 released Ruxley Gravel Pits circa 2002	Data deficient

Notes:

1 Species afforded special protection under the Wildlife & Countryside Act 1981, Schedule 5
https://www.legislation.gov.uk/ukpga/1981/69/schedule/5

2. Listed as Species of Principal Importance for the Purpose of Conserving Biodiversity in England under the NERC Act 2006, section 41 (May 2014)

publications.naturalengland.org.uk/publication/4958719460769792
3. Data & Criteria for red and amber lists, from the Mammal Society https://www.mammal.org.uk/wp-content/uploads/2020/06/RedList_19June2020.pdf
4. London Priority Species (2019) see: www.london.gov.uk/WHAT-WE-DO/environment/environment-publications/london-priority-species
All websites checked 2020

Bats present in LBB are listed separately under Protected Species. For more details see the Bat Species Action Plan

Table VII: Priority Bird Species in Bromley

Species	Wildlife & Country-side Act 1981, Schedule 1, Part 1 *(Note 1)*	NERC Act 2006, Section 41 (2014) *(Note 2)*	BOCC4/ RSPB Conser-vation Concern Status *(Note 3)*	London Priority Species 2019 *(Note 4)*	Location	Comments
Barn owl	Yes	No	Green	No	Mainly south of borough: e.g., Chelsfield and Cudham Valley, but also Nash Lane (2020).	Breeding recorded in 2018 and 2019 after a long absence.
Black-headed Gull	No	No	Amber	No	Throughout the borough	Regular visitor in autumn and winter
Brambling	Yes	No	Green	No	Has been recorded in gardens throughout the borough.	Winter visitor usually recorded in a few gardens during winter each year, although numbers vary.
Bullfinch	No	Yes	Amber	No	Ruxley Gravel Pits (count of up to 6 birds in 2018), woodland edge & scrub Downe & Cudham Valleys, Darrick Wood, Jubilee Country Park, Crofton Heath, Scadbury Park, hedgerows in rural areas LBB. Bred in Lilly's Wood in 2018, and Spring Park 2020. Also reported from gardens.	Quite widely distributed in low numbers. Young birds recorded at Ruxley Gravel Pits and Biggin Hill (2020). Adult seen with food for young in Spring Park (2020).
Cetti's Warbler	Yes	No	Green	No	Ruxley Gravel Pits	Recent colonist in the UK. Breeds at Ruxley Gravel Pits.
Common Gull	No	No	Amber	No	Various including Crystal Palace Park, Kelsey Park, farmland in West Wickham & Hayes.	winter visitor in small numbers
Cuckoo	No	Yes	Red	Yes	Heard in the Cudham Valley every year to 2014 (inclusive), including High Elms. 1 heard at at Ruxley, May 2015. 1 seen in Crystal Palace in 2018. 1 heard in Joelands Wood and near Fox Hill Farm in 2020.	Declining generally in Southern England.

Species	Wildlife & Country-side Act 1981, Schedule 1, Part 1 *(Note 1)*	NERC Act 2006, Section 41 (2014) *(Note 2)*	BOCC4/ RSPB Conser-vation Concern Status *(Note 3)*	London Priority Species 2019 *(Note 4)*	Location	Comments
Dunnock (= Hedge Accentor)	No	Yes	Amber	Yes	Common in parks and gardens throughout the borough.	Breeding in gardens. Has been in the top 10 species in the Bromley RSPB Garden Birdwatch every year since it started in 1979.
Fieldfare	Yes	No	Red	No	Hedgerows & meadows, eg Jubilee Country Park, Pauls Cray Hill Park, West Wickham farmland, High Elms, Cudham. Also gardens.	winter visitor in variable numbers each year. Visits gardens for berries and windfall fruit.
Firecrest	Yes	No	Green	No	Occasional records from Kelsey Park, Scadbury Park, The Warren, St Martins of Tours churchyard (2020).	Rare winter visitor. Numbers in Southern England generally seem to be increasing.
Gadwall	No	No	Amber	Yes	Ruxley Gravel Pits	Now seen throughout the year.
Greylag Goose	No	No	Amber	No	Kelsey Park (count of 95 in September 2019), Keston Ponds, Crystal Palace Park, Priory Ponds, Ruxley Gravel Pits. Rush & Prickend Ponds Chislehurst Common	Flocks in public parks are often semi-tame.
Grey Wagtail	No	No	Red	No	Ruxley Gravel Pits, Kelsey Park, Hawkwood Estate, Rush & Prickend Ponds Chislehurst Common, St Mary Cray, Crystal Palace, Keston Ponds and other areas with water including gardens.	small numbers, declining: a biodiversity indicator of good water quality. Juvenile birds recorded at Ruxley in 2020 .
Herring Gull	No	Yes	Red	No	Ruxley Gravel Pits, Kelsey Park, Keston Ponds, Crystal Palace Park & throughout the borough.	Predominantly a winter visitor, but increasingly reported all year round, e.g., count of 27 at Ruxley in August 2018.

Species	Wildlife & Country-side Act 1981, Schedule 1, Part 1 *(Note 1)*	NERC Act 2006, Section 41 (2014) *(Note 2)*	BOCC4/ RSPB Conser-vation Concern Status *(Note 3)*	London Priority Species 2019 *(Note 4)*	Location	Comments
Hobby	Yes	No	Green	No	Hawkwood Estate (probably breeding). Sightings from Chelsfield, Green Street Green, Holwood and Biggin Hill, Bred at High Elms 2006 and Scadbury Park 2010	Important indicator of invertebrate diversity
House Martin	No	No	Amber	Yes	Still breeds in Cudham, Chelsfield, Biggin Hill Airport and Chatterton Road. Flock of 220 reported in West Wickham in September 2019 apparently feeding up prior to migration.	Build mud nests on the outside of buildings.
House Sparrow	No	Yes	Red	Yes	Gardens and parks with good hedgerows or scrub including Beckenham, Bromley Common, West Wickham, Orpington, St Paul's Cray, Biggin Hill	Citizen science survey 2018-2019 showed wide distribution of records from urban areas, many residents reporting them returning after gap of many years.
Kestrel	No	No	Amber	No	Pauls Cray Hill Park, Crystal Palace Park, Ruxley Gravel Pits, Petts Wood, West Wickham farmlands. Bred at Cudham 2017.Bred at High Elms up to 2014 (inclusive) .	Good biodiversity indicator.
Kingfisher	Yes	No	Amber	Yes	Ruxley Gravel Pits, Keston, Pond 3 2019, 2020, Kelsey Park, Pond Wood (Chislehurst), Rush Pond Chislehurst Common	Occasional. An indicator of good water quality & aquatic biodiversity
Lapwing = Northern Lapwing)	No	Yes	Red	Yes	Most recent records in 2018: 8 at Ruxley, 2 at Cudham.	very occasionally recorded, usually on post breeding dispersal
Lesser Black-backed Gull	No	No	Amber	Yes	Ruxley Gravel Pits, Crystal Palace Park	usually winter visitor, but recorded in all months.

Species	Wildlife & Country-side Act 1981, Schedule 1, Part 1 *(Note 1)*	NERC Act 2006, Section 41 (2014) *(Note 2)*	BOCC4/ RSPB Conser-vation Concern Status *(Note 3)*	London Priority Species 2019 *(Note 4)*	Location	Comments
Lesser Redpoll	No	Yes	Red	Yes	Mainly reported from gardens. Also Lilly's Wood.	Winter visitor in very variable numbers (flocks of up to 17 reported in 2018). Recent increase thought to be due to their adapting to garden feeders.
Lesser Spotted Woodpecker	No	Yes	Red	Yes	Recorded in 2007 Elmstead Woods/Sundridge, Jubilee Park and in Petts Wood, and in 2008 from Crofton Heath. Very occasionally reported from gardens up to 2018.	In serious decline nationally.
Lesser Whitethroat	No	No	Green	Yes	Very occasional. One reported from Jubilee Country Park in April 2020.	Summaer visitor. Prefers scrub habitat.
Linnet	No	Yes	Red	Yes	Lilly's Wood 2018: doing well, Rouse Farm area (25, 2020), Pauls Cray Hill Park	Present in small numbers. Mainly around farmland.
Little Egret	No	No	Green	No	Ruxley Gravel Pits (recorded most months, 4 in August 2018),River Cray Orpington. Bred at Kelsey Park in 2020.	Occuring in Bromley more frequently in line with the national population increase.
Little Grebe	No	No	Green	No	Kelsey Park (has bred), Ruxley Gravel Pits.	Can be secretive. Probably under reported.
Mallard	No	No	Amber	No	Lakes & ponds throughout the borough, e.g., Ruxley, Kelsey Park and Crystal Palace.	fairly common
MarshTit	No	Yes	Red	No	Downe Bank, Biggin Hill, Spring Wood and High Elms.	Has bred in dormouse boxes at Downe Bank and High Elms.
Meadow Pipit	No	No	Amber	No	Farmland around West Wickham, Hayes and Nash. Also arable field east of Lilly's Wood. Flock of 40 recorded at Ruxley in 2016.	occasional winter visitor

Species	Wildlife & Country-side Act 1981, Schedule 1, Part 1 *(Note 1)*	NERC Act 2006, Section 41 (2014) *(Note 2)*	BOCC4/ RSPB Conser-vation Concern Status *(Note 3)*	London Priority Species 2019 *(Note 4)*	Location	Comments
Mistle Thrush	No	No	Red	Yes	Crystal Palace Park (breeding), Jubilee Country Park, Scadbury Park (breeding), Chislehurst Common, West Wickham farmland.	Prefers a combination of woodland and open fields or park land.
Mute Swan	No	No	Amber	No	Kelsey Park, Ruxley Gravel Pits (breeding), Priory Gardens, Crystal Palace Park,	Amber conservation status due to UK holding over 20% of the European population.
Nightingale	No	No	Red	No	Single birds recorded at Ruxley Gravel Pits 2018 & 2019, Jubilee Country Park (2019).	Very unusual in the borough.
Peregrine Falcon	Yes	No	Green	Yes	Confirmed breeding in Bickley and Orpington in 2019. Also reports from elsewhere in the borough.	Seems to be increasing in line with national population
Pochard	No	No	Red	Yes	Ruxley Gravel Pits (max of 20 in January 2018).	Winter visitor
Reed Bunting	No	Yes	Amber	No	Ruxley Gravel Pits (recorded in summer months so probably breeding).	Prefers reedbeds and close to water.
Red Kite	Yes	No	Green	No	Primarily the unbuilt areas of the borough, but increasingly being reported soaring over suburban areas, e.g., Chislehurst, Orpington & Petts Wood.	Increasing in line with national trends.
Redwing	Yes	No	Red	No	Hedgerows, scrub and open meadow/parkland throughout LBB e.g. Crystal Palace Park, Jubilee Country Park, Pauls Cray Hill Park, Hayes & West Wickham & gardens when winter severe	Winter visitor
Rook	No	No	Green	No	Hayes & West Wickham farmland, Biggin Hill. Small rookery in Gates Green Road / Nash Lane area (8 nests in 2020).	Breeding species. Seems to be decreasing in Bromley.

Species	Wildlife & Country-side Act 1981, Schedule 1, Part 1 *(Note 1)*	NERC Act 2006, Section 41 (2014) *(Note 2)*	BOCC4/ RSPB Conser-vation Concern Status *(Note 3)*	London Priority Species 2019 *(Note 4)*	Location	Comments
Sand Martin	No	No	Green	Yes	Ruxley Gravel Pits	Summer visitor. Used to be at Ruxley Nurseries before the new road built. May no longer breed in the borough due to absence of sand banks required for breeding.
Shoveler	No	No	Amber	No	Ruxley Gravel Pits, Crystal Palace Park, Kelsey Park	winter visitor
Skylark	No	Yes	Red	Yes	Undisturbed fields eg Downe Court Farm, Rouse Farm area, West Wickham farmlands, arable fields adjacent to Lilly's Wood, Chelsfield, Mace Farm, Cudham.	In decline due to modern farming methods.
Song Thrush	No	Yes	Red	Yes	Wooded areas, parks & gardens throughout the borough.	Still fairly common in the borough.
Spotted Flycatcher	No	Yes	Red	Yes	Bred in Lilly's Wood 2018, present 2019. Reported from Ruxley Gravel Pits (on migration)	Declining nationally.
Starling (= Common Starling)	No	Yes	Red	Yes	Still occurs throughout the borough. Sometimes forages and roosts in flocks of 50+ in parks and farmland.	Resident population is supplemented by winter migrants from continental Europe.

Species	Wildlife & Country-side Act 1981, Schedule 1, Part 1 *(Note 1)*	NERC Act 2006, Section 41 (2014) *(Note 2)*	BOCC4/ RSPB Conser-vation Concern Status *(Note 3)*	London Priority Species 2019 *(Note 4)*	Location	Comments
Stock Dove	No	No	Amber	No	Parks and farmland throughout the borough, e.g., Jubilee Country Park, Crystal Palace Park, Petts Wood NT, Scadbury Park. Sometimes in gardens.	Amber conservation status due to UK holding over 20% of the European breeding population.
Stonechat	No	No	Green	No	Small no. of sightings each year, e.g., Mace Farm, Bleak House Farm, Pauls Cray Hill Park.	Inconspicuous winter visitor/passage migrant
Swallow (=Barn Swallow)	No	No	Amber	No	Rookery Estates: meadows along River Ravensbourne, Crofton Heath, Ruxley Gravel Pits, Jubilee Country Park, Chelsfield, Pratts Bottom, Rouse Farm area	Declining. Occurs mainly in the more rural parts of the borough.
Swift	No	No	Amber	Yes	Nest under eaves in houses, so occur more in areas with pre-war housing. Hot spots are Eden Park, Plaistow & Mottingham,	RSPB Local Group Survey in 2019 found 61 buildings with swift nest sites (49 in 2018). However, this may reflect our increasing knowledge rather than an increasing population as the no of survey areas where sighted reduced from 76 to 59.
Tawny Owl	No	No	Amber	Yes	Woodland throughout borough e.g. Chislehurst, Hawkwood Estate, Elmstead & Marvels Wood, Jubilee Country Park, Darrick & Newstead Woods, Cudham Valley, Biggin Hill. Breeding confirmed at North End Farm 2013. Also often heard calling from gardens in suburban areas near woods.	Amber listed due to declines in UK breeding population.

Species	Wildlife & Country-side Act 1981, Schedule 1, Part 1 *(Note 1)*	NERC Act 2006, Section 41 (2014) *(Note 2)*	BOCC4/ RSPB Conser-vation Concern Status *(Note 3)*	London Priority Species 2019 *(Note 4)*	Location	Comments
Teal	No	No	Amber	No	Occasionally at Ruxley Gravel Pits and Kelsey Park.	Amber conservation status due to UK holding over 20% of the European winter population.
Yellowhammer	No	Yes	Red	No	Cudham, Chelsfield & Biggin Hill. Bred in hedgerow Chelsfield Lane 2018, and Jackass Lane 2019.	Farmland bird. Still found in rural parts of borough, but declining.
Water Rail	No	No	Green	No	Ruxley Gravel Pits all year round (up to 4 birds present in 2018).	Secretive and prefers reedbeds.
Wigeon	No	No	Amber	No	Occasional records from Ruxley most years.	Amber conservation status due to UK holding over 20% of the European winter population.
Willow Warbler	No	No	Amber	No	Passage records each year. One heard singing regularly on Hayes Common in 2020 may have been breeding.	In early 80s & 90s fairly common in the borough. Now very uncommon. Mainly recorded on passage.

Notes:

1 Species afforded special protection whilst nesting under the Wildlife & Countryside Act 1981, Schedule 1, Part 1
2. Listed as Species of Principal Importance for the Purpose of Conserving Biodiversity in England under the NERC Act 2006, section 41 (May 2014)
3. Data & Criteria for red and amber lists, from RSPB's 'UK Conservation Status Explained"
4. London Priority Species (2019)

All websites checked7th April 2020

Birds included are those that:
i) were recorded in Bromley in most years at least until 2015.
ii) are resident, breeding migrants or winter visitors in the borough (but excluding passage migrants).-

iii) are of conservation concern or have special protection.

Bird records all post 2015 unless otherwise stated.

The following birds previously occurred regularly within the borough but have been omitted from the table above due to now being recorded rarely, if at all, or only as passage migrants: Corn Bunting, Grey Partridge, Tree Pipit, Tree Sparrow, Turtle Dove, Woodcock.

Table VIII: Priority Butterfly Species in Bromley

Species Agassiz et al (2014)	*NERC Act 2006 Section 41 (2014)	Butterfly Conservation Red List 2010	London Priority Species (2019)	Rare in LBB	Location	Comments
Dingy Skipper *Erynnis tages*	Yes	VU	Yes	Yes	Saltbox Hill, West Kent Golf Course roughs & area managed by LWT, Foxhill Farm Keston, High Elms, Strawberry Bank, Spring Park pond area & Bottom Barn Farm	Chalk Grassland
Grizzled Skipper *Pyrgus malvae*	Yes	VU	Yes	Yes	West Kent Golf Course, Saltbox Hill, High Elms, Bottom Barn Farm	Chalk Grassland
Small Heath *Coenonympha pamphilus*	Yes	NT	Yes	Yes	Darrick & Newstead Woods LNR, Jubilee Country Park & Scadbury Park LNRs, Chislehurst Common, Saltbox Hill , West Kent Golf Course, Crystal Palace Park	Fairly widespread in low numbers possibly increasing 2019
Silver-Washed Fritillary *Argynnis paphia*	No	LC	No	Yes	High Elms, Darrick Wood (Broadwater Gdns meadow), Spring Park, Chislehurst Common	Species increasing in numbers since 2000
Dark Green Fritillary *Speyeria aglaja*	No	LC	Yes	Yes	Cudham Valley: High Elms & the Shaws Girl Guide Site, Saltbox Hill, West Kent Golf Course Roughs, Down House grounds	Uncommon in Bromley but sightings confirmed since 2010

Species Agassiz et al (2014)	*NERC Act 2006 Section 41 (2014)	Butterfly Conservation Red List 2010	London Priority Species (2019)	Rare in LBB	Location	Comments
Purple Emperor *Apatura iris*	No	NT	Yes	Yes	Saltbox Hill (2000), West Wickham Common & High Elms (2005)	Slow increase in sightings in Bromley 2000 - 2020
White Admiral *Limenitis camilla*	Yes	VU	Yes	Yes	High Elms, Padmall Wood, Rookery Estates: Ravensbourne Valley Woodlands, West Wickham Common, Spring Park pond area, Hayes Farm, Coney Hall: garden	Leave trailing Honeysuckle when coppicing Hazel and creating glades
Brown Hairstreak *Thecla betulae*	Yes	VU	Yes	Yes	Colony established in Jackass Lane. Sighted at Keston 2019. Under threat from uncontrolled flailing of blackthorn hedges.	Enforce rotational winter cutting of maximum 2/3 of hedge
Purple Hairstreak *Favonius quercus*	No	LC	No	Yes	Scadbury Park, Chislehurst Common, Old Hill, High Elms, Hayes Common	Maintain Oak Woodlands
Green Hairstreak *Callophrys rubi*	No	LC	No	Yes	Cudham Valley, e.g. High Elms, The Shaws Girl Guide Site, Hangrove. Also Saltbox Hill, Strawberry Bank, Hayes Common, West Kent Golf Course, Spring Park pond	Numbers fluctuating yearly Chalk Grassland & Heathland

Species Agassiz et al (2014)	*NERC Act 2006 Section 41 (2014)	Butterfly Conservation Red List 2010	London Priority Species (2019)	Rare in LBB	Location	Comments
White Letter Hairstreak *Satyrium w-album*	Yes	EN	Yes	Yes	High Elms. Small colonies Spring Park pond area & Coney Hall nr Gates Green Rd.	Low numbers but range increasing
Small Blue *Polyommatus icarus*	Yes	NT	Yes	Yes	West Kent Golf Course, Hangrove, (High Elms Burnt Gorse 2019) Oaklands Lane Soakaway SINC	Increasing in 2019 with significant colony found at Hangrove. Manage for Kidney Vetch
Brown Argus *Aricia agestis*	No	LC	No	Yes	Foxhill Farm Keston, Saltbox Hill, High Elms, Hayes Common, Hewitts Bank, Jubilee Country Park, Chislehurst Common	Chalk Grassland & Heathland
Chalkhill Blue *Polyommatus coridon*	No	NT	Yes	Yes	Cudham Valley: Hangrove. White Hills Breeding colony at Saltbox Hill, meadow east of Oaklands Lane Biggin Hill, High Elms Conservation Field (single males)	Chalk Grassland
Adonis Blue *Polyommatus bellargus*	No	NT	Yes	Yes	Breeding colony at Saltbox Hill, meadow east of Oaklands Lane, Biggin Hill.	Chalk grassland with short turf regularly grazed. Warm south facing slopes preferred Manage for sole food plant Horseshoe Vetch

Butterfly records all post 2010 unless otherwise stated

*Listed as Species of Principal Importance for the Purpose of Conserving Biodiversity in England under the NERC Act 2006, section 41 (2014) see Reference 3, below

The Butterfly Red List for Great Britain: Key to Status: NT Near Threatened, VU Vulnerable, EN Endangered, LC Least Concern

References

1. Fox, R., Warren, M.S., and Brereton, T.M. (2010). A new Red List of British Butterflies, Species Status 12; 1-32. Joint Nature Conservation Committee, Peterborough.
2. London Priority Species (2019)
3. Natural England Section 41 Priority Species List (May 2014)- see http://publications.naturalengland.org.uk/publication/4958719460769792
4. Natural History Museum (2019). Data Portal Query on "Checklist of the Lepidoptera of the British Isles [Agassiz, Beavan & Heckford] (amended 19/2/2016)" created at 2019-04-08 12:35:58.447150. Subset of "Checklist of the Lepidoptera of the British Isles - Data" (dataset).

Table IX: Moth Species occurring in Bromley which appear on NERC Act 2006 Section 41 (2014) list.

Species Agassiz et al (2014)[1]	Common in Bromley	Butterfly Conservation Red/Amber List	London Priority Species (2019)	Comments
Acronicta psi Grey Dagger	Yes	Amber	No	No special habitat management requirements at this time
Acronicta rumicis Knot Grass	Yes	Amber	No	No special habitat management requirements at this time
Agrochola helvola Flounced Chestnut	Yes	Amber	No	No special habitat management requirements at this time
Agrochola lychnidis Beaded Chestnut	Yes	Amber	No	No special habitat management requirements at this time
Amphipoea oculea Ear Moth	No	Amber	No	No special habitat management requirements at this time
Amphipyra tragopoginis Mouse Moth	Yes	Amber	No	No special habitat management requirements at this time
Apamea anceps Large Nutmeg	Yes	Amber	No	No special habitat management requirements at this time
Apamea remissa Dusky Brocade	Yes	Amber	No	No special habitat management requirements at this time
Arctia caja Garden Tiger	No	Amber	Yes	Decline is probably due to climate change rather than loss of habitat

Species Agassiz et al (2014)[1]	Common in Bromley	Butterfly Conservation Red/Amber List	London Priority Species (2019)	Comments
Asteroscopus sphinx Sprawler	No	Amber	No	No special habitat management requirements at this time
Atethmia centrago Centre-barred Sallow	Yes	Amber	No	Encourage regrowth of Ash in areas which suffer Ash dieback
Caradrina Morpheus Mottled Rustic	Yes	Amber	No	No special habitat management requirements at this time
Chesias legatella Streak	No	Amber	No	Maintain stands of Broom
Chiasmia clathrate Latticed Heath	No	Red	Yes	Maintain chalk grasslands by mowing and hay raking
Diarsia rubi Small Square-spot	Yes	Amber	No	No special habitat management requirements at this time
Diloba caeruleocephala Figure of Eight	No	Red	Yes	Selectively encourage Blackthorn and Hawthorn in areas of more acid soils
Ecliptopera silaceata Small Phoenix	Yes	Amber	No	No special habitat management requirements at this time
Ennomos fuscantaria Dusky Thorn	No	Red	No	Encourage regrowth of Ash in areas which suffer Ash dieback
Eulithis mellinata Spinach	No	Red	No	Encourage planting of Redcurrant and Blackcurrant on allotments and in residential gardens

Species Agassiz et al (2014)[1]	Common in Bromley	Butterfly Conservation Red/Amber List	London Priority Species (2019)	Comments
Euxoa nigricans Garden Dart	No	Red	Yes	Decline in this species is difficult to correlate with habitat loss. Wide range of foodplants
Hemistola chrysoprasaria Small Emerald	Yes	Amber	Yes	No special habitat management requirements at this time
Hepialus humuli Ghost Moth	No	Amber	Yes	No special habitat management requirements at this time
Hoplodrina blanda Rustic	Yes	Amber	No	No special habitat management requirements at this time
Hydraecia micacea Rosy Rustic	No	Amber	No	No special habitat management requirements at this time
Malacosoma neustria Lackey	No	Amber	No	No special habitat management requirements at this time
Melanchra persicariae Dot Moth	Yes	Amber	No	No special habitat management requirements at this time
Melanthia procellata Pretty Chalk Carpet	No	Amber	Yes	No special habitat management requirements at this time
Perizoma albulata subsp. albulata Grass Rivulet	No	Red	No	Time cutting of grasslands and road verges to promote growth of Yellow Rattle
Pechipogo strigilata Common Fan-foot	No	Amber	Yes	Protect and maintain ancient woodlands

Species Agassiz et al (2014)[1]	Common in Bromley	Butterfly Conservation Red/Amber List	London Priority Species (2019)	Comments
Scotopteryx bipunctaria Chalk Carpet	No	Amber	Yes	Maintain chalk grasslands by mowing and hay raking
Scotopteryx chenopodiata Shaded Broad-bar	Yes	Amber	No	No special habitat management requirements at this time
Spilosoma lubricipeda White Ermine	Yes	Amber	No	No special habitat management requirements at this time
Spilosoma luteum Buff Ermine	Yes	Amber	No	No special habitat management requirements at this time
Timandra comae Blood Vein	Yes	Amber	No	No special habitat management requirements at this time
Tyria jacobaeae Cinnabar	Yes	Amber	No	Discourage pulling of Ragwort
Watsonalla binaria Oak Hook-tip	Yes	Amber	No	Protect and maintain ancient woodlands
Xanthia gilvago Dusky Lemon Sallow	No	Red	Yes	Selectively encourage growth of Wych elms and coppice to promote sucker growth
Xanthia icteritia Sallow	Yes	Amber	Yes	No special habitat management requirements at this time

Table X: Priority Moth Species in Bromley not included in London BAP species list

Species Agassiz et al (2014)[1]	Common in Bromley	Butterfly Conservation Red/Amber List	London Priority Species (2019)	Comments
Sesia apiformis Hornet Moth	No		No	Declining due to loss of mature Black Poplar and failure to replant appropriate replacement trees
Moitrela obductella	No		No	Maintain Chalk Grasslands to encourage Marjoram
Ococera semirubella	No		No	Maintain Chalk Grasslands to encourage Bird's Foot Trefoil and Clovers
Furcula bicuspis Alder Kitten	No		No	Manage Wetlands and wet woodland to promote growth of Alder
Hypena crassalis Beautiful Snout	No		No	Selectively promote growth of Bilberry by removing competing plant species
Anarta myrtilli Beautiful Yellow Underwing	No		No	Maintain Acid Heathland to encourage Heathers
Xestia agathina Heath Rustic	No		No	Maintain Acid Heathland to encourage Heathers

References

1. Natural History Museum (2019). Data Portal Query on "Checklist of the Lepidoptera of the British Isles [Agassiz, Beavan & Heckford] (amended 19/2/2016)" created at 2019-04-08 12:35:58.447150. Subset of "Checklist of the Lepidoptera of the British Isles - Data" (dataset).

London Priority Species (2019)
Natural England Section 41 Priority Species List (May 2014)

Table XI: Priority Vascular Plants in Bromley

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Aira caryophyllea	Silver Hair-grass					Hayes Common	On thin soils
Anthyllis vulneraria	Kidney Vetch					Hangrove, Burnt Gorse, Oaklands Lane Soakaway	Food plant of rare small blue butterfly
Avenula pratensis	Meadow Oat-grass					Good quality chalk grassland: Chelsfield Hill	Area becoming invaded by scrub
Betonica officinalis	Betony					Jubilee Country Park	
Blechnum spicant	Hard-fern					Padmall Wood, Keston Bog (valley side)	
Briza media	Quaking-grass		NT		Yes	Widespread in unimproved chalk grassland eg Cudham and Downe valleys	
Buxus sempervirens	Box				Yes	High Elms	Introduced in past
Calluna vulgaris	Heather		NT		Yes	Keston, Hayes, St Paul's Cray, Chislehurst, West Wickham & Farnborough Commons, Pett's Wood, St Nicholas Churchyard	
Campanula rotundifolia	Harebell		NT		Yes	Dry grassland e.g. Hayes Churchyard, Hayes Common (Redgate Drive area), Musk Orchid Bank, Downe Bank, Farnborough Common, St. Nicholas Churchyard	

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Carex binervis	Green-ribbed Sedge					Keston Bog	
Carex demissa	Common Yellow-sedge					Keston Bog	Appeared after soil scrape not seen since 2015 but likely to be in seed bank.
Carex echinata	Star Sedge		NT		Yes	Keston Bog	
Carex nigra	Common Sedge				Yes	Keston Bog, Ravensbourne wet meadows	
Carex pallescens	Pale Sedge					Padmall Wood, Ravensbourne Meadow, Keston Common	
Carex panicea	Carnation Sedge				Yes	Keston Bog (north-west)	Present in 2010. Possible sighting 2020, needs checking
Carex strigosa	Thin-spiked Wood-sedge					Scadbury Park	
Carlina vulgaris	Carline Thistle		NT		Yes	Chalk grassland e.g. the Shaws Girl Guide Campsite, Hangrove, High Elms	
Cephalanthera damasonium	White Helleborine	Yes	VU	Yes	Yes	Secondary beech./yew woodland on chalk e.g. High Elms, Hangrove, Downe Bank, Girl Guide Site, Cudham Frith, Jewels Wood, Lilly's Wood	
Ceratocapnos claviculata	Climbing Corydalis					Petts Wood	

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Chrysosplenium oppositifolium	Opposite-leaved Golden-saxifrage					Wet woodland e.g. Hoblingwell Wood, High Broom Wood, Scadbury Park	Worrying decline in High Broom Wood due to invasive Three-cornered Garlic (*Allium triquetrum*)
Cichorium intybus	Chicory		VU		Yes	Jubilee Country Park, Norman Park (along River Ravensbourne)	Introduced in past
Clinopodium acinos	Basil Thyme	Yes	VU	Yes	Yes	Chalk grassland on thin soil: Hewitts Bank, The Hillside-opposite Charmwood Farm (2014)	Has become very rare in LBB (& elsewhere)
Convallaria majalis	Lily-of-the-valley					Padmall Wood, Hayes & Keston Commons, Ravensbourne Open Space	Lost from Scadbury 2000
Cruciata laevipes	Crosswort		NT		Yes	Chalk grassland e.g. West Kent Golf Course, High Elms, Hangrove, Blenheim School Meadow	A plant of slightly disturbed areas
Dactylorhiza praetermissa	Southern Marsh Orchid					Darrick Wood meadows, Ravensbourne Wet Meadow	

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Epipactis purpurata	Violet Helleborine					Down House Sand Walk, High Elms and near New Year's Wood	At High Elms it was present intermittently till 1972, then 2006 & 7 after clearance of cherry laurel. Likely to be in the seed bank
Erica cinerea	Bell Heather		NT		Yes	Keston, Hayes & St Paul's Cray Commons	
Erica tetralix	Cross-leaved Heath		NT		Yes	Keston Bog	
Eriophorum angustifolium	Common Cottongrass		VU		Yes	Keston Bog	
Erysimum cheiranthoides	Treacle-mustard		NT		Yes	Hayes Street Farm	Recorded 2014
Euphorbia exigua	Dwarf Spurge		VU		Yes	arable fields & field edges on chalk e.g. below Jewels Wood (1, 2020), in Nash area (2013-likely to be still present) & south of Shire Lane.	
Euphorbia platyphyllos	Broad-leaved Spurge					field below Jewels Wood (6 present 2020)	
Euphrasia pseudokerneri	Chalk Eyebright	Yes	VU	Yes	Yes	Chalk grassland e.g. Cudham and Downe Valleys	

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Filago germanica (=vulgaris)	Common Cudweed				Yes	Field at Hockenden, Oregon Square Orpington (road verge 2020)	Plant of bare sandy places
Fragaria vesca	Wild Strawberry		VU		Yes	grassland and woodland edges on chalk eg Cudham Valley	
Galium parisiense	Wall Bedstraw		VU		Yes	Walls of St Martin's Churchyard, Chelsfield	only site in LBB
Gentianella amarella	Autumn Gentian		NT		Yes	Chalk grassland: West Kent Golf Course (area managed by London Wildlife Trust), Hewitts Bank, meadow east of Oaklands Lane, Biggin Hill valley	
Geranium columbinum	Long-stalked Crane's-bill					Chalk grassland e.g. Cudham Valley: Hangrove, Strawberry Bank	
Gymnadenia conopsea	Chalk Fragrant-orchid					Downe Bank Nature Reserve	
Helianthemum nummularium	Common Rock-rose		NT		Yes	Chalk grassland e.g. The Shaws, Hangrove fields, High Elms, Downe Bank Nature Reserve, Chelsfield Hill, Strawberry Bank, Mace Farm, Saltbox Hill	
Helleborus viridis subsp. occidentalis	Green Hellebore					High Elms	Only site in LBB, but increasing

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
***Himantoglossum hircinum*	Lizard Orchid		LC**		Yes	Location Protected	WCA Schedule 8. South-east of LBB. 1 only in 2019,2020
Hippocrepis comosa	Horseshoe Vetch					meadow east of Oaklands Lane, Biggin Hill valley	Only known site in LBB 2020
Hyacinthoides non-scripta	Bluebell			Flagship species		semi-natural ancient woodland throughout LBB	Now hybridised in many sites
Hydrocotyle vulgaris	Marsh Pennywort		NT			Keston Bog, Scadbury Park	
Hypericum montanum	Pale St John's-wort				Yes	Sundridge railway embankment & Sundridge Park	not seen since 2000. Private land, no access allowed 2019. Vulnerable to building works & scrub encroachment.
Hypopitys monotropa	Yellow Bird's-nest	Yes	EN	Yes	Yes	High Elms (in beech woodland)	Becoming more rare in Kent: lost from Lullingstone & Shoreham
Juncus squarrosus	Heath Rush				Yes	Keston Common, Bassetts Campus Broadwater Gdns	
Juniperus communis	Common Juniper	Yes	NT	Yes	Yes	Downe Bank Nature Reserve	Only site in LBB. Dioecious: Only 1 male plant remains
Kickxia elatine	Sharp-leaved Fluellen					Occasional edges arable fields e.g. Cudham Valley	
Kickxia spuria	Round-leaved Fluellen					Occasional edges arable fields on chalk e.g. arable field south of Shire Lane & Cudham Valley	

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Knautia arvensis	Field Scabious		NT		Yes	Chalk grassland eg High Elms, Hangrove, Blenheim School Meadow, Saltbox valley side	
Koeleria macrantha	Crested Hair-grass					Keston Common & Chislehurst Cockpit area, Blenheim School Meadow	
Lathraea squamaria	Toothwort					semi-natural ancient woodland e.g. High Elms, Downe & Cudham Valleys, Mine Shaw, Biggin Hill	LBB appears a stronghold for this plant. Not common in Kent.
Lathyrus linifolius	Bitter Vetch		NT		Yes	acid soils e.g. Ravensbourne Valley Woodlands -Barnet Wood & Kingswood Glen	
Melampyrum pratense	Common Cow-wheat		NT		yes	Hayes, Keston & Chislehurst Commons, Jubilee Country Park	
Misopates orontium	Weasel's-snout		VU		Yes	Jubilee Country Park: meadow nr Blackbrook Lane Car Park	Present 2013 when pipe laid & soil disturbed. Likely to be in seedbank.
Moenchia erecta	Upright Chickweed		VU		Yes	Keston War Memorial, Tugmutton Common	dry acid grassland

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Narthecium ossifragum	Bog Asphodel				Yes	Keston Bog	
Neottia nidus-avis	Bird's-nest Orchid		VU		Yes	In beech leaf litter Keston Common, High Elms, Holwood	Sometimes also in sweet chestnut coppice. Possibly under recorded.
Onobrychis viciifolia	Sainfoin		VU		Yes	West Kent Golf Course, High Elms, Mace Farm	reported by Charles Darwin in the Downe Valley where it was probably planted as a fodder crop in rotation
Ophioglossum vulgatum	Adder's-tongue Fern					Musk Orchid Bank	
Ophrys insectifera	Fly Orchid	Yes	VU	Yes	Yes	Cudham Valley: High Elms, Hangrove, Downe Bank, Girl Guide Site, Blackbush Shaw, Cudham Frith, Strawberry Bank, Mace Farm	Plant of chalk scrub. Possibly under recorded.
Orchis anthropophora	Man Orchid	Yes	EN	Yes	Yes	Chalk grassland & scrub e.g. High Elms, Saltbox Hill, Heritage Hill Keston	
Orchis mascula	Early-purple Orchid					semi-natural ancient woodland e.g. Homefield Spring, Darrick Wood, Pond Wood, Little Molloms Wood, Bradmanshill Wood	

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Oxalis acetosella	Wood-sorrel		NT		Yes	semi-natural ancient woodland e.g. Padmall Wood, Darrick Wood, High Elms, Barnet Wood, Crofton Woods, High Broom Wood, Hopperbatch Shaw	
Pedicularis sylvatica	Lousewort		VU		Yes	Hayes Common	Last recorded about 2000
Plantago media	Hoary Plantain		NT		Yes	Chalk grassland e.g. High Elms, Hangrove, Downe Bank, Blenheim School Meadow	
Platanthera chlorantha	Greater Butterfly-orchid				Yes	High Elms	Recorded 2013 (1)
Polygala calcarea	Chalk Milkwort					West Kent Golf Course	
Polygonatum multiflorum	Solomon's-seal					Petts Wood Wood, Chislehurst, Ravensbourne Valley Woodlands including Brook Wood & Padmall Wood.	
Potamogeton polygonifolius	Bog Pondweed					Keston Bog	
Potentilla argentea	Hoary Cinquefoil		NT		Yes	Acid grassland at Keston Common & Holwood Estate	
Potentilla erecta	Tormentil		NT		Yes	Keston Bog: west facing slope & well drained dry grassland Jubilee Country Park.	
Ranunculus flammula	Lesser Spearwort		VU		Yes	Keston Bog, Ravensbourne wet meadows, Darrick Wd	Darrick record from Triangle Pond

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Ranunculus lingua	Greater Spearwort					Jubilee Country Park	Planted in ponds
Rhinanthus angustifolius	Greater Yellow-rattle			Yes	Yes	High Elms, Ravensbourne wet meadow, Darrick Wood, Jubilee Country Park, Spring Park.	?Brought in on mowers & now abundant in many meadows
Rosa micrantha	Small-flowered Sweet-briar					On chalk e.g. Cudham Valley	
Sanicula europaea	Sanicle		NT		Yes	semi-natural ancient woodland e.g. Darrick Wood, Jubilee Country Park, Sparrow Wood, Cuckoo Wood, Shaw above West Kent Golf Course.	
Saxifraga granulata	Meadow Saxifrage				Yes	Keston Common War Memorial, Darrick Wood, Hayes & Keston Churchyards	
Scutellaria minor	Lesser Skullcap					Keston Bog	
Silene flos-cuculi	Ragged-Robin		NT		Yes	Ravensbourne wet meadows, Blenheim School Meadow	
Solidago virgaurea	Goldenrod		NT		Yes	Hayes Common, Petts Wood Wood	
Succisa pratensis	Devil's-bit Scabious		NT		Yes	Jubilee Country Park	
Thalictrum flavum	Common Meadow-rue				Yes	Ruxley Gravel Pits	

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Tilia cordata	Small-leaved Lime				Yes	Spring Park & along Croydon Boundary, Fox Hill Shaw Wood. Also planted in Jubilee Country Park.	Includes very large old coppice stools at Spring Park & old 6 stool coppice at Fox Hill Shaw
Torilis nodosa	Knotted Hedge-parsley					Crofton Road verge (TQ450657), Ringers Road Bromley	England Red list LC but notes 33% decline1930-1987
Trifolium fragiferum	Strawberry Clover		VU		Yes	Crystal Palace Park: grassy slope north of terrace	2016 KBRG
Ulex minor	Dwarf Gorse					Hayes & Farnborough Commons,above Keston Bog	
Vaccinium myrtillus	Bilberry					Keston Common	
Valeriana officinalis	Common Valerian		NT		Yes	Crofton Sparrow Wood, Darrick Wood	Decreasing in LBB
Valerianella dentata	Narrow-fruited Cornsalad		EN		Yes	Hewitts Chalk Bank & arable field edges in Cudham valley	Occurs rarely
Verbascum lychnitis	White Mullein				Yes	High Elms, Hangrove	
Veronica officinalis	Heath Speedwell		NT		Yes	Jubilee Country Park: well drained dry grassland at approx TQ435681	Not seen since circa 2010

Taxon	Common Name	*NERC Act 2006 Section 41	England Red List Status 2014	London Priority Species 2019	Kent Rare Plant Register List 2020	Location	Comments
Viscum album	Mistletoe					Has become widespread in recent years on a variety of trees from low numbers in 2005	

All plants present since 2014 unless otherwise stated. Plant names follow Stace 2010

*Listed as Species of Principal Importance for the Purpose of Conserving Biodiversity in England under the NERC Act 2006, section 41 (2014) England Red List Species follow IUCN criteria (see Stoh et al., 2014)

Key to status: NT Near Threatened VU Vulnerable EN Endangered

**WCA Schedule 8 species. Although listed as LC (Least Concern) in Vascular Plant red List for England 2014, comment on the list notes 72% decline '*when assessing1987+ data as a proportion of all records including pre-1930 data*.'

It should be noted that some of the plants listed above are found in lower numbers and in less sites than when the Bromley Biodiversity Plan 2015-2020 was written. In addition, there have been losses from the London Borough of Bromley flora since the 1980s including Dyer's Greenweed (*Genista tinctoria*) last recorded at Jubilee Country Park (1980s) and PROW to Blackbush Shaw on a sunny bank, now scrub covered approx TQ445594 (early 1990s), Round-leaved Sundew (*Drosera rotundifolia*): last seen Keston Bog 1986, Saw-wort (*Serratula tinctoria*): last record open oak woodland near western entrance to Crofton Woods 1994 and Short-leaved Water-starwort (*Callitriche truncata*) last recorded Darrick Wood marsh 1980s.

References:-

Kent Rare Plant Register Check List (2019)

London Biodiversity Action Plan - Priority Species & Species of Conservation Concern

Natural England Section 41 Species List (May 2014)

Stace C. 2010. New Flora of the British Isles third edition Cambridge University Press
Stoh P. A. et al. 2014. A Vascular Plant Red List for England.

Table XII: Priority Fungi Species in Bromley

Taxon	English Name	NERC Act 2006 Section 41 (2014)	Red Data List (BMS) 2006	London Priority Species (2019)	Rare in LBB	Location	Comments
Amanita inopinata	Unexpected amanita				Yes	Garden West Wickham 2007, St Martin of Tours Chelsfield 2002, 2009	On/with *Chamaecyparis lawsoniana*
Boletus legaliae (= *B. splendidus, Boletus satanoides*)	Bilious bolete				Yes	Petts Wood 2011	road verge with oak
**Cortinarius calochrous* var. *platypus*	None found				very rare	High Elms 2010	retained in Kew Herbarium
Cortinarius purpurascens var. *occidentalis*	Bruising Webcap				Yes	Crofton Woods 2007	semi-natural ancient woodland. Retained at Kew Herbarium
**Cortinarius saffronipes*	None found				very rare	High Elms 2010	retained in Kew Herbarium
Cortinarius sodagnitus	Bitter Bigfoot Webcap				very rare	High Elms 2018	On mature beech. Probably fruits very rarely
Gyrodon lividus	Alder Bolete		NT		Yes	Petts Wood woods 2019	alder carr first seen here 2010. Seen regularly since then including 2019. Numbers vary

Taxon	English Name	NERC Act 2006 Section 41 (2014)	Red Data List (BMS) 2006	London Priority Species (2019)	Rare in LBB	Location	Comments
Hericium cirrhatum	Tiered Tooth				Yes	Brook Wood Bromley Common 1995, Ninhams Wood (1996) Jewels Wood (1997), Petts Wood 2002, Crofton Woods	on dead beech (Brook Wood), fallen beech (Jewels Wood), ash (Crofton Woods), sycamore (Petts Wood woods)
Hericium coralloides	Coral Tooth	Yes		Yes	Yes	Crofton Woods 1996,1997,2001	on same ash tree
Hericium erinaceus	Bearded Tooth	Yes		Yes	very rare	Scadbury Park 2019	in damaged veteran Turkey oak
**Hydropus scabripes*	None found				very rare	High Elms 2010	retained in Kew Herbarium
Hygrocybe coccineocrenata	Bog waxcap				very rare	Keston Bog 2019	in sphagnum
Hygrocybe calyptriformis	Pink Waxcap		Annex	Yes	Yes	Down House 2017, Downe Cricket Ground, West Kent Golf Course	regularly seen at these locations in grassland
**Inocybe patouladii*	None found				very rare	High Elms 2012	with beech
Lactarius mairei	Whiskery milkcap		NT		very rare	Holwood 2018, 2019	with oak
Lactarius spinosulus	Lilacscale milkcap				Yes	Birthday Wood (within LBB) 2000	with sycamore
Leccinum duriusculum	Slate bolete				very rare	Keston Common 2018	with aspen
Leucopaxillus gentianeus	Bitter funnel		VU D2		very rare	Petts Wood roadside 2012	

Taxon	English Name	NERC Act 2006 Section 41 (2014)	Red Data List (BMS) 2006	London Priority Species (2019)	Rare in LBB	Location	Comments
**Microglossum olivaceum*	Olive earthtongue	Yes	Annex	Yes	Yes	Saltbox Hill (London Wildlife Trust Reserve) 2001	chalk grassland, retained in Kew herbarium
Mycena inclinata var. *alba*	Clustered bonnet				Yes	Petts Wood woods 2013	seen on the same dead oak stump for a few years
Ossicaulis lignatilis	Mealy oyster				very rare	Cudham Lane 2019	in elm stump
**Phellodon confluens*	Fused Tooth	Yes		Yes	very rare	Barnet Wood, 2019 & 2020	mossy bank. Only record for London, now in Kew Herbarium
Podoscypha multizonata	Zoned Rosette	Yes	NT	Yes	Yes	Beckenham Place Park 2011, West Kent Golf Course car park Downe 2006	Beckenham Place Park with oak WKGC with beech
Postia balsamea	None found				Very rare	High Elms 2020	On dead wood. New record for LBB 2020. NBN has record in LBB for 1967
**Ramaria gracilis*	None found				very rare	Cudham Guide Camp 2011	Retained in Kew Herbarium
Russula rutila	Ruddy brittlegill		NT		very rare	Petts Wood woods 2017	with oak
Russula viscida	Viscid brittlegill		NT		very rare	High Elms 2016	Mixed broad leaved woodland
Scytinostroma portentosum	Mothball crust				Yes	Downe Bank Nature Reserve 2007, 2008, 2009	On same fallen dead beech
**Spongipellis delectans*	Spongy mazegill				Yes	Cudham Valley: Girl Guide Site 2011	on dead beech. Retained in Kew Herbarium

Taxon	English Name	NERC Act 2006 Section 41 (2014)	Red Data List (BMS) 2006	London Priority Species (2019)	Rare in LBB	Location	Comments
**Squamanita paradoxa*	Powdercap Strangler		NT		Yes	Downe Valley: West Kent Golf Course 1982, Down House Garden 2015	parasitic on *Cystoderma amianthinum.* Retained in Kew Herbarium
Tricholoma populinum	Poplar Knight		VU B		Yes	Hayes Common 2008,2009 same tree	with *Populus tremula* (aspen)
Volvariella surrecta	Piggyback rosegill				very rare	Petts Wood woods 2010	on *Clitocybe nebularis* fruit bodies

All fungi records since 2007 unless otherwise stated. Fungal names follow Evans et al., English names from British Mycological Society list
Key to Status: NT Near Threatened VU Vulnerable EN Endangered
Annex' BAP or Schedule 8 species which no longer meet red list criteria but of Conservation Concern
* Identified by Mycologists at Kew & Retained in Kew Herbarium

References:

Evans, S. Henriki, A & Ing, B. (2006) Red Data list of Threatened British Fungi. See https://www.britmycolsoc.org.uk/mycology/conservation/red-data-list

London Priority Species (2019) www.london.gov.uk/WHAT-WE-DO/environment/environment-publications/london-priority-species

NERC Act Section 41 Priority Species List (2014) see http://publications.naturalengland
.org.uk/publication/4958719460769792

Table XIII: Priority Lichen Species in London Borough of Bromley

Taxon	English name	*NERC Act 2006 Section 41 (2014)	Red Data/BLS Conservation Evaluation	London Priority Species (2019)	Rare in LBB	Location	Comments
Caloplaca albolutescens	Firedot Lichen sp	No	LC	no	Yes	Walls with basic influence	Urban garden walls
Cetraria aculeata	Spiny Heath Lichen	No	LC	No	Yes	Hayes Common	Gravelly ground
Chaenotheca trichialis	Pin lichen	No	LC	No	Yes	Holwood, Scadbury	Veteran oak trees
Chaenothecopsis nigra	Weak Pin Lichen	No	NS	No	Yes	Holwood	Veteran oak trees
Cladonia/Cladina species	Reindeer moss sp	No		No	Yes	Hayes, Chislehurst Commons	Lichen heath communities
Cresponea premnea		No	IR	No	Yes	Holwood	Veteran oak trees
Lecidea exigua	Disc lichen sp	No	RLGB_DD	Yes	Yes	Downe	Apple orchard tree
Micarea viridileprosa		No	NR	No	Yes	Holwood	Veteran oak trees
Microcalicium ahlneri		No	NS	No	Yes	Holwood	Veteran oak trees
Parmellina pastilifera		No	LC	No	Yes	Jubilee Country Park	Mature oak bough
Pleurosticta acetabulum		No	LC	No	Yes	Crystal Palace Park	Leaning ash tree

BLS: British Lichen Society; IR: international responsibility; NR: taxa recorded from 1-15 hectads; NS: recorded from 16-100 hectads; LC: least concern; DD: data deficient
*Listed as Species of Principal Importance for the Purpose of Conserving Biodiversity in England under the NERC Act 2006, section 41 (2014) see Reference 2, below.

References:

- London Priority Species (2019) www.london.gov.uk/WHAT-WE-DO/environment/environment-publications/london-priority-species
- Natural England Section 41 Priority Species List (May 2014)
- Woods, RG. & Coppins, BJ. (2012) A Conservation Evaluation of British Lichens and Lichenicolous Fungi. Species Status 13. JNCC, Peterborough.

Appendix D

Invasive Non-Native Species in Bromley

The introduction of invasive non-native species is one of the greatest threats to biodiversity around the world. Across the globe, aggressive colonisers have the potential to displace native flora, fauna or ecosystems. In the UK - physically separated from the continent – some of our native plant, fungi and animal species may differ from other European populations because they have adapted to our climate. Native invertebrates and larger animals may also be adapted to our native flora.

A non-native species is a species which has been introduced directly or indirectly by man (deliberately or otherwise) to an area where it has not previously occurred.

Non-native species come into the UK and become invasive due to the lack of the usual pests and diseases that would control their populations in their native range.

Examples of non-native species having an impact on native UK wildlife includes the reduction of red squirrels following the introduction of American grey squirrels, and the decline in the native water vole population after predation by American mink. Pathological organisms can also be introduced such as the fungi *Hymenoscyphus fraxineus* which causes *Chalara* die back in ash trees and is thought to have been introduced, at least in part, on young trees imported from Europe. Some non-native plants spread prolifically due to lack of predators, prolific seed production or rapid vegetative increase. This can cause reduction or local losses of the native plants which native animals (particularly invertebrates) feed on, leading to further biodiversity losses higher up the food chain. Some introductions can also harm humans, such as Oak Processionary Moth, the caterpillars of which are highly toxic and were introduced to this country via tree stock bought from the continent.

According to the State of Nature Report (2019) an average 10-12 new non-native species become established in the UK annually, 12% of which cause serious adverse impacts which in 2010 cost the UK economy approximately £1.7 billion. The report emphasizes the need to prevent the establishment of invasive non-native species (INNs) as well as removing those existing.

Legislation

As with rare and protected species, the main piece of UK legislation with regards to non-native species is the **Wildlife and Countryside Act 1981** (as amended)
According to the act, it is an offence in England and Wales to:

- release or allow to escape into the wild any animal which is of a kind which is not ordinarily resident in and is not a regular visitor to Great Britain in a wild state, or is included in part 1 of Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).
- plant or cause to grow in the wild any plant listed in part 2 of Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Status in London

Greater London has a great diversity of species and wide range of habitats. However, the risk of non-native species causing harm or becoming invasive is increased in London, partly through warmer urban temperatures and partly due to high rates of importation and the presence of a port and several airports.

Many of London's non-native species are aquatic. Invasive aquatic species can increase the risk of flooding, impact on recreational use and reduce species diversity.

The London Invasive Species Initiative (LISI), a working group including the Environment Agency, partnered with and hosted by Greenspace Information for Greater London (GiGL). It aims to coordinate action to prevent proliferation, control and eradicate invasive non-native species in London. LISI have produced a list of Species of Concern in London. Those that are relevant to Bromley are listed in the table below.

To find out more about invasive non-native species (INNs) in London, and to send in records see the London Invasive Species Initiative.
For general information about control of some INNs see the Environment Agency booklet, Managing Invasive non-native Plants.

Invasive Native Species

Some native species, such as bracken, can also be invasive and may have detrimental effects on habitats and wildlife if allowed to dominate. Further advice can be found in Appendix E: Best Practice Guidelines for Land Managers.

The Weeds Act 1959

The Weeds Act 1959 invokes statutory action to control the spread of five harmful weeds. It was designed with agricultural land in mind. The weeds listed are:

- Common Ragwort (*Senecio jacobaea*)
- Spear Thistle (*Cirsium vulgare*)
- Creeping or Field Thistle (*Cirsium arvense*)
- Curled Dock (*Rumex crispus*)
- Broad Leaved Dock (*Rumex obtusifolius*)

Responsibility for the control of these weeds rests primarily with the occupier of the land on which the weeds are growing. In LBB these weeds are controlled rather than eradicated as they are each of them important for various animals. Spear and creeping thistle, for example, are good nectar sources for insects and together with the docks provide seeds eaten by birds. Common ragwort is the foodplant of cinnabar moth caterpillars. Good land management for biodiversity lowers the nutrient status of the soil which reduces the numbers of these weeds naturally, see **Section 6.2: Bromley Biodiversity Best Practice Guidelines**
For more information, please see DEFRA Enforcing the Weeds Act 1959.

Table XIV: Non-Native Invasive Species in Bromley

Common name	Latin name	Designation	LISI Priority Category	Recommendations for removal and further information
Terrestrial Plants				
Japanese Knotweed	*Fallopia japonica*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 3: Species of high impact or concern which are widespread in London and require concerted, co-ordinated and extensive action to control/eradicate.	Spray with glyphosate 2 times /year (may take 5-7years to eradicate) or stem treatment (injection and cut stem treatment). See https://www.cabi.org/isc/datasheet/23875 http://www.nonnativespecies.org/home/index.cfm An Environment Agency permit will be needed if using pesticide within 1metre of water.
Cherry Laurel	*Prunus laurocerasus*	Species relevant to London	Priority 3: Species of high impact or concern which are widespread in London and require concerted, co-ordinated and extensive action to control/eradicate.	Kent Wildlife Trust Land Management Advice Sheet_9_-_woodland_management_-_control_of_rhododendron (also has advice re cherry laurel control)
Rhododendron	*Rhododendron ponticum*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 2: Species of high impact or concern present at specific sites that require attention (control, management, eradication etc).	Forestresearch.gov.uk – Rhododendron Control https://www.forestresearch.gov.uk/research/management-of-upland-native-woodlands/rhododendron-control
Snowberry	*Symphoricarpos albus*	Species relevant to London	Priority 2: Species of high impact or concern present at specific sites that require attention (control, management, eradication etc).	Cut back with loppers, remove with tree poppers.

Common name	Latin name	Designation	LISI Priority Category	Recommendations for removal and further information
Spanish & hybrid Bluebells	*Hyacinthoides hispanica & H. x massartiana*	Species relevant to London	Priority 4: Species which are widespread for which eradication is not feasible but where avoiding spread to other sites may be required.	Remove whole plant (including bulb), leave to dry for 4 weeks+ and dispose of securely off site. Plantlife Guide https://www.plantlife.org.uk/application/files/9614/8155/3587/GuidetoBritainsBluebells.pdf
Variegated Yellow Archangel	*Lamiastrum galeobdolon subsp. argentatum*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 4: Species which are widespread for which eradication is not feasible but where avoiding spread to other sites may be required.	Remove whole plant and dispose of securely off site.
Three-cornered Garlic	*Allium triquetrum*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 4: Species which are widespread for which eradication is not feasible but where avoiding spread to other sites may be required.	Remove whole plant and dispose of securely off site. May have to continue this treatment for a number of years to remove all bulbils and seeds from soil.
Giant Hogweed	*Heracleum mantegazzianum*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 3: Species of high impact or concern which are widespread in London and require concerted, co-ordinated and extensive action to control/eradicate.	Highly toxic so professional help is required. See: Centre for Agriculture and Bioscience International https://www.cabi.org/isc/datasheet/26911#topreventionAndControl non-native species secretariat at http://www.nonnativespecies.org/home/index.cfm
Himalayan Balsam	*Impatiens glandulifera*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 3: Species of high impact or concern which are widespread in London and require concerted, co-ordinated and extensive action to control/eradicate.	Hand pull before seeding occurs. Repeat for several years until seeds in seedbank removed.
Terrestrial form of amphibious bistort	*Persicaria amphibia var terrestris*	Species relevant to Bromley		Remove whole plant and dispose of securely off site. Apply pesticide to leaves

Common name	Latin name	Designation	LISI Priority Category	Recommendations for removal and further information
Buddleia	*Buddleja davidii*	Species relevant to London	Priority 3: Species of high impact or concern which are widespread in London and require concerted, co-ordinated and extensive action to control/eradicate.	Do not introduce to countryside sites. Cut down and dig out root. Return to site for several years to remove seedlings
Aquatic Plants				
New Zealand Pigmyweed	*Crassula helmsii*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 3: Species of high impact or concern which are widespread in London and require concerted, co-ordinated and extensive action to control/eradicate.	See: Centre for Agriculture and Bioscience International https://www.cabi.org/isc/datasheet/16463 GB non-native species secretariat http://www.nonnativespecies.org/home/index.cfm
Parrot's-feather	*Myriophyllum aquaticum*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 3: Species of high impact or concern which are widespread in London and require concerted, co-ordinated and extensive action to control/eradicate.	For information re control/eradication, see Centre for Agriculture and Bioscience International https://www.cabi.org/isc/datasheet/34939 GB non-native species secretariat http://www.nonnativespecies.org/home/index.cfm
Floating Pennywort	*Hydrocotyle ranunculoides*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 3: Species of high impact or concern which are widespread in London and require concerted, co-ordinated and extensive action to control/eradicate.	For more information see Centre for Agriculture and Bioscience International https://www.cabi.org/isc/datasheet/28068 GB non-native species secretariat http://www.nonnativespecies.org/home/index.cfm
Water Fern	*Azolla filiculoides*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 2: Species of high impact or concern present at specific sites that require attention (control, management,	For more information see Centre for Agriculture and Bioscience International https://www.cabi.org/isc/datasheet/8119 GB non-native species secretariat

Common name	Latin name	Designation	LISI Priority Category	Recommendations for removal and further information
			eradication etc).	http://www.nonnativespecies.org/home/index.cfm
Birds				
Ring-necked Parakeet	*Psittacula krameri*	Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 4: Species which are widespread for which eradication is not feasible but where avoiding spread to other sites may be required.	See LWT Position Statement (2013) at: https://www.wildlondon.org.uk/sites/default/files/2019-07/LWT%20Position%20statement%20-%20ring-necked%20parakeet%20-%20October%202009%2C%20May%202011%20review.pdf
Fish				
Goldfish including Koi Carp	*Carassius auratus*	Species relevant to London	Priority 2: Species of high impact or concern present at specific sites that require attention (control, management, eradication etc).	survey ponds annually, report non-native fish to Environment Agency (EA). If removal is necessary it must be done under licence from EA.
Reptiles & Amphibians				
Other terrapins see	Advice as for Red eared slider terrapin. See also Independent article on abandoned terrapins			
Invertebrates				
Non-native crayfish (including signal & Turkish crayfish)		Great Britain non-native species secretariat list Wildlife and Countryside Act 1981 (as amended). Schedule 9 species	Priority 4: Species which are widespread for which eradication is not feasible but where avoiding spread to other sites may be required.	For information see: https://cdn.buglife.org.uk/2019/07/Final-Crayfish-ID-distribution-and-Legislation-23-06-15_JG.pdf If necessary can be trapped under licence from the Environment Agency

Common name	Latin name	Designation	LISI Priority Category	Recommendations for removal and further information
Oak processionary moth	*Thaumetopea processionea*	Species relevant to London	Priority 2: Species of high impact or concern present at specific sites that require attention (control, management, eradication etc).	Do not try to remove OPM caterpillars or nests yourself, because of the health risks. Notify the Forestry Commission at : https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/oak-processionary-moth-thaumetopoea-processionea.

NB. Permission must be obtained from the Environment Agency regarding pesticide use within 1metre of watercourses, wells, ponds, bore holes etc.

Natural England permission must be sought regarding pesticide use on a SSSI