Woodland Habitat Action Plan

"There is a serene and settled majesty to woodland scenery that enters into the soul and delights and elevates it, and fills it with noble inclinations."

Washington Irving

1 Aims

- To maintain and enhance the ecological health of existing woodlands and ensure that management is appropriate;
- To create new woodlands and extend the existing woodland areas; Any unavoidable loss should be adequately compensated with the securement of a Biodiversity Net Gain.
- To raise the awareness of the importance of woodlands amongst council officers and the public, to encourage appreciation of woodlands across the borough.

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2 Introduction

Over the past 20 years, since the publication of Frans Vera's 'Grazing Ecology & Forest History' in the year 2000, there has been a significant shift in the scientific consensus regarding the composition of woodlands across Europe in the pre/early human era. It is now no longer accepted that much of Europe was dominated by ubiquitous, species-poor, closed canopy forest (Rackham, 1976); but a dynamic and complex mosaic of woodland pasture, driven by a suite of species whose grazing and behaviours were pivotal factors, as well as the more traditionally recognised importance of vegetation succession. This awakening has helped to reframe the narrative when it comes to managing our woodland environments.

Woodlands of the London area will have been managed from the Bronze Age. The establishment of Roman Londinium demanded large quantities of timber, and many of Roman London's needs would have been supplied from its surrounding woods and forests. Indeed, when the Romans first built Kingston Bridge in AD 43, it must have required significant amounts of local timber. Through the middle ages to the time of the industrial revolution this demand grew to meet the needs of an expanding population, where wood was used for construction, ship building and charcoal. It is important to acknowledge these historical perspectives when considering woodland management, as London's woods cover about 4.5% of the region, and about 40% are ancient semi-natural woodland (dating back to at least 1600 AD) (Morris, n.d.).

Ancient Woodland (AW) is one of the richest of all British habitats in terms of its ability to support animals and plants, many of which are specialist species which have poor powers of dispersal and are found nowhere else (see appendix 1 for a list of ancient woodland vascular plants, with little or no ability to colonise secondary woodland). More generally speaking, deciduous woodland is defined as any woodland in which more than 80% of its trees are broadleaved species.

Many chance phenomena operate both to conserve and destroy woodland in urban areas. The survival of odd corners and strips cut off during the construction of roads and railways can be locally important (Gilbert, 1989). Examples include Coombe Wood divided by the A3, The Grapsome divided by the Esher By-pass and Chessington Woodlands divided by the Leatherhead Road (as well as an old railway embankment).

In the 2020 Site of Importance for Nature Conservation (SINC) review, 29 of the 45 SINC sites were said to support deciduous woodland of varying degrees of size and ecological health. However, we recognise that this is not inclusive of all the woodland across the borough. **Figure 1** produced by GiGL shows the distribution of woodland habitat across the borough which covers approximately 13% (496 Hectares) of Kingstons' total land area.

Much of the deciduous woodland across the borough is classed as secondary growth woodland which has developed through natural colonisation of open sites over the last four centuries. This includes sites such as the Berrylands Nature Reserve (formally known as the Raeburn Open Space) now dominated by hazel, hawthorn, blackthorn, with some mature oak trees which are remnant from the old hedgerows once separating the agricultural fields. This habitat type, though not as revered as AW, still has significant ecological value to a

wealth of biodiversity including woodland birds, bats, saproxylic communities and mycorrhizal fungi. Kingston is also fortunate to have a number of remnant ancient semi-natural woodland sites which are primarily located in the north of the borough such as Coombe Wood and Kingston University's Kingston Hill Campus and some areas in the south of the borough at Chessington Wood, Sixty Acre Wood (majority in neighbouring Elmbridge) and Jubilee Wood.

This document is an updated version of the previously published Habitat Management Plan for Woodland, Copses and Tree Belts, created in 2014. This Habitat Action Plan is not intended to provide site specific context and management recommendations, but provides an overview of the current borough level situation and a framework in which site management interventions can be agreed.

3 Current status

a. Legal / policy status

- Trees can be protected from felling through The Forestry (Felling of Trees) Regulations 1979 and Tree Preservation Orders.
- Many species that commonly inhabit woodland are protected by The Wildlife and Countryside Act 1981 and The Conservation of Habitats and Species Regulations 2010 (England and Wales). A survey should be undertaken to check for rare and protected species before a development can take place.
- Archaeological relics found in ancient woodland may be scheduled and protected by The Ancient Monuments and Archaeological Areas Act 1979.
- The Nation Planning Policy Framework states that development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.
- Many woodlands also have both statutory and non-statutory protection secured via Local Nature Reserve Status and SINC designation respectively.

b. Conservation status - Wet woodland is a UK BAP Priority Habitat. Small areas of this habitat can be found at Jubilee Wood and Tolworth Court Farm Moated Manor. Wood-Pasture and Parkland are also a UK BAP Priority Habitat and there is the intention and aspiration to work toward creating such a habitat at Tolworth Court Farm (See Appendix A for SINC sites in RBK with woodland habitat).

c. Distribution

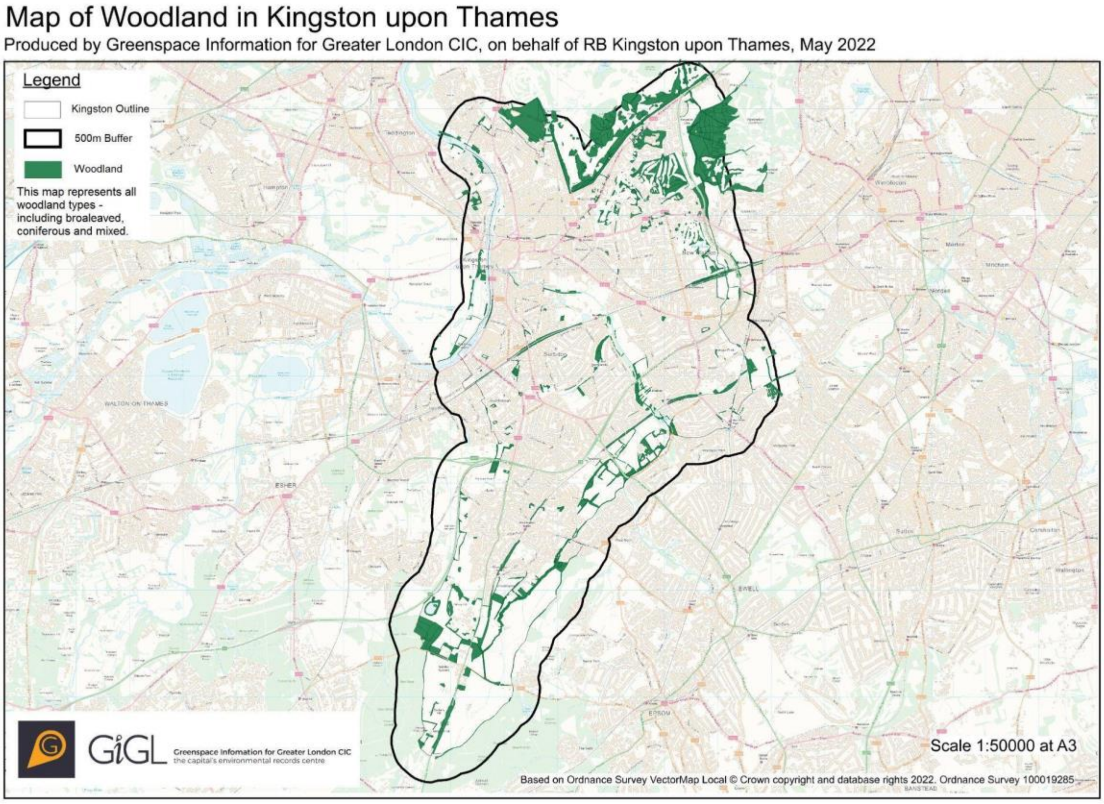

Figure 1 Distribution of woodland habitat in RBK with a 500m buffer into neighbouring boroughs.

4 Associated Indicator Species

A woodland managed for biodiversity outcomes can provide ecological niches for a wide range of species. It is therefore important to ensure that our woodlands are managed to maximise the potential for species diversity and that they are well connected to enable colonisation, movement and address issues such as habitat fragmentation. Key indicator species include:

- Great & Lesser Spotted Woodpeckers
- Native Bluebell
- Treecreeper
- Bats
- Saproxylic Beetles
- Pedunculate Oak
- Purple Hairstreak Butterfly
- Vascular plants associated with ancient woodland (Appendix B)
- Barnacle lichen (indicator of ancient woodland)

Ancient woodlands are a highly valued resource that support a number of scarce and nationally important species. In recent history, losses of AW as a result of the clearance for agriculture and development has meant that ancient semi-natural woodlands cover a mere

1-2% of Britain's landscape (Thompson *et al.,* 2003). Due to the long time-scales needed for AW to develop and the distinctive genetic make-up of locally adapted tree populations, if we don't restore and protect what we have left we are at risk of losing it forever.

5 Ecosystem Functionality and Services (Role in the Climate Emergency)

Although some may see woodlands as being static features, this is indeed not the case. They are dynamic, ever-changing systems with complex and intricate species interactions continually taking place. An ecologically healthy woodland will support a range of ecosystem processes and enhance the resilience of the area to the challenges faced by climate change. One assessment found that London's existing trees and woodlands provide ecosystem services worth £133 million per year through pollution removal, carbon storage and storm water attenuation services alone. It was also estimated that if urban forests were lost, the cost of replacing these services would equate to around £6.12 billion (Rodgers *et al.,* 2015).

5.1 Carbon Sequestration

Forests in the UK store approximately 4.6% of the country's total carbon emissions. As part of the London Environment Strategy, the government has set ambitious targets to plant over 30,000ha of woodland per year by 2025, offering a significant opportunity to mitigate climate change through carbon sequestration (Coomes *et al.,* 2021).

Of particular importance are large, mature trees, which have been shown to provide ecosystem services on a disproportionately beneficial scale. For example, Gugan *et al.* (2019) found that the largest 100 trees on a university campus, which made up only 7% of the total number, provided over one third of the environmental benefits in terms of carbon sequestration, pollution removal and flood risk. Often, the felling of mature trees is compensated by the planting of young saplings. Consequently, there is a significant loss of or time lag (around 25 years) in the provision of ecosystem services. This makes a very strong case for retaining as many mature trees in the borough as possible.

While woodlands are a valuable carbon store, soils currently dominate the total land cover carbon store across all UK habitats (Field *et al.,* 2020). However, it is reasonable to point out that tree covered soils are associated with the highest carbon stocks, with soil production estimated to outpace erosion by as much as five times in these habitats (Robinson *et al.,* 2017). It is, therefore, extremely important to conserve native woodlands, followed closely by grassland and wetland habitats, to prevent the loss of both above and below ground carbon.

5.2 Reducing Flood Risk

Due to global sea level rise and increasing extreme weather events, the occurrence of flooding has become more frequent. Traditionally, flood management methods have involved the construction of hard infrastructures which often incur high costs for construction and maintenance. They can be aesthetically displeasing and can have adverse impacts on the natural environment (Wheater, 2006; Alexander et al., 2012).

When applied appropriately, planted and managed woodlands provide a nature-

based solution to flood by intercepting rainfall, increasing infiltration rates, reducing and delaying flood peaks and increasing water storage (Nesshöver et al., 2017; Waylen et al., 2018; Cooper et al., 2021). It is also important to consider how species survival will be affected by flooding in certain areas and how flooding may influence changes in species diversity within our woodlands.

5.3 Soil Erosion

It is predicted that increases in both temperature and intense precipitation as a result of climate change are likely to increase soil erosion and, subsequently, the quantity of sediment lost and transported into the river Thames (Bussi *et al.,* 2016). Woodlands play a key role in retaining soils, particularly through increasing rainfall interception capacity and by acting as natural barriers, reducing both wind and water erosion. Deep rooting trees can also improve soil quality by providing stability, structure and nutrition. These protective features tend to strengthen with higher canopy cover and living biomass (Altieri *et al.,* 2018).

5.4 Water Supply & Quality

While climate change is inevitable, it is almost impossible to predict how London will be impacted specifically. Projections forecast that by 2050, London's climate could resemble that of Barcelona's current climate (Bastin *et al.,* 2019), with an increase in mean summer temperature by 2.7°C and a decrease in mean summer rainfall of 18%. These statistics would suggest an increased probability of drought and water shortages in an already 'water stressed' region (Greater London Authority, 2016). Not only does planting trees alongside watercourses reduce diffuse pollution (Hutchins *et al.,* 2010), trees also reduce wind speed and water

loss and provide dappled shade, increasing ecosystem services and helping to lower water temperatures for fish and other wildlife (Bachiller-Jareno *et al.,* 2019)

5.5 Thermoregulation

Adapting to climate change will require preparing for future heatwaves and their impacts. London is already experiencing the 'urban heat island' effect due to hard, dry surfaces which provide less shade and moisture than natural landscapes. This urban microclimate will have major implications for quality of life, especially for people living in accommodations that are unable to cope with heat.

Primarily, trees influence urban climate through shading and evapotranspiration (Winbourne et al., 2020), thus reducing land surface temperatures. Schwabb et al. (2021) found the potential for land surface temperature reduction in Great Britain to be high, as urban trees can increase cooling by 2-4 times compared to treeless urban areas (Schwabb et al., 2021).

5.6 Health & Recreation

In urban areas, trees and woodlands are essential for communities as they support wellbeing, reduce pollution and improve quality of life. A report by Forest Research (2021) found that in England alone, woodlands save £141 million in costs associated with mental health illnesses by reducing visits to GPs, drug prescriptions, inpatient care, social services and the number of days lost due to mental health issues.

Access to greenspaces such as woodland also helps to address physical inactivity, which is a major driver of ill health in the UK, associated with 1 in 6 deaths and costing £7.4 billion annually (GOV, 2022).

5.7 Air Quality

Trees play an invaluable role in contributing to air quality in London. While the primary objective of air quality policy is to reduce emissions at their source, the biosphere is an important sink for many pollutants. Trees are particularly effective at removing particulate matter, as tree canopies provide a surface area between 2-12 times greater than that of the land areas they cover (Broadmeadow and Freer-Smith, 1996). Woodlands therefore have a sizable potential for pollution absorption which has been linked to increased health benefits, such as extended life expectancy and preventing hospital admissions related to poor air quality (Powe & Willis, 2004). A prominent measure in urban development is to increase the number of trees for tackling air pollution. However, absorption capacity

and resilience to environmental stressors is species-specific, varies widely and should be considered in planting regimes (Samson *et al.,* 2017).

5.8 Biodiversity
Woodlands provide a range of micro-habitats and niches, helping to deliver a critical underpinning role for other ecosystem services (Harrison et al., 2014). While semi-natural and replanted woodlands have high biodiversity value (Field et al., 2020), ancient woodlands are known to support more threatened species than any other habitat in the UK (Corney et al., 2008). The diversity within woodland is typically greater in stands that are structurally diverse in terms of their age, species, edge habitat, ground flora and deadwood components (Sing et al., 2021).

6 Threats to Habitat

Woodlands are complex ecosystems that face a wide range of threats. These tend to be interlinked, meaning one threat might compound another with implications for a broad spectrum of taxa.

6.1 Habitat Destruction & Fragmentation
Habitat destruction and fragmentation are major causes of biodiversity loss resulting from a number of interrelated processes, such as the increasing distance between habitat patches, a reduction in the size of those patches and also through edge effects (Fahrig, 2003). Climate change is expected to shift the geographic range of habitats and organisms and without connectivity to these new spaces, some woodland species may be forced to local extinction in the face of increasingly unsuitable habitat and barriers to dispersal (Pearson and Dawson, 2003; Opdam and Wascher, 2004).

The consequences of habitat loss are highly site and species-specific, depending on the quality and connectivity of the surrounding landscape and the dispersal power of the species in question. Species with high dispersal power, such as generalist birds, may move from woodland to woodland easily with little regard for the quality of the habitat matrix in-between (Sverdrup-Thygeson *et al.,* 2017). On the other hand, species with limited dispersal powers such as saproxylic insects (e.g. stag beetles) (Alexander, 2004) and native trees with short pollinating distances (Rackham, 2008) may be confined.

Corridors need to be maintained or created between patches of woodland along which plants, animals, fungi and microbes can travel and repopulate areas to form a healthy environment. It is thought that increasing the physical linkage of woodlands through habitat creation lessens the negative impacts associated with fragmentation, by providing 'stepping stones' for biodiversity between isolated populations. However, if the newly created habitats do not provide sufficient resources to meet the basic needs of vulnerable, sedentary and sessile species, then wildlife corridors can be functionally ineffective and can see increased rates in mortality of the species using them (see Appendix C for woodland wildlife corridor recommendations).

6.2 Lack of Policy

The UK has been criticised for its lack of clear, enforceable policies, underpinned by the continual loss of healthy woodlands as a result of poor management and urban development (Razzaque & Lester, 2021). However, the proper management of woodlands is a task that requires considerable time and effort even with policies present to reinforce standards. As policy makers are increasingly looking towards nature-based solutions for mitigating climate change, woodland creation policy would benefit from comprehensive and long-term studies at both local and regional scales (Cooper *et al.,* 2021). Examples that indicate proper management could include the lack of invasive species and disease present at a site, or the presence and volume of dead or decaying wood and standing veteran trees.

6.3 **Climate Change**

Projected changes in temperature, rainfall patterns and extreme weather events,

changes in growing conditions and seasonality and the increased incidence and severity of floods, droughts, pests, diseases and invasive species will gradually but ultimately influence UK woodland composition, and are all major risks to native woodland biodiversity (Ray, Morrison & Broadmeadow, 2010). Adapting to such changes must involve increasing the resilience of woodlands to the effects of climate change while maximising and utilising ecosystem services for society (Rackham, 2008). Maintaining and enhancing woodland diversity and connectivity, matching species correctly to site conditions and developing contingency plans to deal with the potential impacts will be pivotal.

While ancient woodlands are likely to be fairly resilient to climate change due to high species diversity, climate-related impacts are especially significant for the development or expansion of ancient woodlands, which require longer periods in which to form their unique composition (Rackham, 2008).

6.4 Unnecessary Removal of Trees & Dead Wood

Across the world, a fascinating diversity of life can be found in decaying wood. Unsurprisingly, they carry out hidden yet important ecological processes that extend far beyond the decomposition of wood. The cycling of nutrients and soil enrichment leads to higher woodland productivity and biodiversity (Stokland, Siitonen & Jonsson, 2012). This in turn sequesters higher rates of carbon, contributes to the production of humus and can even influence watercourses and geomorphology (Cheesman & Wilde, 2003). The quantity and quality of deadwood present can therefore be an

indicator of the quality of woodland ecosystems (Lassauce *et al.,* 2011).

Among other factors, this diversity is seriously threatened by the removal of dead wood and trees in managed woodlands. While urban woodlands are usually less intensively managed and provide habitat for species threatened by forestry practices (Korhonen *et al.,* 2020), mature trees are often removed for public safety or aesthetic reasons. Preserving old-growth woodland is, therefore, critical for protecting relict populations of the most sensitive species (Ulyshen & Koerner, 2018). If managed sensibly, urban woodlands could in future become even more significant for conservation, as demonstrated by the high proportion of the European stag beetle, *Lucanus cervus,* in the southern and western London boroughs.

6.5 Invasive Species

As climate change and globalisation increase their incidence and severity (Seebens *et al.,* 2018; Smith *et al.,* 2018), controlling invasive species is becoming increasingly important for society. Not only are they associated with transporting disease (Medlock & Leach, 2015), they can be major drivers of local and global extinctions (Doherty *et al.,* 2016). In the UK for example, the introduction of American conifers for logging led to competition for canopy space with slower-growing broadleaf species and facilitated the inflation on grey squirrel populations in certain areas (Pryor, Curtis & Peterken, 2002). Grey squirrels in turn continue to out-compete the native red squirrel and further damage native tree species through bark stripping behaviour, with significant implications for forestry.

Typical examples of invasive species that can be found in Kingston's woodlands include:

- Rhododendron
- Laurel
- Bamboo
- Yellow and variegated archangels
- Snowberry
- Spanish bluebell
- Winter heliotrope
- Japanese knotweed
- Himilayan balsam
- Giant hogweed
- Three cornered leek
- Grey squirrel

Where found, management practices should be implemented to control and prevent further spread. Site-specific records of invasive species can be found in the "Review of Sites of Importance for Nature Conservation, Kingston upon Thames" (LUC, 2021).

6.6 Pollution & Litter

Chemical pollution comes from a range of sources though in urban environments these are most likely to be from transport, commerce and industry, waste disposal facilities and development. Impacts may include changes in the composition of woodland ground flora, reduced tree health, wildlife poisoning and loss of soil microorganisms with implications for nutrient cycling (Corney *et al.,* 2008).

Picnic sites adjacent to woodland can also have a strong local effect on woodland ecology, as sites with increased food availability have been shown to attract larger-bodied and more aggressive bird species, which may displace woodland specialists (Piper & Catterall, 2006). Litter from picnic areas and nearby waste disposal facilities may also cause wildlife casualties through ingestion or being trapped by rubbish (Corney *et al.,* 2008).

6.7 Diseases & Infestation

Climate change, globalisation and other environmental stressors have triggered a massive spread of pests and diseases beyond their native ranges (Rotherham, 2020). In an evolutionary context, native plants will adapt alongside pathogens, often causing little harm to their host. However, when a pathogen escapes its native range and is introduced to communities with little natural resistance, the resulting damage may extend far beyond the effect of the host species and can collapse entire ecosystems (Brasier, 2008). For example, the first Dutch elm disease pandemic in the UK resulted in the loss of 30% of its total elm population, with permanent consequences for ecosystems, economies and cultural heritage (Gibbs, 1978; Peace, 1960).

As part of the current climate strategy and move towards Net Zero, the UK aims to increase tree cover from 13% to 17% by 2050 (Committee on Climate Change, 2020). To avoid the unnecessary loss of woodlands and their associated economic and cultural benefits, sourcing these trees must be done with care and all imports should be considered as a biosecurity risk (Brasier, 2008). Additionally, to identify, prevent and manage outbreaks, any sign of disease or infestation should be reported immediately to local authorities.

6.7 Lack of Knowledge

Policy objectives are currently limited by knowledge gaps and a lack of evidence to make case for woodland management, afforestation and the ecosystem services provided by differing woodland types (Ngai *et al.,* 2017; Burton *et al.,* 2018; Cooper *et al.,* 2021).

7 Conservation actions (Tabulated)

Action	Timeframe	Lead	Partners	Evidence base
W01 - All woodlands in RBK Local Nature Reserves to have active conservation management plan	2023 -2028	RBK	Friends groups	Highgate Wood Management Plan Create a Woodland Management Plan - GOK.UK
W02 - All woodlands in RBK owned SINC sites to have active conservation management plan	2022-2025	RBK	Friends groups	See above

W03 - All woodlands in RBK owned parks to have active conservation management plan	2022-2025	RBK	Friends of Parks groups	See above
W04 - Provide guidance to those who have woodland sites on how to manage them appropriately	2022 - Onwards	RBK		Maintaining and Managing Woodland - GOV.UK Managing Woodland for Wildlife
W05 - Promote funding opportunities to deliver habitat management / creation among Friends Groups and conservation organisations	2022 - Onwards	RBK (this could be led by H&H if we helped with a Kingston Biodiversity Partnership or Friends Forum)		N/A
W06 - Contribute to a database of species records in London. Ensure the GiGL SLA is renewed.	2022 - Onward	RBK	NGO Community groups Local naturalists	N/A
W07 - Continue to update and review SINC designations as necessary following 2020 assessment	Next full assessment due 2025, update as appropriate until then	RBK		Review of Sites of Importance for Nature Conservation, Kingston
W08 - Reduce and provide guidance on non-native species in woodlands	2022- Onwards	RBK		Managing Invasive and Non-native Forestry Species - Forestry Commission

W09 - Leave all standing deadwood in woodlands unless health and safety reasons dictate otherwise	2022 - Onwards	RBK		Deadwood Guidance - Forestry Commision
W10 - Establish areas of dead wood in all parks	All parks to have deadwood habitat by 2024	RBK		See above
W11 - Woodland creation and tree Planting targets	Integrate	RBK		The England Trees Action Plan 2021-2024 - GOV.UK
W12 - Establish Miriwaki forest in two parks	2025	RBK		The Miyawaki Method - Creating Tomorrow's Forests A Guide to the Miyawaki Method
Engagement & Awareness	**Timeframe**	**Lead**	**Partners**	**Evidence base**
W13 - Run 4 community tree walks per year (1 per neighbourhood)	2022- Onwards	RBK		N/A
W14 - Set up a tree warden scheme as part of the Friends Forum, with appropriate training provided.	2022- Onwards	RBK		Kingston Trees - Become a Tree Warden

8 Planning Context - Biodiversity Net Gain

In the UK, a planning condition is defined as ‘a constraint placed on the granting of planning permission which allows development to go ahead only if the conditions are satisfied’. When used properly, conditions can enhance the quality of development and enable it to proceed where it would have otherwise been necessary to refuse, by mitigating the adverse effects. As an automatic condition of the Environment Act 2021, applicants will need to measure the existing and proposed biodiversity values of their sites before development begins in order for permissions to be granted.

As a priority habitat for the borough, woodland should be protected through the planning system and, where possible, habitat creation and enhancement is encouraged. As part of the new conditions, if the loss of a habitat cannot be avoided appropriate mitigation and compensation actions must be taken, with a minimum of 10% biodiversity net gain (calculated using The Biodiversity Metric 3.0). Additionally, these biodiversity enhancements must be secured for a minimum of 30 years. Reaches of adjoining priority habitats, such as hedgerows, grasslands and freshwater habitats, may form an integral part of woodland conservation management.

The new Biodiversity Net Gain (BNG) policy does not trump other environmental policies, meaning irreplaceable and locally important habitats should remain protected from development and are not to be insufficiently replaced with newly created habitats. The delivery of BNG through landscaping and green infrastructure is preferred onsite. Where onsite improvements are not possible measurements must be delivered off site on land holdings or via habitat banks, or as a last resort, through the purchase of statutory biodiversity credits.

9 Monitoring

Metric	Process of Monitoring	Timeframe	Lead	Partners
W01, W02, W03 - Number of active management plans	Annual account	2023 - ongoing	RBK	
W04, W08 – Distribution list and number of landowners / land managers engaged	Annual report	2023 - 2028	RBK	
W05 – Record of funding opportunities promoted	Annual account	2023 -2028	RBK	

W06 – Date of SLA renewal & spreadsheet of species records	Ad hoc, annual account	2023 - ongoing	RBK	
W07 – Record of updates to SINC review	Ad hoc, annual account	2025 assessment	RBK	
W09, W10, W11, W12 - Number of habitat enhancement projects undertaken	Annual report	2023 - ongoing	RBK	
W13 - Number of events and number of attendees	Annual account	2023 - 2028	Glendale	
W14 - Number of new tree wardens	Annual report of their findings	2023 - 2028	RBK	

10 Other relevant HAPs/ SAPs

a) Bats
b) Stag Beetles
c) Pollinator Parks
d) Standing Open Water
e) Rivers & Streams
f) Badger
g) Amphibians
h) Hedgehogs

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12 Abbreviations

AW - Ancient Woodland
H&H - Habitats & Heritage
RBK - Royal Borough of Kingston
PAWS - Planted Ancient Woodland Sites
ASNW - Ancient Semi-Natural Woodland

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14 Appendix

Appendix A. SINC designation status of RBK sites with woodland habitat.

Site	Habitat	SINC Designation
Sixty Acre Wood	Botanically diverse, deciduous woodland and ancient woodland	Metropolitan
Jubilee Wood	Botanically diverse, deciduous woodland	Metropolitan
Jubilee Meadows	Deciduous woodland	Borough (Grade 2)
Canbury Gardens	Deciduous woodland	Unspecified
Kingston Cemetery	Deciduous woodland with veteran trees	Local
Edith Gardens Allotments	Woodland-scrub	Local
Coombe Hill Golf Course	Deciduous woodland and ancient woodland	Metropolitan
Chessington Wood	Ancient, deciduous woodland	Borough (Grade 1)
Coombe Wood	Deciduous woodland	Borough (Grade 2)
Hogsmill Valley	Semi-natural broadleaved woodland, deciduous woodland	Borough (Grade 1)
Alric Avenue Allotments	Broadleaved woodland and ash dominated woodland	Unspecified
The Leyfield (or Old Malden Common)	Deciduous, secondary woodland	Borough (Grade 2)
Coombe Wood Golf Course	Deciduous woodland	Borough (Grade 2)

Barwell Estate Lake	Deciduous woodland	Borough (Grade 1)
Kingston University, Kingston Hill	Semi-natural broadleaved woodland, deciduous woodland	Borough (Grade 1)
Hogsmill Valley Sewage Works and Hogsmill River	Deciduous woodland	Borough (Grade 1)
Royal Park Gate Open Space	Deciduous woodland and woodland-scrub	Local
The Grapsome	Supports ancient woodland	Borough (Grade 2)
World's End	Deciduous woodland, semi-natural broadleaved and old plantation woodland	Borough (Grade 1)
Green Lane	Broadleaved deciduous woodland	Borough (Grade 2)
Tolworth Court Farm Fields and Medieval Moated Manor	Deciduous woodland, supports wet woodland	Borough (Grade 1)
Rushett Farm, Rushett Common & Telegraph Hill	Mature deciduous woodland	Borough (Grade 2)
Castle Hill and Bonesgate Open Space	Broadleaved deciduous woodland	Borough (Grade 1)
Bonesgate Stream	Deciduous woodland	Borough (Grade 2)
Bonesgate Open Space	Deciduous woodland	Unspecified
RAF Chessington (Kingston upon Thames)	Woodland	Unspecified
Fishponds	Broadleaved woodland with mature trees	Borough (Grade 2)
Manor Park	Deciduous woodland	Local
Beverley Brook in Kingston	Deciduous woodland	Borough (Grade 2)
Winey Hill	Deciduous woodland	Borough (Grade 2)

Clayton Road Wood	Ancient, deciduous woodland	Borough (Grade 2)
Riverhill House	Mature deciduous woodland, broadleaved woodland, riparian woodland	Borough (Grade 2)
Causeway Copse	Semi-natural broadleaved woodland	Local
Mount Road Open Space	Deciduous woodland, immature woodland	Local
Raeburn Open Space	Deciduous, secondary, broadleaved woodland	Borough (Grade 2)
Knollmead Allotments	Woodland	Unspecified
Beverley Park	Immature woodland	Unspecified
Oakhill, 'The Woods' and Richard Jefferies Bird Sanctuary	Mature woodland	Borough (Grade 2)
Malden Golf Course and Thames Water Pipe Track (Kingston)	Semi-natural broadleaved woodland, deciduous woodland with veteran trees	Borough (Grade 1)

Appendix B. Examples of vascular plant species indicative of ancient woodland, with little or no ability to colonise secondary woodland.

Latin Name	Common Name
Carex pallescens	Pale Sedge
Carex pendula	Pendulous Sedge
Carex remota	Remote Sedge
Equisetum sylvaticum	Wood Horsetail
Galium odoratum	Woodruff
Lamiastrum galeobdolon	Yellow Archangel
Luzula sylvatica	Great Wood-rush
Lysimachia nemorum	Yellow Pimpernel
Melica uniflora	Wood Melick

Milium effusum	Wood Millet
Oxalis acetosella	Wood-sorrel
Potentilla sterilis	Barren Strawberry
Primula vulgaris	Primrose
Tilia cordata	Small-leaved Lime

Appendix C. Considerations for woodland wildlife corridor design.

- Edge effects penetrate around 50 m into woodlands. Corridors should, therefore, be larger than 100 m wide in order to support interior woodland habitat and increase the likelihood of resource provision for dispersing individuals. This is especially important for interior woodland specialists with poor dispersal. As a rule of thumb, 'as wide as possible' is recommended for corridor design.
- Consider the type of species worth conserving. It is the species of intermediate dispersal ability that are likely to benefit from wildlife corridors but also be hindered by them, if the matrix habitat is 'hostile'. For successful colonisation, these species should be able to move in sufficient numbers, at a sufficient frequency, for movement to be beneficial and to allow a metapopulation to develop across the landscape.
- Think long-term. Another consideration should be the possibility of facilitating rare, long-distance dispersal events. Facilitating long-distance dispersal will allow for species to keep up with future shifts in woodland range, as a result of factors such as climate change, fragmentation and habitat loss.
- Minimise gaps, barriers and roads in corridor design, as these can increase the risk of the threats. Additionally, be aware that the history of land use may reduce the quality of newly created links for some time.