



BRADBOURNE LAKES, SEVENOAKS, KENT

Conservation Management Plan

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Summary

Zenith Built Heritage and Collington Winter were commissioned by Sevenoaks District Council to undertake a Conservation Management Plan for the extent of Bradbourne Lakes Park, Sevenoaks, Kent as part of their Bradbourne re-bourne landscaping project. This is the final submission of the project, which is looking to establish the history of the development of Bradbourne Mansion, its parkland and the subsidiary component which was the Lakes Park. The latter is the subject of the present study and presents a plan for the preservation of the historic landscape.

The development of the lakes can be established on cartographic evidence. A map of 1769 clearly shows the Brad stream, Bradbourne Farm, and all the main features of the Mansion, but does not show any lakes just north of the turnpike road. The next map in sequence is the 1801 William Mudge 1" map which shows a slightly trapezoidal shape indicating a dam at its northern end that corresponds with the location of Lake 5. Between the 1801 map and the 1833 sales map the remaining lakes (2-4) appeared which were very rectangular in form, and which contrasted with the more irregularly shaped Lakes 1 and 5, which had earlier origins. Their regular shape is out of keeping with the typical form of lakes from a pleasure ground, which are usually of an irregular form and shape intended to emulate a natural lake or pond. The regular rectangular shape would suggest, therefore, that they originally had a practical rather than ornamental function and may reflect an attempt to use the site to earn income for the estate.

The field survey identified 46 archaeological features which demonstrate a development of the landscape from the mid eighteenth century through to the present, formerly as private pleasure grounds for a manorial estate and subsequently as a municipal park serving the community that has developed around it.

The landscape resource can be broadly divided into natural and man-made fabric. The natural fabric of the landscape comprises all the living elements such as the trees, grassland etc, which are supported by the underlying geology and soils. The man-made fabric broadly comprises the built features, such as the lake retaining walls, fences, bridges and furniture. The natural and man-made elements combine, to create the unique landscape character setting of Bradbourne Lakes and the special qualities of place.

Collectively the parkland has a high significance, based on its historic Lakeland landscape, its aesthetic value, its value to the community, and its arboricultural value, which includes two London plane trees that are up to 200 years old.

The study has developed an action plan, which includes improvements to the hydrology of the lakes, the management of the trees, and the introduction of marginal and emergent plant species to improve the aquatic and riparian habitats within the lakes to enhance biodiversity and improve water quality.

The plan schedules the improvement of the grassland to encourage visitors to the parkland and includes schemes to improve the visitor interactions with nature, and improve the public's appreciation of the heritage and wildlife. It includes maintenance and repairs to the lake edges, the improvement of access around the lakes, and improving the visitor furniture, such as natural play areas.

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1 INTRODUCTION

1.1 Introduction

Zenith Built Heritage and Collington Winter were commissioned by Sevenoaks District Council to undertake a Conservation Management Plan for the extent of Bradbourne Lakes Park, Sevenoaks, Kent as part of their Bradbourne re-bourne landscaping project. This is the third submission of the wider project incorporating the earlier documentary study with the results of a field survey and the Landscape Report. The overall study is looking to establish the history of the development of Bradbourne Mansion, its parkland and the subsidiary component which was Lakes Park and is the subject of the present study.

The documentary study (Section 3 and 4) has been a process of examining secondary documentary records coupled with a detailed map regression to examine the historical development of the Lakes Park. It incorporates the Historic Environment Record as it pertains to the study area.

The ground survey (Section 5 and Appendix B) has developed on from the documentary study and has examined the physical evidence for features identified by the documentary study, setting the results within a chronological framework. A landscape assessment has been implemented which has identified the key components of the landscape (Sections 6 and 7).

The study has assessed the heritage significance of the wider landscape and the individual feature on the basis of standardised Historic England conventions (Section 8). This defines the priorities for management categorised in terms of their importance within the wider context and those of the park.

The study has assessed the current issues, vulnerabilities and opportunities connected with the management and conservation of the landscape resource at Bradbourne Lakes and presents these through consideration of previous surveys, a review of the changes in the landscape over time, an assessment of the current condition of the elements which combine to create the unique landscape at Bradbourne Lakes and from an understanding of the current landscape management which is being carried out (Section 9).

The future approach to management is proposed which is based on an understanding of the value and significance of the landscape, and which helps to guide the future management and conservation of the landscape. The outline objectives and management principles are presented in Section 10.

1.2 Objectives

The brief for the Conservation Management Plan (CMP) is “to document the natural and cultural heritage of the site, evaluate their significance, assess current and potential risks, and establish policies to guide future management.

The contents of the final written plan should be based on the National Heritage Lottery Fund (NHLF) guidance, encompassing all aspects of the historic environment, including:

- Buried Archaeology: A Desktop-Based Archaeological (DBA) survey will be commissioned separately.
- Built Heritage and Landscape: Both designated and non-designated heritage assets.
- Natural Heritage: This includes veteran trees, historical planting evidence, and the ecological and biodiversity values of the park.

The CMP serves as a strategic document to guide the preservation, protection, and sustainable use of Bradbourne Lakes' natural and cultural heritage. It will:

- Identify the significance of the site.
- Assess its condition and associated threats.
- Provide clear objectives and actionable strategies to ensure its long-term viability.

The CMP will act as a foundational resource for informed decision-making, ensuring that conservation priorities align with stakeholder needs, legislative frameworks, and planning requirements. The overarching goal is to safeguard the site's heritage values for future generations while promoting responsible use of this valued community green space.

(Bradbourne Re-Bourne – Consultant Brief Conservation Management Plan (2025) Sevenoaks District Council).

1.3 Landscape Context

Bradbourne Lakes are a series of lakes extending along the line of the Brad stream, which is a tributary of the Darent River, in Sevenoaks, Kent (NGR 55210 15610) (Fig 1). It was formerly a part of Bradbourne Park and adjacent to Bradbourne Hall, which has an extended history that potentially dates back to the time of King John, but now the parkland is a small survival of woodland and lakes within the extended suburban development of Sevenoaks.

Despite being surrounded by residential properties, Bradbourne Lakes has a green and wooded character, providing an oasis of calm and tranquillity. Defined to the north by the busy A25, Bradbourne Vale Road and dissected into the North and South Parks by Betenson Avenue, there are limited audible effects within the site, and the landscape remains predominately tranquil. Beyond the boundary properties to the east, south and west are relatively quieter residential streets; Lambarde Road, Lake View Road and Robyns Way respectively. Beyond the A25, Bradbourne Vale Road to the north is the Sevenoaks Wildlife Reserve, which is managed by the Kent Wildlife Trust, allotments and open agricultural land.

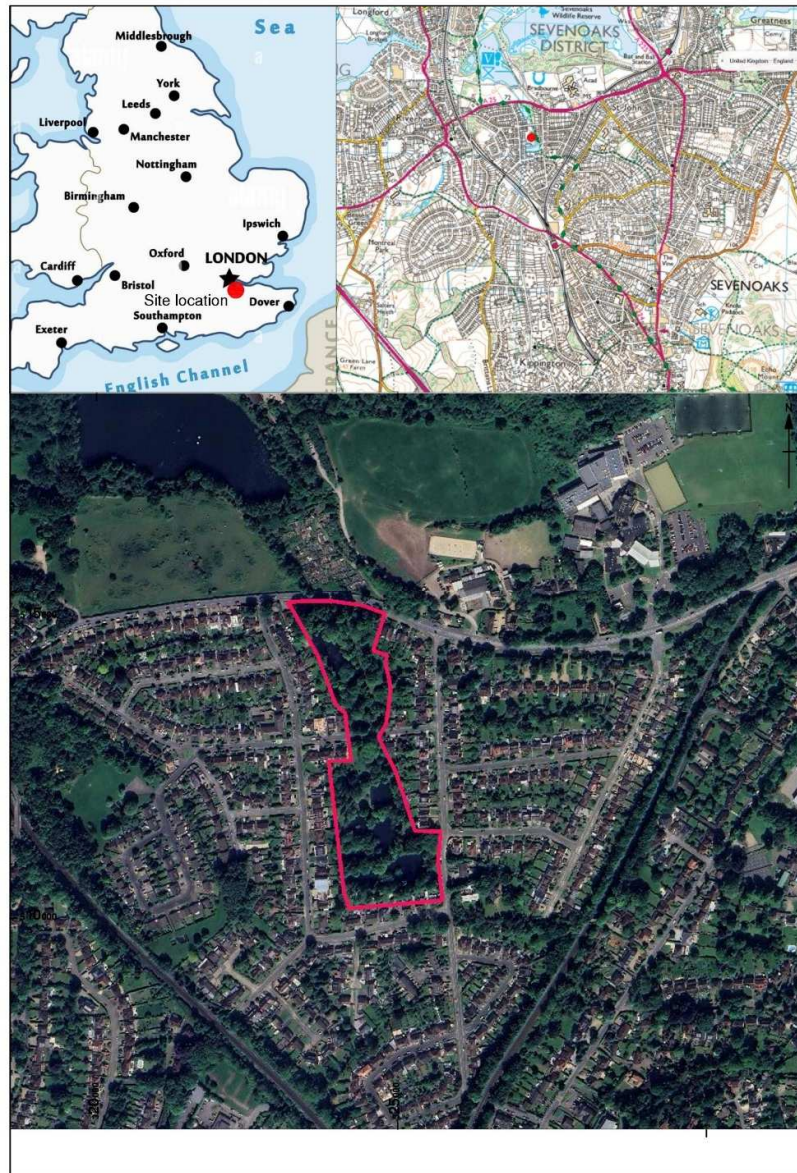


Figure 1: Bradbourne Lakes Location Map

1.3.1 Landscape Character

The landscape character of the wider study area of Sevenoaks and beyond is described as being located within National Character Area 120. Wealden Greensand. The NCA profile notes that the area comprises a “long, curved belt of the Wealden Greensand runs across Kent, parallel to the North Downs, and on through Surrey. It moves south, alongside the Hampshire Downs, before curving back eastwards to run parallel with the South Downs in West Sussex. Around a quarter of the NCA is made up of extensive belts of woodland – both ancient mixed woods and more recent conifer plantations. In contrast, the area also features more open areas of heath on acidic soils, river valleys and mixed farming, including areas of fruit growing”. Whilst the south western extents of the NCA “remains essentially rural, with only small

market towns such as Petworth and Petersfield, but eastwards from Dorking the character becomes considerably more urbanised, with many towns including Maidstone, Reigate, Ashford and Folkestone. The area forms a major transport corridor, with the M25, M20 and M26 motorways and other major road and rail routes all running through it”.

The key characteristics typical of the wider scale landscape of the NCA are:

- Extensive areas of ancient mixed woodland of hazel, oak and birch, with some areas having been converted to sweet chestnut coppice in past centuries;
- Semi-natural habitats include: remnant lowland heathland, mostly concentrated in West Sussex, Hampshire and West Surrey; the wetlands associated with the River Arun in West Sussex; and unimproved acid grasslands found in commons, parklands, heathland and other areas of unimproved pasture;
- Fields are predominantly small or medium, in irregular patterns derived from medieval enclosure. Boundaries are formed by hedgerows and shaws, with character and species reflecting the underlying soils;
- Agricultural land comprises a mosaic of mixed farming, with pasture and arable land set within a wooded framework. There is a fruit-growing orchard belt in Kent and also around Selborne in Hampshire;
- The local built vernacular includes the use of Greensand, ragstone and, in the west, malmstone, bargate stone, plus dark carrstone patterned in the mortar between stones (‘galleting’) in Surrey, as well as timber-framing and weatherboarding;
- There are a range of historic landscape features, including field monuments, old military defences, prehistoric tumuli, iron-age hill forts, Roman forts, the Royal Military Canal, small quarries and relics of the iron industry (including hammer ponds). Sunken lanes cut into the sandstone are a historic and characteristic feature, as are older deer parks and more recent 18th-century parklands.
- Surface water is an important feature across the Greensand, with many streams and rivers passing through the NCA: the Western Rother, Wey, Arun, Medway and the Great and East Stour.

The Sevenoaks Landscape Character Assessment prepared in 2017 by LUC updates the district’s previous Landscape Character Assessment for the wider study area beyond Bradbourne Lakes. The urban extents of Sevenoaks are not covered by the 2017 assessment, however the Supplementary Planning Document: Sevenoaks Residential Character Area Assessment, which was adopted in 2012 as a part of the Sevenoaks District Council’s Local Development Framework, identifies Bradbourne Lakes are located within area the Residential Character Area C: Inter War Planned Development (Sevenoaks DC 2025).



Figure 2: The C01 – Lambarde Road Area Townscape Map
(<https://www.sevenoaks.gov.uk>)

The Inter War Planned Development area is further divided into 12 sub areas, with Bradbourne Lakes located within the C01 Lambarde Road, the historical context of which is described as a grid of roads which “*was laid out in the 1930s on the site of Bradbourne Hall and Bradbourne Hall Farm in the triangle of land between branches of the railway line, south of the A25 (Fig 2).*”

- *A grid of straight or slightly curving roads lined with bungalows and two storey houses on the lower ground*
- *The topography rises towards the south and east;*
- *The houses are set back behind wide verges, pavements and front gardens enclosed by hedges, brick or stone walls and wooden fences. Those facing the A25 are behind deep grass verges and/or deeper front gardens;*
- *The houses are set on a regular building line on similar sized plots, creating an orderly, planned character;*
- *The low building height, long straight roads, set back of the houses and limited on-street parking contribute to an open, unenclosed character;*
- *The eastern section of the area is predominantly bungalows, whereas the west has more two storey properties;*

- *Considerable alteration has taken place including many loft conversions with the introduction of dormer windows and other alterations to the roofline. However, a number of the detached and semi-detached bungalows retain original 1930s features*;
- *The 1930s character of the area has been retained despite subsequent alterations due to the persistence of the original layout, enclosed front gardens and many design features;*
- *The character of the area is enhanced by the verges and the belts of trees visible behind and between the houses on all sides;*
- *The sloping topography and straight roads allow some longer views over rooftops and trees, with occasional views of the North Downs;*
- *This section of the A25 is verdant with tall trees, hedges and open countryside on the north side. The green character is enhanced by the landscaped front gardens and boundary hedges;*
- *Clock House Lane is a historic footpath with tall trees either side providing links with the Bradbourne Estate;*
- *Bradbourne Lakes is an important landscape feature at the heart of the area comprising treed green open space, streams and lakes. The tall trees are visible from surrounding streets, and the area provides a link with the historic Bradbourne Estate;*
- *There is a vista of the listed Bradbourne Farmhouse to the north of the A25 outside the character area.*

The profile notes a number of locally distinctive positive features of the area, including the retention of the original designs and 1930s details together with the visible tree belts above and between the houses, which contribute to the overall green character of the area. Bradbourne Lakes is also seen as a distinctive positive feature.

The profile concludes by offering Design Guidance, which includes the protection and retention of the mature trees and hedge boundaries which contribute to the character of the area and “*Bradbourne Lakes open space should be protected and enhanced*”.

1.3.2 Geology

The British Geological Survey describes the underlying bedrock geology as predominantly comprising the sandstone Folkestone Formation, which is a sedimentary bedrock formed during the Cretaceous period, between 126.3 and 100.5 million years ago. Sedimentary superficial deposits of alluvium are present to the western extents of the South Park, comprising clay, silt, sand and gravels formed between 11.8 thousand years ago and the present during the Quaternary period. The southernmost extents of the South Park comprise the Hythe Formation, with sandstone and limestone, interbedded.

The Folkestone Formation lies above the Sandgate and Hythe Formations respectively and forms a part of the Lower Greensand Formation, a medium to coarse

grained, unconsolidated sand and weak cemented sandstone, which was characteristically formed in a low and shallow marine beach setting and is now a major aquifer in the Thames Basin. The Hythe Formation comprises predominantly a fine to medium-grained, sparsely glauconitic sands, sandstones and silts, which are often locally pebbly, and often with calcareous or siliceous cement in beds or lenses in some areas (Hydreau 2019; BGS 2020). The Hythe Formation extends east to west to the southernmost aspects of the South Park (Fig 3). The presence of the Hythe geological Formation results in artesian flows, generating springs which are the primary water source for the lakes (ibid). Soils at Bradbourne Lakes are described by LandIS as being freely drained and slightly acid loamy soils, which typically support neutral and acid pastures and deciduous woodlands.



Figure 3: Bedrock and superficial Geology (The British Geological Survey)

1.3.3 Topography

The topography of Bradbourne Lakes is very gently sloping north west, from approximately 79m AOD at the south eastern corner of the South Park, adjacent to Lambarde Road, to approximately 72m AOD at the north western corner of the North Park, adjacent to the A25, Bradbourne Vale Road. This gently sloping profile corresponds to the wider study area, which largely slopes gently to the north and north west.

1.4 Ownership and Management

Bradbourne Lakes is owned and managed by Sevenoaks District Council and is identified within the Sevenoaks District Council's Local Development Framework and

is in the Kent Compendium of Historic Parks and Gardens. Sevenoaks District Council considers that it is an important part of the area's heritage and as a registered Open Space, Bradbourne Lakes makes a significant contribution to the character of the local area and is important to the local community.

The Bradbourne Resident's Association is working towards the restoration and conservation of Bradbourne Lakes, in conjunction with Sevenoaks District Council. The Bradbourne Resident's Association organises small-scale management work within the site, predominantly looking after the soft landscape and ensuring that fallen debris is removed, however they also manage some water management tasks, ensuring that the watercourse, drains, gullies and sumps are maintained debris free wherever possible.

1.5 Legislative Framework for the Conservation Management Plan

A Conservation Management Plan (CMP) sets out how the heritage significance of the landscape will be managed over time and is based on Historic England and the National Lottery Heritage Fund (NLHF) guidelines. It helps decision-makers balance conservation with change and sustainable use. The key elements of a CMP are:

- **UNDERSTANDING THE SITE**
 - Historical, ecological, and cultural significance
 - Physical condition and vulnerabilities
 - Stakeholders and communities involved
- **ASSESSING THE SIGNIFICANCE**
 - Identifying key heritage values (e.g., environmental historical, aesthetic, communal)
 - Understanding what is essential to conserve
- **IDENTIFYING RISKS AND OPPORTUNITIES**
 - Potential threats (e.g., environmental, human impact, neglect)
 - Opportunities for enhancement, adaptation, or increased public access
- **DEVELOPING POLICIES FOR MANAGEMENT**
 - Conservation priorities and strategies
 - Sustainable use and maintenance plans
 - Balancing change with preservation
- **IMPLEMENTATION AND MONITORING**
 - Action plans, funding strategies, and responsibilities
 - Review mechanisms to update the CMP

The first stage is implemented by a desk-based archaeological assessment and archaeological ground survey that examines the heritage potential of the study area. This will identify and catalogue the heritage and environmental features within the landscape and assess the individual and collective significance of the environmental and heritage resource.

1.5.1 National Planning Policy Framework (NPPF):

The proposed conservation works may also have a planning requirement and therefore would be bound by the policy framework set by the National Planning

Policy Framework government guidance. The National Planning Policy Framework (NPPF) sets out national planning policies relating to historic environment conservation (MHCLG 2024). The revised National Planning Policy Framework was updated in December 2024 and sets out the government's planning policies for England and how these are expected to be applied. The NPPF sets out the Government's economic, social and environmental planning policy and those relevant to the landscape at Bradbourne Lakes are set out below (MHCLG 2024).

Valued sites of archaeological or cultural heritage that merit consideration in planning decisions are grouped as 'heritage assets' and are an 'irreplaceable resource', the conservation of which can bring wider social, cultural, economic and environmental benefits (DCLG 2012, section 126). The setting of designated heritage assets is not statutorily protected, but changes to it can affect their significance and are a material consideration in the planning process (Historic England 2015).

In addition to standing remains, heritage assets of archaeological interest can comprise sub-surface remains and, therefore, assessments should be undertaken for a site that 'includes or has the potential to include heritage assets with archaeological interest' (DCLG 2012, section 128).

The NPPF draws a distinction between designated heritage assets and other remains considered to be of lesser significance; great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be...substantial harm to or loss of a grade II listed building, park or garden should be exceptional. Substantial harm to or loss of designated heritage assets of the highest significance, including scheduled monuments, protected wreck sites, battlefields, grade I and II* listed buildings and grade I and II* registered parks and gardens and World Heritage Sites, should be wholly exceptional' (DCLG 2012, section 12.132). Therefore, preservation in-situ is the preferred course in relation to such sites unless exceptional circumstances exist.

It is normally accepted that non-designated sites will be preserved by record, in accordance with their significance and the magnitude of the harm to/loss of the site, to minimise or avoid conflict conservation and development (DCLG 2012, section 129). Non-designated heritage assets of archaeological interest will also be subject to the policies reserved for designated heritage assets if they are of equivalent significance to scheduled monuments (DCLG 2012, section 132).

The landscape provisions of the NPPF that are relevant to Bradbourne Lakes are set out below:

Promoting Healthy and Safe Communities: Planning policies and decisions should aim to achieve healthy, inclusive and safe places which:

- *are safe and accessible, so that crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion – for example through the use of attractive, well-designed, clear and legible pedestrian and cycle routes, and high quality public space, which encourage the active and continual use of public areas; and*
- *enable and support healthy lifestyles, especially where this would address identified local health and well-being needs – for example through the provision*

of safe and accessible green infrastructure, sports facilities, local shops, access to healthier food, allotments and layouts that encourage walking and cycling (paragraph 92).

Open Space and Recreation: *Access to a network of high-quality open spaces and opportunities for sport and physical activity is important for the health and well-being of communities and can deliver wider benefits for nature and support efforts to address climate change. Planning policies should be based on robust and up-to-date assessments of the need for open space, sport and recreation facilities (including quantitative or qualitative deficits or surpluses) and opportunities for new provision..... (paragraph 98).*

Planning policies and decisions should protect and enhance public rights of way and access, including taking opportunities to provide better facilities for users, for example by adding links to existing rights of way networks including National Trails (Paragraph 100).

The designation of land as Local Green Space through local and neighbourhood plans allows communities to identify and protect green areas of particular importance to them. Designating land as Local Green Space should be consistent with the local planning of sustainable development and complement investment in sufficient homes, jobs and other essential services. Local Green Spaces should only be designated when a plan is prepared or updated and be capable of enduring beyond the end of the plan period (paragraph 101).

The Local Green Space designation should only be used where the green space is:

- *in reasonably close proximity to the community, it serves;*
- *demonstrably special to a local community and holds a particular local significance, for example because of its beauty, historic significance, recreational value (including as a playing field), tranquillity or richness of its wildlife; and*
- *local in character and is not an extensive tract of land (paragraph 102).*

Policies for managing development within a Local Green Space should be consistent with those for Green Belts (paragraph 103).

Achieving Well-Designed Places: *The creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities. Being clear about design expectations, and how these will be tested, is essential for achieving this. So too is effective engagement between applicants, communities, local planning authorities and other interests throughout the process (paragraph 126).*

Conserving and enhancing the natural environment: *Planning policies and decisions should contribute to and enhance the natural and local environment by:*

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

- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; (paragraph 174).*

Habitats and Biodiversity: *To protect and enhance biodiversity and geodiversity, plans should:*

- *Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*
- *promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity (paragraph 174).*

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

- *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate (paragraph 180).*

1.5.2 Local Planning Policy

The Sevenoaks District Council has an emerging new Local Plan 2040, however until such time that it is formally adopted, the Local Development Framework Core Strategy, which was adopted in 2011 remains the key document of relevance in the existing Local Plan.

With a Vision to “provide for future development requirements by making effective use of urban land within existing settlements, while protecting the environment, the Core Strategy and its spatial vision for the future of the Sevenoaks District will “deliver an annual average of 165 dwellings (net addition), equivalent to 3,300 additional dwellings over the period 2006 to 2026 in a sustainable way.....

The high quality natural built and historic environment will be conserved and enhanced, especially in those parts of the District designated to protect their distinct character. New development throughout the district will be of a high-quality incorporating design that respond to the distinctive local character of areas of high environmental quality or make a positive contribution to the environmental enhancement of other areas. The design of new development will incorporate sustainability principles taking into account potential climate change. A Green Infrastructure Network will be developed including areas of value for biodiversity, open space and recreation....”.

Policies set out in the Core Strategy that are relevant to Bradbourne Lakes are set out below:

Policy SP 1: Design of New Development and Conservation: *All new development should be designed to a high quality and should respond to the distinctive local character of the area in which it is situated..... The District's heritage assets and their settings, including listed buildings, conservation areas, archaeological remains, ancient monuments, historic parks and gardens, historic buildings, landscapes and outstanding views will be protected and enhanced (page 60/61).*

Policy SP 10: Green Infrastructure, Open Space, Sport and Recreation Provision: *A Green Infrastructure Network will be developed of accessible multi functional green space, primarily based on maintaining and linking existing areas of open space.....Open space, sport and recreation facilities, including indoor sports facilities of value to the local community will be retained.....For the purposes of this policy, open space includes amenity open space, parks and formal gardens, natural and semi natural open space, children's play areas, outdoor sports facilities, churchyards and allotments (page 83/84).*

Policy SP 11: Biodiversity: *The biodiversity of the District will be conserved and opportunities sought for enhancement to ensure no net loss of biodiversity.*

Sites designated for biodiversity value will be protected with the highest level of protection given to nationally designated Sites of Special Scientific Interest, followed by Local Wildlife Sites and sites of local importance for biodiversity. Designated sites will be managed with the primary objective of promoting biodiversity whilst also providing for appropriate levels of public access.

Opportunities will be sought for the enhancement of biodiversity through the creation, protection, enhancement, extension and management of sites and through the maintenance and, where possible, enhancement of a green infrastructure network to improve connectivity between habitats (page 85).

2 METHODOLOGY

2.1 Introduction

The present study is the final stage of a Conservation Management Plan, which incorporates both the documentary study and field survey. The documentary study and field survey were carried out in accordance with the relevant Chartered Institute for Archaeologists (CIfA) and Historic England guidelines (CIfA 2022, Code of Conduct; CIfA 2020, Standard and Guidance for Historic Environment Desk-based Assessments; Historic England 2015, Management of Research Projects in the Historic Environment (MoRPHE)).

A copy of this study will be deposited with the Kent HER for reference purposes, and also with the Archaeology Data Service (ADS).

2.2 Historic Desk-based Assessment

Sources and Information: The sources of information consulted were historical and modern maps of the study area and published and unpublished secondary sources. The desk-based research comprised a search of the Kent HER and an online search for digital secondary and primary sources and the Kent Archives and Local History. Significant secondary sources include the Hasted, E, History and topography of the county of Kent (Vol 3), and Dunlop, J, The Pleasant town of Sevenoaks.

Kent HER: the Kent Historic Environment Record (HER) is maintained by the Kent County Council. It is a Geographical Information System (GIS) and has a linked database of records relating to known heritage assets; it is supported by an extensive archive, including reports, site records and publications. Data regarding listed and designated buildings and areas was accessed from the HER.

Kent Archives and Local History Services: a search was undertaken of the Kent Archives and Local History Services for information relating to the study area, from which historic mapping was obtained, and a number of primary and secondary sources were consulted.

On-Line Sources: particularly of note is the Kent Compendium of Historic Parks and Gardens for Sevenoaks District, which was a very useful resource (www.kentgardenstrust.org.uk/wp-content/uploads/2024/10/Bradbourne-Lakes-Park.pdf), and also the historical summary of the Bradbourne Lakes Residents Association.

2.3 Field Survey

The process of field survey provided descriptions, mapping and ground photographs for all sites identified by the reconnaissance process.

Walk Over Survey: a walk over survey was undertaken covering the extent of the Bradbourne Lakes study area examining all hydrological features as well as ground features and examined all sites identified from the map regression. Where archaeological sites were encountered, the features were recorded, and a site description was generated.

Site Description and Assessment: a detailed description was recorded for the identified sites which were incorporated into a site database in the field using an iPad. The description incorporates a provisional interpretation of the function and purpose of the sites with an assessment of the site's chronology based on the map regression where possible.

Photographic Survey: a photographic archive was generated during the survey using a DSLR camera, including landscape and detailed photography. Detailed photographs were taken of both sites and overview shots. A scale bar and north arrow were used for all detailed photography. The photography was undertaken with a digital camera of 24 megapixels. All photos were labelled by site number when uploaded to the database.

Site Mapping: The sites were mapped by transcription and ground measurement using a Leica Disto to ensure close correlation and checking of the LUC base map. The sites were drawn on site or recorded by GPS and ultimately transcribed onto the CAD system. The sites that have been identified from the detailed orthophotography and survey have been refined by drawing around each site onto the enlarged orthophotography.

2.4 Archive

A copy of this study will be deposited with the Kent HER for reference purposes, and also with the Archaeology Data Service (ADS).

3 HISTORIC SOURCES

3.1 Setting the Scene

The place name Bradbourne derives from the Anglo Saxon brād (meaning broad) and burna (meaning stream or brook). So Bradbourne means broad stream (Horsley 1921) and was a common type of name referring to features of the landscape. The stream refers to the Brad which extends through the Bradbourne Lakes and is a tributary of the River Darwent.

The earliest historical reference to Bradbourne, near modern day Sevenoaks, was that the sub-manor of Bradbourne, was within the great manor (or honour) of Otford along with the manor of Kemsing and Seale, and were in the possession of Baldwin de Béthune, Earl of Albemarle, during the reign of King John (1199–1216). Subsequently these estates passed by marriage into the family of the Mareschalls (Marshals), the earls of Pembroke (Hasted 1797) (Fig 4). In 1537 the honour of Othford was passed by Archbishop Cranmer to Henry VIII (Killingray and Purves 2012, 19)

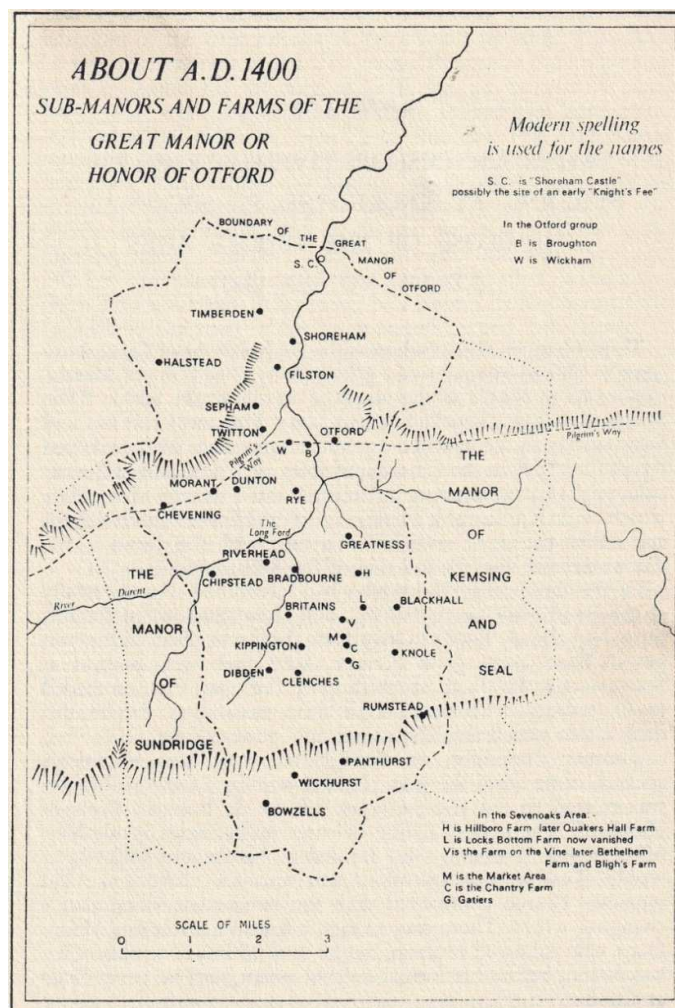


Figure 4: The Sevenoaks area in the late medieval period (after Dunlop 1964)

3.2 Sixteenth / Seventeenth Centuries

Bradbourne and its estates were sold by the crown to Sir Ralph de Bosville in 1555 (Ogley 1976; Hasted 1797; Dunlop 1964; Killingray and Purves 2012, 19). The Bosville family were from Yorkshire where they held considerable lands; and Ralph was a 'gentleman of Lincolns Inn' and clerk to Queen Elizabeths Court of Wards (ibid). Up to this time, elements of the estate had been rented out to local people, and in effect the transfer of ownership meant a change from medieval manor to country estate. Ralph died in 1580-1 and the estate was passed down the family line, first to Henry Bosville and then to his son Sir Ralph Bosville. By this time (1593) Bradbourne lands were extensive and covered much of the northern part of Sevenoaks totaling nine hundred acres as cited in a contemporary notebook (BLRA – History 2025).

A mill was referred to as being at Bradbourne from the medieval period and predating the acquisition of the estate by Sir Ralph de Bosville. The location of the mill was not documented but would have been on the Brad stream, which was a tributary of the Darent, and it may correspond to the HER purported site of a mill to the north of Lake 5 (MKE116484) (Dunlop 1964, 128).

Sir Ralph Bosville was responsible for the establishment of the Bradbourne Chapel on his Bradbourne estate in 1614 (Historic England Listed Building entry 1336356). The establishment of the chapel was endorsed by the Archbishop of Canterbury, who acknowledged that their house (Bradbourne Hall) was at least a mile away from the parish church and access was difficult on wet or stormy days (Dunlop 1964; Killingray and Purves 2012, 19) justifying a private chapel. It is possible that the documented chapel was within the original Bradbourne House, and which was demolished by William Bosville when he constructed a new building on the site (See below). This possible explanation is supported by an absence of baptisms and other historical references after the 1680s (op cit, 19).

The estate passed, by way of Leonard Bosville, to Lady Margaret Boswell in 1639, who held it but did not significantly develop it. The same could not be said of William Bosville who inherited the estate from Lady Margaret Boswell in 1682 (Hasted 1797; Dunlop 1964) and then proceeded to construct a new house in 1689 on the site of the earlier house (built by the Pevenley and Ashe families) (Rayner 1997, 50).

3.3 Eighteenth and Nineteenth Centuries

Henry Bosville inherited the property in 1740, and continued the development of the house, the parkland and gardens (op cit, 140). On Henrys death in 1761 the property passed to Richard Bettenson (son of Edward Bettenson of Lincolns Inn), and he improved the estate (Hasted 1797. His wealth and standing are reflected in the fact that in 1765 he served as High Sheriff of Kent (Fig 5). Richard died without issue and the estate then reverted to Thomas Lane in 1785 (ibid).

Clock House: although the clock house has been attributed as being the chapel constructed by Richard Bosville in 1614, a study by Anthony Stoyel indicates that it was constructed as a pair of eighteenth-century cottages that were facaded on the

sides facing Bradbourne so as to have the appearance of a gothic chapel (Killingray and Purves 2012, 19; Stoyel 1998).

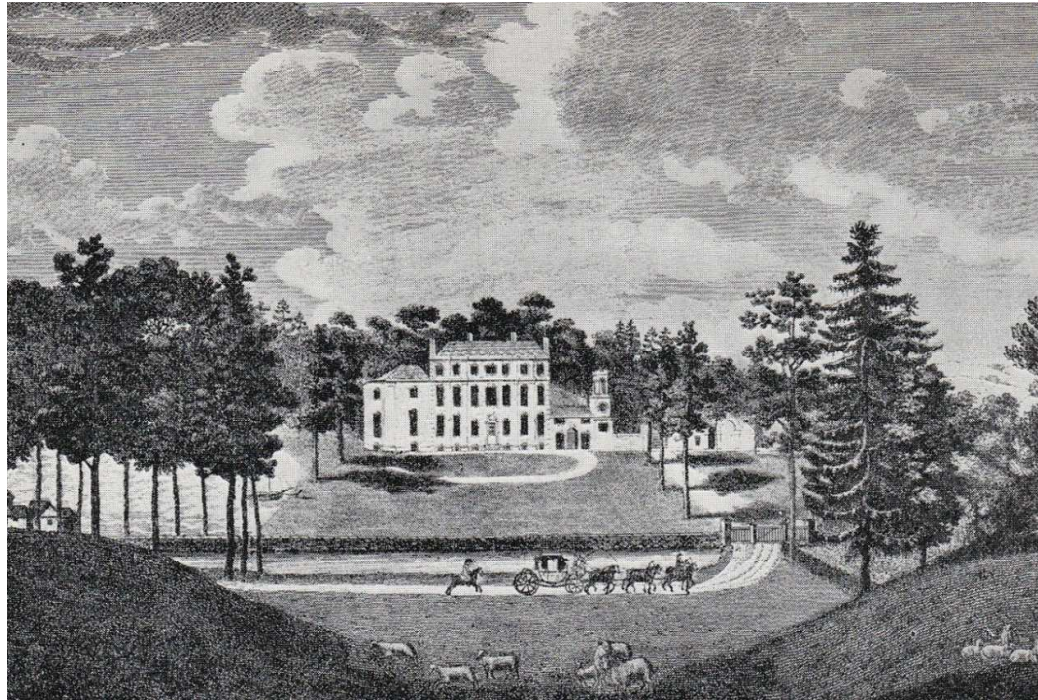


Figure 5: Bradbourne at the time of Sir Richard Betenson (c 1770) (Dunlop 1964)

Thomas died in 1805, leaving Bradbourne to his twelve-year-old son Henry Thomas (BLRA History 2025). In 1833 the estate and house were auctioned by Mr George Robins in three lots, with the first comprising the mansion, gardens and park extending over 45 hectares and two further lots of agricultural land extending over 60 hectares. This was documented by a sales proposal which incorporated a map and engraving (U851/P1). It is not known if it was sold at this time and if so to whom. It was, though, eventually sold to Henry Hughes in 1840, who had acquired considerable holdings of land (Dunlop 1864) and was relatively wealthy and able to develop the estate. However, this was interrupted by his death in 1865 and the property passed to his nephew Admiral Hughes D'Aeth, who did not live at Sevenoaks (Dunlop 1964, 171).



Figure 6: Engraving of Bradbourne Place in the 1833 sales particulars (Kent History and Library Centre, U851/P1)

In 1870 Francis Crawshay purchased Bradbourne House; he was a charismatic foundry owner from Merthyr Tydfil who inherited the Hirwaun ironworks and Trefforest plateworks from his father (Dunlop 1964; Kent Gardens Trust 2011; Cynon Culture 2025). Francis actively developed the estate – he erected a belfry on top of the Clock House tower and placed a large bell within it. A further, and much larger, bell, being over two tons in weight and was for the time one of the largest bells in the UK; was established adjacent to his house, erected on a tripod (ibid; Love and Pickford 2025). He also brought monoliths from South Wales, one of which has now been displaced to its present location within the area of the Lakes Park (Site 16) (Cynon Culture 2025). He was purported to have modified the lakes but the major changes to the lakes had taken place before his tenure of Bradbourne (the survey dates for the first edition 6" map were 1868-9). Subsequent maps do not show any significant change, and it is not apparent what modifications he made, and in keeping with much of his activity these may have been very visual, but in practice superficial modifications that have not shown up on landscape mapping.

3.4 The Decline in the Twentieth Century

In 1896, Francis Crawshay died leaving the estate to his eldest son, who could not cope with the financial strain of the estate and who passed it to Multon Lambarde by way of mortgage (Cynon Culture 2025). Multon died the same year leaving Bradbourne to his son, Major William Gore Lambarde (BLRA 2025). The Lambarde's were an old family with considerable connections from the area (Dunlop 1964); a previous Lambarde (William) had been Queen Elizabeth's antiquary (BLRA 2025), and the family had been active in local affairs since William's grandson had moved to

Sevenoaks. Major Lambarde resided at Bradbourne in preference to the family house at Beechmont (ibid).

Major Lambarde was the last of his family, having only daughters, of whom the eldest died in the First World War, and the younger was married but had no children. By this date the estate was very run down and Major Lambarde decided to sell it. In 1926 the contents of the house were sold and in 1927, the whole estate itself went up for auction (Dunlop 1964, 197; Kent Gardens Trust 2011). The estate was ultimately acquired by the New Ideal Homestead Company who utilised the land to construct a housing estate. The area of Lakes was separate from the purchase by the intermediate purchaser Hugh Goff, who gave it to the Urban District Council (forerunner of the Sevenoaks District Council) allowing it to be retained as a public park (Rayner 1997, 118). The hall was not immediately demolished and survived for another 10 years, during which it increasingly deteriorated in condition (ibid).

Date	Name	Relationship
1555	Sir Ralph Bosville	Purchased from the Crown
1580	Henry Bosville of Bradbourne	Son of Sir Ralph
1593	Sir Ralph Bosville	Son of Henry
	Sir Leonard Bosville	Son of Ralph
1639	Lady Margaret Boswell	Sister of Sir Leonard
1682	William Bosville	Grand Nephew of Sir Ralph
1740	Henry Bosville	Son of William
1761	Sir Richard Bettenson	Distant relative of Henry
1785	Dr Thomas Lane	By will of Sir Richard / Henry
1805	Henry Thomas	Son of Thomas Lane
1840	Henry Hughes	By purchase
1865	Admiral W G D'Aeth Hughes	Nephew of Henry
1870	Francis Crawshay	By purchase
1878	Multon Lambarde	By purchase
1896	Major William Gore Lambarde	Son of Multon
1927	Sold to the New Ideal Homesteads Co	By purchase

Table 1: Genealogy of Bradbourne Owners (after Dunlop 1964, 209)

4 DOCUMENTARY STUDY

4.1 Bradbourne Lakes Map Regression

4.1.1 1769 Andrews J - A topographical Map of the County of Kent in 25 sheets (Fig 7)

This is the earliest usable and available map of the area and is a somewhat schematic and inaccurate depiction of the site. It shows the location of Bradbourne Place being within an area of parkland extending between a road that is no longer extant and a road that is now the A224. At the eastern end of the parkland is a substantial building, which is not precisely on the location of Bradbourne Place and does not have the shape of Bradbourne Place (as depicted on later mapping) but, given the schematic nature of the mapping, will probably correspond to the house. The park and farm are labelled 'Bradborne'; it is labelled as being the property of Sir Richard Betenson, which would correspond with the historical narrative as Sir Richard inherited the property in 1762. A stream, which is a tributary of the River Darent, is shown extending north/south through the park to the east of the house. Significantly there is no representation of any lakes on this map, although there is a building shown adjacent to the western side of the stream and its function is uncertain. The area to the north of the former road, in the area of the present-day Lake 5, is shown as farming land at this time.



Figure 7: 1769 Andrews map centred on the area of the Lakes

4.1.2 1797 – Hasted (1797) The history and Topographical Survey of the county of Kent (Fig 8)

Hasted's map of Kent incorporates the area of Bradbourne and was both general and largely schematic, and significantly it correlates quite closely with the 1769 Andrews map; the shape and orientation of the roads, stream and farms are markedly similar incorporating inaccuracies from the earlier map that are not reflected in subsequent maps. It would therefore appear that Hasted's map has to a large extent been based on the earlier map. So, although this later map shows the line of the stream without lakes or modifications, this cannot be taken as an indication that there were no lakes constructed in 1797, which is a mere three years before the publication of the Mudge map, which was evidently a new and bespoke creation.



Figure 8: 1797 - Hasted's map of Kent

4.1.3 1801 - William Mudge, An Entirely New and Accurate Survey of the County of Kent (1801) (surveyed 1788-98) 1" map (Fig 9)

This 1" map was surveyed potentially only a short time after the previous map even though it was subsequently published in 1801 but has a greater accuracy and would appear to be less schematic. The area of parkland is more reliably depicted and is shown to cover a smaller area than previously. The western part of the park is centered on a group of buildings which would appear to correspond to Bradbourne Place, and in this instance the location appears to be broadly correct, but the shape of the building outline does not correlate with the later (and more accurate) depictions of the building. The building is not named on this map, although Bradbourne Farm is. The house extends south from the east / west turnpike road which is broadly similar to that on the earlier 1769 map, and again there is a road extending south from this turnpike parallel to the stream channel.

The stream channel is shown extending from a very small pond or possibly a spring in the area of what is now Lake 1 and extends north underneath the turnpike to a lake in the area of Lake 5. The shape of the lake is sub-triangular and tapers outwards to a straight line at its northern, downslope end and would appear to reflect that the stream channel has been dammed, but the lake has not yet been excavated and opened into its sub-rectangular shape as shown on later mapping.

The stream channel (Site 24) appears to be in the same location as on the later maps, being located against the road that converges upon the turnpike. On the previous map this was a stream which extended from the southwest near to Montreal Park. However, in this 1801 map it extends only as far as the area of Lake 1, where there is the representation of a small pond. The implication is that this was the site of a substantial spring, and indeed Lake 1 is now fed by one or more springs. This pond is much smaller than the later Lake 1. The representation of the stream and small ponds would appear to indicate that this reflects a window of the very early stage of development of the lake system.

There is a rectangular building depicted just to the south east of, and at a higher elevation than proto-Lake 5; its function is uncertain but does appear to be spatially associated with proto-Lake 5. The building was not depicted on the previous mapping and was no longer extant on the OS 1st edition mapping (1871).



Figure 9: 1801 Mudge map of Kent centred on Bradbourne

4.1.4 1833 Bradbourne Place, detail of engraving from sale map, 1833 (Kent History and Library Centre, U851/P1) (Fig 10)

In the early part of the nineteenth century there were frequent changes of ownership and parts of the Bradbourne Park estate were sold off. In 1833, the property was auctioned by Mr George Robins in three lots, the mansion with gardens and park amounting to 45 hectares and two further lots of more distant agricultural and woodland amounting to 60 hectares. The sales details contain an attractive engraving of the house and immediate surrounds viewed from the east, showing part of the park (Kent History and Library Centre U 851/P1), but more importantly a map of the estate. This is the first detailed map of the estate available and would appear to be reasonably accurate. It shows the outline of Bradbourne Place and the detail of the now developed lake system. It also shows that by this date a road bypass had been established around the northern side of the park, and which now corresponds to the line of the A25 Bradbourne Vale Road. The earlier turnpike is still in place but was clearly depicted as a diminutive side road and is shown as bridging the stream channel and converging with the now larger northern road at both sides of its course at the edge of the park.

The lake complex had developed since the earlier 1801 mapping, and which was at that point in an early stage of development. What was then a tiny pond formed from a spring and feeding the main stream channel, is by this date, a curved Lake 1, which converges at its northern end into the mainstream channel. That channel extends in

a canalised straight line towards Lake 5, which was expanded into an elongated and rectangular lake. It has an outfall on the western side of its northern side with an extended open channel extending straight out from the lake. This would correspond with the Site 11 outfall and Site 14 channel and would confirm that this was the original sluice structure and channel.

In addition to these two lakes which were formerly represented albeit in a diminutive form on the 1801 plan, there were by this date four very rectangular, regularly constructed lakes to the west of the channel and which were presumably fed from Lake 1. Their regular outline is not consistent with ornamental lakes which typically emulate natural formations and correspondingly have irregular shapes, and it is possible that these instead had functional value such as for cress beds or fishponds.

The building to the southeast of Lake 5 is shown in more detail and is depicted as having two wings and faced to the southeast (Site 7). It is shown as being relatively large and of an unusual design but given that it has not survived beyond the first edition map it is not possible to propose a function. A further building is shown immediately to the east of Lakes 3 and 4, and to the east of the stream channel. The building is shown as being accessed from a road / track extending from the southeast.

Immediately to the east of Lake 1 a building was shown on this map, which was on subsequent maps labelled as Bradbourne Hall Farm, and was presumably an estate farm.

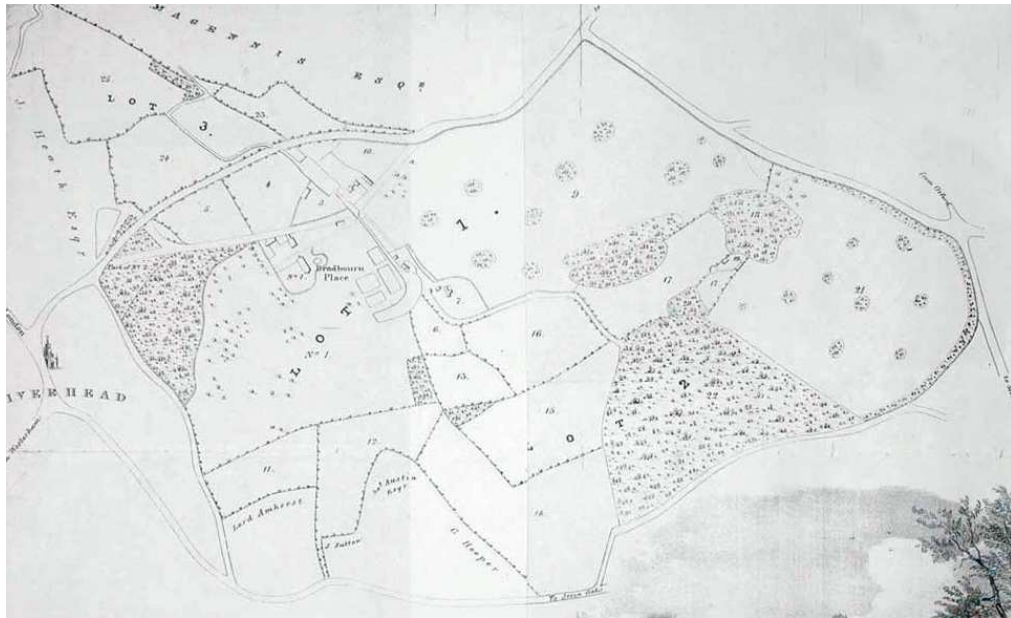


Figure 10: Map of the Bradbourne estate from the 1833 sales proposal

4.1.6 1840 Tithe Map Sevenoaks parish ref Kent History and Library Centre (CTR 330 b) (Fig 11)

This is a tithe map covering the extent of Bradbourne Park, prepared in 1840 and only a few years after the 1833 sales map. It shows less detail than the 1833 sale map and is more schematic but does provide some pertinent detail. The configuration of the maps is similar to that shown in 1833 and still has very rectangular shapes to the lakes. However, the map does not show the stream channel, which is clearly an omission of cartography than any change in the landscape. The large Lake 1 formerly curved round to converge into the stream channel but now, and in subsequent maps, it has a truncated northeastern terminal which broadly corresponds to the present outline of the lake. This edge was presently defined by the earthen bund Site 25, and it is possible that this bund was put in place between the two maps to contain the lake at about this time.

The former turnpike road now stops at the edge of the lake complex, presumably at the line of the former bridge over the stream channel, and there is no depiction of a continuation towards the new bypass road. The building located within the study area to the south east of Lake 5 (Site 7) is still in place on this mapping.

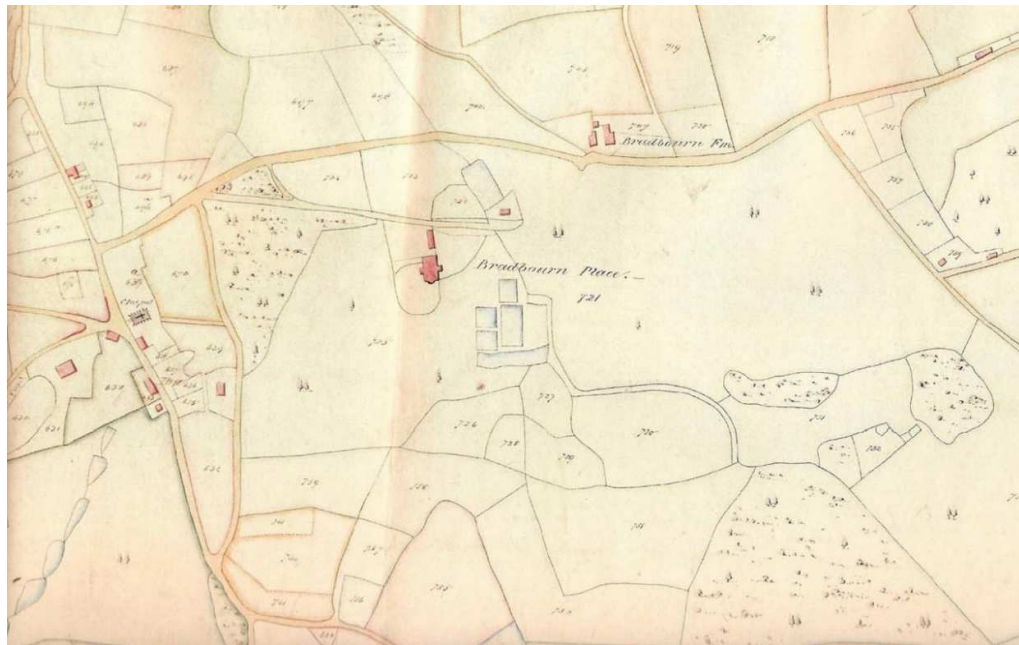


Figure 11: 1840 Tithe Map centred on Bradbourne Lakes

4.1.7 1871 Kent sheet XL 6" map surveyed 1868-9 (Fig 12)

The mapping reflects a more detailed and accurate map than others and shows the wider context, not just within the extent of the park. It shows the area of the lakes as being entirely within an area of parkland and the area beyond comprises mainly agricultural fields. The area to the north of the former turnpike (including Lake 5) is shown as being more intensively landscaped and would probably correspond to an area of gardens specifically associated with Bradbourne House. This is separated from

the southern part of the estate, which would be conventional parkland, by a boundary which may have been a ha-ha.

By the time of the first edition map the arrangement of the lakes had been extensively remodelled, and in particular Lake 3 had been formed from two earlier adjacent lakes, and been provided with rounded and more irregular outlines, particularly to the west, although the north-western edge still retained its rectangular outline from the earlier lake. Similarly, the shape of Lake 1 had been made more irregular by comparison with its semi-rectangular depiction on the tithe map. It would appear that the shapes of the lakes have been adjusted from one pertaining to a functional use to one more fitting as a landscaped ornamental lake.

A series of springs are shown feeding into Lakes 1 and 4, and also the stream channel extends from an area to the south of the area into Lake 1. The building near Lake 1, shown on earlier maps, is no longer present on this mapping. However, a building to the immediate east of Lakes 3 and 4 (Site 22), formerly shown on the 1833 Sale map, is still depicted on this 1871 mapping.

The line of the turnpike road, which was decreasing in use as depicted on the tithe map, has completely gone by the time of the first edition map, although the line of a stream channel was depicted immediately to the north of the space which was formerly occupied by the road.

Bradbourne Hall Farm, formerly shown on the 1833 mapping, was located immediately to the east of Lake 1. Near to it is the location of the clock house (outside the study area), which was not shown on the 1833 sales map, but which is from this date through to the present depicted on all subsequent maps.



Figure 12: 1871 6"to 1 mile map (surveyed 1868-9)

4.1.9 1885 1879-85 25" map First edition map (Figs 13 and 14)

The 1885 map was produced only a short time after the 1871 maps and was being surveyed only 8 years after the publication of the 6" first edition map. Being a 25" map it shows more detail than the 6" map but the depiction of the features is broadly very similar reflecting that the landscape has not significantly changed during this short period.



Figure 13: Image of Bradbourne Hall at the time of the First edition map (Raynor 1997, 64)

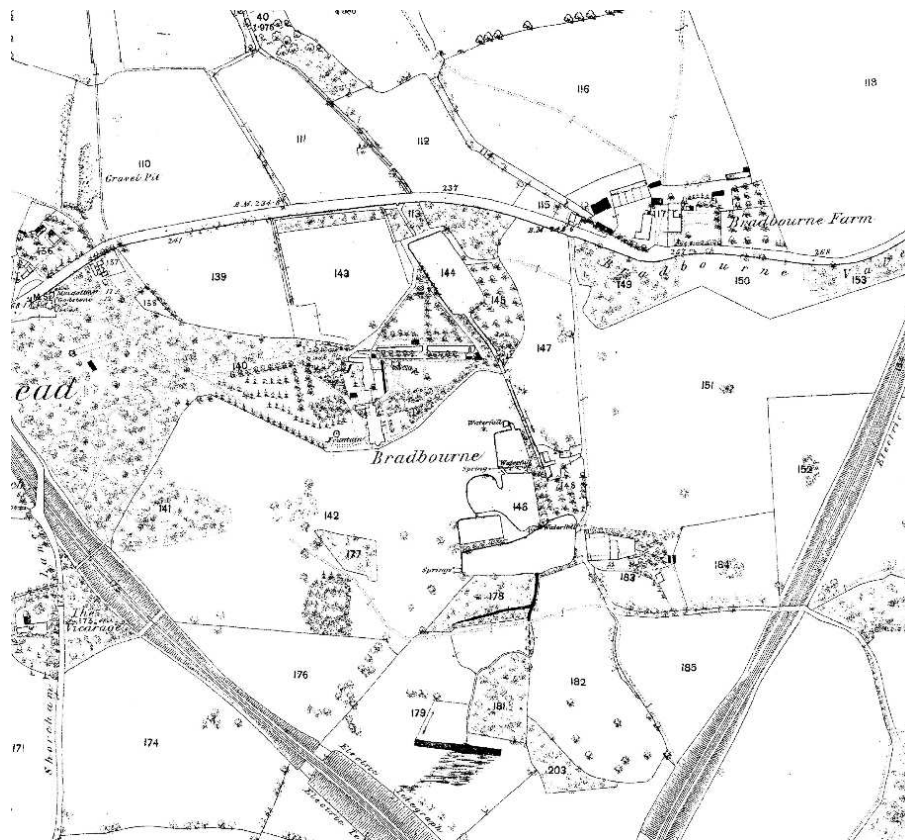


Figure 14: 1885 25" to 1 mile map – first edition

4.1.10 1897-1900 25" map 2nd edition (Fig 15)

There is very little change in the mapping since the first edition 25" map was published, and generally the form and layout of the lake pleasure grounds have remained relatively static. There are no longer springs depicted feeding Lakes 1 and 3. There is also a second outfall from the northern end of Lake 5, which is on the eastern side of the lake and forms an overflow into a stream channel.

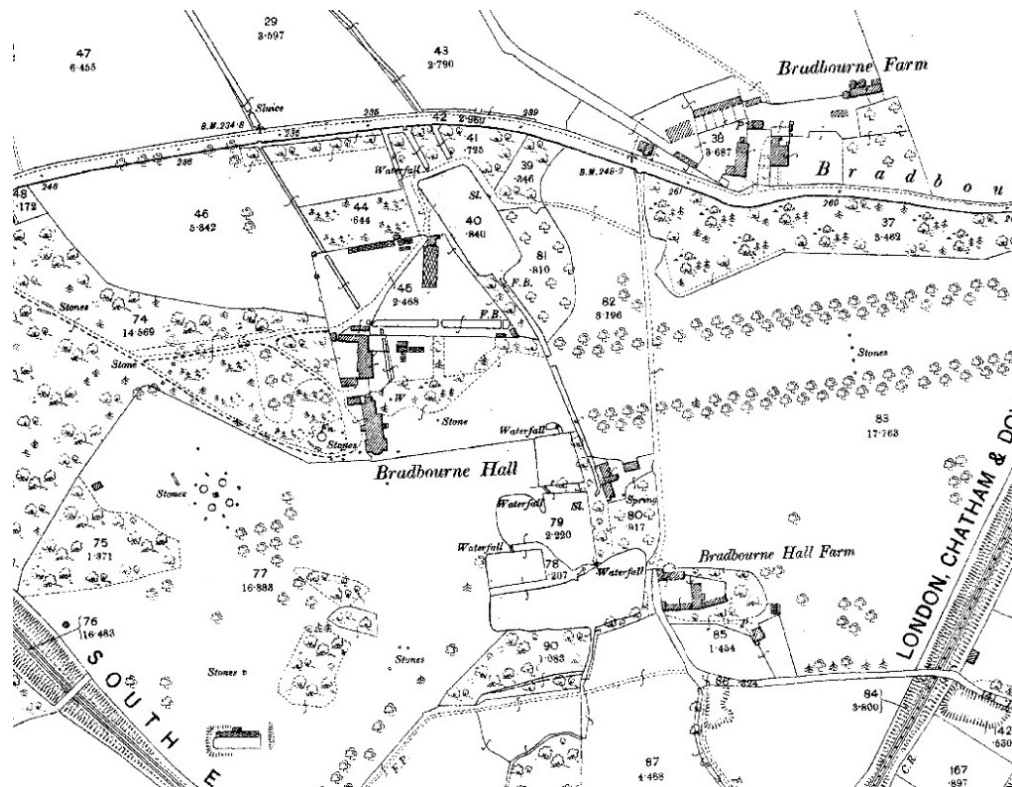


Figure 15: 1900 25" to 1 mile map

4.1.11 1909 25" map 2nd edition (Fig 16)

The configuration and layout of the lakes have not significantly changed since the previous map, but there is a change in the extent of the pleasure gardens, which have been extended to the south, and a wooded copse or plantation has been located just to the northwest of Lake 1. The nomenclature for the map is somewhat uncertain, but it would appear that all of the lakes have been incorporated into these pleasure grounds, which contrasts with the earlier maps which show them as being outside. Within the southern parkland a stone circle has been established, of which there is a surviving monolith from this stone now displaced into the present study area (Site 16).

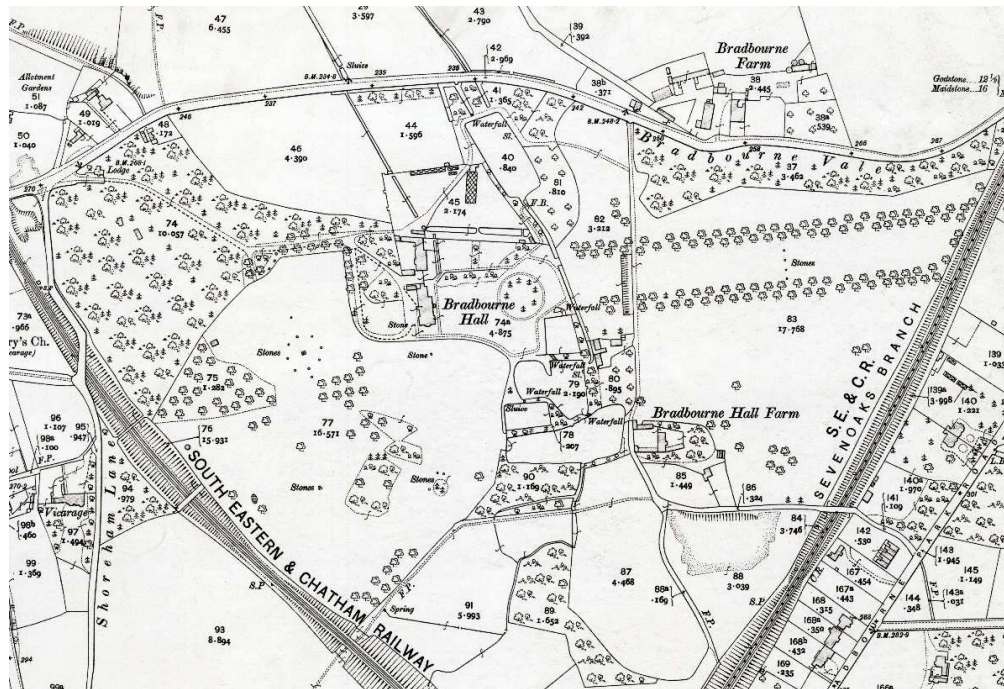


Figure 16: 1909 25" to 1 mile map

4.1.12 1946 6" to 1 mile map (Revised 1938) (Fig 17)

Major William Lambarde was the last owner of the house and had no surviving family to pass the property to and with the estate much depleted, having been left empty for a period, on the 8th/9th December 1826, he sold the contents of the house. The estate was then sold to developers in May 1827.

There are two maps, with almost identical information, being the 1838 6" map and the 1941 25" map. These will be treated as the same and the 25" map, having more detail will be described.

There are substantial changes to the environs of the Lakes Park; extensive estate housing has been established along with all the supporting road network and encompasses the extent of the former Bradbourne parkland. The new housing extends right up to the margins of the lakes and the Lake Park, but the area within the lakes park boundary has mostly been preserved intact. The Bradbourne House has partly been demolished, with one wing still standing but this is an isolated structure surrounded by new housing development build. The surviving house is shown as extending into the middle of the modern Betenson Avenue which cuts through the middle of the Lakes Park, approximately on the line of the former trunk road, and it is possible that the bridge (Site 1) over the stream channel was in part original, albeit substantial modified as part of the housing development.

The stone circle has survived being within an area that at this stage had not been developed for housing. Similarly, the Bradbourne Park Farm is still extant albeit substantially encroached by housing and the former building Site 22 is still, at this

stage, not developed, but within a small enclave of undeveloped land so was at this stage liable for continued expansion of the housing estates.

Within the lakes park, little change had occurred, although the outfall (Site 11) from the north side of Lake 5 was no longer shown. A new foot bridge, to the south of Lake 5, has by this date been established.

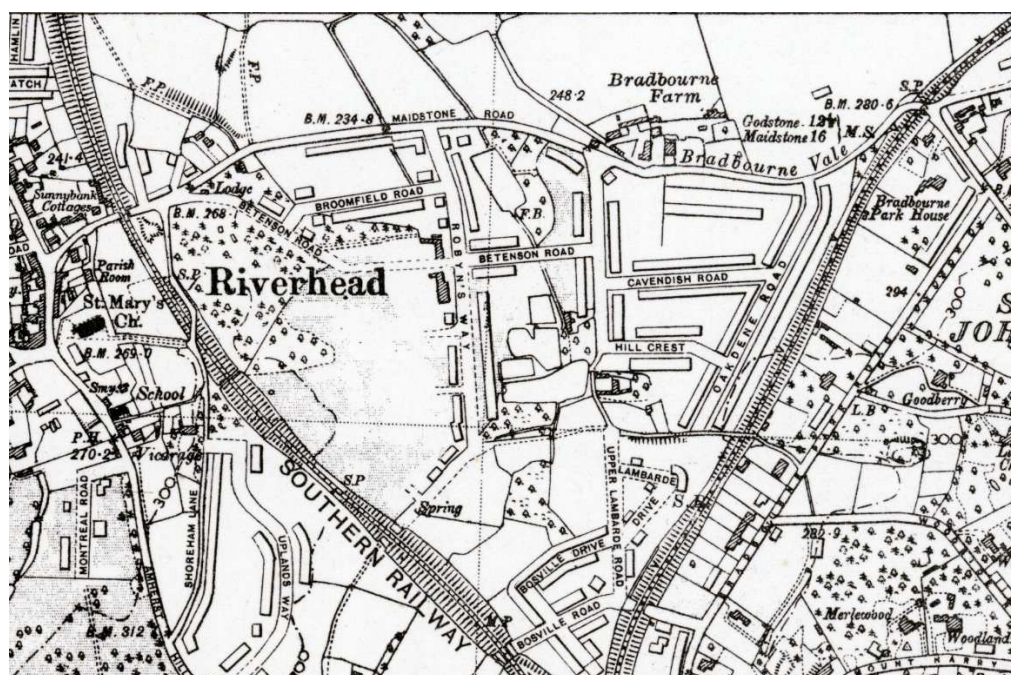


Figure 17: 1946 6" to 1 mile map (Revised 1938)

4.1.13 25" to 1 mile map – 1966 (Fig 18)

The expansion of the housing estates to the west has continued unabated, resulting in the infilling of the rest of the park. The surviving part of Bradbourne House is still in place and is labelled as an "Ambulance Station". The other notable change is that the sandpits at the southwestern part of the parkland have expanded considerably and by this date have merged with the housing estate which is expanding in the opposite direction. Bradbourne Park Farm has by this date been demolished and is now an area of woodland, but the clock house to the southeast is still extant.

Within the Lakes Park area there have been few changes, although the remapping of the area for this map has shown some features that were almost certainly previously in existence. The small island (Site 5) and culvert outfall (Site 6) were shown for the first time, even though they were implied as the outfall of the nineteenth century culvert. The archaeological evidence would also appear to indicate that these features are older than 1966. Similarly, the map shows the divert channel (Site 13), which was not shown on the 1941 map, but which must have been in place once the earlier channel (Site 14) had been blocked (which had occurred prior to 1941).

4.2 Historic Environment Record

A search was undertaken of the Historic Environment Record (HER) that is maintained by Kent County Council. The Bradbourne Lakes study area was defined as having a 200m buffer zone around the extent of the study area, and which encompassed the Bradbourne Mansion. Presented below are the HER sites within the study area and significant sites on the margins of the study area. In Appendix 1 there is a larger number of sites within the outer buffer zone. The locations of the HER sites are presented on Figure 18 which has them superimposed on top of the 1966 25" to 1 mile map by which stage the majority of the housing development has been implemented.



Figure 18: HER site superimposed onto 1966 25" to 1 mile mapping

4.3 Heritage Designated Sites within the Wider Study Area

There are two classifications of designated sites within this wider area: Grade II Listed Buildings and Locally Listed Buildings.

Listed Building II: A Grade II listed building is a structure officially recognized in the UK as being of special architectural or historic interest, warranting efforts to preserve it. The aim is to protect the heritage while allowing the building to remain in use. The implications of a Grade II are as follows:

- It cannot be demolished, extended or altered in any way that affects its character without listed building consent.
- It covers not just the exterior, but the interior and any attached or curtilage structures.
- Routine maintenance and modifications are allowed but we should use traditional materials and methods.

Locally Listed Building: A locally listed building is a structure that has been identified by a local authority as having local architectural or historic significance but is not on the national statutory list maintained by Historic England. The implications of a locally listed building are as follows:

Non-statutory listing: It is not legally protected like nationally listed buildings (Grades I, II*, or II), but its inclusion on a local list is a material consideration in planning decisions.

Local heritage value: These buildings contribute to the character and identity of an area. They might have unique design features, historical associations, or social importance.

4.3.1 Listed Grade II buildings within the wider study area

There are no Listed Building Grade II sites within the extent of the study area, but there are four listed buildings within the wider area:

- MKE 31988 – The Clock House – LBII
- MKE30693 (TQ 55 NW 197) – Bradbourne Farmhouse – LB II
- MKE31980 (TQ 55 NW 211) - Buildings adjoining Bradbourne Farmhouse – LBII
- MKE32007 (TQ 55 NW 235) - Granite Column in No 5 Pointoise Close – LBII

4.3.2 Locally Listed Buildings

There are two Locally Listed Buildings within the study area:

- MKE115070 (TQ 55 NW 582) – Locally Listed Building 10791
- MKE115125 (TQ 55 NW 610) – Locally Listed Building 10793

There are five Locally Listed Buildings within the wider buffer area:

- MKE358 (TQ 55 NW 58) – Locally Listed Building 10692
- MKE115085 (TQ 55 NW 561) – Locally Listed Building 10829
- MKE115095 (TQ 55 NW 602) – Locally Listed Building 10795
- MKE115165 (TQ 55 NW 665) – Locally Listed Building 10833
- MKE115140 (TQ 55 NW 643) – Locally Listed Building 10729

4.4 Landscape Designations

The 73-hectare wildlife reserve was once a gravel pit and was the first gravel pit in the UK to be developed as a site of nature conservation. The SSSI is managed as the Sevenoaks Wildfowl Reserve by the Jeffery Harrison Memorial Trust and was first notified as a SSSI in 1968 as the *“interest of this group of lakes, formed by the flooding of the former gravel workings and fed by the River Darent, centres on its breeding bird populations. Extensive landscaping to create shallows, spits and islands, and the planting of trees and aquatic plants have provided conditions suitable for both breeding and wintering birds.*

The most numerous breeding species are Canada and greylag geese, mallard and tufted duck. Many other water birds breed including great-crested grebe, kingfisher, moorhen and coot. Wintering and passage wildfowl include pochard, shelduck, teal and shoveler, and passage waders are also attracted including greenshank and green sandpiper. The uncommon little ringed plover is a regular breeding species here.

The woodland and reed beds support a typical range of song birds including whitethroat, reed, and sedge warblers. There is also a large rookery, and a sand martin colony in a sand face in the south of the site. Sand martins have undergone a major fluctuation in population levels in recent years, and this face supports one of the few significant colonies in West Kent.

*The botanical and entomological interest of the site is also known to be developing. Thirteen species of Odonata (dragonflies) are present including the locally-distributed downy-emerald dragonfly *Cordulia aenea*. Plants of note include small cud-weed *Filago minima*, dwarf elder *Sambucus ebulus*, and slender birds-foot trefoil *Lotus angustissimus*” (Natural England 2025).*

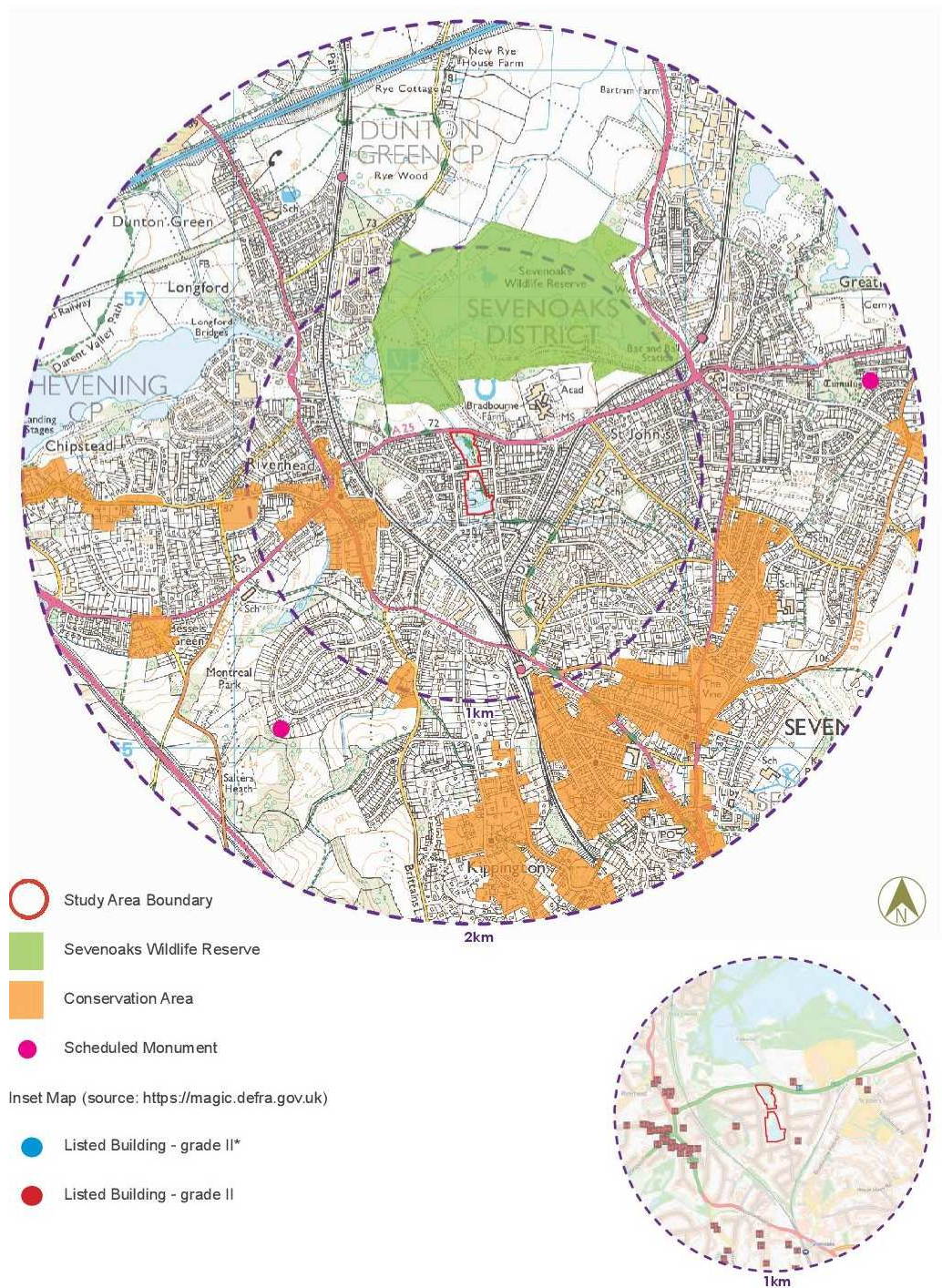


Figure 19: Landscape and Heritage Designated Sites

4.5 HER Sites within the Study Area

HER Number	MKE373
Record Type	Findspot
Site Name	Papal bull found 1982 – 1066AD – 1539 AD

Description	A papal bull of Pope Boniface VIII (1294 - 1303) was found by Mrs P. Thacker in June 1982, by the Bradbourne Lakes.
Sources	Arch Cant 101 1984 379 (DB Kelly) (OS Card Reference). SKE34596
Location	National Grid Reference - TQ 521 560 (point) TQ55NW
Finds	None recorded
Designated	

HER Number	MKE31988 – TQ 55 NW 205
Record Type	Listed Building
Site Name	The clock house Grade II listed building. Main construction periods 1614 to 1972
Description	The following text is from the original listed building designation: CLOCK HOUSE LANE 1. 1614 The Clock House TQ 55 NW/3/102A II 2. Originally a private chapel built by Sir Ralph Bosville of Bradbourne House in 1614. It remained in use as a chapel until, probably, the early C19, when converted into a dwelling. Building dated partly from C17 and partly early C19 and consists of a main wing and tower. 2 storeys, stone rubble. Casement windows with small square leaded panes. The west front has 2 windows with dummy point tops, and the south front is similar with a gable over. The tower is in the south-west corner. Originally crenelated, but the spaces between have been filled in with brick, A modern observation platform in wood has been added. Also, modern wing to the east. Listing NGR: TQ5222656036
Sources	Map: English Heritage. List of Buildings of Special Architectural or Historic Interest.
Location	National Grid Reference - TQ 5216 5606 (point) TQ55NW
Finds	None recorded
Designated	Listed Building (II) - 1336356 THE CLOCK HOUSE Active DKE5953

HER Number	MKE83707
Record Type	Farmstead
Site Name	Bradbourne Hall Farm
Description	Type: Regular courtyard multi-yard Farmhouse: Farmhouse detached in central position Position: Located within a village Survival: Only the farmhouse remains
Sources	Forum Heritage Services, 2012, Kent Farmsteads & Landscape Project (Unpublished document). SKE18075 – No 300543 <2> English Heritage, 2009, Historic Farmsteads: A Manual for Mapping (Unpublished document). SKE18076.
Location	National Grid Reference - TQ 5216 5606 (point) TQ55NW
Finds	None recorded
Designated	

HER Number	MKE115070 TQ 55 NW 582
Record Type	Building
Site Name	Building, Betenson Avenue, Sevenoaks
Description	One of a collection of Druid stones brought in the late 19th century from the west country by eccentric Welsh ironmaster, Francis Crawshaw for his Bradbourne Hall Estate. Other stones are placed as follows: In the garden of number 38 Robyns way (Asset Record 10792). In the garden of no 6 The Meadway (Asset Record 10833). In the garden of no 12 Cavendish Avenue, where there are four stones in a line running north to south along the eastern border of the property (Asset Record 10834). (1)

Sources	Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets. Report generated
Location	National Grid Reference - TQ 5205 5622 (point) TQ55NW
Finds	None recorded
Designated	Locally Listed Building - 10791
HER Number	MKE115125 TQ 55 NW 610
Record Type	Monument
Site Name	Building, Betenson Avenue, Sevenoaks Public garden. Main construction: 1740 to 1760.
Description	Bradbourne Lakes. Now a public park, the chain of artificial lakes was first laid out prior to the 1801 Mudge map. The surviving features of the designed landscape consist of five interconnecting lakes made by damming a branch of the River Darent, is largely unchanged from when it was laid out in the late 18th Century and early nineteenth century. (1)
Sources	Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets.
Location	National Grid Reference - TQ 5205 5620 (point) TQ55NW
Finds	None recorded
Designated	Locally Listed Building - 10793 (designated by Sevenoaks District Council)

HER Number	MKE116484
Record Type	Monument
Site Name	Bradbourne Watermill
Description	No documents or photos, therefore no idea of date of construction or demolition
Sources	None recorded
Location	National Grid Reference - TQ 5200 5640 (point) TQ55NW
Finds	None recorded

4.6 Aerial Imagery

Aerial photography reveals only the canopy of trees and provides little usable information on the landforms beneath the canopies. However, DTM LiDAR provides second strike capability and can record the underlying ground surface albeit with lower resolution (1m pixels). Represented below is a hillshade enhanced view of the ground surface across the extent of the study area. In particular, it shows the general topography and shows the area of springs as hollows adjacent to Lake 4 and Lake 3 (Fig 20). Interestingly it shows a series of linear features within the extent of Lakes 1, 2 and 3 and it would appear that the water levels were reduced at the time that the LiDAR was captured, and these may have been temporary barrage structures.

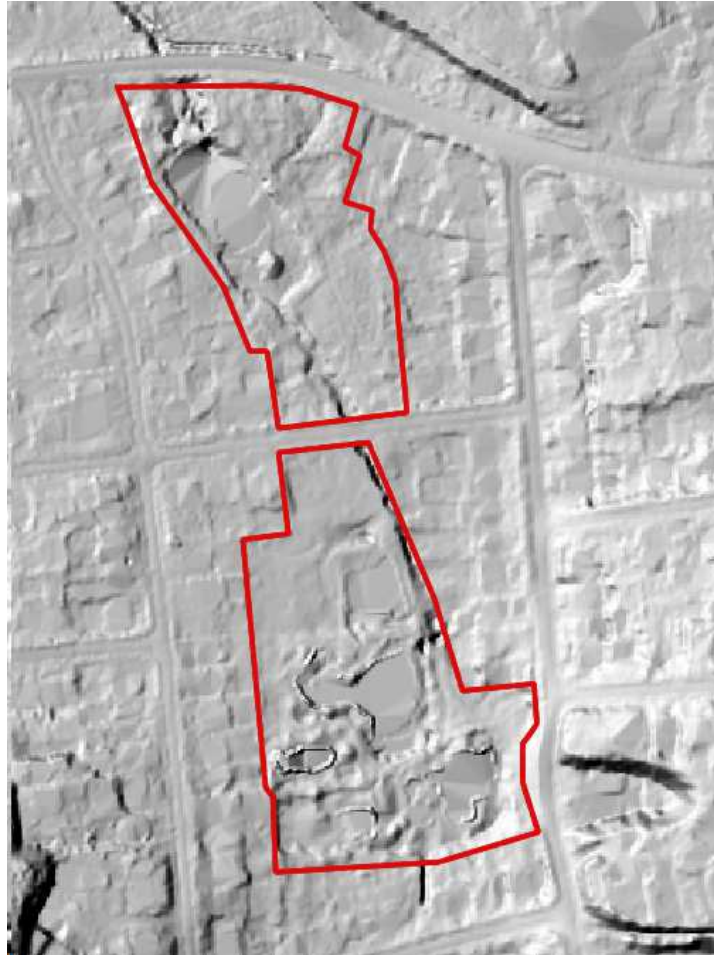


Figure 20: 1m DTM LiDAR of the extent of the Bradbourne Lakes

4.7 Documentary Study Conclusion

4.7.1 Bradbourne Mill

The HER (Site MKE116484) records the location of Bradbourne Watermill at the northern end of Lake 5. It is a 6-figure grid reference and has therefore an accuracy of only $\pm 100\text{m}$, but its location would broadly correspond as being on the line of the Brad Stream. The entry provides no sources of information and little information beyond the location. There are no indications on any historical mapping of a mill in this location, but its position on an active stream would make it a logical location for a mill. Although there are no indications of a mill, there is an arrangement of channels, which may be an indicator of a former mill. To control the water- flow into a mill, there is typically a requirement for two water channels, one to provide the feed for the mill and the second is the primary overflow channel. Control is provided by allowing a flow from the primary (overflow) channel to the watermill through the feed channel or leat. At this location, north of Lake 5, there is the line of the primary channel, and then a secondary channel which diverts to the west, and then around the side of a rectangular field, before reuniting with the main channel 170m from the point of diversion. Although there is no depiction of a mill on any historic mapping, it

is probable that there was in the past a mill located somewhere on the line of the divert channel, which would have served as a leat. Given that there is no depiction of a mill on any mapping it can be suggested that it had fallen out of use by the time of the earliest maps.

4.7.2 History of the Lakes

Both Ralph and Henry Bosville are commonly attributed as the persons who constructed all the lakes at Bradbourne (eg Dunlop 1964, 140; Kent Gardens Compendium); however, this is in conflict with the cartographic evidence. The map of 1769 (Andrews, Drury and Herbert) clearly shows the Brad stream, Bradbourne Farm, and all the main features of the Mansion, but does not show any lakes just north of the Turnpike Road. Its publication date is after the death of Henry Bosville, and while it could potentially be argued that the survey may have taken place prior to his death and the given date is only the publication date; however, it is clearly shown on the map that the owner of Bradbourne was Sir Richard Betenson. The next map in sequence is the 1801 William Mudge 1" map, which was surveyed between 1788 and 1789, this shows only Lake 5, but which has a slightly trapezoidal shape indicating a dam at its northern end and was seemingly smaller than the later representations of the Lake in 1833 and 1840. The map shows the line of the stream channel (Site 24) which extended into the area of Lake 1 where there was the representation of a small pond and by implication a spring. While this is a far cry from the considerably more extensive lake arrangement that is seen on the later maps, it is an indication of the very first stages of the development of the lake system. It can be attributed to the work of Dr Thomas Lane, who was still the owner of the estate in 1797 when the Hasted history of Kent was published (Hasted 1797) as he was referred to "as the present owner of the seat", and which was a date that was subsequent to the survey dates for the map. He ultimately died in 1805 passing the estate to his son – Henry Thomas (BLRA 2025).

Between the 1801 map and the 1833 sales map the remaining lakes (2-4) appeared, which were very rectangular in form, and which contrasted with the more irregularly shaped Lakes 1 and 5, which had earlier origins. Their regular shape is out of keeping with the typical form of lakes from a pleasure ground, which are usually of an irregular form and shape intended to emulate a natural lake or pond. The regular rectangular shape would suggest, therefore, that they originally had a practical function such as cress, flax or fishponds and served to provide a source of income for the estate. This would accord with the circumstances of the then owner Henry Thomas who had inherited a large estate that was expensive to run. The worsening fortunes of the then owner are reflected in the apparently unsuccessful attempt to sell the estate in 1833 and then the ultimately successful sale to Henry Hughes in 1840.

The tithe map in 1840 reiterated the 1833 sales map, and then the next map in sequence was the 1871 OS 1st edition which showed substantial change to the layout of the lakes. The lakes had merged and had taken on a more irregular outline and may reflect that the formerly functional lakes now served as the features of a pleasure ground. If so then this parkland development must be attributable to Henry Hughes, as the works took place before 1869 (so not the

works of Francis Crawshaw who acquired the estate in 1870). It was probably also not by Admiral William Hughes D'Aeth, who did not reside at the property.

Subsequent mapping shows that the arrangement of the hydrology has not changed significantly. There is a modification to the outfall arrangement at the north end of Lake 5, and the change of a small footbridge across the stream feeding Lake 5, and the visible loss of springs feeding Lakes 1 and 3. What the mapping does show is that the lakes park has been an oasis of calm amongst a maelstrom of developmental landscape change just beyond its very confined borders as the parkland became suburban housing.

5 SITE SURVEY

5.1 Introduction

A survey of the identified features within the extent of the Bradbourne Lakes Park was undertaken which examined all potential archaeological features and, for the most part, were related to the designed landscape within the park being principally hydrographic features. The survey also included documented features that were depicted on early mapping, but which are no longer visible on the surface (eg Site 7). HER sites were also included where they were within the vicinity of the Lakes Park, although some were outside, such as the Clock House. The descriptions and selected photographs are included in the site gazetteer, which is included as Appendix 2, and the locations of the site are presented as Figures 21 and 22.

5.2 Summary Description of Sites

Presented below is a broad assessment of the results of the site survey, presented chronologically and which incorporates the more significant features within the landscape, but this list is not inclusive of all features as they are also presented in full within the gazetteer (Appendix 2).

Site 41 – Bradbourne Hall - 1689: perhaps the earliest site within the immediate confines of the study area was Bradbourne hall, which was reportedly constructed in 1689 by William Bosville. It was at the heart of Bradbourne Park, and the fortunes of the park are reflected in those of the Hall and its owner. The building was demolished to make way for the surrounding housing estate, and nothing now survives of the building.

Site 38 – Watermill – Pre 1769: there is little reliable information on the existence of a watermill at Bradbourne, an approximate location is provided within the HER entry (MKE83707), but this does not attribute a data source. Its existence can be presumed from the presence of divert and overflow channels to the north of Lake 5, but there is no depiction of a mill on any of the historic maps. Either the maps did not show it even though it was in existence (which would be unusual given that other mills are shown), or it had gone out of use by the time of the oldest mapping. If the latter is the case, then it could have predated Bradbourne Hall.

Site 1 – Bettenson Avenue - 1769: the bridge over the Brad Stream and currently supporting the wide and modern Bettenson Avenue is approximately on the line of a bridge shown on the 1769 map. The bridge has been heavily modified and incorporates the addition of a substantial concrete lining to take the weight of modern vehicles, but the primary structure is constructed in stone. Because of the extent of what are clearly later modifications, it cannot be confirmed that the primary structure is that depicted on the eighteenth-century mapping, but there is a possibility that some of the fabric survives from the earlier structure.

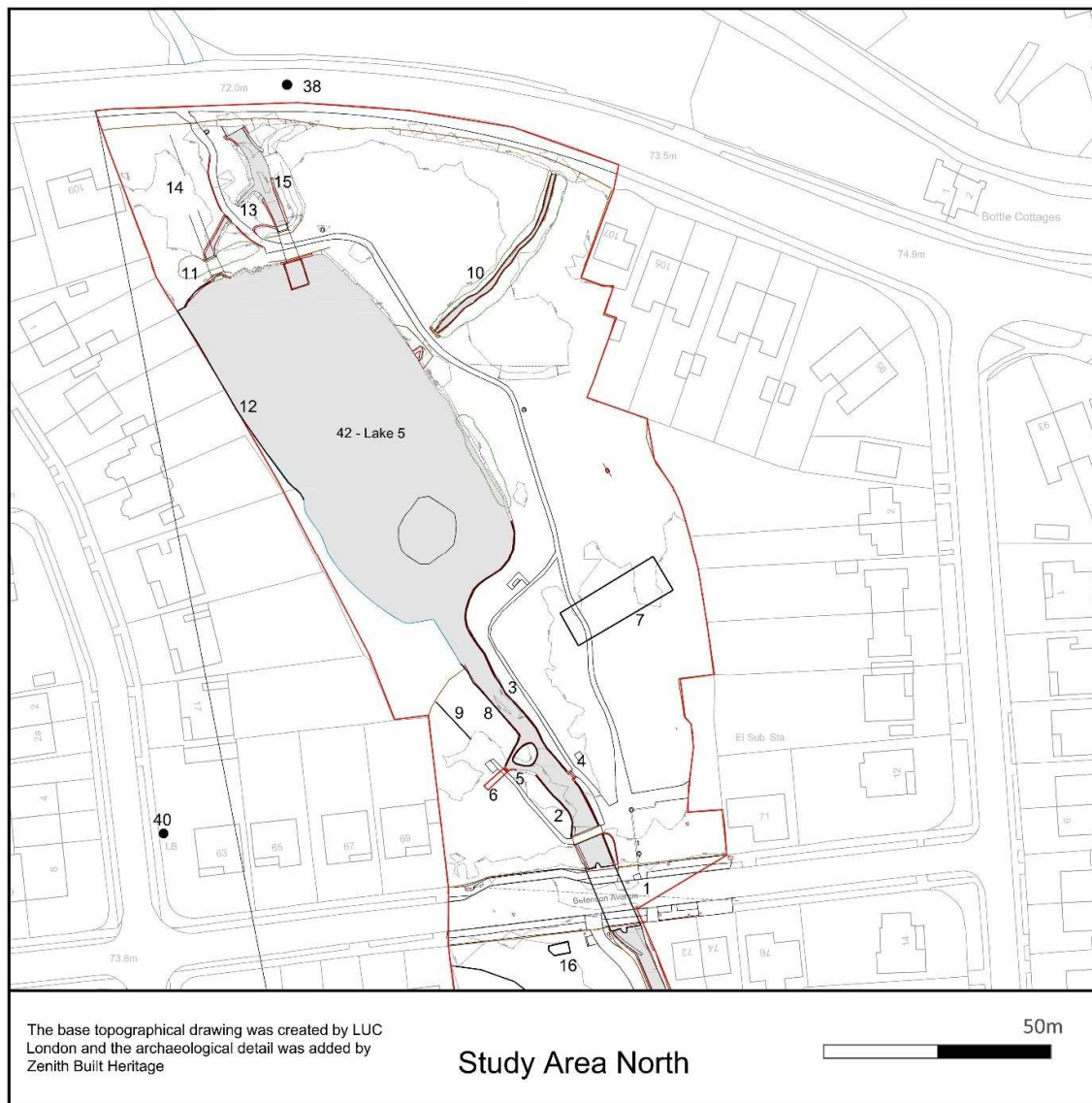


Figure 21: Survey mapping showing principle archaeological features in the northern part of the study area

Sites 11 and 42 – Lake 5 - 1801: the earliest mapping to show a lake is the 1801 Mudge map, which shows a trapezoidally shaped lake with a straight edge on its northern side (Site 42). The straight edge is a classic indicator of a dam, and it has a stream channel extending out from the western side of that dam (Site 11). Subsequent, more detailed, maps (eg 1833 and 1885), show the line of this channel being defined by a substantial channel (Site 14). The lake was substantially modified, subsequent to this map, to expand it and give it a sub-rectangular shape by the time of the 1883 sales map. This latter map showed that there were two channels extending out from the dam, one leading to a divert channel and the other being an overflow channel leading down to the original line of the stream. This split arrangement of channels provides evidence for the potential former existence of a mill (Site 38?) or similar structure that would necessitate multiple channels.

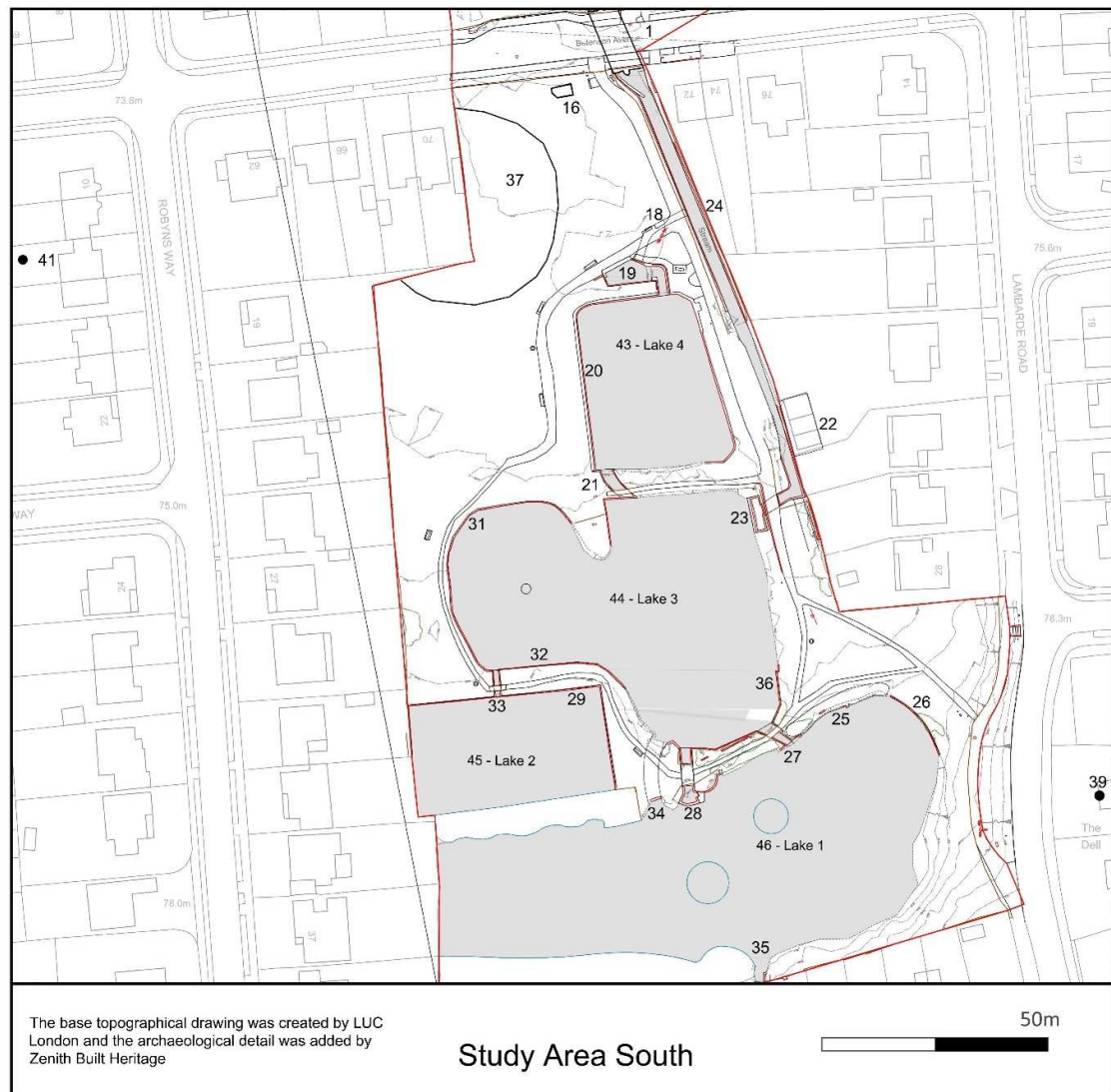


Figure 22: Survey mapping showing principle archaeological features in the southern part of the study area

Sites 24 and 46 – Brad Stream and Spring - 1801: depicted on the 1801 map is the line of the Brad Stream (Site 24), which extends out from a small pond in the area of what is now Lake 1. The stream is slightly undulating in course, so it may not have been canalised at this date, although it was undoubtedly canalised by the time of the 1833 sales map. It would appear that this map (1801) shows the very earliest stages of the development of the stream and lake, which was largely completed by the time of the 1833 sales map. The stream channel has been substantially modified with the incorporation of culverts extending from Lakes 3 and 4 and also a further underground culvert extending in from the south, although the spatial origin of this latter culvert is uncertain.

Sites 43, 44 and 45 – Lakes - 1833: by the time of the 1833 map the lakes system was largely established incorporating an expanded Lake 5, four rectangular lakes (Lakes 2-

4) and an expanded Lake 1. The mapping is not of sufficient detail to show the flow between the lakes, but it is to be presumed that the locations of the weirs, outfalls and culverts (Sites 18, 19, 21, and 23) were as subsequently depicted on the more detailed 1871 first edition OS map. The four lakes had a very deliberate rectangular arrangement, with narrow banks between each, which is not a normal feature of water features within pleasure grounds, which would typically have an irregular, natural shape conforming to the picturesque movement, emphasising naturalistic and romanticised landscapes. As such these lakes would appear to be functional, even though they were within an area of parkland, and may reflect an attempt to extract income from these water features.

Sites 22 and 39 – Buildings – 1833: the 1833 mapping depicted for the first time two buildings, which have subsequently been degraded by the expansion of the housing estate development, but are still, to a limited extent, surviving. Site 22 is shown as a small insubstantial, and unnamed building on the 1833 map but by the time of the 1871 OS map it was a substantial domestic building backed against the canalised stream (Site 24). Now the only surviving element of the building is a wall constructed on top of the canalised stream wall, and which also demonstrates that the stream was canalised prior to 1833. Site 39 was shown as a small farmhouse (Bradbourne Hall Farm) on the 1833 map, but by the time of the 1871 map the farm had developed into a larger farm complex with a courtyard configuration of outbuildings. Now only the farm building survives, and it serves as a domestic building within the housing estate.

Sites 25 and 44 – Southern Lakes – 1871: by the time of the 1871 mapping two of the rectangular lakes had been merged to form Lake 3 (Site 44) and the edges had been softened and rounded. It is possible that by this later date their role had been changed to parkland, pleasure ground features, and reflects a general change in perspective whereby a greater emphasis was seemingly placed on the outward appearance of the features. Lake 1 (Site 46) was shrunk from its former arrangement where it had fed into the stream channel (Site 24), and its northeastern limit was defined by a substantial earthen bund (Site 25). The flow entering the lake was from two springs to the west of the lake, and a stream inlet (Site 35) which led via a sinuous stream course from a linear lake in the southern part of the park. The water flow was then fed primarily via Lake 3 and then diverted into the stream channel by weir Site 23.

Sites 6 and 9 – Northern Lake Pleasure Ground – 1871: the 1871 map provides a far superior level of cartographic detail by comparison with earlier mapping and shows features that may have been in place earlier, but which were not previously depicted. What it particularly shows is that there was a clear divide between the northern part of the park, which was centered on Bradbourne Hall, and had become formalised gardens, tree defined avenues and within which, as a principal feature, was Lake 5. By contrast the area to the south, encompassing Lakes 1 to 4, was within an area of parkland and did not have the same landscape status. To the northeast of the Hall was a sub-triangular area of gardens which was edged by walls and had a linear lake or broad channel marking its southern limit. This water feature had a subterranean culvert feeding eastwards into the mainstream, and for which there is the limited survival of an outfall (Site 6) that opens out into the stream, but which is no longer fed as the linear lake is no longer extant. As the garden was at least partially walled it

was possible that this served as a kitchen garden, and later mapping (1885) shows green houses at the northern limits of the triangular garden. Much of the garden is now under the housing estate, but its eastern wall (Site 9) survives as a foundation and can be seen to have been gated as there are now the remains of a hinge.

Sites 10 and 16 – Later Pleasure Ground Modifications – 1900: the 1900 OS 25" to 1 mile map reflects the impact of the eccentric Francis Crawshay. He established a stone circle folly within the grounds of his park, and the now migrated monolithic elements of this (Site 16) are within the extent of the Lakes Park. First depicted within this map there is also the line of an overflow channel (Site 10) extending southeast from the side of Lake 5.

Site 37 – Ornamental Plantation – 1909: the LiDAR identified a sub-circular earthwork to the northwest of Lake 4 which closely corresponds with a circular plantation shown on the 1909 25" to 1 mile map, and only that map. Part of the plantation has been destroyed by the establishment of housing, but this shallow earthwork does demonstrate limited survival.

Sites 2-5, 8,12, 20, and 26 – retaining walls – Twentieth Century: the lakes were rationalised by the establishment of retaining walls around their perimeters. These were not original as they previously had poorly defined lake edges, but it is difficult to establish their dates on the base of the cartographic evidence, as these do not define when the lake edges were formally retained. For convenience this is provisionally defined as being from the twentieth century but in practice could have occurred over an extended period and which encompassed the latter part of the nineteenth century.

Site 7 – Building - 1801: A building is shown immediately to the southeast of Lake 5 on both the Mudge 1801 map, the 1833 sales map, and the 1840 tithe maps, but by the time of the 1871 OS first edition map it was gone, probably as a result of parkland landscaping. It is most clearly depicted on the 1833 Sales map (Fig 23) which seems to show two wings linked by an architectural 'hyphen'. This layout appears to be fairly elaborate and may indicate a parkland building such as a pavilion, particularly given its proximity to Lake 5. There is now nothing visible on the site, but there is a possibility that the foundations survive below ground.

A geophysical (GPR) survey was undertaken by Tigergeo (2025) which was intended to determine if there is any below ground survival of the building and if so to clarify where it is and if there will be any conflict with proposed landscape designs. The survey did identify a rectangular feature that was c 7m x 5m in size, which is about 5m to the north west of the predicted location of the building based on the 1833 map (Figure 24). The geophysical survey report (*ibid*) suggests that this anomaly "could have a structural origin, e.g. a buried floor surface" but also raises the caveat that this is only a tentative interpretation. The anomaly is approximately orientated with the documented feature, and is in the right approximate location, but is smaller than that shown on the 1833 map where each wing was depicted as being orientated north west/ south east and c 10m x 6m (Figure 25). While the anomaly is evidently smaller than the depiction on the map, that could be down to draughting discrepancies on the pre ordnance survey mapping. Although there is some correlation in terms of

orientation, location and approximate size, this could only correspond to one of the wings and there are no indications of the other wing or the linking structure.



Figure 23: Enlargement of the Site 7 building from the 1833 sale map showing the two connected wings

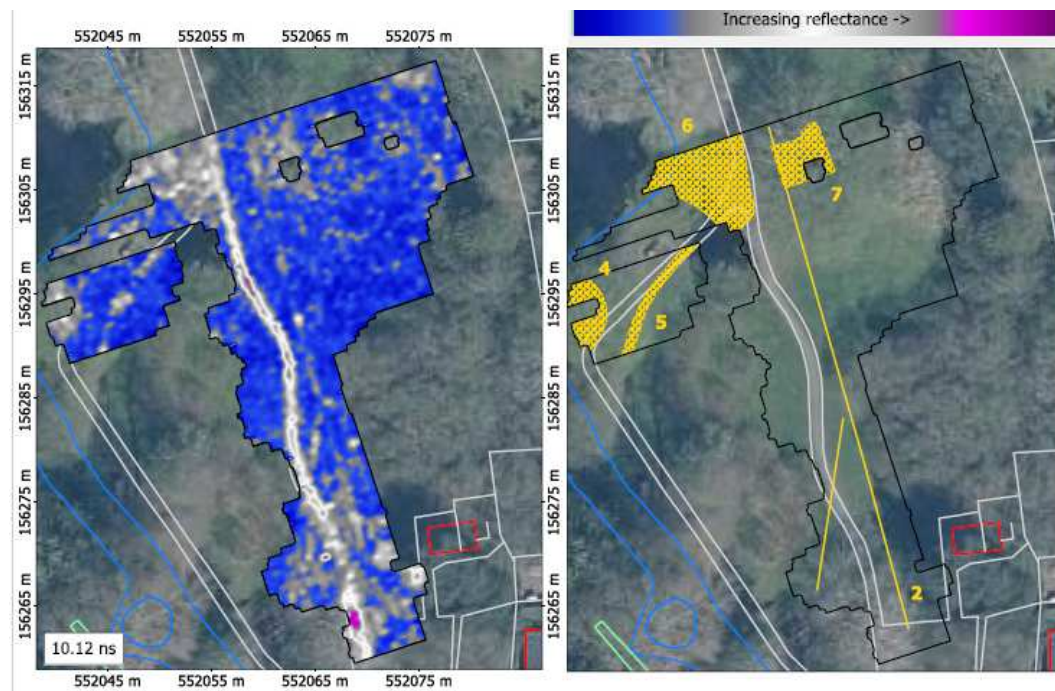


Figure 24: Geophysical Survey showing raw data and interpretation (Anomaly 7)

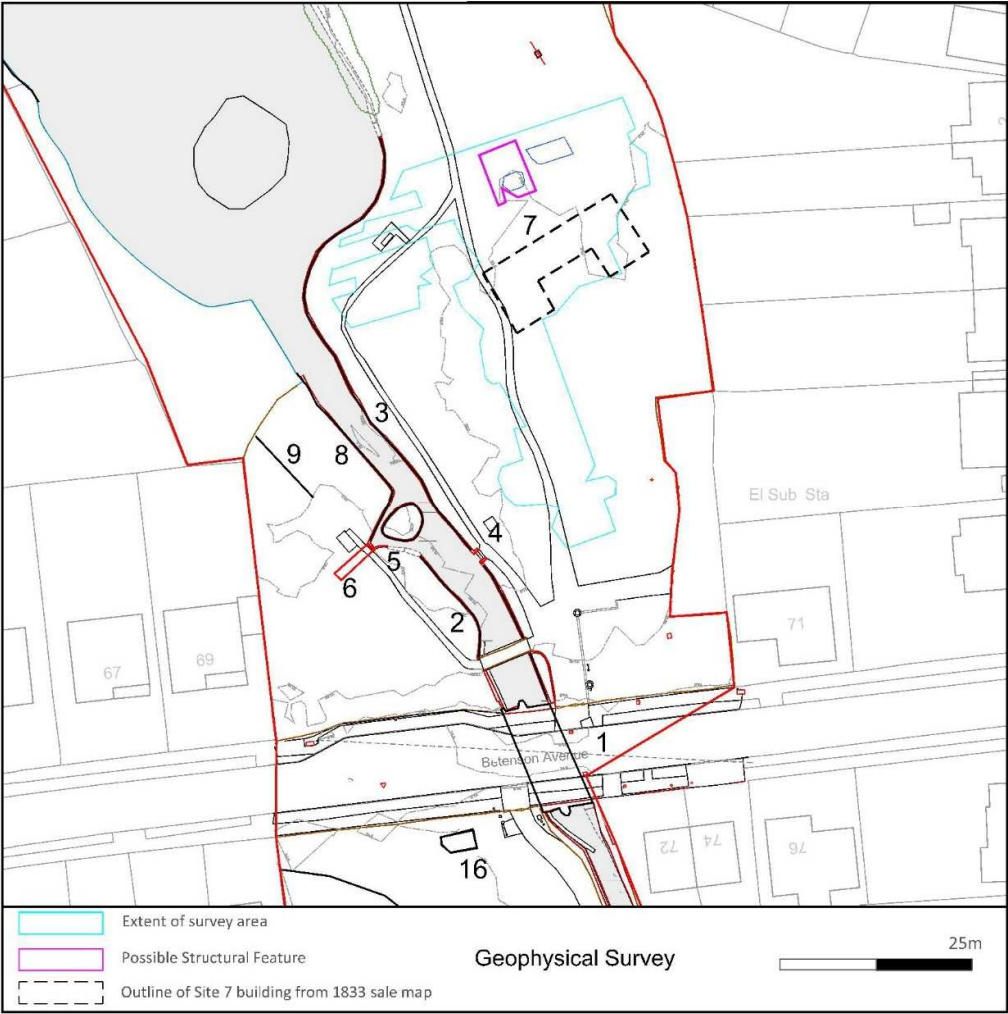


Figure 25: Geophysical (GPR) Survey results showing the possible structural anomaly

6 LANDSCAPE CHARACTER AREAS

6.1 Introduction

The following section provides an overarching description of the landscape, land-use, key elements and management within each character area. Detailed information of the individual elements, both natural and man-made, which combine to create the distinct landscape at Bradbourne Lakes are given in Section 4: Landscape Resource.

The character areas were established by the Design Team at LUC, as a part of the first-round application to the Heritage Fund and were set out in the 2023 Bradbourne Re-bourne Condition Survey. Each character area has a set of unique elements and special qualities, which distinguish that area from its neighbour and when combined, give rise to the landscape that we see today. In 2023, the park was divided into nine broad areas of similar character, in order to assist with any proposals within the future proposed landscape scheme that may or may not be suitable within each of those spaces. As a part of the baseline survey for this CMP, we have considered the nine-character area boundaries, land-use, key elements and management within each of those areas and have concluded that the area boundaries remain valid.

6.2 Character Area 1 – Northern Vegetated Buffer

The Northern Vegetated Buffer provides a green boundary to the northern extents of the North Park and a buffer between the green oasis of calm within Bradbourne Lakes and the busy A25, Bradbourne Vale Road. The boundary, which is formed by a wooden cleft fence (Plate 1.1), defines the entrance to the North Park (Plate 1.2) with a rural character, with the mature native trees which stand to the centre and east of the character area complementing this character. This wooded vegetation further provides both a visual and to some extent, an auditory buffer to vehicle noise.

The boundary to the west is formed by a tall wooded close board fence, adjacent to neighbouring residential properties and discrete domestic gateways provide access for local residents. To the east a similar wooden domestic fence provides the boundary definition although access for residents appears to be restricted by a dense shrub layer at the edges of the character area.

To the south, the boundary is naturally formed by the northern extents of Lake 5, with the boundary drawn randomly through the open grassland towards a narrow water course which outfalls beneath the A25 and presumably onwards into the Sevenoaks Wildlife Reserve. At the time of survey, water appeared to be moving slowly within the watercourse. Moisture loving, emergent vegetation is present.

The tree canopy is dense across the character area, with the highest concentration of trees and shrubs to the western extents of the character area, thinning slightly with scattered mature trees to the centre and east. To the west, a combination of sycamore, ash, hazel & cherry laurel amongst other species provides a dense canopy, with an almost impenetrable shrub layer, with some outgrown ornamentals, bramble, currant, ferns and sedges where soils are wetter. A small grass clearing adjacent to the residential properties appeared to have been recently mown and contained scattered wildflower species, with dogs' mercury, celandine, bluebell and bugle. A small area of paving was also noted adjacent to the northern bank of Lake 5.

Centrally, mature lime, sycamore and ash are scattered through an informal grassland setting, which has a pleasant and informal character and affording dappled shade for park users (Plate 1.3).

To the east, a slightly more dense canopy is provided by species such as hazel, ash and sycamore, with bramble and ferns creating a dense shrub layer adjacent to the boundary. Deadwood is scattered throughout the character area, providing a valuable biodiverse resource for local fauna and flora.

There is a single, hard surfaced path which runs through the character area, providing a surface for the public right of way Footpath 0221/SU11/3, which follows the route of the Darent Valley Path and connecting the North Park to the A25, Bradbourne Vale Road (Plate 1.4).

Whilst there are no lakes within this character area, moving water is a characteristic feature, with two fast flowing outfalls from the North Lake, one from a formal concrete overflow spillway to the north east of the lake and the second a shallow culverted structure, which falls into a small canalised brick lined structure and connecting to the spillway outfall some distance to the north. Fast moving water is audible and, to some extent, counteracts vehicle noise from the A25. The noise of running water also contributes to the sense of arrival into the character area, establishing a sense of a landscape filled with water for visitors entering from the northern boundary.

Opportunities to view the fast-flowing water are afforded from the footpath, by way of low bridges and gaps within the dense vegetation. The outfall watercourse to the southern boundary of the character area has a characteristic slow and gentle character and appeared to have a silted bed (Plate 1.5). Formed with a line of rough ragstone, this watercourse issues from the eastern bank of Lake 5 and it is unclear from the site survey as to whether the outfall is sluice controlled or varies according to the water level within the lake.

Management within this character area largely comprises grass cutting beneath the canopy of the mature trees to the centre of the space, with largely overgrown vegetation to the periphery. With gated access for some residential properties, it appears that some of the residents may also undertake some management processes within close proximity of their properties, such as weeding and planting.



Figure 26: Character Areas



Plate 1: Images of Character Area 1

6.3 Character Area 2 – Northern naturalist Lake and Edge

Occupying a large portion of the North Park, the Northern Naturalistic Lake and Edge character area comprises Lake 5, which is the only waterbody in the North Park and a small peripheral section of lakeside bank, extending towards the footpath to the east.

The lake has an irregular shape and is the most natural in character of all the Bradbourne Lakes, largely defined on all sides by vegetation, some mature (Plate 1.6). The lake edge appears to be of a ragstone construction in places, however access to the full extent of the lake was not possible at the time of survey and where the ragstone is visible, it appears to be in poor condition. Water flows into the lake via the shallow stream to the south and outfalls to the north. The north eastern corner of the character lake edge is fenced with a combination of tall iron railings, painted black and a wooden cleft fence (Plates 1.7 and 1.8). Large swathes of bamboo are present to the lake edge, especially to the north east, which largely restricts visual access across the water and in some places, is encroaching upon the mature bank side trees.

A key element within this character area is an impressive, dual stemmed veteran London plane tree, which stands to the north east of the lake and dominates the landscape (Plate 2.1). Other mature trees line the eastern lake side, including Scots pine, hornbeam and sycamore. There are also numerous alders along the lake edge, some of which appear to be growing into the lake sides and culverts.

The western bank of the lakeside, whilst inaccessible at the time of site assessment, was visually assessed and comprises mature lakeside trees, including oak, sycamore and yew, together with smaller species such as cherry and hazel. The boundary with the residential properties comprises a low wooden fence, allowing visual access to the lake for residents (Plate 2.2).

Areas of marginal vegetation appear frequently to the lakes edges and were noted to provide both habitat and foraging opportunities for the abundant waterfowl which appear in the park. At the time of site assessment, the water level in the lake appeared to be low and it was noted that leaf litter covered many of the marginal edges and exposed areas of silt, creating rafts which were also utilized by the waterfowl for resting and nesting.

A key structure within this character area is the square concrete outflow spillway at the northern dam edge, which, it is understood, outfalls into the River Darent (Plate 2.3). A shallow concrete culvert to the west of the square outflow spillway enables water to discharge from the lake into the river.

There is a small island standing to the south of the lake, which appears to be heavily colonised by young, coppiced trees and shrubs, with abundant emergent aquatic vegetation to the edges. There was no access to the island at the time of site assessment, however it appeared to be utilised by a variety of nesting waterfowl.



Plate 2: Images of Character Area 2

6.4 Character Area 3 – North-Eastern Open Fringe

Forming the eastern boundary of the North Park, the North-Eastern Open Fringe character area comprises a long and narrow strip of grassland with scattered trees and belts of hazel coppice. The north western edge of this character area includes a section of the outfall watercourse from the adjacent lake, which is the only element of water within this character area. At the time of site assessment, the watercourse

was heavily silted although there was a steady flow of water to the north east. This watercourse is edged with ragstone and contained emergent vegetation (Plate 2.4).

The eastern boundary of this character area comprises a tall wooden close board fence to the north, creating a tall division between the adjacent residential properties and the park. A large amount of scrub vegetation is growing adjacent to this fence, which appears to be largely unmanaged (Plate 2.5). Further to the south, domestic boundaries also include high laurel evergreen hedges, with wooden gates (Plate 2.6).

The boundary to the west is formed by the tarmac path which runs throughout the North Park, with the Northern Naturalistic Lake and Edge beyond. This area has a more open character even though there are a number of mature trees, which create shade and visual enclosure. The grassland is maintained as close mown, although peripheral areas appear to be left un-mown, and whilst, when combined with abundant shrubs and scrub, creates an unmanaged appearance, this is an important habitat for local wildlife (Figure 2.7). Shrubs within the internal spaces in the character area appear more frequently maintained (Plate 2.8).

A number of mature trees grow in this area, predominantly sycamore, with ash, oak and a mature yew. A large group of hazel coppice creates a heavily shaded, enclosed area to the south east of the character area. An abundant and varied ground flora was noted beneath the hazel.

The North-Eastern Open Fringe feels like a transitional space rather than an area where park users would spend time, with users observed to be passing through the area quickly rather than using the open space. There are no benches within this area and views into the lake were limited, at the time of site assessment, by vegetation.



Plate 3: Images of Character Areas 3 and 4

6.5 Character Area 4 – Shallow Stream and Adjacent Grassland

The Shallow Stream and Adjacent Grassland character area is a small, densely wooded area occupying the south western corner of North Park. Adjoining Betenson Avenue, the roadside boundary comprises an open wooden pail fence and a stone wall denotes the location of the bridge over the canalised stream which connects both parks (Plate 3.1).

The shallow stream emerges from beneath Betenson Avenue within two box culverts and runs in a narrow channel towards Lake 5. A narrow pedestrian bridge, with wooden pail fencing crosses the narrow stream and allows access into the south western corner, beneath the canopy of the mature trees (Plate 3.2). The channel is retained by a ragstone wall (Plate 3.3); however, this has failed in several locations and there are clear desire lines leading into the water. A set of stone steps on the eastern bank also allow access into the stream. At locations where the retaining wall has failed, marginal vegetation is colonising the bare ground.

A significant historic feature of the narrow stream is a small island, defined by a ragstone revetment, standing close to the western bank. The island has a single mature London plane tree and, at the time of site assessment, also had abundant vegetation growing into the wall structure (Plate 3.4). Roots from the London plane are visible beneath the revetment and are potentially undermining it. Two channels encircle the island, leading from a small culvert to the west and it is unclear whether the revetment was constructed to protect the tree or if the tree was planted atop the island. Either way, this is an interesting feature and is no doubt associated with the designed pleasure grounds associated with Bradbourne Hall, which stood to the west of this location. To the west of the island feature is an overgrown area where a line of mature yew trees is visible beneath the dense tree canopy. The yew may be the remnants of a yew hedge or a formal line of yews, which were associated with the designed landscape of Bradbourne Hall, as a double row of trees are visible on both the 1871 Ordnance Survey at 6" to 1 mile which was surveyed in 1868-9 and the 1st edition Ordnance Survey, 1885 25" to 1 mile (Figure 12). Beneath the yew and beyond the hard surfaced path are the remains of a wall and gate piers, possibly also associated within designed landscape of the pleasure grounds (Plate 3.6)

A number of mature trees stand in the south west corner of the park, including western red cedar, juniper, tulip, alder and ash (Plate 3.7). Significant areas of hazel coppice occur beneath the higher canopy trees, to the north east of the character area, where open grassland is heavily shaded (Plate 3.8). Despite the heavy shading, this is a well-used area within Bradbourne Lakes and at the time of the site assessment, a number of families with young children were seen using this space. The presence of wooden benches and a picnic bench also encourage park users to linger for longer in this area and children were seen enjoying the stream and playing within the dense vegetation to the west.



Plate 4: Images of Character Areas 5 -6

6.6 Character Area 5 – Shallow Stream and Adjacent Grassland

The smallest of the character areas, the Northern Park Threshold occupies a location to the south east of North Park and is the transitional space into the park. Forming a boundary with Betenson Avenue to the south, with a wooden pail fence and wooden pedestrian gate defining the boundary, this space has an open character (Plate 4.1).

The boundary to the east is defined by a tall wooden close board fence, with a significant area of bamboo and hazel coppice creating an enclosed vegetated area (Plate 3.2). A single oak stands within close mown grass to the south eastern corner, and a ginkgo stands adjacent to the gateway. A mature Holm oak was noted standing in open grassland to the north of the character area.

This is perhaps an underutilised, transitional space and the location of rubbish/recycle bins perhaps dissuades park users from lingering here.

6.7 Character Area 6 – Eastern Open Grassland and Specimen Trees

The Eastern Open Grassland and Specimen Trees character area is located to the western aspects of South Park, defined to the north by a wooden pail fence adjoining Betenson Avenue (Figure 3.6). This is a welcoming arrival space into South Park, with a wooden notice board and signs on the pedestrian gate providing visitor and event information.

A significant feature within this character area is a stone monolith, which is understood to have originally stood close to Bradbourne Hall and was re-located to this location (Plate 4.5). This area has an open grassland character, despite a high number and variety of mature trees. To the north of the area, species range from a monkey puzzle and silver maple to a number of more common cherry trees. To the western edges there are a number of beech and red oak, with numerous poplar species, providing narrow vertical interest. To the far south west are lime, alder and eucalyptus (Plate 4.6).

The boundary to the west of the character area with residential properties comprises a high, close board wooden fence, which is supplemented in places by groups of mature shrubs, including alder, hazel and holly together with and a belt of Lawson cypress trees, forming a dense screen (Plate 4.7). Where the shrubs are less abundant, views of the residential properties give rise to a suburban character (Plate 4.8). The boundary to the south is defined by the northern vegetated edge of Lake 2, whilst the boundary to the east is defined by the vegetated banks of Lake 3 and the edge of the tarmac path to the west of Lake 4. To the north, the boundary is defined by the walled edge of the canalised stream which flows beneath Betenson Avenue and into the North Park. There are no waterbodies within this character area, however there is visual access to adjacent areas of open and running water.

This character area is perhaps the most popular and has a high value in terms of visitor use. Numerous park users were observed in this space during the site assessment. This character area is also where a large number of waterfowl congregate, close to the lakes and to the visitor feeding station on the adjacent Ornamental Lake. Such high numbers of waterfowl do however have an impact upon the grassland, which is showing signs of wear due to the constant grazing pressures placed upon it. Tree roots within this area were also observed to be exposed and vulnerable to damage.

6.8 Character Area 7 – Ornamental Lake

The Ornamental Lake character area is predominantly water, surrounded by a grass covered bank with ornamental and native trees and a swathe of ruderal vegetation along the southern lake edge.

The lake is rectangular in shape and is the most formal in character of all the lakes. Constructed with a ragstone retaining revetment, the lake is used for model boating and is the site of the Duck Feeder, which distributes food for the resident waterfowl (Plate 4.1).

Water enters the Ornamental Lake via an outfall from Lake 3, which is crossed by a narrow pedestrian bridge with a wooden pail upstand (Plate 4.2). The stepped outfall, which appears to be in visually good condition, is an aesthetically pleasant feature, with the sound of fast flowing water adding to the character of the lake.

To the east of this outfall is a vegetated bank above the ragstone wall, which has a number of mature trees, including holly, sycamore and ash growing into the bank and wall (Plate 4.3). Many of the branches of these trees overhang the water.

The eastern side of the Ornamental Lake has no trees, however there is a small shrub. Despite the lack of trees, the lakeside bank has a poor covering of grass, which may be attributed to several factors including poor light levels from adjacent trees and the constant wear from park users and the resident waterfowl.

The eastern boundary of the character area is formed by a wooden pail fence adjacent to the Canalised Stream character area. The boundary to the south is formed by the northern edge of Lake 3 and the boundary to the west and north is formed by the tarmac path which encloses the Eastern Open Grassland & Specimen Trees character area.

Water leaves the lake via a cascade at the north eastern corner and then moves through an overflow pond into culverts before entering the Canalised Stream to the east (Plate 4.4). At the time of site assessment, this cascade had an untidy appearance, with vegetation debris strewn across the outfall. A high number of waterfowl congregate here, close to the Duck Feeder.

The most significant mature trees in the character area stand to the north. A Norway maple stands to the north west, an ash stands centrally, and a horse chestnut stands at the north eastern corner.



Plate 5: Images of Character Areas 8 and 9

6.9 Character Area 8 – Canalised Stream

The Canalised Stream character area occupies a narrow strip of land to the north east of the South Park and carries water from the weir, which outflows to the north east of Lake 3 and the culvert to the north east of Lake 4, towards the two box culverts beneath Betenson Avenue and on into the North Park.

The Canalised Stream has a different and unique character compared to the rest of Bradbourne Lakes; it is largely hidden behind vegetation, and the water level is lower than the adjacent path, making glimpses into the canal difficult, but made possible in part due to the wooden pail fence which denotes the boundary to the west (Plate 4.5). The boundary to the east is defined by the residential garden boundaries of properties standing on Lambarde Road above a ragstone revetment (Plate 4.6). Some of the walls are up to 1.6 meters in height, with ivy growing into the wall. Vegetation along the banks of the channel is growing into the revetment and causing damage in places (Plate 4.7).

Whilst this character area is a narrow strip of land, there are a number of trees and shrubs associated within it, including a number of mature beech and yew trees, along with ash, alder, elder and groups of holly and hazel.

The secluded character of this waterbody makes it an ideal foraging habitat for wildlife and during the site assessment, a number of bird species were observed in the water, including moorhen (Plate 4.8), dipper and a great wagtail.

6.10 Character Area 9 – Southern Naturalistic Lakes with Structured Edges and Walking Routes

Occupying the largest area within Bradbourne Lakes, the Southern Naturalistic Lakes with Structured Edges & Walking Routes is located to the south of the South Park and predominantly comprises three interconnected water bodies; Lakes 1, 2 and 3, which are surrounded by narrow, hard surfaced paths and enclosed by mature wooded vegetation.

The gateway into the character area off Lambarde Road has a similar character to the gateway off Bradbourne Vale Road to the north of the North Park, with mature broadleaved trees, set within grass and defined by a wooden cleft fence (Plate 4.1). Lambarde Road sits at a higher elevation and the ground slopes down into the South Park at this point (Plate 4.2).

A narrow tarmac path leads from the single wooded pedestrian gate into the character area (Plate 4.3).

The rear gardens of residential properties standing on Lake View Road define the southern boundary of the character area and are often open to the lake edges, with a strip of predominantly sycamore, alder, elder, ash with occasional holly and hawthorn to the south west and lime, Norway maple, beech with occasional sycamore and ash to the south east. Lower canopy vegetation is abundant in places, making the lakeside inaccessible. To the west, the boundary of the character area is defined by the rear gardens of residential properties standing on Robyns Way and the south eastern edge of the Eastern Open Grassland and Specimen Trees character area. To the north the boundary is defined by the path which runs between Lakes 3 and 4, whilst to the north east, a small open grass area adjoins the wood fences of the domestic rear gardens of properties on Lambarde Road.

This is a heavily shaded character area, with all three water bodies surrounded by mature vegetation (Plate 4.3). There are narrow strips of grass where the banks of the

lakes extend up towards the paths, however most of these grass edges were heavily worn at the time of site assessment, with the sward struggling with low light levels, the high volume of visitor traffic and the high numbers of waterfowl observed within this character area, especially around the popular waterfowl feeding areas. High numbers of waterfowl, combined with visitor traffic is leading to the exposure of roots of the mature broadleaves around the lake (Plate 4.4).

The lake edges have a varying condition, although the overwhelming character where edges have been artificially reinforced, is one of a steady decline in condition. Where trees are growing close to the lake revetments, there is visible damage to structures, with fallen trees and exposed tree roots creating breaches in the walls. Natural lake edges occur around all three of the water bodies and vary in condition according to bank side vegetation. Where vegetation is abundant and restricts access to the water for waterfowl, the edges appear in better condition than those where soil is being eroded away.

Trees in the character area appear generally less well managed than in other character areas, growing close together with a dense canopy and species such as sycamore and alder are abundant. To the eastern side of the character area, ornamental species such as silver birch and cherry are prevalent, with groups of hazel.

There are three small islands in the middle of Lakes 1 and 3, which have abundant overgrown vegetation. The islands are inaccessible to all except the waterfowl and make excellent nesting habitats (Plate 4.7). There is also a small area between Lake 1 and Lake 2, which is fenced to restrict access (Plate 4.8). This area is largely overgrown with scrub and mature trees, predominantly sycamore and alder, however there is a semi-mature yew, which is in good condition and several hawthorns. With retained deadwood and restricted access to park visitors, this small, fenced area is a wildlife haven to the east of the fenced area, and standing on the northern bank of Lake 1, is an impressive mature London plane tree (T283).



Plate 6: Images of Character Area 9

7 LANDSCAPE RESOURCE

7.1 Introduction

The landscape resource can be broadly divided into natural and man-made fabric. The natural fabric of the landscape comprises all the living elements such as the trees, grassland etc, which are supported by the underlying geology and soils. The man-made fabric broadly comprises the built features, such as the lake retaining walls, fences, bridges and furniture. The natural and man-made elements combine, to create the unique landscape character setting of Bradbourne Lakes and the special qualities of place.

The landscape comprises a holistically connected mosaic of habitats, with man-made elements, and a land-use and management regime which combine to form the characteristic and unique setting of Bradbourne Lakes. The following section describes the natural and man-made fabric within the study area and should be read in conjunction with other detailed condition surveys, including:

- *Bradbourne Field Survey Report* (2025) Zenith Built Heritage;
- *Bradbourne Lakes Tree Survey Schedule* (2025) PJC Consultancy;
- *Assessment of Existing Structures and Outline Proposals for Remedial Works* (2022) Civic Engineers;
- *Review of the Ponds and a Sediment Survey at Bradbourne Lakes* (2019) Hydreau; and
- *Bradbourne Lakes Preliminary Ecological Appraisal* (2025) PJC Consultancy (note: currently covers the internal lake areas only - update to follow which covers the CMP BLB).
- *Bradbourne Lakes Preliminary Ecological Appraisal* (2025) Ricardo
- *Bradbourne Lakes Biodiversity Net Gain Report* (2025) Ricardo

7.2 Man-Made Fabric

The man-made fabric comprises a range of water bodies and the associated structures, boundary features, route-ways throughout the North and South Park and furniture, which all contribute to the character of the landscape.

7.2.1 Water – Man Made Structures

Issued in 2019 and revised in 2022, the *Assessment of Existing Structures and Outline Proposals for Remedial Works*, prepared by Civic Engineers, is a site survey and visual assessment of the five artificial lakes and the structural features, including the river walls, culverts, bridges, weirs and waterfalls. A second survey was carried out to assess the structures in the upstream section of the overflow stream and make further observations of the site at a time when water levels were lower. The report was revived in 2022 to provide up to date survey information of the water features and to provide guidance on areas where further investigation is recommended or where remedial works are necessary.

The *Review of the Ponds and a Sediment Survey at Bradbourne Lakes* was also carried out in 2019 by Hydreau and sets out a concise assessment of the quantity and quality of sediment within the five lakes and the composition of the lake beds and lining structures. It is understood that this report is currently being updated.

The five lakes are linked and provide a visual and auditory movement of water through the South and North Park. Water issues through a culvert into Lake 1, from the River Darent at the southern boundary of the South Park, through the Lakes and into North Park, via the stream to the eastern boundary and onwards beneath Betenson Avenue and into Lake 5, leaving North Park through a small outflow and onwards beneath the A25 Bradbourne Vale Road. The movement of water and the associated sounds that the movement creates are a pleasant and relaxing feature within the parks.

The Lakes are all man-made and have various edge features from naturalised, with vegetated banks to more formal brick and ragstone sidewalls or combinations of both (Plates 7.1 and 7.2). Varied in shape and size, the five lakes combined are the largest feature within the Bradbourne Lakes landscape. The condition of the vegetated banks and man-made sidewalls varies throughout the North and South Parks. Many of the man-made sidewalls are in poor condition and various repairs have historically been carried out, with corrugated sheet piles visible. Where damage is visible, or where historic repairs are incongruous to the vernacular structures, there is a visual reduction in the quality and character of the fabric (Plate 7.3).

Lake 1 - The southernmost of the lakes and naturalistic in shape and partially in edging, Lake 1 is understood to be relatively shallow, with two small central islands, both of which are heavily colonised by vegetation and self-set trees. The eastern bank is situated close to the South Park's entrance at Lambarde Road, glimpses of the waterbody are afforded through the trees and provide a visually attractive feature. Due to the shape and size of this waterbody and the position of the central islands, there are no locations where the entire lake is visible (Plate 7.4). A narrow path leads visitors along the northern edge of the Lake; however, the full extent of the Lake is not accessible for park users.

The lake issues out into Lake 3 via a stone retained weir which is centrally located along the northern lake edge (Plate 7.5). A similar stone retained outfall is located to the north eastern edge of the lake, also issuing into Lake 3. Some of the man-made retaining structures along the northern edge of the Lake appeared to have been historically repaired.

The naturalised edges of Lake 1 were seen to be eroding in places, and this is presumed to be due predominantly to the movement of waterfowl into and out of the water. A number of mature trees were also observed to be growing atop and into the stone retaining sidewalls (Plate 7.6), creating a dense shaded canopy over the water. The trees are contributing to the build up of silt, which is visible during low water events. A small section of bank between Lake 1 and Lake 2 is fenced to prevent general access. At the time of the site assessment, a large tree had recently fallen, and the timber restricted clear access (Plate 7.7).

The *Assessment of Existing Structures and Outline Proposals for Remedial Works* noted in 2022 that there is damage to the easternmost island bank "Plastic sheet

piling seems to have been originally installed to protect the earth bank of the island. However, the earth has subsequently been washed away leaving a water filled void behind the sheet piles”.

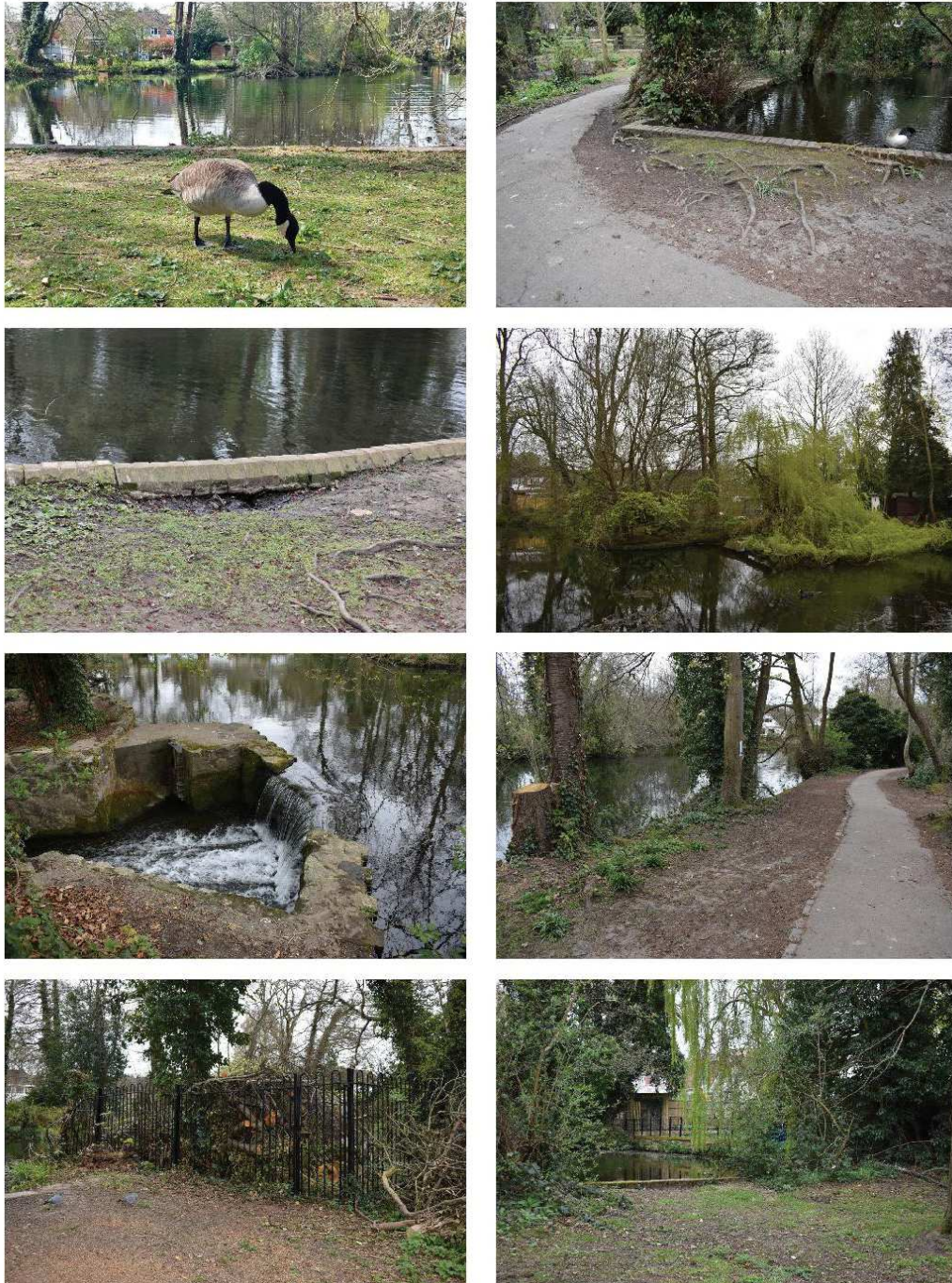


Plate 7: Man-Made Lake Features

Lake 2 - The smallest of the waterbodies, Lake 2 is a rectangular feature to the western edge of the South Park and lies between Lake 1 and Lake 3. Lake 2 is understood to be spring fed, presumably towards the western edge and outfalls into Lake 3 via a brick side-walled weir. The edges appear, from the access available at the

time of site assessment, to be stone and brick lined (Plate 7.8) although heavy vegetation and restricted access along the southern edge makes a full visual assessment difficult. It is certainly the case that mature trees are growing close to the edges (Plate 8.1).

The Review of the Ponds and a Sediment Survey at Bradbourne Lakes has made a full assessment of the likely bed of Lake 2 to be puddled clay atop the Sandgate Formation bedrock and notes that the bed, at the time of survey, was “deeply covered in organic matter (leaf-fall, branches etc) as the pond is greatly overshadowed by mature deciduous trees”.

The Assessment of Existing Structures and Outline Proposals for Remedial Works report noted in 2022 that a “section of the brick masonry wall running along the eastern bank of Lake 2 has deflected horizontally towards the lake”, although a full survey was restricted by the location of private gardens to the east. The report further notes that the “banks of Lake 2 are formed of brick capping above corrugated plastic sheet piling, mass concrete was observed to be present below the capping in some locations, the extent of the concrete cannot be determined without intrusive investigation.

This detail is only present on lengths of sidewall where trees are not present, in the areas where trees are present roots have damaged the walls and have not allowed the typical repair detail installed to the majority of the banks”.

Lake 3 - An irregular shaped lake to the south of the South Park, Lake 3 has inlets from both Lake 1 and Lake 2 and outfalls in Lake 4, at the north western corner and into the stream at the north eastern corner. There is a hard surfaced route which circumnavigates the edges of this Lake, providing a variety of views. A narrow vegetated peninsular on the northern edge provides visual interest and is used as habitat by waterfowl.

The edges of Lake 3 appear to be retained predominantly by a ragstone wall with brick copings (Plate 8.2), which is in visually reasonable condition however the Assessment of Existing Structures and Outline Proposals for Remedial Works report notes that at the eastern edges “Historic remedial repairs appear to have been made to the base of this section of wall using permanent corrugated plastic formwork...”. There are, however, sections where the coping has been undermined.

The number of inlets and outfalls creates visual and auditory interest for park users, where water is flowing into and out of the Lake. The outfall into the stream is visible at close quarters and provides a dramatic feature, with water tumbling over the stone weir and down through a culvert beneath the path into the canalised stream (Plate 8.3). These structures were noted to be in good condition in the *Assessment of Existing Structures and Outline Proposals for Remedial Works* report, however there is concern that the ragstone walls are undermined in several locations “*due to scouring of bed joints by fast flowing cascade* (at the inlet from Lake 2)” and “*Local undermining has resulted in voids at the base of the ragstone retaining wall* (south eastern edge)”. The report also notes that “*Large trees have grown to surround the original masonry retaining wall. This has led to damage of the walls through the ingress of roots and root heave* (western edge)”.



Plate 8: Man-Made Lake Features

Where the edges are naturalised, erosion has occurred, such as at the south western edge adjacent to Lake 2 (Plate 8.4), however at the northern edge, adjacent to Lake 4, the naturalised edge appears stronger and intact. The erosion of the naturalised edges may be largely caused by the prevalent waterfowl, especially where the key feeding areas are located.

Lake 4 - The ornamental Lake is rectangular and lies to the eastern edge of the South Park, adjacent to the Stream. This is the most formal of all the waterbodies, with a ragstone edge to each side (Plate 8.5) and a hard surfaced path which circumnavigates the water body. Water enters Lake 4 at the south western corner, via an attractive stepped inlet (Plate 8.6) and leaves via a gentle cascade (Plate 8.7) into a small outlet pond (Plate 8.8) and then through a culvert into the Stream. At the time of site assessment, there was an abundance of vegetation debris on the cascade and in the outfall pond. This is a largely hard surfaced area with an area of random stone paving adjacent to the cascade. The duck Feeding Station is also positioned here, and waterfowl and other bird species were observed in high numbers.

There are a high number of mature trees which stand at the edges of Lake 3 however the shading effects of these deciduous trees appears to be less significant, partially due to the larger water surface area.

The *Assessment of Existing Structures and Outline Proposals for Remedial Works* report noted several areas of concern in 2022 with the ragstone walls, which included scouring of bed joints due to fast flowing water and the ingress of vegetation roots causing damage to bed joints and the undermining of the walls.

The Stream - A canalised stream connects the lakes in the South Park with Lake 5 in the North Park and runs between the culverted outfalls from Lake 3 and Lake 4, through a culvert beneath Betenson Avenue and onwards to issue into Lake 5. Within the South Park, the Stream is formed by tall ragstone walls (Plate 9.1) and runs along the eastern boundary, formed by the residential gardens of properties on Lambarde Road. Inlet and outfall culverts are discussed in detail in the *Assessment of Existing Structures and Outline Proposals for Remedial Works* report.

Visibility into the Stream is partially restricted by dense vegetation on the western edge of the Stream and by the lower water level than the adjacent path. A wooden cleft fence defines the western boundary (Plate 9.2). A number of mature trees stand on the edges of the Stream and the *Assessment of Existing Structures and Outline Proposals for Remedial Works* report notes that in places the wall is heavily damaged due to the ingress of tree roots and “*Displacement to the wall, likely due to root heave, has led it to be highly out of plumb. There is evidence of historic collapse with ragstones littering the bed of the stream*”.

Shallow Stream - The canalised Stream flowing from the South Park and through the culvert beneath Betenson Avenue emerges into a Shallow Stream to the south of the North Park (Plate 9.3). This Shallow Stream is formed by low level ragstone walls of variable condition. There are visible areas where the wall is deteriorating and visible areas where it has been completely destroyed, presumably through historic vegetation ingress and the movement of park users wishing to gain access into the water (Plate 9.4).

The stream is shallow, with a stone base and the gentle movement of water toward Lake 5 is relaxing. During the site assessment visit, a number of park users were observed to spend time at this location, making use of the adjacent picnic table and bench.

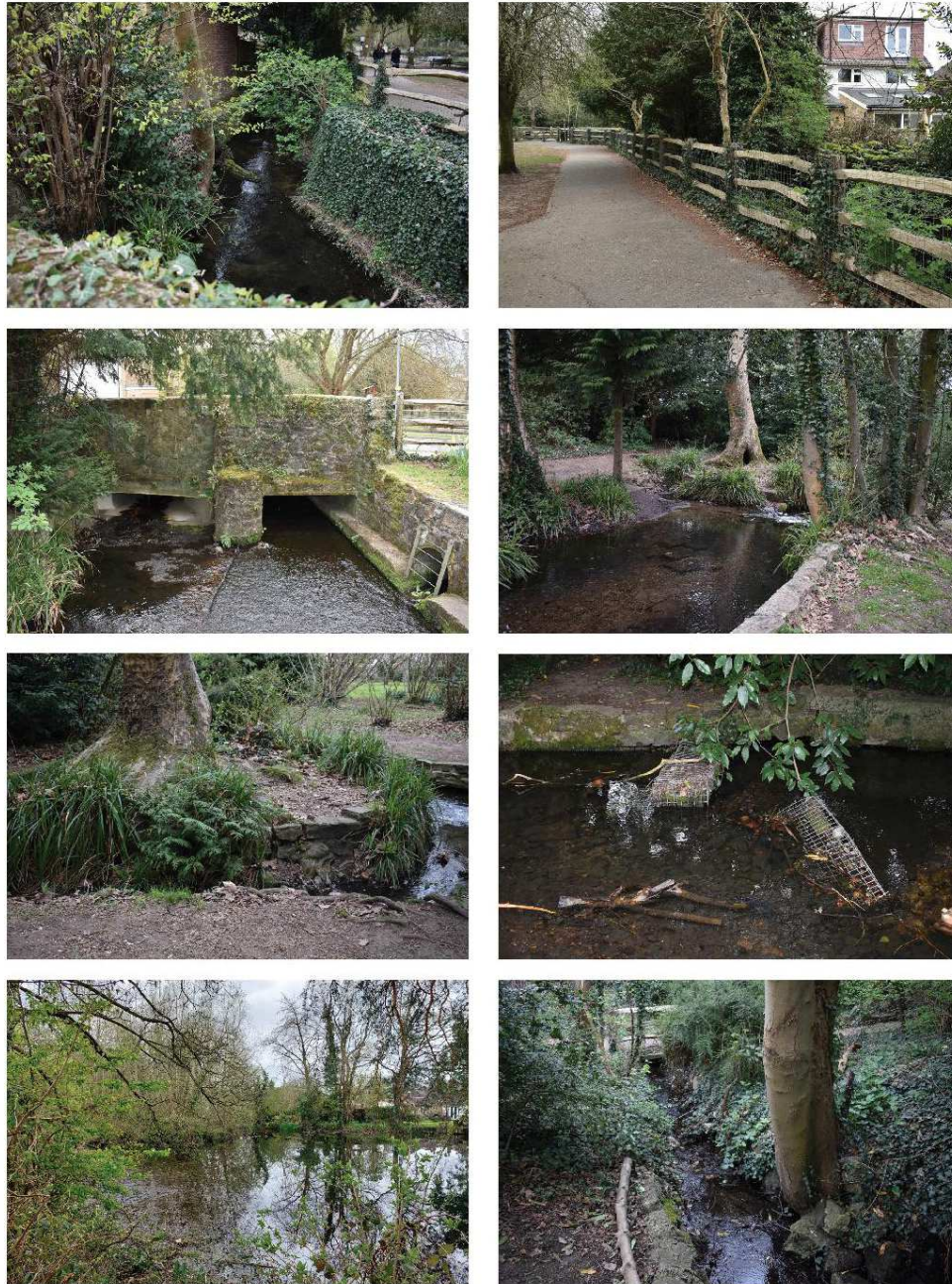


Plate 9: Man-made lakes and water features

A number of mature trees grow adjacent to the stream, many with roots ingressing into the stonework. A key feature of the stream is a small central island, located mid way between the Betenson Avenue Bridge and Lake 5. The island, which stands proud above the water level and is retained by a ragstone wall, contains a single mature London plane tree, which may pre-date the island (Plate 9.5). The ragstone revetment is damaged, presumably by the scouring action of water and root ingress.

There is abundant riparian vegetation within close proximity of the stream, growing where the water level is low and in areas where the ragstone wall has collapsed. This

riparian vegetation is especially prevalent around the base of the small island, presumably where the wall has been undermined.

The presence of stone filled, gabion boxes (Plate 9.6) was noted in the stream to the north of the small island, although the purpose of these boxes is not clear. They may have been placed to slow the flow of water, or to collect stream debris, however at the time of site assessment, one of the boxes had been moved. The presence of the boxes, surrounded by stream debris has an untidy appearance and detracts from the tranquil and scenic quality of the stream at this point.

Lake 5 - This is a large and irregularly shaped water body located in the North Park, which has a naturalistic character due to the mature vegetation growing at the edges (Plate 9.7). It is understood that this man-made lake was originally retained by a ragstone revetment, however, there have been historic collapses, presumably due to the undermining effects of the water and ingress by tree roots.

Water flows into Lake 5 from the Shallow Stream and outflows through a square, concrete walled, overflow spillway into the river Darent. There is also a second outfall spillway to the north west of the square box spillway, which also flows into the River Darent (Plate 9.8). The water, once into the River Darent, flows out of the north park beneath the A25, Bradbourne Vale Road. The movement of water at the northern extent of Lake 5 enhances the character of the park and, to some extent, masks the noise from the busy A25.

The Assessment of Existing Structures and Outline Proposals for Remedial Works report notes several areas where the ragstone wall is cracked and displaced in the outflow streams, however the edges of Lake 5 appear to be in reasonably good condition, apart from a section of wall to the south eastern corner where a vertical crack in the wall is believed to have been caused by the differential settlement of two sections of the ragstone retaining wall. The report notes that the “ragstone and concrete sidewalls to the overflow stream (leading from the square overflow spillway) have been partially undermined by water flowing through the overflow stream. Scouring of the bed joints has led to the loosening of stones and undermining of wall, with evidence of historic collapse at various points along the stream” and the “ragstone and concrete sidewalls to the overflow stream (at the north western corner of Lake 5) have been partially undermined by water flowing through the overflow stream. Scouring of the bed joints has led to the loosening of stones and undermining of wall, with evidence of historic collapse along at various points in the stream”.

High levels of silt and debris were noted in Lake 5 during the site assessment visit, and a number of nesting platforms had been formed by the resident waterfowl.

7.2.2 Bridges

There are a number of bridges which feature in the landscape, connecting waterbodies and enabling visitors to the North and South Parks access to a number of circular routes. The condition of the various bridges is discussed in the *Assessment of Existing Structures and Outline Proposals for Remedial Works* report, and they appear to be generally in good condition.

The bridges add character and visual interest to the landscape setting, with the wooden cleft fence guard rails in a similar style to the external boundary fencing at

each of the park entrances, promoting a rural and naturalistic character for Bradbourne Lakes (Plate 10.1 and 10.2). They also bring about a sense of adventure and exploration, especially for the younger park users and act as key wayfinding elements within the landscape, especially on the circular routes.

The bridges are predominantly narrow, with a hard surfaced footpath over the bridge deck and some are currently difficult to access for wheelchair users and visitors with double width prams.

The longest of the bridges is located in the North Park, spanning the shallow stream as it emerges from the culverts beneath Betenson Avenue (Plates 10.3 and 10.4). This narrow bridge has an inviting character, encouraging exploration beyond the stream, however sadly the path is a dead end.

7.2.3 Boundaries

Boundary features are an intrinsic part of a designed landscape, usually denoting the extent of a historic park and changes in land use over time. There are a variety of boundary features across the landscape at Bradbourne Lakes, which are briefly discussed below.

The wooden cleft fencing, found at each of the entrances into the North and South Parks, has a rural, rustic character and is a reminder that this was once part of a rural, agricultural estate. The cleft fence is visually permeable, enabling views into the landscape from locations on the outer roads (Plates 10.5 and 10.6) and simple wooden gates allow access into the North and South Parks. At the time of the site assessment visit, the fencing appears to be in visually good condition, enhancing the character and quality of the landscape. The cleft fencing also extends along the western and parts of the eastern boundary of the shallow Canalised Stream.

The majority of the outer boundaries are defined by tall, close board timber fencing, which has a domestic garden character and varies in condition and appearance throughout the landscape (Plate 10.7). Some sections of the timber fencing have trellis panels along the top and several garden gates, of various sizes and styles, were observed to have been fitted within the fencing, enabling adjacent residents access into the park. Timber fencing along the eastern boundary of the North Park, was observed to be in poor structural condition, with heavy ivy growth pulling the fence panels over (Plate 10.8).

Occasional hedgerows have been planted alongside the timber fencing (Plate 11.1), although these are predominantly ornamental species such as cherry laurel (*Prunus laurocerasus*). There is generally a visual discord in the character of the boundary features, which detracts from the overall character and quality of the North and South Parks.



Plate 10: Bridges and Boundaries

There are also some low-level domestic boundaries which adjoin the western boundary of Lake 5 and the southern boundary of Lake 2, enabling adjacent residents to have clear visual access into the lakes. Access onto the adjacent lake edges was restricted by vegetation at the time of the site assessment visit, so the condition of these lower-level fences is unclear. Some of the external boundaries are not visible due to dense vegetation, such as the south western boundary of the North Park.

Iron Railings were observed in several internal spaces and are largely used to restrict access into lakeside areas. In the South Park, adjacent to Lakes 1 and 2 is a section of tall iron railing which restricts access to the bankside vegetation. The southern section of this railing was damaged when a mature tree fell during a recent storm and is awaiting repair (Plate 11.2). In the North Park, adjacent to the north eastern corner of Lake 5 is a section of tall iron railing, a section of which appears to be in poor condition, with deteriorating paintwork (Plate 11.3).

7.2.4 Paths

The majority of the paths at Bradbourne Lakes are hard surfaced, with either a macadam surface or, in the case of the area by Lake 4, a 'crazy' paving finish and there are a variety of path widths.

Hard Surfaced Paths - The hard surfaced paths provide access through the North and South Parks with the Darenth Valley Footpath SU11 route connecting Lambarde Road with the A25, Bradbourne Vale Road (Plate 11.4). Lakes 3 and 4 are the only ones to have a hard surfaced route around the entire lake edge, with Lakes 1 and 2 only having a short section of hard surfaced path to enable visitors access to the water's edge. Lake 5 has a pathway along the eastern edge, and the Canalised Stream has a path along the western edge.

Path widths vary across both parks, with many very narrow, making access for wheelchair users or families with a buggy very difficult. The result is often worn path edges, where visitors have no option than to walk to the side of the path (Plate 11.5) and damage to path edging materials. There is a section of the hard surfaced path which is wider. At the south entrance to the North Park, off Betenson Avenue, there is a vehicle gate, and the tarmac path is wide enough to support vehicle movements, presumably for park maintenance vehicles (Plate 11.6).

The tarmac surface is generally in poor condition throughout both the North and South Parks, with damage occurring due to wear and tear, but also with the ingress of tree roots. Tree roots also disturb the levels of the paths, making many uneven and, in places, dangerous (Plate 11.7). The 'crazy' paving surface adjacent to Lake 4 was also found to be in a poor condition, with many of the pavers raised and uneven.

Informal Paths and Desire Lines - Desire lines were noted during the site assessment visit and are largely concentrated in areas where visitors congregate, such as around Lake 4 and the shallow stream to the south of Lake 5. These lines are created perhaps as visitors are unable to find circular routes and wish to explore further into the landscape. One path that has been created is to the south west of the shallow stream in the North Park, where the hard surfaced path leads visitors across a bridge but terminates at a wooden bench. A desire line extends from the bench into the adjacent woodland and to a point where the streamside ragstone retaining wall has been damaged and an earth path has been created into the water (Plate 12.1).

Other desire lines have created routes through the trees, connecting to other hard surfaced paths (Plate 12.2).

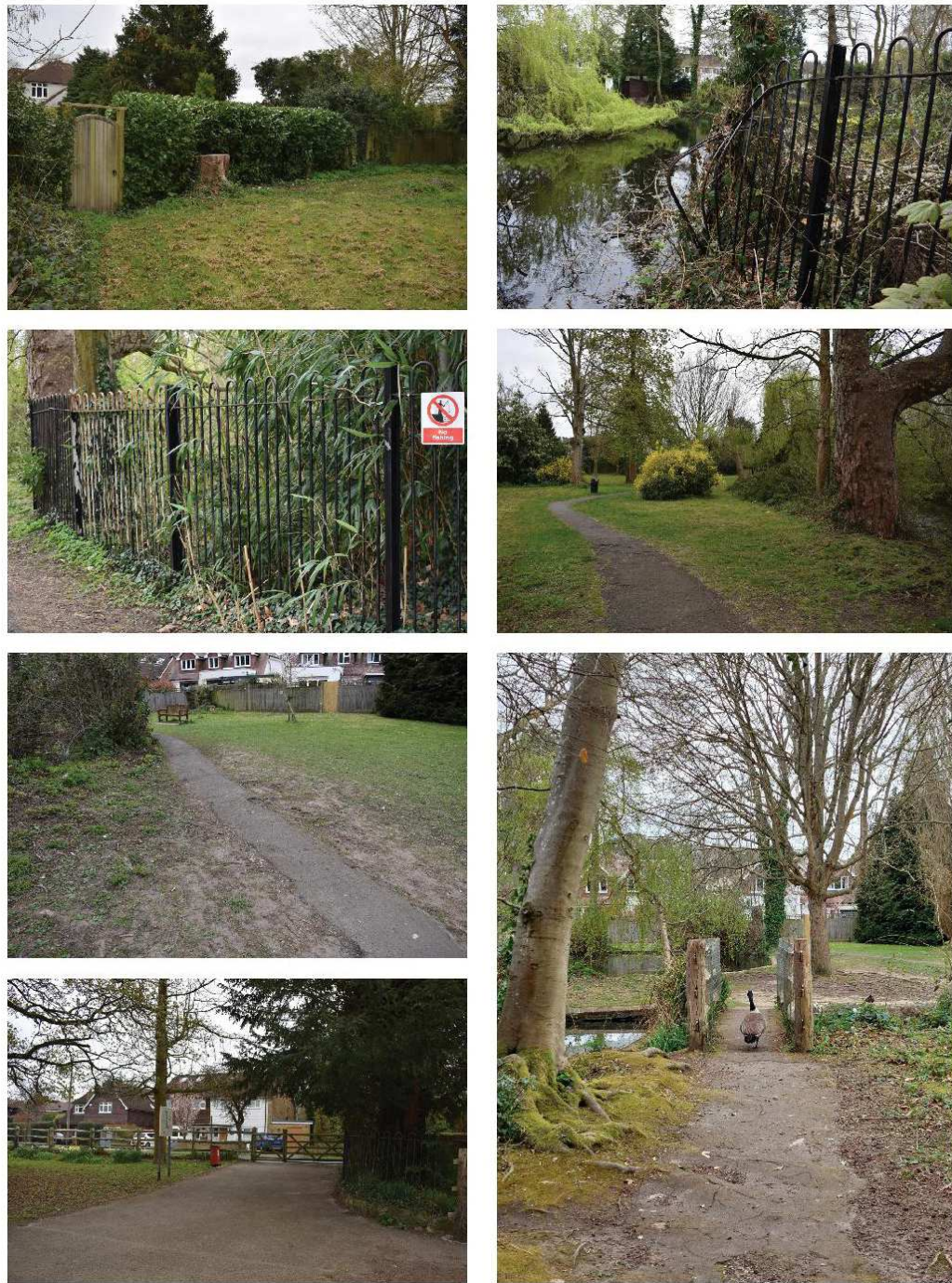


Plate 11: Boundaries and paths

7.2.5 Furniture

Furniture, includes benches, bins and information boards, is discussed below. There is currently no lighting in the North and South Parks.

Benches - There are few benches throughout the park and those that are sited at key locations comprise simple wooden structures. In the North Park, there is one timber

bench and 1 picnic bench, sited adjacent to the shallow stream at the south western corner (Plate 12.3). In the South Park, timber benches are located adjacent to Lake 4 and there are timber picnic benches. Other benches are located along the park's western boundary with views over Lake 3 and on the path between Lakes 1, 2 and 3. The benches are all in good condition and it is understood that some of the benches are a relatively recent addition to the landscape, however visitors would benefit from a wider choice of seating locations.

Bins are located in prominent positions adjacent to the gateways and vary in condition (Plate 12.5). They are all metal and urban in character. Dog waste bins are also provided close to the gateways (Plate 12.6).

Information Boards and Signage - There is a formal information board located at the entrance to the South Park, off Betenson Avenue. This board has a rural, village character and displays a number of posters about the park and local area. At the time of the site assessment, information boards were also placed alongside the wooden cleft fence to advise park users about the Bradbourne-Reborn project. Other gateways have signage attached to the wooden gates or fences (Plate 12.7)

Duck Feeding Station - A solar powered duck food dispensing machine is located adjacent to the eastern edge of Lake 4 and is operated and managed by the Feed Ducks Initiative Ltd (Plate 12.8). It is understood that a percentage of the commission received from the sale of duck food is directly invested back into community projects. The aim of the feeding station is to dispense small quantities of healthy duck and wildfowl seed, for the public to use and to discourage the feeding of bread, which is often fed in large unsustainable quantities and is a poor-quality food source and can be detrimental to the health and longevity of waterfowl.

The initiative should also help to improve water quality, however during the site assessment visit, it was noticeable that a large number of both waterfowl, corvid and passerine species congregated around the feeding station, which is leading to high levels of bird droppings on the ground and a significantly worn grass sward.

Sculpture - A significant feature standing at the northern boundary of the South Park is a stone monolith, which is understood to have originally stood close to Bradbourne Hall and was a part of an eight-stone circle, brought to the designed landscape by Francis Crawshay, as a late 19th century folly. The monolith was re-located to this location and is surrounded by large slabs of stone.



Plate 12: Furniture

7.3 Natural Fabric

The landscape is a holistically connected mosaic of habitats, which together create the characteristic elements at Bradbourne Lakes.

7.3.1 Grassland

Across the landscape grassland is a predominant feature, which encircles the lakes and provides the setting for the many trees. Comprising of a predominantly modified

sward, which is close mown, the grassland in many locations was observed to be under pressure from footfall and the grazing effects of the large population of waterfowl which reside at Bradbourne Lakes.

The character and composition of the grassland found at Bradbourne Lakes has formed as a result of changing land-uses over time, as the landscape developed from a pleasure ground associated with Bradbourne Hall to an often intensively well-trodden public park and largely reflects the freely draining and slightly acid loamy soils which overlay a sedimentary bedrock.

The grassland across the North and South Parks is informal and pleasant in character, however where there are intensive pressures upon the sward, there is a low visual quality. There are no areas that are managed as 'lawns' and there are no grassland areas that are managed as long grass meadows, although with the regular pressures of visitor footfall and grazing waterfowl, longer grass meadows may struggle to thrive, especially beneath the heavy tree canopies. Perhaps the most successful swards are found in the North Park, where the tree canopy is lighter than in the South Park. To the north in the Northern Vegetated Buffer character area (Plate 13.1), the grassland sward is regularly mown, however footfall here is possibly lighter than that in the South Park and less erosion of the sward was observed. In the North- Eastern Open Fringe character area a similar quality of sward was observed (Plate 13.2) with abundant dandelions and buttercups present, where the canopy was less dense.

Where visitor and waterfowl pressure are at the highest, around Lake 4 for example, the grassland sward exhibits clear signs that it is suffering as a result of soil compaction and puddling, combined with footfall wear and tear and heavy canopy shading of some of the mature trees also contributes to the poor sward coverage (Plate 13.3).

To the south of South Park, the largest concentrations of waterfowl were observed, and bank side grass was worn away, especially where the narrow banks between the Lakes concentrate visitor access and create pinch points. Where feeding of the waterfowl occurs, bankside vegetation is the most sparse (Plate 13.4).

7.3.2 Habitats

A botanical survey, which defines habitat types in accordance with the *National Vegetation Classification* (NVC) (Rodwell, 1991; 1992; 2000) has not been carried out. However, a *Preliminary Ecological Assessment* (PEA), which provides an initial assessment of the habitats present at Bradbourne Lakes, has been carried out in October 2025 by Ricardo. The following text has been extracted from the report and is reproduced below. The PEA in full is also appended to this CMP.

The site consists of a series of five interconnected ornamental ponds with associated ditches and inflow/outflow channels, forming part of a historic landscape feature. The waterbodies are fringed by broadleaved woodland and scattered mature trees. Several of the trees on site are semi-mature to mature specimens, contributing to local visual amenity and ecological value.

The wider surrounding landscape comprises a mosaic of residential gardens, amenity grassland, and parkland, with further areas of deciduous woodland and urban infrastructure beyond. The ponds ultimately drain via a small outflow channel

that connects to the local surface water network to the southeast.

The study area broadly comprised the following Phase 1 Habitat Survey classifications:

- Standing open water (ornamental ponds);
- Running water (connecting ditches and outflows);
- Lowland mixed deciduous woodland;
- Developed land, sealed surface;
- Amenity grassland.

Habitats: One **Habitat of Principal Importance** (HPI), Lowland mixed deciduous woodland and three non-priority habitats were identified within the site boundary during the UKHab survey.

Lowland Mixed Deciduous Woodland: Several areas of broadleaved deciduous woodland occur around the pond margins at Bradbourne Lakes. The canopy is dominated by sycamore (*Acer pseudoplatanus*), common ash (*Fraxinus excelsior*), sweet chestnut (*Castanea sativa*), and English oak (*Quercus robur*), with frequent silver birch (*Betula pendula*), hawthorn (*Crataegus monogyna*), and holly (*Ilex aquifolium*). Scattered specimens of horse chestnut (*Aesculus hippocastanum*), lime (*Tilia × europaea*), and cherry (*Prunus avium*) are also present, alongside areas of dense scrub comprising elder (*Sambucus nigra*) and bramble (*Rubus fruticosus* agg.).

Understorey structure varies, with locally dense holly and elder beneath more mature stands, and sparse ground flora dominated by ivy (*Hedera helix*), bramble, and nettles (*Urtica dioica*) in shaded areas. Wetter ground adjacent to the ponds supports willow (*Salix cinerea* and *S. fragilis*) and alder (*Alnus glutinosa*), particularly along the inflow and outflow channels.

This woodland represents lowland mixed deciduous woodland, a Habitat of Principal Importance, and provides valuable structure and connectivity for birds, bats, and invertebrates within the parkland setting.

Ornamental Pond: The five interlinked ornamental ponds are located centrally within the site, extending in a linear chain from the northern boundary southwards, connected by a series of narrow ditches and culverts. The northernmost ponds are larger and more open, while the southern ponds are smaller, shaded, and partially enclosed by surrounding woodland.

The ponds support standing open water with varying degrees of marginal and emergent vegetation. Margins are generally steep and engineered, with areas of stone or concrete edging, particularly around the northern ponds. Vegetation around the pond edges includes willow (*Salix cinerea*, *S. fragilis*), alder (*Alnus glutinosa*), and reedmace (*Typha latifolia*), with soft rush (*Juncus effusus*), yellow flag iris (*Iris pseudacorus*), water mint (*Mentha aquatica*), and common reed (*Phragmites australis*) occurring sporadically in less shaded areas.

Surface water quality varies, with some ponds showing high silt accumulation and dense algal growth, particularly where inflows are slow-moving. Shadier ponds support duckweed (*Lemna minor*) and submerged macrophytes in lower

abundance. The man made ponds have developed semi-natural margins that provide habitat for aquatic invertebrates, amphibians, and waterfowl.

Ditches: A series of narrow ditches connect the ornamental ponds, forming part of the site's surface water drainage system. These ditches run between and alongside the ponds, particularly along the western and southern boundaries, linking the northern inflow to the southern outflow of the lake chain.

7.3.3 *Species and Species Groups*

Notable Plants (includes macrophytes): No protected or notable plants were recorded during the field survey. The survey was conducted in October and therefore, protected or notable plant species were readily visible at the time of the survey.

Invasive Non-Native Species (INNS): Two INNS were recorded during the field survey; Bamboo (*Bambusa spp.*) and Rhododendron (*Rhododendron spp.*). Japanese knotweed (*Fallopia japonica*) has also been recorded on the site this year. The survey was conducted in October, therefore, INNS may not have been readily visible at the time of the survey and still may be present within the vicinity and wider environs of the site.

Amphibians: The site contains five artificial, ornamental, and historic lakes (Lakes 1–5). These lakes support a high density of waterfowl, experience significant disturbance from recreational activities, and have very limited aquatic and marginal vegetation. An eDNA survey conducted on 15th June 2025 indicated that great crested newts (GCN) are likely absent from all five lakes. Given the lack of suitable waterbodies for GCN breeding within the Site and its immediate surroundings, GCN are considered likely absent during both their aquatic and terrestrial lifecycle stages.

The broader study area provides suitable terrestrial habitat for widespread amphibians, offering opportunities for foraging, commuting, and shelter. Woodland areas, in particular, contain features suitable for amphibian hibernation.

Reptiles: Potential reptile habitat on the site is largely restricted to narrow, relatively undisturbed strips along the lake edges. Development activities, including habitat clearance or the movement and deposition of materials such as silt, could pose a risk of injury or mortality to reptiles present.

Birds: All birds, along with their nests and eggs, are protected from killing, injury, and the destruction of nests or eggs under the Wildlife and Countryside Act 1981 (as amended). Species listed in Schedule 1 (Part 1) of the Act are additionally protected from disturbance while nesting or with dependent young, carrying special penalties. Many bird species are also listed as Species of Principal Importance (SPI) under the NERC Act 2006.

Most of the semi-natural habitats on the Site including woodland, scattered trees and shrubs, and marginal vegetation around the lake edges provide suitable nesting and foraging opportunities for a wide range of common bird species. However, due to the absence of steep exposed earth banks and the high levels of disturbance from recreational activity, nesting opportunities for kingfishers (*Alcedo atthis*) are considered likely to be absent.

Bats: The site, particularly the lake margins, provides suitable habitat for bat foraging and commuting. These areas are connected to high-quality habitats in the wider

landscape, including Sevenoaks Gravel Pits SSSI and the River Darent. Overall, the Site is considered to have moderate suitability for bat foraging and commuting.

NOTE: At the time of writing this CMP, a Bat Survey Report has been undertaken but has not been received.

Invertebrates: Overall, the site offers very limited habitat opportunities for protected or notable invertebrates due to the lack of key microhabitats such as high-quality woodland, herb-rich grassland, and deadwood.

7.3.4 Mammals (excluding bats)

Badger (*Meles meles*): No evidence of badger activity, such as hairs, latrines, dung pits, snuffle holes, mammal paths, scratching posts, or setts, was recorded within the site or within 30m of its boundaries during the survey, where access and visibility allowed. The habitats across the site were considered to offer very limited opportunities for sett building, foraging, or commuting due to high levels of disturbance, recreational pressure, and the Site's relative isolation within an urbanised environment.

Hazel dormouse (*Muscardinus avellanarius*): Potentially suitable dormouse habitat within the site is largely confined to the woodland immediately outside the site, with occasional extensions along the lake margins and site boundary. However, the adjacent woodland was considered to have very limited suitability for dormice due to its sparse and fragmented understorey and the limited presence of preferred native tree and shrub species.

Given the high levels of disturbance and recreational pressure within and around the site, combined with its isolation in a relatively urban environment and minimal arboreal connectivity to other suitable habitats, dormice are considered likely absent from the site.

Otter (*Lutra lutra*): The site contains potentially suitable habitat for otters, including a network of artificial and ornamental lakes, a stream, and surrounding woodland. However, due to the site's relative isolation within an urban environment and the likely high levels of disturbance and recreational pressure, otters are considered highly likely to be absent.

Water vole (*Arvicola amphibius*): The site contains five artificial, ornamental, and historic lakes. These waterbodies are likely subject to high levels of disturbance and recreational pressure and have very limited aquatic and marginal vegetation. Many of the lake embankments are engineered or consist of shallow or heavily vegetated (typically scrub) banks, which are unsuitable for burrowing by water voles. However, given the complex network of waterbodies within the site and the hydrological connectivity to Sevenoaks Gravel Pits SSSI and the River Darent, where water voles have previously been recorded, the presence of water voles cannot be completely ruled out.

Other notable mammals: The site contains areas of semi-natural habitat that could provide suitable conditions for hedgehogs, including patches of dense vegetation, scrub, and brash piles that could offer shelter and foraging opportunities. While the Site offers these resources, the size and nature of the site, combined with the availability of additional suitable habitats in the surrounding landscape, suggest that

hedgehogs are unlikely to be restricted to this area. Overall, the site provides some potential habitat for hedgehogs but is not considered a limiting factor for their presence in the wider area.

7.3.5 Trees

A tree survey was carried out in April 2025 BY PJC to help to inform the Landscape Masterplan proposals as a part of the Bradbourne Re-Bourne project. The survey identified a total of 378 individual trees planted across the North and South Parks. The full tree survey and tree schedule, including retention and removal plans will be appended to this CMP.

The arboricultural resource at Bradbourne is significant and has been identified as a **Habitat of Principal Importance (HPI)**, Lowland Mixed Deciduous Woodland. Lowland Mixed Deciduous Woodland is a semi-natural woodland, found largely in lowland areas and across a wide soil variety and is a key consideration in planning decisions. This is a vitally important habitat for wildlife, and the presence of Lowland Mixed Deciduous Woodland signifies that woodland has been present on the site for over 400 years.

The trees, however, have not been managed effectively and according to their status as a HPI for a number of years, leading to overcrowding, poor growth patterns and the over colonisation of self set species such as sycamore and alder. The historic design of the landscape has been lost due to this overcrowding, and the abundant self-set trees now threaten the historic fabric of the Lakes.

The domination of key species, which abundantly self seed across Bradbourne Lakes, has led to a degradation of the fabric of the Lakes themselves, with numerous trees damaging important structures, disturbing the path network and casting a heavy shadow across the open water. Leaves falling into the water and the shading effects of the heavy canopy have led to a reduction in water quality and increasingly issues with a heavy silt burden.

There are, however, some significant individual trees, including a veteran London plane (Tree No. 403) (*Platanus x hispanica*) several mature London plane, beech (*Fagus sylvaticus*) and lime (*Tillia x europaea*), remnants of the former designed landscape, which stand out amongst the self set sycamore.

Tree condition across the landscape is largely good, however key issues include structurally poor growth, leaning, ivy covered limbs, epicormic growth and basal decay. See Tree Schedule at Appendix C for full details.



Plate 13: Natural Fabric - grassland

8 STATEMENT OF SIGNIFICANCE

8.1 Significance

Significance is a concept that underpins current conservation philosophy. The significance of heritage assets is defined as *“The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset’s physical presence, but also from its setting.”* (National Planning Policy Framework (MHCLG 2024, 78)).

8.2 Assessment of Values

The approach adopted here is that established in *Conservation Principles, Policy and Guidance* (EH 2017; chapter 2), with significance related to the family of heritage values set out in that document, which have been updated in line with the NPPF terminology. The significance of Bradbourne Lakes is therefore considered in terms of its historical (including communal), archaeological (evidential), architectural and artistic interest (aesthetic) and natural assets. The range of values that may contribute to the significance of a place can be categorised under the following headings.

- **Evidential Value:** the potential of a place to yield evidence about past human activity, which itself is likely to feed into the historical interest of a site or landscape. Archaeological interest includes above-ground standing structures as well as earthworks and the buried remains more commonly associated with archaeological excavation. Any activity that impairs the prospects of a future archaeological investigation harms the research value of a heritage asset and expert advice will often be needed to identify those sensitivities and assess how they can be worked around or how harm may be minimised.
- **Historical Value:** the associative or illustrative ways in which past people, events and aspects of life can be connected through a place to the present. This includes associative, illustrative and representational value, and one or all of these can become enmeshed with the identity of a community. The historical interest of a building or landscape also encompasses, among other things, its rarity, whether it has associated archival documentation, whether it can be seen to characterise a particular period or periods, and its relationship with other monuments, locally or at a national scale.
- **Aesthetic Value:** the ways in which people draw sensory and intellectual stimulation from a heritage asset or place, building or landscape (or a juxtaposition). This includes not only formal visual and aesthetic qualities arising from architectural design for a particular purpose but more fortuitous relationships of architectural and visual elements arising from the development of a place through time, and aesthetic and emotional values associated with the actions of nature (either real or perceived). Some emotionally driven reactions to architecture and nature (such as ivy charmingly rooting in ruinous masonry) in causing physical damage may detract from a site’s architectural and archaeological significance. Sustaining architectural interest tends to depend on appropriate stewardship to maintain the integrity of a designed concept, be it

landscape, architecture, or structure. While artistic or aesthetic values may be related to the age of a place, they may also be amenable to restoration and enhancement.

- **Communal Value:** the associated meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. It reflects how groups of people use, remember, or identify with a place, rather than its physical or historical attributes alone. Communal values embrace commemorative value for places associated with a particular event (eg war memorial). Social Value is for places important as venues for communal gathering (eg parks). Spiritual value (eg churches, and Cultural Identity that form part of community's sense of place.
- **Arboricultural and Ecological Value:** biodiversity (the range of flora and fauna) and the quality of habitats. This includes habitat diversity, species richness, connectivity, natural processes, and synergy with cultural value. The Arboricultural value includes criteria of age / longevity, species rarity, landscape contribution, cultural associations and management potential.

Within each of the main categories of heritage value, the following degrees of significance have been adopted:

- **Outstanding:** elements of the place that are of key national or international significance, being among the best or only surviving examples of an important type of monument, or being outstanding representatives of important social or cultural phenomena.
- **Considerable:** elements that constitute good and representative examples of an important class of monument (or the only example locally), or that have a particular significance through association (although surviving examples may be relatively common on a national scale) or that make major contributions to the overall significance of the monument.
- **Moderate:** elements that contribute to the character and understanding of the place, or that provide a historical or cultural context for features of individually greater significance.
- **Low:** elements that are of low value in general terms, or have little or no significance in promoting understanding or appreciation of the place, without being actually intrusive.
- **Uncertain:** elements that have potential to be significant (e.g. buried archaeological remains) but where it is not possible to be certain on the basis of the evidence currently available.
- **Intrusive:** items that detract visually from or that obscure understanding of more significant elements. Recommendations may be made on their removal or on other methods of mitigation.

8.3 General Statement of Significance

8.3.1 Evidential Value

The heritage remains reflect the development of a designed landscape from one that was essentially functional to one that was primarily a pleasure ground. Most of the early features as depicted on the early nineteenth century mapping are intact and the development is represented in the physical landscape, with many of the intermediary features presenting a process of landscape development. This includes what may be the below ground survival of a building (Site 7) (Section 5.2) that was depicted on the 1933 Sale map, and which was then part of the Bradbourne estate. A geophysical survey has revealed an anomaly that may correspond to the building and its below ground survival would add to the evidential value of the landscape as well as the actual feature.

Overall, there is considerable evidential value for the designed landscape, which is able to define and present the history of land usage and modification over the post medieval period. While collectively the landscape presents a degree of overall considerable significance, individually there is a fluctuation of significance depending on their age and degree to which they characterise the overall landscape, and accordingly the individual features are defined under Section 8.4.

8.3.2 Historical Value

The lakes landscape is a designed landscape that has been individually created and modified by the Bosville family and subsequent owners of Bradbourne House and estate. Its development has been defined by the changing ownership events and indeed the eccentricities of individuals, notably Francis Crawshay, and as such the Heritage resource collectively has a considerable historical value as the landscape features have a close correlation with the historical record for Sevenoaks and the wider environs.

8.3.3 Aesthetic Value

The Sevenoaks Residential Character Area Assessment (2012) notes that “Bradbourne Lakes is an important landscape feature at the heart of the area comprising trees, green open space, streams and lakes. The tall trees are visible from surrounding streets, and the area provides a link with the historic Bradbourne Estate”.

Bradbourne Lakes is a significant resource for local people, providing an extensive area of public open green space within a built up, urban area of Sevenoaks. This is a well used open green space, with five man-made, ornamental lakes, set amongst mature broadleaved and coniferous trees, providing a range of sensory experiences for park users. The combination of man-made elements, which channel and move water, set within a naturalistic ‘pleasure ground’ landscape, delivers a range of subjective experiences for park users, which is considered to be of considerable value. Bradbourne Lakes make a significant contribution to the quality and character of the surrounding townscape.

The interior landscape of the park provides a range of sensory experiences, from the well managed lawns with scattered ornamental trees to secluded spaces which are heavily vegetated. It is easy for park users to forget that they are in the middle of an urban area. The degree of significance is therefore considered to be Considerable.

8.3.4 Communal Value

The communal value of the landscape at Bradbourne Lakes is Considerable, as the landscape is a much loved and well used open green space, which brings together local people of all ages.

Bradbourne Lakes provides opportunities for local people to participate in social exercise, with reasonable accessibility for low impact walking and jogging. Opportunities for relaxation and social interactions of all ages are cherished by local users and there is space for organised and informal social events. Feeding the waterfowl is a popular activity and the Duck Feeding Station, located by Lake 4 facilitates this activity in a way which is beneficial to both the waterfowl and the community. There is a long history of welcoming and caring for waterfowl at Bradbourne Lakes, photographs taken in c1955 of the swans are illustrated at Figure 5.1 and 5.2 (Photographs courtesy of the Bradbourne Residents' Association), although the last time it is understood that swans nested here was around 20 years ago.

The ornamental lake has a long history of activity and has been used up until relatively recently for model boat enthusiasts.

The wildlife that resides within Bradbourne Lakes are much loved and there has been a long history of organised care for the waterfowl. A group of eight swans were welcomed into the park in 2004.

There is an active and passionate Residents' Association, who care deeply about the restoration and future stewardship of this landscape and organise regular volunteer working parties.



Plates 12: Swans at Bradbourne in c1955

8.4 Arboricultural and Ecological Value

The landscape within Bradbourne Lakes supports a range of habitats of regionally and nationally significant species and habitats.

The estimated planting or regeneration year of the trees at Bradbourne Lakes varies from recent planting for the youngest trees to the mid-17th and early 18th century for the oldest. Two London plane trees (T142 & T283) are estimated to be around 200 years old and one veteran London plane (T403) is estimated to potentially be up to 300 years old. There is also a Yew (T199), which could potentially be up to 200 years old.

The woodland resource is considered to be a Habitat of Principal Importance (HPI), Lowland Mixed Deciduous Woodland, assessed as of national significance, for the habitat it provides, as well as the range of birds and bats present within the woodland areas which it supports. Whilst not in the best condition, this is an important habitat within the local area and denotes the significance of Bradbourne Lakes for biodiversity.

Roosts and foraging habitats for bats are likely to be of at least local if not regional importance, as are nesting bird communities. Many of the trees surveyed carry evidence for the potential for both individual and maternity roosts and 10 species of bat have been recorded by the Kent & Medway Biological Records Centre, within 2 km of Bradbourne Lakes, with several records associated with the lake and stream corridors within and immediately adjacent to the site. Of those 10 species, Noctule (*Nyctalus noctula*), Soprano pipistrelle (*Pipistrellus pygmaeus*), and Brown long-eared (*Plecotus auritus*) bat are listed as **Species of Principal Importance** under Section 41 of the Natural Environment and Rural Communities Act 2006 (NERC) Act 2006.

The Lakes comprise habitats which are of value for a range of waterfowl and wading birds, as well as amphibians. They also provide valuable foraging habitat for a number of bats species which have been recorded on the site.

The contribution that the individual trees, woodland and lakes make to the historical, aesthetic, communal, landscape and ecological value of Bradbourne Lakes and the wider landscape is Considerable, providing a range of amenity and naturalistic habitats, which are highly valuable to species within the local area.

8.5 Heritage Significance of Individual Features

This process has reviewed the landscape features at a national level but there is also a need to provide a relative significance assessment within the context of the Bradbourne Lakes Park and within the local community and provide a higher level of gradation than would be achieved on a national scale.

The documentary study has demonstrated the development of the Bradbourne landscape based on the cartographic study. Features that are shown on early maps and also survive as visible features within the present-day landscape have a high evidential value and would include the outfall for Lake 5 (Site 11) which is the original outfall for the earliest lake and is still in reasonable condition. The lakes (Sites 42-46) are all shown in different forms on the earlier nineteenth century maps and accordingly have a high significance, and this is enhanced by the large numbers of visitors who regularly visit the lake park and appreciate the environmental qualities of the parkland and add to the communal value of the wider site. These lakes originally had earthen banks or shorelines and indeed some lake edges still only have earthen shore banks. The retaining walls that now define many of the lake edges were later modifications and non original, hence have a lower significance than the lakes that they defined.

The monolith from the Stone Circle folly (Site 16) is now out of situ, and has no original setting or context, and archaeologically has little value. However, the original

circle was documented as having been created by the eccentric Francis Crawshay so is linked to an historic individual and as such has a higher score for its historic value. The monument has been locally listed reflecting that it has value to the local Sevenoaks community and as such also has a higher value as a community asset.

The (Site 7) building documented on the 1801 map is no longer visible as a surface feature but has the potential to survive as a below ground feature. A geophysical survey Tigergo (2025) identified a small sub-rectangular structural anomaly only about 5m away from the documented location of the building from the 1833 Sale map and has the potential to correspond in part with the documented building (Section 5.2). If the anomaly is confirmed as being the foundations of the documented structure, then it would have high evidential value and rarity value as one of the earliest features within the landscape and architectural / aesthetic value as one of the only buildings within the study area.

Criteria for Determination of Significance of Individual Features

<i>Significance</i>	<i>Level</i>	<i>Details</i>
Historical	Medium	Any features attributable to specific people or dates (eg Francis Crawshay)
Evidential	Medium to High	Surviving features shown on early historical mapping (19 th century)
Evidential	Low to Medium	Surviving features shown on twentieth century maps including lake revetment walls
Communal Value	Medium	Features that contribute to the use by the community as a recreational park (eg the lakes and the standing stones)

Table 2: Criteria for Determination of Significance of Individual Features

Site No	Type	Status	Date / Depicted	Significance
1	Bridge		1909 / 1769	Medium
2	Revetment Wall		20 th Century	Low to medium

3	Revetment Wall		20 th Century	Low to medium
4	Steps		20 th Century	Low
5	Island with Plane Tree		1966	Low to medium
6	Culvert / Outfall		1871	Medium
7	Site of Building		1801	High
8	Revetment Wall		20 th Century	Low to medium
9	Garden Wall		1871	Medium
10	Open Culvert		1897	Medium
11	Outfall for Lake 5		1801	High
12	Revetment Wall		20 th Century	Low to medium
13	Open channel		1966	Low
14	Embankment on line of former culvert		1885	Medium
15	Outfall from Lake 5		1871	Low to medium
16	Monolith from folly (out of situ)	HER LLB	1897	Medium to high
18	Underground culvert		1833	Medium to high
19	Culvert Lake 4		1871	Medium to high
20	Revetment Wall		20 th century	Low to medium

21	Outfall - Lake 3 to 4		1871	Medium
22	Building Fragment		1833	Medium
23	Weir / Lake Outfall		1833	Medium to High
24	Canalised stream channel		1801	Medium to High
25	Lake bank / bund		1871	Medium
26	Revetment Wall		20 th Century	Low to medium
27	Weir Lake 1 to 3		1871	Medium
28	Weir Lake 1 to 3		Late 20 th century	Low
29	Revetment Wall		Late 19 th century	Low to medium
30	Revetment Wall		1871	Low to medium
31	Revetment Wall		1871 / 20 th century	Low to medium
32	Revetment Wall		1871	Low to medium
33	Weir		1871	Medium
34	Weir		Unknown	Medium
35	Channel feeding Lake 1		1871	Medium
36	Revetment Wall		1909	Low to medium
37	Former Plantation		1909	Medium

38	Purported Windmill	HER	Unknown	Low
39	Farmhouse (outside study area)	HER	1833	Medium to high
40	Pillar Box (outside study area)	HER	1933-6	Medium
41	Bradbourne Hall (outside study area)	HER	1689	Medium to High
42	Lake 5	HER / LLB	1801	Medium to High
43	Lake 4	HER / LLB	1833	Medium to High
44	Lake 3	HER / LLB	1833	Medium to High
45	Lake 2	HER / LLB	1833	Medium to High
46	Lake 1	HER / LLB	1833	Medium to High

Table 3: Significance of Individual Features

9 ISSUES AND OPPORTUNITIES

9.1 Introduction

The following section summarises current issues, vulnerabilities and opportunities connected with the management and conservation of the landscape resource at Bradbourne Lakes. There are challenges and conflicts for the management of any landscape, let alone one of historical significance and great community value such as the setting of Bradbourne Lakes.

The following section sets out the key issues and vulnerabilities, which have been identified through consideration of previous surveys, a review of the changes in the landscape over time, an assessment of the current condition of the elements which combine to create the unique landscape at Bradbourne Lakes and from an understanding of the current landscape management which is being carried out.

9.2 Management Context

There are challenges and conflicts for the management of any landscape, which includes the day to day maintenance requirements of the elements which combine to create the unique landscape at Bradbourne Lakes. Ensuring that management, maintenance and conservation work is carried out with due regard to the significance and importance of the historic landscape setting, ensuring compliance with any protected species legislation and biodiversity guidance and enhancing visitor access and experience, is combined with resourcing allocations. External pressures may also have an influence on the landscape in the future, such as climate change and flooding, neighbours and boundaries and any future adjacent developments.

The routine, day to day management of the landscape within the study area is carried out by a combination of the parks team at Sevenoaks District Council, the Bradbourne Lakes Residents Association volunteers and, to a more limited extent, by residents who live adjacent to and have direct access into the parks.

9.3 Future Issues and Vulnerabilities

Landscapes are in a constant state of evolution, constantly changing and can rapidly deteriorate if not frequently maintained. This landscape setting is an important historic asset to the local area, popular for residents and visitors for the green open space and accessibility to local wildlife. The condition of the elements which combine to create the landscape setting requires regular monitoring – both in terms of the condition of the grassland, trees, shrubs and woodland, the structures and the archaeological resource. High standards are vitally important and should be evident at all times, indicating the significance and value of this landscape, whilst low standards of maintenance can reflect badly on the custodians of this landscape.

Issues may affect the landscape at Bradbourne Lakes as we see it today and vulnerabilities which may occur, through a cessation or change of a management practice in the future, are considered in the following section. It should be noted that whilst the appropriate management of these elements is predominantly taking place

at this time, the cessation of this practice in the future, may be considered to be a vulnerability for the landscape.

Issues and vulnerabilities which could affect the quality and character of the landscape in the future are:

- Any future changes in the ownership, entrusted care boundary or management responsibility, that could lead to a change in the recommended management philosophy, which could have a detrimental effect upon the character of the landscape setting of Bradbourne Lakes;
- A failure to understand and manage the sensitivity and significance of any above and below-ground archaeology may compromise their long-term survival and state of preservation;
- Maintenance responsibility has implications for resources and long-term programming, and economy of scale have cost benefits for any maintenance scheme. It is essential that adequate capital provision is made for appropriate repair and maintenance of all elements which combine to create the landscape and is planned for repair, enhancement and conservation projects each year;
- A decline in the condition and health of trees, shrubs and scrub vegetation, due to a cessation of a management practice or any decline attributed to pests and diseases, such as *Chalara* ash dieback disease. If disease becomes firmly established, it could significantly impact upon the character of the landscape and reduce the significance of the arboricultural and ecological resource;
- A failure to recruit the next generation of trees and maintain a varied age structure, which represents all stages in the life cycle of trees, will result in a decline in the quality and character of the landscape;
- A decline in the condition of the built fabric would have a significant impact upon the character and quality of the landscape setting;
- Repair programmes should follow best practice guidance and be undertaken by appropriately qualified specialists. Inappropriate specification or poor workmanship can damage sensitive historic fabric and accelerate rather than prevent decay;
- Protected species - it is understood that several of the trees provide habitats for wildlife, bats in particular. The presence of any protected species has the potential to affect the timing or nature of any proposed restoration or repair works.

9.4 Key Issues and Vulnerabilities

The following observations have been made on the current issues and vulnerabilities for the landscape setting, which may have an impact upon the significance of the asset or could affect the significance in the future. These observations have been combined with the detailed condition surveys undertaken as a part of the Bradbourne Re-bourne Project.

The fabric, appearance and character of these elements which combine to create the unique landscape at Bradbourne Lakes are vulnerable to inappropriate use or change

of management or a lack of maintenance. The following observations on the current condition and presentation are made, following a thorough review of the landscape and in its historical context and are common to most character areas across the park. Key issues and vulnerabilities which have been found are as follows:

9.4.1 Historic Fabric

The principal heritage remains that survive within the study area are the designed landscape features themselves, many of which are in active use, and include the lakes, channels, weirs, and outfalls. Some of these features have been recently modified and are accordingly of lower significance (Section 8.4), but if all of the landscape fabric comprises archaeological features, then they need to be preserved or modified subject to heritage mitigation constraints. The significance assessment has defined which individual features are of greater need for preservation, and also, where there is a low significance, which features can be modified with little or no archaeological mitigation. The same features define the identity of the landscape for the users and modifications to these features, for logistical reasons, could affect the understanding and appreciation of the parkland.

The northern park, which incorporates Lake 5 is historically the earliest part of the hydrological landscape and which was more functional than recreational. The lake may have served as a mill pond and the area to the north of the lake would have been the location for a former mill or head race for a mill, although such a feature has not been confirmed on the ground. Accordingly, there is a higher sensitivity within this park area as any management or modifications to the area or the hydrology of Lake 5 could adversely impact not only the visible elements within the landscape, but also buried remains that relate to an earlier usage of the site.

Proposals to repair or stabilise the dam of Lake 5 has the potential to adversely impact the historic outfall of the dam (Site 11), which was the original outfall, and may, in an earlier form, have been part of the mill pond usage (Section 9.5.1). Further investigation and sensitive repair is needed to ensure that the overall heritage significance of the northerly park is not affected by the stabilisation works.

The documentary study has identified an early building to the south east of Lake 5 which was first represented on mapping in 1801, but by the time of the OS first edition map (1871) had been demolished and the area around it had been landscaped. A geophysical (GPR) survey (Tigergeo 2025) has identified a rectangular anomaly which potentially could correspond with this building, and which is near to the location from the 1833 Sales map. If confirmed that this building still survives, albeit as a buried feature, it would increase its significance as it is relatively old, and was in place before the landscape was made into a pleasure ground. The existence of the building would potentially need to be taken into account when design features are proposed for the northern park.

9.4.2 Lake Hydrology

The 2019 *Review of the Ponds and a Sediment Survey at Bradbourne Lakes* by Hydreau sets out a summary of the current hydrological balance within each of the lakes following sediment sampling from each of the Lakes and concludes that silt levels remain high, with high percentage of organic content.

Heavy siltation is due in part to the adjacent, over-hanging mature trees and vegetation which grow close to the edges of the Lakes, with leaves and fallen branches falling directly into the water below. There is also a significant population of waterfowl which reside at Bradbourne Lakes, and their droppings are a contributory factor in the high siltation of all the water bodies. Erosion and highway runoff also contribute to creating silt and the Hydreau report notes that there are high levels of antimony a metal associated with road traffic pollution (vehicle exhausts, brake linings) and mineral oil, in Lakes 1 and 2.

It appears that the Lakes have not been de-silted for a number of years, and it is understood that currently, the required capital works to get the lakes back into good condition are far beyond existing Sevenoaks District Council maintenance budgets. While some silt accumulation is natural, when there is an excessive build-up, the balance in water quality can lead to reductions in water quality, excessive algae growth and a dramatic reduction in the visual quality of the hydrological resource.

Accumulations of silt within the Lakes has also had an effect on the recreational qualities for Bradbourne Lakes and the model boat club which used Lake 4 is no longer able to sail the boats. Excessive silt builds up, together with excessive debris from the adjacent trees reduces the visual quality of the landscape.

The Lakes are overgrown in places and much of that vegetation is in poor condition, due to heavy siltation and accumulations of fallen timber from the trees. Trees are largely unmanaged, overshadowing the Lakes and natural succession is creating a dense screen in places, preventing views towards the Lakes.

9.4.3 Paths and Access Around the Lakes

The networks of hard surfaced paths throughout the North and South Parks are in poor condition, deteriorating badly in places and not fit for purpose.

Many of the hard surfaced paths are too narrow to be usable by wheelchair or mobility scooters users, or families with prams and buggies. Where paths pass beneath the mature trees, the root systems of those trees are pushing up through the path surfaces, causing displacement and uneven surfaces, which are becoming a serious hazard.

Whilst some routes do circumnavigate the lakes, many do not and often desire lines have been worn into the grass surface to enable visitors to continue a loop or short-cut a path in order to reach a destination or complete a circuit. These desire lines are further exacerbating the poor grass cover in many of the character areas. Over time, these desire lines wear away the turf, compact the ground beneath and, when conditions are wet, become muddy and difficult to negotiate.

9.4.4 Boundary Features

The boundary features, which define the outer extents of Bradbourne Lakes largely comprise domestic timber fencing, of various styles and colours, which reduces the quality of the landscape and more importantly reduces its importance as a designed picturesque landscape associated with Bradbourne Hall. It is assumed that the care and management of these domestic timber fences fall with the ownership of the residential properties and areas of timber damage was observed. In places and

especially where vegetation is overgrown and the boundary fences damaged, the sense of place is reduced to a feeling of being in an area of disused ground rather than in a public open green space of historic significance.

Where the boundaries are defined by wooden cleft fencing, the character is strengthened, and the sense of place is strong.

9.4.5 Hydrological Structures

The 2022 report *Assessment of Existing Structures and Outline Proposals for Remedial Works* by Civic Engineers, set out the findings of a structural survey of the Lakes and the associated structural features, including the river walls, culverts, bridges, weirs and waterfalls. Following the survey, a series of recommendations were proposed, including remedial measures and recommendations for priority works.

The report concluded that there are many of the structures associated with the Lakes which are in need of repair, many due to the high concentrations of trees growing along the lake edges, causing damage through ingress. Further investigation works were recommended prior to the development of detailed repair and restoration proposals.

The results of the structural survey and details of specific issues can be found in the *Assessment of Existing Structures and Outline Proposals for Remedial Works* report. As the structural condition of the Lakes and the associated structural features is of great concern, the following text has been extracted from the report and is reproduced in full below.

9.5 Recommendations for Landscaping and Repair

The recommendations for repair have been split into two categories:

- Extensive repairs - These repairs relate to large areas which require significant overhaul; and
- Localised repairs - These are general details which are non-specific and can be implemented where needed across the site.

9.5.1 Extensive Repairs

Lake 4 (Site 43): The historic repairs made to Lake 4 appear to have only been made down to the water level within the lake, with mass concrete present below the water level at some locations. During the second site visit it was observed that there was some scouring present to the bed joints of the ragstone walls below the historic repairs. It is advised that these bed joints are repointed with a mortar suitable for this environment to ensure the robustness of the retaining wall.

For effective repairs to be carried out the walls which are currently below the water level in the lake would need to be exposed. The system of weirs which control the movement of water through the site allows for the water entering Lake 4 to be redirected to the overflow stream via the overflow weir at the north east corner of Lake 3. Any remaining water in Lake 4 could then be pumped into the overflow stream, draining the Lake and allowing for access to carry out further investigative work and any repair works required.

It has been noted that Lake 4 is one of the Lakes identified in the masterplan document as a priority area to be dredged. It may be advisable to co-ordinate the repair work to the walls with the dredging of the lake.

Remediation work recommended at this point is limited to the repointing of bed joints; further remediation works may be deemed necessary following further observations made after the draining and dredging of the Lake and the completion of intrusive investigation works.

If undermining is found to be present below the footing of the wall, then new mass concrete footings for the wall may be required.

During site visits it was noted that despite a steady flow of water into Lake 4 there was no water visible flowing from the lake into the overflow stream. Discussions with Sevenoaks council have confirmed that during summer months this is often the case, and it has been therefore concluded that the lake is not retaining water in the way it was designed to. No observations could be made of the base of the lake due to the presence of a thick layer of silt. A detail may be required to ensure that the lake retains water in the future. This could be assessed following observations made after the draining and dredging of the lake.

Overflow Pond (Site 19): Specific repair work to the overflow pond includes the removal of vegetation and repointing to the southern sidewall and the repair of the ragstone section of the feature waterfall. Two options have been identified for the repair of the waterfall.

- Reinstall the feature stone waterfall- the current character of the waterfall could be maintained if the scoured bed joints were re-pointed using suitable mortar for this environment and any loose stones were re-bed. This detail would still be susceptible to bed joint scour.
- Re-design the waterfall using concrete- the waterfall structure could be rebuilt entirely out of concrete. This would result in a structure with a considerable improvement in longevity compared to a design based on the current structure. This would however affect the aesthetic character of the waterfall.

The north sidewall is currently constructed of concrete filled sandbags. This wall could be removed and replaced with a ragstone retaining wall, which is more in fitting with the character of the park if deemed appropriate by the client.

This work should be coordinated with the removal of silt and debris from the pond.

Overflow Stream (Site 24): The walls to the overflow stream have been identified as an area which requires a significant overhaul. Two options for remediation have been identified:

Remedial patch repairs - this would likely result in a short-term solution only, with the walls still at risk from future undermining and from the ingress of tree roots.

Full overhaul- the sidewalls of the overflow stream could be dismantled, the trees removed and the ragstone wall rebuilt using mortar appropriate for this environment. The wall would likely sit on concrete foundations and utilise a root barrier membrane behind the wall to limit the damage caused to the wall by vegetation.

It has been noted that a number of feature and self-seeded trees are causing damage to the side walls of the overflow stream. In some cases, it is advised that these trees should be removed, however it has been noted that this process would be costly and could potentially affect the character of the park.

Some of the trees in non-critical locations could be left in place and individual repair details could potentially be developed for areas where trees are located, with potential remediation options being developed on a location-by-location basis. This would require co-ordination between the Structural Engineers, LUC, SDC and an Arboriculturist.

Steel Beam Supported in-Situ Concrete Bridge: Due to the condition of the bridge, it is advised that it is replaced using an alternative design which is better suited to an exposed environment where it has the potential to come into contact with water.

A new bridge could be constructed using a similar design to the other in-situ concrete bridges present in the park, or of treated timber suitable for use in an exposed environment.

Lake 5 historic outfall (Site 11): it is proposed to ensure against the failure of the dam of Lake 5 by repairing or removing a perceived weak point of the dam, being the historic outfall, and to follow up with the stabilisation of the dam. However, this would result in the loss of one of the most significant heritage features within the landscape, and should be retained if at all possible. It is proposed to examine the waterside of the outfall structure and the dam once the lake has been drained, and to develop a restoration plan that would protect the stability of the dam and the outfall; such a plan should be developed with archaeological input. It is in any case recommended that a detailed archaeological record be made of both sides of the outfall once the lake has been drained and may entail excavation of the silts to expose the water side of the outfall.

9.5.2 Localised Repairs

Non-essential localised repairs could be made to areas of concern which have been defined in Section 3.1-3.6 but have not been identified as requiring extensive repairs due to a small risk to the public and/relatively low risk of structural failure.

General localised repairs which could be made include-

- Areas which have been damaged through the ingress of vegetation- Localised repairs would involve the removal of vegetation and the cleaning and repointing of bed joints using suitable mortar as well as replacing lost masonry elements.
- Areas where undermining has occurred to sidewalls- Localised repairs would involve patch repairs to the masonry walls using cementitious mortar and ragstone, concrete underpinning may be required in some locations.
- Areas where scouring has occurred to sidewalls- Localised repairs would involve the cleaning and repointing of bed joints using suitable mortar as well as replacing lost masonry elements.
- Areas where cracking or displacement of the Lake sidewalls has been caused by the presence of trees- some trees, especially smaller self-seeded trees could be removed, preventing any future damage which may be caused by heave or the ingress of roots. Walls in these locations would have to be locally re-built with

root barriers could be installed behind the walls to prevent future vegetation ingress. If trees are deemed to be vital to the character of the park, or if removal is found to be complicated and costly then trees could be left in place, with potential remediation options being developed on a location-by-location basis. This would require co-ordination between the Structural Engineers, LUC, SDC and an Arboriculturist.

9.5.3 Landscape Modifications

Establishment of an Eco-toilet near Lake 5: It is proposed to locate an accessible eco-toilet 13m to the south of the geophysics anomaly (Site 7), but is within the area of the documented location of that building. The geophysical survey suggests that there are no buried features within the proposed location of the eco-toilet, but a geophysical survey cannot provide a guarantee that there are no buried features or deposits within the location. The proposed eco-toilet may not have a deep foundation, but the GPR survey has indicated that the structural anomaly is at a shallow depth.

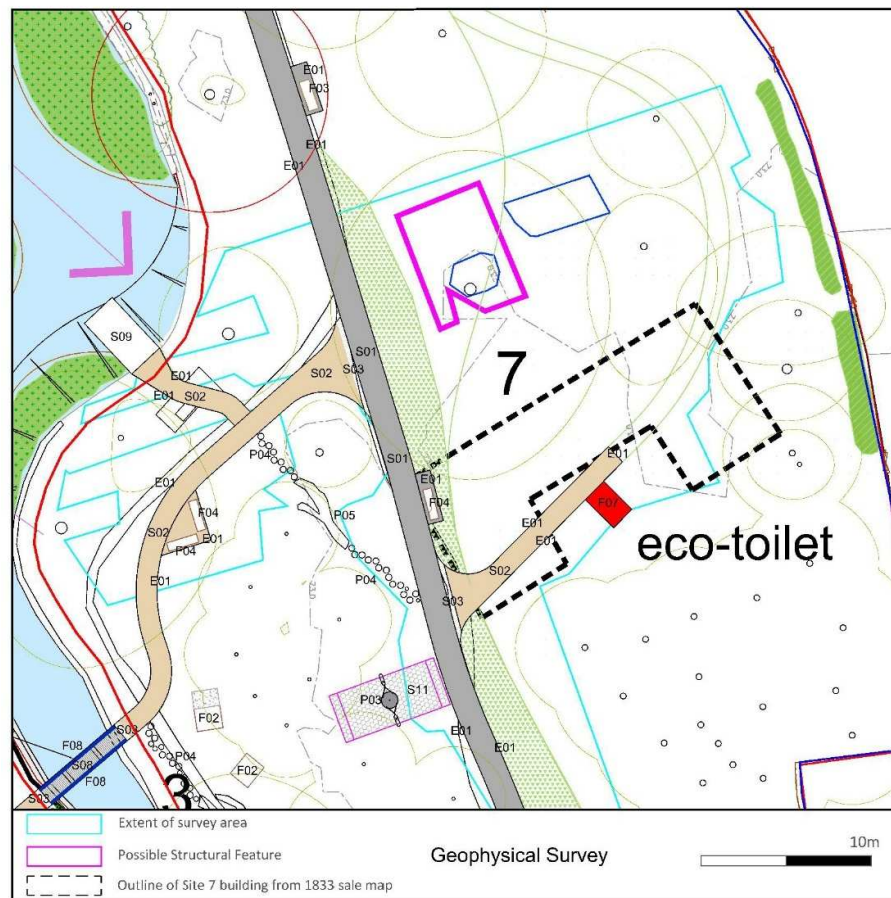


Figure 27: Location of proposed eco-toilet in relation to the GPR anomaly

It is therefore recommended that an archaeological watching brief be maintained during the ground works for the toilet.

9.6 Recommendations for Further Investigations

The following investigative works have been identified as being required to develop repair details for the areas which are of a high priority for remedial work.

9.6.1 Draining and Dredging

Lake 4 (Site 43): Lake 4 has been identified in the masterplan document as a priority area for dredging. It is advised that any intrusive investigative works are coordinated with the dredging of the lake. The dredging of Lake 4 would also allow for a full structural assessment of the existing walls and for additional remedial works to be carried out.

Overflow Pond (Site 19): the overflow pond from Lake 4 was heavily silted at the time of inspection, the removal of silt in this area would allow for a more accurate inspection of the sidewalls of the pond.

9.6.2 Trial Pits

- **Lake 4 (Site 43):** Following our initial findings of the condition of Lake 4, further investigations have been identified as being required in order to develop effective repair details. An initial proposal of two trial pits has been suggested. For an indicative plan of the suggested trial pit locations please refer to (SK)010 contained within Appendix C. This work should be subject to archaeological monitoring to ensure that the information from the exploration can be used to inform the development of the features development.

Trial pits are required to understand the depth of the retaining walls, the nature of the lake bed and the depth and size of the footings (if any). It should be noted that the lake would require draining and dredging to allow for this work to be undertaken.

- **Upstream Overflow Stream (Site 43):** The upstream overflow stream section may also require trial pits to determine the extent of the ragstone retaining wall and the size of the footings (if any).

For an indicative plan of suggested trial pit locations and an outline of the investigative works recommended to develop repair details for the areas requiring remedial works in the medium and long term please refer to (SK)011 and (SK)009 contained within Appendix C of Assessment of Existing Structures and Outline Proposals for Remedial Works (2022) Civic Engineers.

In conclusion, it should be noted that recommended repairs are not limited to these areas, and many of the structures within the park require general repairs to ensure the longevity of the lake banks and improve the general aesthetics of the park.

- **Lake 5 historic outfall (Site 11):** it is proposed to ensure against the failure of the dam of Lake 5 by repairing or removing a perceived weak point of the dam, being the historic outfall, and to follow up with the stabilisation of the dam. However, this would result in the loss of one of the most significant heritage features within the landscape, and should be retained if at all possible. It is proposed to examine the waterside of the outfall structure and the dam once the lake has been drained, and to develop a restoration plan that would protect the stability of the dam and the outfall; such a plan should be developed with archaeological input.

It is in any case recommended that a detailed archaeological record be made of both sides of the outfall once the lake has been drained and may entail excavation of the silts to expose the water side of the outfall.

9.6.3 Additional Actions

The following actions have been identified as being required to develop the required repair details:

- The draining and dredging of Lake 4 and its outflow pond, facilitating further investigation and remedial works.
- Trial pits dug at key locations to determine the current construction and condition of the sidewalls and base of Lake 4, and the sidewalls of the overflow stream.
- Coordination between LUC, Sevenoaks District Council, and arboricultural and Civic Engineers to develop solutions in areas where trees add to the complexity of the repair details.
- Coordination between LUC, Sevenoaks District Council and Civic Engineers to ensure that repair details are optimised in regard to cost, aesthetics, robustness and longevity.

One point of note in the recommendations and conclusions to the structural survey of the Lakes and the associated structural features, including the river walls, culverts, bridges, weirs and feature waterfalls is that there appears to be little or no consideration of historical aspects and it is strongly recommended that Zenith Built Heritage is included in any future consultation and coordination to develop solutions.

9.6.4 Tree Issues

There are character area specific issues with the spacing and natural succession of the tree stock throughout the North and South Parks. Natural succession, where successful, increases the tree stock, often leading to overcrowding, leading to the growth of 'leggy' trees, with a reduced visual amenity. Without proactive arboricultural management, overcrowding will continue, which in turn creates dark spaces, with a high-density canopy overshadowing the lakes and exacerbating siltation levels and reducing enjoyment levels for park visitors.

The arboricultural resource has been identified as a **Habitat of Principal Importance** (HPI), Lowland Mixed Deciduous habitat, leading to the structurally poor, ivy clad trees, suppressed by overcrowding, that dominate the landscape Woodland, however previous management of this woodland has not been effective or appropriate for such a significant ecological resource.

9.6.5 Grassland

The quality of the grass at Bradbourne Lakes varies across the North and South Parks. Where there is moderate to heavy shading from the tree canopy, the sward is generally poor, and many areas of bare ground were observed. These areas also suffer from the high numbers of waterfowl living around the Lakes and the grazing action of the waterfowl, combined with their movements across the grass and

visitor footfall, combines to leave vast swathes of bare and sometimes muddy ground. This is visually unappealing and reduces the quality of the landscape.

9.7 Key Opportunities

The key concerns, identified throughout the survey for this CMP, are the hydrological and structural condition of the Lakes and their associated structures, the deteriorating condition and usability of the path network and the poor condition of the grassland throughout the North Park, and also predominantly across the South Park. Therefore, the key opportunities where funding allows are to address these issues.

9.7.1 Lake Hydrology and Hydrological Structures

Follow the recommendations as set out in the following reports, or in any revised or subsequent reports.

- *Assessment of Existing Structures and Outline Proposals for Remedial Works* (2022) Civic Engineers; and
- *Review of the Ponds and a Sediment Survey at Bradbourne Lakes* (2019) Hydreau.

9.7.2 Paths and Access Around the Lakes

There is a patchwork of path surfaced widths across the park, all in varying conditions. A landscape-wide paths and tracks strategy, which creates a hierarchy of hard and soft surfaces and widths, according to land-use and character, would improve accessibility for all.

9.7.3 Historic Fabric

Enhanced Interpretation: An improved understanding of the development of the landscape has been achieved, and it is considered that an enhancement of the interpretation panels and on-line literature could be generated so as to bring out the complexities and significance of the landscape for the users of the park. This could serve to celebrate not only the parkland and its historic development, but also the role that Bradbourne has played in the growth of Sevenoaks.

Archaeological Investigation of the Site 7 GPR Anomaly: Despite the geophysical survey, there is an uncertainty if the identified GPR anomaly corresponds with the building first depicted on the 1801 Mudge map. If it can be confirmed, then that would enhance the significance of the individual feature and the wider parkland landscape. This can potentially be confirmed by an archaeological excavation / evaluation, which could be limited in scope and accordingly would have limited impact upon the heritage resource. It is suggested that such a localised exploration can be brought within the scope of the Historic England promoted Rejuvenate National Pilot Scheme (Historic England 2025). This is delivered in partnership with schools, and is linked into curriculum, and also engages with a community programme to involve youths in their heritage. Such an exploration would need to be supervised by professional archaeologists and would need to incorporate post excavation processing and culminate with a professional archaeological report. The

processes, however, can be undertaken by local children and youths, and can provide considerable educational value for what would be a limited archaeological intervention.

Subject to the results of the intervention the process can be widely publicised to demonstrate community archaeology in action and would help to highlight the history of the parks. If significant remains are identified, then a formal archaeological excavation can be implemented to expose the building remains, that can be conserved and exposed as part of the visitor experience.

9.7.4 **Boundary Features**

The varied character and appearance of the boundary features across the parks could be rationalised by the planting of native hedgerows, with a selection of species of local provenance and managed for maximum biodiversity gain.

9.7.5 **Tree and Vegetation Management**

Arboricultural and habitat management should be balanced between biodiversity and amenity.

Lowland Mixed Deciduous Woodland: Whilst non-intervention management of lowland mixed deciduous woodland, is a recognised and acceptable form of management for wildlife and promoting biodiversity, in the case of Bradbourne Lakes, which is a well used and valued public open space, management aims must balance the importance of the habitat type with amenity value. The ongoing management of the woodland is detailed in the Tree Survey Report, and following immediate interventions to remove key trees which are reducing the structural integrity of the lakes fabric, it is recommended that the ongoing future management should focus on enhancing the valued and future valued features of the woodland, such as age structure, natural regeneration of high value species, promoting biodiversity and deadwood retention

The Next Generation of Trees: There are very limited opportunities for new tree planting across the park, given the extent of the existing tree stock, however where opportunities do present themselves, such as where a tree is lost, the opportunity to replant, with an appropriate species, should be taken to ensure a varied age structure in the arboricultural resource, which represent all stages in the life cycle of trees.

9.7.6 **Landscape Maintenance for Biodiversity Gain**

Having less intensive landscape maintenance in some areas, such as grass cutting, in some character areas, would have positive impacts upon the ecological and biological resource. Consider creating a maintenance zoning plan, to set out which areas of the park require more intensive interventions, with positive benefits realised elsewhere, with less intensive interventions, for the benefit of ecosystem services such as carbon capture, rain water absorption and increase species diversity etc.

9.7.7 **Biodiversity Value**

Improving the ecological and biological sustainability of the landscape at Bradbourne Lakes is a key aim and any opportunities to improve the ecosystem and expand ecological connectivity with the wider landscape should be taken. Sevenoaks is rich in biodiversity. In both rural and urban areas, wildlife makes an important contribution to the quality of life. Biodiversity conservation is central to maintain a healthy countryside and townscape.

Sustainable development can be defined as “*development, which meets the needs of the present without compromising the ability of future generations to meet their needs*” and encompasses three elements; society, economy and the environment all of which need to be considered and balanced to achieve sustainable development. Biodiversity is dependent upon and an indicator of a sustainable and healthy environment. Species lost can never be replaced and habitats cannot simply be recreated. A clearer understanding of the way in which development may affect biodiversity, will better inform decisions relating to the capacity of the environment to accommodate our growing needs, without adverse effect.

In 1992 Biodiversity became a global agenda when 150 governments signed the Convention on Biological Diversity at the Earth Summit in Rio de Janeiro. It called for national strategies and action plans to be created and enforced which would conserve, protect and enhance biological diversity and was the first time a legal framework was applied to biodiversity. In 1994 the ‘UK Biodiversity Action Plan’ (UK BAP) was launched endorsing a multi-organisational approach to biodiversity conservation with an agreed set of targets and objectives. The overall goal of the UK BAP is to conserve and enhance biological diversity within the UK and to contribute to the conservation of global biodiversity through all appropriate mechanisms.

9.7.8 Biodiversity Net Gain (BNG)

The *Bradbourne Lakes Biodiversity Net Gain Report* (2025) by Ricardo provides a Biodiversity Net Gain Assessment, in support of the proposed development of the landscape at Bradbourne Lakes and establishes an ecological baseline, considers the potential impacts of the proposed works and identifies how statutory requirements for biodiversity net gain will be met. *“The ponds on site require de-silting, this will result in the removal of roughly 50 trees (accurate numbers are hard to determine as some areas are defined as groups instead of individual trees). The purpose was to assess the baseline habitats, the impacts of the proposal and how a 10% net gain will be delivered. When implemented successfully, these recommendations will ensure that the development proceeds in line with all relevant laws, as well as contributing to an increase in site biodiversity.”*

The BNG report found that the “site is dominated by moderate and poor condition ‘lowland mixed deciduous woodland’, with an existing track (sealed surface), five ponds of poor condition and a ditch of poor condition’. The baseline conditions at the site support 16.83 BNG area units. The linear features on the site supply a total baseline of 0.74 BNG units, in this case a ditch in poor condition”.

There is however huge potential to increase the levels across the landscape and the proposed enhancement of the landscape through the Bradbourne Re-Bourne project alone is calculated to enhance the surveyed habitats from ‘poor’ to ‘moderate’

condition. *“The proposed enhancement works include pond de-silting, removal of invasive non-native species and targeted management of woodland, to improve habitat quality and restore native biodiversity. Following implementation, the site is predicted to deliver 7.88 additional habitat units, equating to an overall net gain of 11.4%. The proposals therefore exceed the minimum 10% biodiversity net gain requirement under the Environment Act (2021) and will provide measurable, long-term improvements to site condition, ecological function, and biodiversity value”.*

10 APPROACH TO FUTURE LANDSCAPE MANAGEMENT

10.1 Future Management Approach

A series of policies and objectives have emerged, based upon a thorough understanding of the uniquely inherent qualities and characteristics of the elements which combine to create the landscape at Bradbourne Lakes, the assessment of significance and the identification of issues and vulnerabilities, potential conflicts and opportunities which may affect the landscape now or in the future.

10.2 Vision

With an understanding of the value and significance of the landscape, it is recommended that a vision, which is inspired by spirit of place, and helps to guide the future management and conservation of the landscape. The vision has the overarching aim to protect, conserve and enhance the unique qualities and character of the landscape, so that it may be enjoyed by current and future generations and play a significant role in connecting and extending ecological habitats and providing the high biodiversity value.

10.3 Key Aims and Objectives

Taking into consideration the significance of the landscape, and an understanding of the current management and conservation of the landscape, it is suggested that the overarching approach to the future protection, restoration, conservation and management is:

- To manage and conserve the landscape at Bradbourne Lakes, based upon an understanding of the historic development and value of the landscape and its component elements and with a philosophy which is appropriate and beneficial to the overall quality and character, so that features are revealed, protected, restored and conserved for current and future generations of park users to enjoy.
- Ensure that the protection and management of the landscape is carried out with a thorough understanding of the importance of an ecosystem-wide approach, which aims to deliver maximum ecosystem services, maximising biodiversity value wherever practically possible, to benefit the landscape, its component elements and current and future generations of park users.
- Ensure that the protection and management of the landscape is carried out with a thorough understanding of the importance of an ecosystem-wide approach, which aims to deliver maximum ecosystem services, maximising biodiversity value wherever practically possible, to benefit the landscape, its component elements and current and future generations of park users.
- The historic tradition of continual additions and changes to the landscape at Bradbourne Lakes should be continued and celebrated by current and future custodians of the landscape, as part of an ongoing legacy for this important public green space. Historic features of particular significance in the landscape must be conserved as a high priority, however there are opportunities to add new elements and make structural changes according to current uses, be it new species planted, new habitats created, new landscape features or new buildings

and structures, so that Bradbourne Lakes continues to be a place of inspiration, relaxation and value.

- To use, wherever possible, environmentally sustainable methods of repair and maintenance, minimising environmental impacts wherever practically possible, by sourcing local materials. Investigate the use of renewable energy sources.
- To enhance the visitor experience and engage with park users about the landscape setting, encouraging wider exploration and stewardship of the landscape and nature.
- To enhance the visitor experience and engage with park users about the landscape setting, encouraging wider exploration and stewardship of the landscape and nature.
- To protect, conserve, manage and enhance the ecological habitat network, ensuring that any management works within Bradbourne Lakes do not cause any significant impacts on the wider ecological habitat networks. A philosophy where landscape-wide habitat is created, managed, enhanced, and connected to the wider ecosystem, benefiting a wide range of species, rather than maintaining unsustainable 'island populations' of individual species, should be promoted.
- To protect, manage and conserve the arboricultural resource and to instigate the recruitment of the next generation of trees in specific areas, along with the replacement of any lost, significant tree as necessary.
- Ensure that current and future management teams have an understanding of the value and importance of the landscape setting of Bradbourne Lakes and are aware of the key aims and objectives established to guide current and future management, restoration and conservation.

10.4 Underpinning Management Principles

The following underpinning principles address the aims and objectives for the future management of the landscape and are based upon a thorough understanding of place; of the uniquely inherent qualities and characteristics of the landscape, an assessment of the value of the landscape and its characteristic elements and the identification of the issues and vulnerabilities which may affect the landscape now or in the future. The underpinning principles are presented under five strategic headings, which are then expanded to provide specific and targeted management principles as necessary:

A	Protect
B	Conserve
C	Fabric
D	Present
E	Partnership

10.4.1 Conservation Principles

Conservation Principles, Policies and Guidance for The Sustainable Management of The Historic Environment by Historic England sets out the now widely accepted guidance for heritage conservation, as a means of ensuring a consistency of approach for carrying out its role as the Government's statutory advisor on the historic environment in England.

Principle 1	The Historic Environment is a shared resource
Principle 2	Everyone should be able to participate in sustaining the historic environment
Principle 3	Understanding the significance of places is vital
Principle 4	Significant places should be maintained to sustain their values
Principle 5	Decisions about change must be reasonable, transparent and consistent
Principle 6	Documenting and learning from decisions is essential

The Conservation Principles were originally intended for use by Historic England staff, however today they are widely accepted as a 'good practice' approach to the restoration and conservation of a wide variety of heritage landscapes and set out a method for thinking systematically and consistently about the heritage values that can be ascribed to a place.

The six principles ensure that conservation does not mean preventing change to heritage assets and preserving and restoring a place as if it is frozen in time, presenting it how it appeared at that particular period in time. Conservation in the 21st century is an acceptance of appropriate change, as society's requirements for a heritage asset changes over time. It is with a thorough understanding of the landscape at Bradbourne Lakes and with the Conservation Principles providing a 'golden thread', which underpins good management practice, the following underpinning principles have been developed.

10.5 Protect

10.5.1 Policy

- **THE NATIONAL PLANNING POLICY FRAMEWORK (NPPF):** Updated in December 2024, providing the planning policy framework, with emphasis on the local plan, produced by local planning authorities. The National Planning Policy Framework aims to guarantee strong protection for the natural and historic environment.
- **THE TOWN AND COUNTRY PLANNING ACT 1990 PLANNING (LISTED BUILDINGS AND CONSERVATION AREAS ACT 1990):** Provides the legislative framework for managing heritage assets. Section 66(1) of the Planning (Listed Buildings and Conservation Areas) Act 1990 indicates that special regard shall be given to the desirability of preserving a listed building or its setting.

- **LOCAL POLICY:** A new Local Plan 2040 is currently being prepared by Sevenoaks District Council; however, the existing Local Plan remains valid until such time that the new plan is formally adopted. See Section 2 for policies relevant to Bradbourne Lakes.

10.5.2 Consents

Ensure that statutory consents are obtained, if necessary, prior to any repair, restoration or consolidation works carried out either as part of routine maintenance or specific conservation projects on the landscape, landscape elements, species and habitats, buildings and structures. Repair programmes should follow best practice guidelines, as inappropriate specification or poor workmanship can damage sensitive historic buildings and structures and accelerate rather than prevent decay.

Tree Preservation Orders (TPO): There are currently no TPOs on any of the trees within the landscape at Bradbourne Lakes and the landscape is not included within a Conservation Area, however there may be future TPOs placed on any trees of significant amenity value for the local area.

A Tree Preservation Order is an order made by a local planning authority in England, to protect specific trees, groups of trees or woodlands in the interests of amenity. Trees that are subject to a TPO require permission from the local planning authority (LPA) for any felling or pruning work, subject to various exemptions. There is an exemption from the requirement to obtain consent to fell trees that are dead or dangerous, but landowners are encouraged to provide the LPA with five days written notice to allow them to confirm the exemption.

Felling Licence: Tree felling on non-residential land is controlled by the need to obtain a Felling Licence from the Forestry Commission before felling more than five cubic metres of timber (or two cubic metres if the timber is sold) per three-month period, subject to various exemptions. There is an exemption from the requirement to obtain a Felling Licence to fell trees that are dead or dangerous.

Protected and Notable Species: All bats and their roosts are protected by the Wildlife and Countryside Act 1981 (as amended) and gain additional protection under the Conservation of Habitats and Species Regulations 2010. Birds listed under Schedule 1 of the Wildlife and Countryside Act 1981 and all bat species are also protected from disturbance when using nesting or roosting sites.

Prior to repair, restoration or conservation work being carried out where there is a known population of a protected species, a suitably qualified ecological consultant should be appointed to confirm the presence of the protected species and offer guidance on the precautions which should be taken to minimise any disruption or disturbance.

Custodianship and Boundary: In the event of a change to the occupancy and/or custodianship boundary, in whole or part, the suitability of the future custodians, occupants and managers should be governed by a sympathetic understanding of the importance and uniqueness of the landscape assets, and the conservation needs of the assets and their settings. Necessary funds for routine maintenance and longer-term conservation should be secured.

10.6 Conserve

The following sections consider the key policies and objectives for all elements which combine to create the unique landscape at Bradbourne Lakes. These key policies and objectives will form an overarching framework for future management and aim to inform the subsequent maintenance practices. Management of the landscape should recognise and be informed by a thorough understanding of the importance and significance of the chronology of its development, the character of the landscape setting, the individual elements which combine to create the unique character and context of the wider landscape surrounding Bradbourne Lakes.

Landscape and Fabric: Conserve and maintain the landscape at Bradbourne Lakes, in which the elements identified in the subsequent sections, which create the natural and man-made fabric, are of particular merit in their own right, as well as combining to form a superb landscape.

Archaeological Resource: The overriding policy is to conserve and protect archaeological features in situ. Management and maintenance operations, visitor access and visitor events should respect the importance and sensitivity of the archaeology where visible and buried features occur. The heritage resource includes the lakes and all the component hydrological features and these need to be maintained without compromising their historic integrity.

Ecological Habitat Resource: Opportunities to conserve, enhance and effectively manage the existing and future ecological habitat network across Bradbourne Lakes should be given priority, wherever practically possible. Management priorities should aim to maintain and enhance a rich mosaic of habitats to encourage species diversity and longevity. Enhancement of habitats for invertebrates and pollinating insects will have the long-term benefits of increasing habitat value for birds, which in turn, help to keep pests under control. Ensure that the requirements of protected and notable species, such as bats are met during any maintenance and restoration work.

Grassland: Grassland is a major habitat across both the North and South Park, varying in composition and management. The grassland is predominantly modified, which is perhaps the most common habitat for landscape settings such as Bradbourne Lakes. Modified grassland is often rye-grass dominated and has a low biodiversity value, largely due to the management regimes undertaken to keep the sward short. Dandelions and buttercups are common species associated with modified grassland and were observed at Bradbourne Lakes. Where intensive mowing regimes occur, herb growth is restricted, lowering biodiversity value.

To maximise biodiversity value, consider allowing areas of the grassland to grow unchecked, flowering and setting seed before taking a late season cut.

The use of herbicides and pesticides is also discouraged.

Arboricultural Resource: There is a need for an ongoing and proactive management of the arboricultural resource, with a long term strategy for the recruitment of the next generation of trees together with a proactive approach to the continued care of the tree stock to ensure health and longevity, to promote a high quality park landscape.

The arboricultural resource at Bradbourne is significant and has been identified as a Habitat of Principal Importance (HPI), Lowland Mixed Deciduous Woodland. The woodland is however in moderate to poor condition, which is a result of a lack of the appropriate and sensitive management for the key species, enabling the domination of self-set species.

Lowland Mixed Deciduous Woodland: Management of this habitat should favour the conservation of key mature species found at Bradbourne Lakes, such as sweet chestnut (*Castanea sativa*), English oak (*Quercus robur*), London plane (*Platanus x hispanica*), beech (*Fagus sylvaticus*), horse chestnut (*Aesculus hippocastanum*) and lime (*Tilia x europaea*).

Large, mature trees within this woodland habitat, when able to develop to their full potential without being suppressed by an overcrowded woodland structure, support a wide variety of unique microhabitats, from the root system to the canopy, and are therefore responsible for a lot of the structure and wildlife diversity that is an important component feature of Lowland Mixed Deciduous Woodland.

The Lowland Mixed Deciduous Woodland at Bradbourne Lakes is not used for the production of a timber crop and therefore management of the woodland should focus on the following principles:

- Maintain and wherever suitable restore the natural ecological diversity;
- Maintain and where appropriate improve their aesthetic value; and
- Maintain the genetic integrity of populations of native species, so far as is practicable.

Woodland should be managed on a continuous cover basis, with felling limited to thinning and the regeneration felling of single trees and small groups.

Key Individual Trees: There are a number of key species scattered throughout the landscape, including the veteran London plane (Tree No.403). These trees should be managed as valuable landscape features, with a varied habit, form and texture, with minimal intervention other than that necessary to maintain risk as low as reasonably practicable. Halo thinning around the existing mature trees, to prevent competition and overshadowing from the younger, self set trees, is of vital importance to maintain the health and longevity of this valuable arboricultural resource.

Water: The Lakes are an important ecological resource and should be managed to ensure maximum biodiversity value as well as hydrological functionality. Bankside management of vegetation should be routinely carried out to ensure that heavy canopy shading is reduced, emergent aquatics are able to thrive.

Scrub: Scrub is an important successional habitat, forming the building blocks of a wood pasture habitat and enabling key tree species to establish through natural regeneration and thrive. Scrub provides significant habitat for a diverse flora and fauna; however, it should be sensitively managed to ensure that a balance is achieved with other habitat types. Scrub typically forms at habitat edges, and management should ensure that scrub does not dominate more than 30% of any habitat type. A diverse scrub assemblage should be encouraged in key areas, including fruiting species to provide nectar for insects and seeds for birds and mammals, to increase biodiversity value.

Invasive Species: Rhododendron is listed on Schedule 9 of the Wildlife and Countryside Act, though it is common within the settings of historical landscapes. *Rhododendron ponticum* can dominate habitats and prevent other ground flora from establishing in woodland habitats. The targeted removal of rhododendron should be carried out to encourage ground flora to establish.

Habitat for Nesting Birds: Nesting Birds, such as the passerine species which frequent Bradbourne Lakes, are provided with a high value habitat, however opportunities for further habitat enhancements exist. A strategic approach to the installation of nest boxes throughout the site, would encourage key species to thrive.

Deadwood: A Deadwood strategy should be developed, with a preference for retention within the less formal areas. Deadwood should be retained wherever possible and a creative and artistic approach to deadwood retention be adopted through the use of wooden sculpture, small contemporary bug hotels and log piles contained in steel mesh baskets, vertical log arrangements etc, to offer deadwood opportunities, which the local community can participate in the creation of. The benefits of deadwood retention across the landscape are:

Invertebrates	Keep habitat for Saproxylic invertebrates, which rely on deadwood for their survival. Deadwood is important for the larval stages of many insects.
Bats (standing deadwood)	Utilise rot holes etc for roosts.
Mammals	Feed on invertebrates/larvae within deadwood. Provision of deadwood habitat along riverbank can encourage otter.
Reptiles	Use as hiberacula.
Birds	Feeding on invertebrates.
Soil Composition	Soil layer is built up with decaying wood, biomass.
Pollinators	Several pollinators are able to overwinter in deadwood.
Pest Control	Invertebrates can act as a natural pest control.
Fungi	Rare and scarce deadwood fungi.

Standards of Repair, Restoration and Conservation: All restoration, repair and management work should be of an exemplar standard. High standards for repair, restoration and maintenance are recommended, by which is meant that works should comply with expert advice (where appropriate), use contractors with the necessary experience and skills, follow recognised standards of workmanship and use the most appropriate materials in the correct way.

Ensure that adequate capital provision is allocated to ensure the correct standards of restoration, repair and conservation is undertaken and any repair, restoration, conservation and development work should be carried out in accordance with the

most appropriate style and technique, so that the integrity, character and significance of the historic landscape is retained and enhanced.

10.7 Fabric

Trees and Woodland: The long-term vision for the management of the arboricultural resource at Bradbourne Lakes is contained in the Tree Survey and Tree Schedule, attached at Appendix C.

Lowland Mixed Deciduous Woodland: Management should seek to retain and enhance this habitat. Management should be informed by a detailed woodland survey, as a minimum woodland National Vegetation Classification (NVC) communities should be mapped and their condition assessed.

General management objectives should include gradual removal of non-native self regenerating saplings (regen.) such as sycamore and alder, in favour of native regeneration, such as oak, ash and willow and the targeted removal of invasive species. The woodland at Bradbourne Lakes comprises dense patches of cherry laurel (*Prunus laurocerasus*), rhododendron (*Rhododendron spp.*), and bamboo (*Phyllostachys spp.*), all of which suppress light availability and restrict ground flora diversity. The removal of these species will allow for increased light penetration and structural diversity within the woodland, encouraging the regeneration of native ground flora and improving the overall ecological function of the area. Removing invasive species such as bamboo and rhododendron from lake margins will also improve the ecological connectivity between aquatic and surrounding terrestrial habitats.

Arboricultural Management: Bradbourne Lakes contain large mature trees, some of which overhang or stand within falling distance of the well-used paths and private gardens which adjoin the landscape. The trees therefore represent a potential hazard to visitors, and SDC has a duty of care to inspect the trees, determine the risk and manage the trees. The risk needs to be balanced against the many benefits that they provide to this important public green open space and designed historic landscape, the wider landscape and biodiversity.

It is recommended that a site-specific tree risk policy is developed for the site, unless SDC already has a site-specific policy for this. The policy would set out requirements for tree inspection and management and describe how the tension between tree risk and benefits would be balanced. Advice is present in the National Tree Safety Group document '*Common sense risk management of trees*'.

It is recommended that wherever possible works are carried out between September and February in order to avoid impacting on nesting birds. Many of the mature trees on the site contain features that are commonly associated with bat roosting, such as cracks, cavities, loose bark and dense ivy cover. It is recommended that these trees are assessed before felling or pruning by an ecologist, who will advise on requirements for additional survey and precautions that may be required to avoid impacting on bats.

Arboricultural Pests and Disease: Trees on the site face a number of significant threats from pests and diseases.

Ash Dieback Disease (*Hymenoscyphus fraxineus*): is present on the site and widespread in the local area. The disease has the potential to damage and kill large numbers of ash trees, although the exact impact of the disease in the UK is still to be accurately predicted.

The progress of ash dieback on the site and its implications for tree health and safety should be monitored as part of a routine tree inspection programme. Where the disease is present, it is recommended that infected trees are generally retained (where compatible with public safety and landscape objectives) as there is likely to be genetic variation in disease resistance, and some infected trees may show greater resistance to the disease which will allow them to survive in the long term and produce regeneration with increased resistance to the disease. The decision to fell or retain trees with significant infection should be informed by a risk assessment carried out as part of the arboricultural inspection. It will be more appropriate to retain trees in the zones of lower public risk. In contrast, it will be more appropriate to fell trees in the zones of high public risk, such as trees besides footpaths.

Bacterial Canker is caused by pathogens, such as *Erwinia alni* bacteria and *Phytophthora alni* oomycetes are particularly noted for causing canker in Alder species. There are no chemical controls available and therefore management of the arboricultural resource should focus upon best practice hygiene, including removing the infected parts of the tree and sanitizing all tools after use to prevent the spread to other trees. Environmental stress, such as drought or overcrowding can lead to a higher risk from canker.

Visitor Compaction: Parts of Bradbourne Lakes, especially in the South Park adjacent to Lake 4, are subject to high visitor usage and some of the trees are suffering from visitor soil compaction where narrow paths pass close to trees and visitors walk on the grass. The depth of compaction, and impact on soil quality in relation to the trees is unknown, but it has led to the exposure of surface roots in some places, whose bark is then damaged by foot traffic and mowing. The high concentrations of waterfowl may also contribute to the compaction. The Bradbourne Re-Bourne project aims to improve the network of routes around the park, however where tree roots continue to be exposed, it is recommended that visitor compaction is addressed using the following measures.

- Temporary rope fencing around the tree and mulching with compost,
- Temporary rope fencing around the tree, careful raising of soil levels and re-seeding.
- Consider the construction of low impact footpaths.

The appropriateness of each measure will depend on the condition of each tree, and its situation in relation to the use of the park. High pressure air lances can be used to de-compact the soil around some trees. This technique is useful when soils are highly compacted, but mulching should be used in preference where appropriate.

Grassland: Modified grassland is predominantly found throughout the North and South Parks and is predominantly maintained as close mown. Where possible, areas of improved and species-poor grassland should be allowed to develop a more diverse, herb-rich sward. Plant native woodland and grassland herbs into ornamental grassland, including wood sorrel and wood anemone, or single flowered introduced species such as primula and cowslips, to provide a higher nectar and pollen resource for invertebrates.

It is recommended that a mowing strategy is developed, which identifies areas where potential low intensity maintenance could be carried out, leaving the grass longer and allowing natural processes to change the character and composition of the grass over time. The mowing method should be determined according to the ecological interest for each area. A zoning plan, to show the hierarchy of importance for mowing could help reduce mowing regimes, with information boards positioned adjacent to these areas to guide visitors on management strategies for enhancing biodiversity.

Areas of high amenity grassland should have a low input management, with herbicides and fertilisers avoided, and grass cuttings removed, to reduce nutrients in the soil to allow for a more diverse mix of herbs to develop within the sward.

Where possible, ensure that natural, uncut corridors are maintained within the grassland, as refuges for invertebrates and amphibians in the ornamental garden area

Man Made Water Features: Guidance for lakes and water features in historic landscapes is available from Historic England at <https://historicengland.org.uk/images-books/publications/water-features-historic-settings/>.

Consider a programme of continued investigation and restoration of the ragstone walls, edge features and hydrological resource to protect the historic integrity of these significant man-made elements within the landscape.

Ensure that management of the banks and bankside vegetation is appropriate for the historic landscape setting and respects the historic design philosophy of a picturesque pleasure ground. Remove any debris in and adjacent to the lakes, cascade, bridges, culverts and other hydrological elements so that structures are not damaged. Ensure that any protected and notable species are not disturbed through routine management and maintenance of bankside vegetation.

Boundary Features: Programme a formal regime of condition and/or structural inspections, for built features within the park and action the recommendations in order of priority. The presence of boundary fences defines the quality and character of the landscape at Bradbourne Lakes and sets the standard for the sense of place for visitors.

All boundary fences and gates should be maintained to a consistent high standard, reflecting a positive visual image of care and attention to detail. Routine inspections of the boundary fencing and gates should occur on a regular basis, and any defects or damage should be repaired as soon as possible, as part of the regular maintenance regime. Ensure that all wooden cleft fencing is routinely checked to ensure that its structural integrity is maintained. All damaged fencing should be removed and replaced. Gateway surfaces should be monitored for signs of wear and surface repairs

carried out as a part of the regular maintenance regime, to ensure that each gateway is presented to a highest standard.

Where boundary fencing falls beyond the ownership and management control of Sevenoaks District Council, consider undertaking repairs on behalf of neighbouring properties to ensure that the quality and character of the landscape is maintained.

Paths: The condition of the path network around the North and South Park reflects the quality and character of the landscape. All paths should be maintained to the highest standards of repair to ensure that areas are accessible for everyone throughout the year. Routine maintenance of path surfaces to the highest standards of repair will ensure that visitors are less likely to stray from the paths in order to proceed with a clear footing.

Consider a programme of upgrade and repair to path surfaces and widen narrow routes to ensure they are fully accessible for all park users.

Consider mowing paths through grassland areas, especially where sensitive ecological habitats or below (or above) ground archaeology exists, to guide visitors. Appropriate reinforcement of this route may be necessary through areas of wetter ground.

Furniture: Ensure that sufficient benches and seating opportunities, to an agreed 'house style' are provided so that opportunities for resting are available, yet visitors feel able to explore further into the landscape. However, ensure that key areas of the North and South Parks do not become cluttered by benches.

All benches should be consistently maintained to the highest standards of repair so that a positive visual contribution is made to the character of the landscape. Ensure that the surface beneath each bench is well maintained, free from slip and trip hazards.

10.8 Presentation

Visitor Access and facilities: Bradbourne Lakes should continue to be welcoming, accessible and safe for all visitors, ensuring that the landscape setting of the Lakes is maintained to the highest standards, to enhance the character and quality of the visitor experience and sense of place.

Visitor facilities should always be provided where necessary, however they should be sympathetic to and subservient to the character of the historic landscape and its component elements. There should be a general presumption against the introduction of temporary structures within the landscape, which may compromise the landscape setting or affect the peaceful enjoyment of this important historic asset and high quality public open green space.

Interpretation, Signage and Education: The importance and significance of the landscape at Bradbourne Lakes, including information about the development of the picturesque pleasure ground landscape, arboricultural and ecological resource, should be interpreted to visitors, so that their experience and understanding of the landscape is appreciated and enhanced.

Ensure that sufficient, yet discreet interpretation signage is provided, to facilitate visitor enjoyment, understanding and exploration, without compromising the green space. All signage should continue to be to an agreed 'house style'.

Event Management: Ensure that the repair of damaged grassed areas, from visitor footfall or following park events, has prompt attention, with soil decompaction and reseeding carried out where necessary. Regular inspection and recording of any damage should be carried out. If there is a need to import topsoil, the quality of the topsoil should be in accordance with industry standards and of local provenance. The use of a sterile topsoil should be used in any archaeologically sensitive areas.

10.9 Partnership

Skills and Resource: Ensure that any park rangers and team members working in the landscape have an understanding and appreciation of the importance of the landscape, both in terms of the historic development of the picturesque pleasure ground and the rich arboricultural and ecological resource.

Funding: Ensure that there is a cyclical budget, with funds dedicated for the routine review and maintenance of the natural and man-made fabric, with adequate funding made available for the inspection, repair and conservation of the key features.

Accountability, Monitoring and Review: The results of all surveys carried out through the Bradbourne Re-bourne project, and any subsequent surveys should be analysed and recorded in a Bradbourne Lakes Archive, in digital format. Any plans for management or restoration works, including method statements, detailed design, plans and condition surveys should also be stored in this archive.

All archaeological reports should be deposited with the local Historic Environment Record. Original documents and fieldwork reports should also be archived to the appropriate standards.

The ecological and arboricultural surveys carried out as a part of the Bradbourne Re-bourne project should be seen as the foundation for ongoing monitoring for the landscape and should be built upon with further studies, wherever possible. Such baseline information should be used as a basis for future management and should be regularly updated by suitability qualified professionals, to ensure that a full record of the natural resource is maintained.

It is strongly recommended that a regular programme of review of the proposals as a part of the Bradbourne Re-bourne project is undertaken, with new management priorities set out and updated on a regular basis. This will be especially important when any new survey is carried out.

Sustainability: Management and maintenance of the landscape at Bradbourne Lakes should strive to achieve the highest standards of environmentally sustainable management. Consider innovative opportunities for recycling and energy saving initiatives at all times. Sustainable planting and management should be carried out wherever possible. Reuse and recycle all redundant fence posts, tree guards and other hard materials used within the landscape, wherever possible and recycle others than cannot be re-used.

It is recommended that chemicals, such as insecticides, molluscicides, and herbicides should only be used as a last resort and in compliance with good horticultural standards and requirements for public health and safety. The use of chemicals should be kept to an absolute minimum and should not be used on any areas of significant habitat, in or near water or neutral semi-improved grassland.

Herbicides, pesticides and fertilisers should be carefully controlled and used strictly in accordance with a site-specific pesticide and chemical policy. If this is not available, the *Herbicide Handbook. Guidance on the use of Herbicides on Nature Conservation Sites* (2003) English Nature, should be used as a default guidance document.

11 ACTION PLAN

11.1 Introduction

The preceding section sets out an overarching framework for the future management of the landscape at Bradbourne Lakes, with a series of underpinning management principles, which should be used to guide day-to-day operations and inform any long-term projects. The following action plan sets out a series of specific management actions and recommendations for the landscape.

This study is not ‘set in stone’ and should be seen as a dynamic and adaptive document, which responds to the evolving qualities and character of the landscape, and is updated and revised, with new project priorities, time-scales and community aspirations added where and when necessary. Whenever new survey information is available, it is strongly recommended that the corresponding management principles and actions are reviewed and revised, as necessary, to ensure that the most appropriate management of the landscape is carried out.

Where any management principles and actions are not wholly successful, or fail, for any number of reasons, it is recommended that discussions are held promptly with key stakeholders and suitably qualified professionals, so that appropriate steps can be taken to ensure that management prescriptions are adapted and revised, to continue to achieve the desired outcomes.

The overarching principle for the landscape at Bradbourne Lakes is to manage and maintain all elements, to the highest standards, so that those elements, both as features in their own right and when combined to create the landscape that we see today, is maintained, repaired, restored, enhanced and conserved, so that they may be enjoyed by current and future generations.

A series of key recommendations are set out below, together with a series of high, medium, low and ongoing work priorities.

11.2 Work Priorities

Work Priority		Time-scale
H	High	1 - 3 years
M	Medium	4 - 6 years
L	Low	7 - 10 years
O	Ongoing	

An action plan would usually set out recommendations according to the individual character areas within the study area, however, in this instance, as the issues, vulnerabilities and opportunities identified in the previous sections have established, the issues faced at Bradbourne Lakes are largely site-wide and therefore, the following action plan recommendations apply to the majority of the

character areas. Where recommendations apply to only one-character areas, this will be highlighted in the text.

11.3 Site-Wide Recommendations

Recommendation	Priority
LAKE HYDROLOGY: The 2019 <i>Review of the Ponds and a Sediment Survey at Bradbourne Lakes</i> by Hydreau sets out a summary of the current hydrological balance within each of the lakes, following sediment sampling from each of the Lakes and concludes that silt levels remain high, with high percentage of organic content.	
Carry out the recommendations contained within the 2019 <i>Review of the Ponds and a Sediment Survey at Bradbourne Lakes</i> by Hydreau in order of the listed priorities. See the report for further details.	H
Carry out localised management of emergent and lakeside vegetation, including a number of self set trees, which are growing into the retaining walls of the lakes and have been identified within the 2025 <i>Tree Retention Plan - All Removals</i> (PJC), to improve the hydrological balance within the lakes.	H
Introduce native marginal and emergent plant species, such as <i>Iris pseudacorus</i>, <i>Mentha aquatica</i> and <i>Typha latifolia</i>, to improve the aquatic and riparian habitats within the lakes to enhance biodiversity and improve water quality.	M
Target the management of invasive non-native species around and within the lakes, such as Himalayan balsam, Canadian and Nuttall's waterweeds, and water fern, to prevent further spread and maintain the ecological integrity of the lakes and stream.	M
HYDROLOGICAL STRUCTURES: The 2022 report <i>Assessment of Existing Structures and Outline Proposals for Remedial Works</i> by Civic Engineers, set out the findings of a structural survey of the lakes and the associated structural features, including the river walls, culverts, bridges, weirs and waterfalls. Following the survey, a series of recommendations were proposed, including remedial measures and recommendations for priority works	
Carry out the 'Extensive Repairs' recommendations, contained within the 2022 report <i>Assessment of Existing Structures and Outline Proposals for Remedial Works</i> by Civic Engineers. These repairs relate to large areas of site-wide damage or deterioration, which require a significant overhaul. See the report for further details.	H
Carry out targeted felling of self set trees, which are growing into and compromising the structural integrity of the retaining walls of the lakes and have been identified within the 2025 <i>Tree Retention Plan - All Removals</i> (PJC)	H
Carry out the 'Further Investigation' recommendations, contained within the 2022 report <i>Assessment of Existing Structures and Outline Proposals for Remedial Works</i> by Civic Engineers.	H
Carry out the 'Localised Repairs' recommendations, contained within the 2022 report <i>Assessment of Existing Structures and Outline Proposals for Remedial Works</i> by Civic Engineers. These repairs are general details, which are non-specific and can be implemented where needed across the site, as necessary. See the report for further details.	O

HERITAGE RESOURCE: the structures and landscape were created as a pleasure ground over 200 years and the remains need to protected, celebrated and investigated.	
Interpretation panels informing the public of the history of the site and the characters who were responsible for its creation and development.	H
A programme of archaeological investigation at the northern side of the park to examine the original hydrology of the site and the possibility of identifying the site of a former mill	M
A programme of archaeological investigation involving the Historic England promoted Rejuvenate National Pilot Scheme (Historic England 2025) to explore the site of the Site 7 building, which is implied by the existence of a geophysical anomaly.	H
An investigation into the Lake 5 dam to examine the original outfall and the development of the structure	H
PATHS and ACCESS AROUND THE LAKES: There is a patchwork of path surfaced widths across the park, all in varying conditions. Often paths in poor condition can reduce the perceptual quality of the landscape and cause dissatisfaction for visitors. A landscape-wide paths and tracks strategy, which creates a hierarchy of hard and soft surfaces and widths, according to land-use and character, would improve accessibility for all	
Review the surface treatments of informal routes, paths and tracks across the park and ensure that they are all fit for purpose. Carry out any urgent repairs to path surfaces, especially those where tree roots have broken the surface and caused a deterioration of the surface, which may become a trip hazard.	H
Consider the preparation of a landscape-wide paths and access strategy, to assess the existing path networks throughout Bradbourne Lakes, assess where 'desire lines' have formed and develop a hierarchy of surfaces and widths and establish a palette of suitable surface treatments to be used, according to land-use and character, to improve accessibility for all.	H
Consider opportunities to create new circular routes, especially where 'desire lines' indicate visitors are trying to link to existing paths. For instance, is there is an opportunity to create a new route to the western side of the shallow stream to the south of Lake 5?	M
Where grass routes are under pressure from high numbers of visitors, consider options to install reinforcement for the grass sward or create hard surfaced paths.	M
BOUNDARY FEATURES: There are a variety of boundary features across the landscape at Bradbourne Lakes, however the majority of boundaries to the outer edges of the landscape are defined by all, close board timber fencing, which has a domestic garden character and varies in condition and appearance throughout the landscape. There is generally a visual discord in the character of the boundary features, which detracts from the overall character and quality of the North and South Parks.	
Consider the preparation of a landscape-wide boundary strategy, to assess the condition and character of existing structures and consider where a 'house style' of fencing may be adopted, to improve character.	M

Consider opportunities for the planting of native, species rich hedgerows alongside some of the domestic close board fencing, to improve the visual appearance of the boundary, improve ecological connectivity and enhance biodiversity.	M
Instigate a rolling programme for the review, repair and ongoing maintenance of all wooden cleft fencing within the landscape.	O
Instigate a rolling programme for the review, repair and ongoing maintenance of all iron railings within the landscape.	O
TREES: Arboricultural and habitat management should be balanced between biodiversity and amenity	
See recommendations contained in the Tree Survey Report	
Take any opportunities for the planting of the next generation of trees wherever possible. When a tree is lost, unless it is for a specific reason such as bank stabilisation, the opportunity to replant, with an appropriate species, should be taken to ensure a varied age structure in the arboricultural resource, which represent all stages in the life cycle of trees.	O
GRASSLAND MANAGEMENT: Whilst the key feature across the landscape at Bradbourne Lakes is the Lowland Mixed Deciduous Woodland, with scattered trees surrounding the lakes, the habitat beneath the trees is predominantly grass, which is maintained as a close mown sward.	
Develop a holistic management strategy for all areas of modified grassland across the landscape. Review current grass cutting regimes with the aim of identifying areas where a more diverse and herb-rich sward may be allowed to develop with a reduced cutting regime.	H
Investigate the use of shade and heavy wear tolerate grass mixes for area where the grassland sward exhibits clear signs that it is suffering as a result of soil compaction and puddling, combined with footfall wear and tear and heavy canopy shading of some of the mature trees. Use routine de-compaction techniques for area that have the highest visitor footfall	H
Maintain grassed areas to ensure that where any vegetation is reverting to scrub, where reduced mowing regimes are instigated and management not able to keep up with growth, scrub is not allowed to take over any emerging herb-rich grassland communities.	M
Where areas of grassland are encouraged to diversity, consider encourage way-finding by mowing discrete paths for visitors to follow	O
VEGETATION & HABITAT MANAGEMENT: Opportunities to conserve, enhance and effectively manage the existing and future ecological habitat network across Bradbourne Lakes should be given priority, wherever practically possible.	
Develop a long-term Ecological Management Plan to ensure that habitats within the landscape are maintained in favourable condition and to secure measurable biodiversity gains, in line with the local Biodiversity Action Plan (BAP) priorities for wetland, woodland edge and urban greenspace habitats.	H
Consider planting areas of native shrub and smaller trees, using species of local provenance, such as hawthorn, field maple, hazel and dogwood, to create and enhance	H

foraging and shelter opportunities, habitat connectivity and increase biodiversity. Enhancing hedgerow and woodland edge structure along the Bradbourne Stream corridor would improve the ecological network connectivity for bats, dormice and small mammals, linking Bradbourne Lakes to the wider green infrastructure of Sevenoaks	
Sensitively manage Himalayan balsam, and undertake selective canopy thinning, where appropriate, to ensure that a more diverse ground flora is able to develop beneath the mature trees.	H
Introduce native marginal and emergent plant species, as set out above, such as <i>Iris pseudacorus</i>, <i>Mentha aquatica</i> and <i>Typha latifolia</i>, to improve the aquatic and riparian habitats within the lakes to enhance biodiversity and improve water quality.	M
Scrub vegetation at the margins of the character areas should be kept under control so that it does not cover more than 40% of the habitat type.	O
Develop a deadwood strategy, with a preference for retention, within the less visitor trafficked areas. Deadwood should be retained wherever possible, through the use of log and brash piles in shaded areas and a creative and artistic approach to deadwood retention could be adopted through the use of wooden sculpture, small contemporary bug hotels and log piles contained in steel mesh baskets, vertical log arrangements etc, to offer deadwood opportunities to support species such as hedgehog, amphibians and invertebrates.	O
FURNITURE: Furniture, which includes benches, bins and information boards, is an important part of the fabric of the landscape and can reduce or improve the experience of visitors to Bradbourne Lakes.	
Develop a 'Design Guide' to establish a palette of materials and finishes, to establish a 'house style' for all furniture across the landscape. Instigate a programme of replacement of signage and bins, to the house style, at the earliest opportunity, to improve the quality of the landscape and to denote the importance of Bradbourne Lakes as a significant public green space within the borough.	H
Provide more seating opportunities, located in key areas, to take advantage of key views or where key habitats are located.	M
Provide information boards, to the house style, to increase public awareness of local wildlife, the flora and fauna at Bradbourne Lakes and the importance of sensitive management to protect and further enhance biodiversity	M
OPPORTUNITIES FOR VISITOR INTERACTIONS WITH NATURE: Opportunities for visitors to have close interactions with key species at Bradbourne Lakes, apart from waterfowl species, are currently limited and there is potential to develop a programme for visitor interactions and a greater understanding of nature, is an ecosystem service that could be improved.	
Consider opportunities to run events for visitors, such as evening bat walks, species identification events, invasive species control and bug hotels etc.	H
BIRD & BAT BOX STRATEGY:	
Develop a strategic approach to installation of nest boxes throughout the site for bird & bat species, including a network of nest boxes for a variety of bird species, to be installed at key optimum locations	H

Any future lighting at Bradbourne Lakes should follow the protocols outlined in the Institute for Lighting Engineers document <i>“Guidance for the Reduction of Obtrusive Lighting”</i> (2005) and BCT’s <i>“Bats and Artificial Lighting in the UK”</i> (2018), to minimise disturbance and sky-glow off site. No lighting should be directed at any of the trees, shrubs or areas of dense vegetation within the park.	H
WATERFOWL POPULATIONS & DUCK FEEDING STATION: The food dispensing machine, located adjacent to Lake 4, is designed to dispense small quantities of healthy duck and wildfowl seed, for the public to use, however it is noticeable that a large number of both waterfowl, corvid and passerine species congregate around the feeding station, which is leading to high levels of bird droppings on the ground and a significantly worn grass sward.	
Consider undertaking a study of the populations of waterfowl and certain bird species at Bradbourne Lake, to establish whether there is a healthy and sustainable population level of key species and investigate how the grass sward surrounding the duck feeding station and other popular waterfowl feeding locations, can be protected in the long term.	H

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APPENDIX A - HER SITES IN BUFFER ZONE OUTSIDE THE STUDY AREA

HER Number	MKE358 – TQ 55 NW 58
Record Type	Building
Site Name	32,34, Bayham Road, Sevenoaks
Description	Pair of large semi-detached villas built around 1890, two-storey and attics. Uncoursed ragstone with red and yellow brick banded quoins and window and door surrounds. No.32 has tiled roof; No.34 has concrete tiles. Opposed entrance doors part-glazed with sidelights and fanlights under semi-circular head, single arched windows above. To L and R, three-storey slightly projecting gables with decorated bargeboards and pair of arched windows over two-storey canted bay windows. All windows plain timber sashes with horns. (1)
Sources	Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets.
Location	National Grid Reference - TQ 5363 5580 (point) TQ55NW
Finds	None recorded
Designated	Locally Listed Building - 10692

HER Number	MKE115085 – TQ 55 NW 561
Record Type	Building
Site Name	Bottle Cottages, Bradbourne Vale Road, Sevenoaks
Description	Pair of ornamental early 19th century semi-detached houses. Random stone with red brick quoins and dressings to windows. Symmetrical elevation of two storeys with centre projecting gable, oversailing on first floor. Front on first floor, gable with ornamented rendered panels inlaid with broken bottle glass. Ridge tile roof with eaves and gutter. Small gabled features of one storey to right and left originally forming porch entrances on both sides but now altered on the right-hand side were the gable is retained simply as a decorative feature. Ground floor with two square-paned casements under flat segmental brick arches to right and left. Centre recessed brick panel. First floor with one square paned casement in centre of projecting gable. Centre ridge stack. (1)
Sources	Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets. <1> Sevenoaks District Council, Sevenoaks District Council Local List of Heritage Assets SKE53505.
Location	National Grid Reference - TQ 5213 5638 (point) TQ55NW
Finds	None recorded
Designated	Locally Listed Building - 10829

HER Number	MKE31980 – TQ 55 NW 211
Record Type	Listed Building
Site Name	Farm Buildings adjoining Bradbourne Farmhouse

Description	The following text is from the original listed building designation: BRADBOURNE VALE ROAD 1. 1614 (North Side) Farm Buildings adjoining Bradbourne Farmhouse TQ 55 NW/3/101A II Group of farm buildings, including C18 barn of coursed local stone with half hipped ridge tile roof. Listing NGR: TQ5223756380
Sources	English Heritage, List of Buildings of Special Architectural or Historic Interest (Map). SKE16160.
Location	National Grid Reference - TQ 5219 5641 (point) TQ55NW
Finds	None recorded
Designated	Listed Building (II) - 1281426 FARM BUILDINGS ADJOINING BRADBOURNE FARMHOUSE Active DKE5945

HER Number	MKE83706
Record Type	Farmstead
Site Name	Bradbourne Farmhouse
Description	Type: Dispersed multi-yard Farmhouse: Farmhouse detached in central position Position: Located within a village Survival: Altered - partial loss of original form (less than 50%) Notes: Listing vague as to what is listed (1-2)
Sources	<1> Forum Heritage Services, 2012, Kent Farmsteads & Landscape Project (Unpublished document). SKE18075. <2> English Heritage, 2009, Historic Farmsteads: A Manual for Mapping (Unpublished document). SKE18076.
Location	National Grid Reference - TQ 5222 5640 (point) TQ55NW
Finds	None recorded
Designated	Kent Farmsteads & Landscape Project - 300542

HER Number	MKE356 TQ 55 NW 59
Record Type	Findspot
Site Name	Mesolithic core from Bradbourne Farm
Description	TQ 540540 (sic). Bradbourne Farm. One Mesolithic core found. Now in Dartford Museum. Information from R.M. Jacobi. (1) (Bradbourne Farm house is at TQ 52245638). (2) <1> CBA Res Rep 20 1977 Gaz Me & Upper Pa sites in Eng & W 156 (J J Wymer) (OS Card Reference). SKE38816. <2> R1 CJH 8 1 87 (OS Card Reference). SKE48929.
Sources	OS Card Reference: CBA Res Rep 20 1977 Gaz Me & Upper Pa sites in Eng & W 156 (J J Wymer). [Mapped feature: #35493 find,] (2) OS Card Reference: R1 CJH 8 1 87.
Location	National Grid Reference - TQ 5223 5637 (point) TQ55NW
Finds	None recorded
Designated	FKE2266 CORE (1) (Mesolithic - 10000 BC to 4001 BC) STONE

HER Number	MKE30693 TQ 55 NW 197
Record Type	Listed Building

Site Name	Bradbourne Farmhouse
Description	The following text is from the original listed building designation: BRADBOURNE VALE ROAD 1. 1614 (North Side) Bradbourne Farmhouse TQ 55 NW/3/101 13.4.51 II* 2. Circa 1700. 2 storeys. 5-window facade. Heavy projecting moulded modillioned eaves and gutter. Hipped tiled roof. 2 flat-roofed leaded dormers. Red brick with blue headers. Flat arches over windows of rubbed red headers. Coursed stone plinth. Painted brick band above ground floor windows. Sash windows with glazing bars in moulded exposed frames. Centre panelled door with fanlight over. Fanlight with tracery. Rounded pilasters on either side of door with open dentilled pediment above. Panelled reveals to doorcase. Up 2 moulded stone steps to door. Listing NGR: TQ5223756380 (1) Description from record TQ 55 NW 41: (TQ 52195642) Bradbourne Farm (NAT) (2) 1614 BRADBOURNE VALE ROAD (North Side) Bradbourne Farmhouse TQ 55 NW/3/101 13.4.51 II* 2. Circa 1700. 2 storeys. 5-window facade. Heavy projecting moulded modillioned eaves and gutter. Hipped tiled roof. 2 flat-roofed leaded dormers. Red brick with blue headers. Flat arches over windows of rubbed red headers. Coursed stone plinth. Painted brick band above ground floor with entablature over with carved corona and enriched ovolo moulding. 1st floor with 2 tripartite sash windows with glazing bars to right and left and centre recessed brick panel. Painted figure of "The Black Boy" in centre supported on projecting triangular shaped bracket. Yard to rear of public house with various C16 or C17 gabled outbuildings. (3) Bradbourne Farm, Bradbourne Vale Road, near Riverhead. A delightful example of a common type; c. 1700. Red brick chequered with blue headers. Five bays. Two storeys. Hipped roof; dormers. Deep white cornice and white stringcourse. late 18th century doorcase. (4)
Sources	Sources (1) XY map: English Heritage. List of Buildings of Special Architectural or Historic Interest. [Mapped feature: #30223 Building,] (2) OS Card Reference: OS 1:10000 1975. (3) OS Card Reference: DOE (HHR) Dist of Sevenoaks U.D. Kent. Sept. 1972 3. (4) OS Card Reference: Bldgs of Eng W Kent and the Weald 1980 518 (J Newman). Article in serial: Sevenoaks District Architectural History Group. 1986. Bradbourne Farmhouse, Bradbourne Vale Road, Sevenoaks. Arch Cant 103, 1986, pp. 238.
Location	National Grid Reference - TQ 52236 56377 (point) TQ55NW
Finds	None recorded
Designated	Listed Building (II*) - 1086043 BRADBOURNE FARMHOUSE Active DKE4658 Report generated

HER Number	MKE115095 TQ 55 NW 602
Record Type	Building
Site Name	12, Cavendish Avenue, Sevenoaks
Description	Four standing stones in a line running north to south along the eastern border of 12 Cavendish Avenue that form part of a collection of Druid stones brought in the late 19th century from the west country by eccentric Welsh ironmaster, Francis Crawshaw for his Bradbourne Hall Estate. Other stones are placed as follows: At Betenson Avenue, by the southern gate entrance to Bradbourne Lakes (Asset Record 10791) In the garden of number 38 Robyns way (Asset Record 10792) In the garden of no 6 The

	Meadway (Asset Record 10833) (1)
Sources	(1) Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets.
Location	National Grid Reference - TQ 5228 5624 (point) TQ55NW
Finds	None recorded
Designated	Locally Listed Building - 10834 Active

HER Number	MKE115139 TQ 55 NW 642
Record Type	Building
Site Name	Building, Robyns Way, Sevenoaks Pillar box/ letter Post Box. Main construction: 1910 to 1936. Designated a Locally Listed Building by Sevenoaks District Council
Description	George V letter box. (1)
Sources	(1) Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets. SKE53505.
Location	National Grid Reference - TQ 5197 5624 (point) TQ55NW
Finds	None recorded
Designated	Locally Listed Building - 10795

HER Number	MKE77819 TQ 55 NW 352
Record Type	Building
Site Name	A George V pillar box, Robyns Way / Betenson Avenue. Letter Box Study Group Box Type: 27/2. Dates from 1933 to 1936.
Description	George V letter box. (1)
Sources	2004, Letter Box Listing (Unpublished document). SKE17125. Unpublished document: The Letter Box Study Group. 2004. Letter Box Listing.
Location	National Grid Reference - TQ 5196 5624 (point) TQ55NW
Finds	None recorded
Designated	Letter Box Study Group - 27/2

HER Number	MKE78339 TQ 55 NW 344
Record Type	Monument
Site Name	Former site of Bradbourne Place. Site of a post-medieval mansion house, demolished in 1937.
Description	Bradbourne Place was the mansion at the heart of the landscape that is now Bradbourne Lakes Park. Hasted thought the first mansion was built in the reign of Edward III. The house was remodelled at the time of the landscaping that created the adjacent lakes, in the 1740s. It was demolished in 1937. <1> Kent Gardens Trust, 2011, Bradbourne Lakes Park, Sevenoaks: The Kent Compendium of Historic Parks and Gardens for Sevenoaks District (Unpublished document). SKE17278.
Sources	Unpublished document: Kent Gardens Trust. 2011. Bradbourne Lakes Park, Sevenoaks: The Kent Compendium of Historic Parks and Gardens for Sevenoaks District.
Location	National Grid Reference - TQ 51942 56179 (point) TQ55NW
Finds	None recorded
Designated	

HER Number	MKE115165 TQ 55 NW 665
Record Type	Building

Site Name	6, The Meadway, Sevenoaks
Description	One of a collection of Druid stones brought in the late 19th century from the west country by eccentric Welsh ironmaster, Francis Crawshaw for his Bradbourne Hall Estate. Other stones are placed as follows: At Betenson Avenue, by the southern gate entrance to Bradbourne Lakes (Asset Record 10791). In the garden of number 38 Robyns way (Asset Record 10792). In the garden of no 12 Cavendish Avenue, where there are four stones in a line running north to south along the eastern border of the property (Asset Record 10834). (1)
Sources	Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets.
Location	National Grid Reference - TQ 5183 5615 (point) TQ55NW
Finds	None recorded
Designated	Locally Listed Building - 10833

HER Number	MKE32007 TQ 55 NW 235
Record Type	Listed Building
Site Name	Granite column in rear garden of No 5 - Grade II listed building. Main construction periods 1867 to 1899
Description	The following text is from the original listed building designation: The following entry: - PONTOISE CLOSE 5280 0/1148 Granite Column in rear garden of No 5 II shall be amended to read: - TQ5155/25 PONTOISE CLOSE Granite Column in rear SP1148 garden of No 5 - 7.1.86 II PONTOISE CLOSE 1. 5280 0/1148 Granite Column in rear garden of No 5 II 2. Probably later C19. Tall Doric column of red Cornish granite, now in rear garden to No 5 Pontoise Close, but originally in the grounds of Bradbourne Hall (demolished). The column formed the centrepiece of a Druidical circle, some of the remnants of which remain eg monoliths in gardens to Nos 6 and 8. Thought to have been fashioned and erected by order of the then owner Francis Crawshaw (1811-78), of the Crawshaw family of Cyfarthfa Castle, Merthyr Tydfil; the Crawshays were amongst leading late C18 and early C19 iron masters in South Wales, and owned iron tinplate works in the Merthyr Tydfil area. Francis Crawshaw was a member of the Order of Druids of Wales, and is thought to have erected a Druidical Circle at Pontypridd, when he managed the family tinplate works at nearby Treforest. Listing NGR: TQ5182556129
Sources	Map: English Heritage. List of Buildings of Special Architectural or Historic Interest.
Location	National Grid Reference - TQ 5182 5612 (point) TQ55NW
Finds	None recorded
Designated	Listed Building (II) - 1336380 GRANITE COLUMN IN REAR GARDEN OF NUMBER 5 Active DKE5972

HER Number	MKE115140 TQ 55 NW 643
Record Type	Building
Site Name	Building, Robyns Way, Sevenoaks Standing stone. Main construction: 1870 to 1896. Designated a Locally Listed Building by Sevenoaks District Council
Description	One of a collection of Druid stones brought in the late 19th century from the west country by eccentric Welsh ironmaster, Francis Crawshaw for his Bradbourne Hall Estate. Other stones are placed as follows: At Betenson Avenue, by the southern gate entrance to Bradbourne Lakes (Asset Record 10791). In the garden of no 6 The Meadway (Asset Record 10833). In the

	garden of no 12 Cavendish Avenue, where there are four stones. In a line running north to south along the eastern border of the property (Asset Record 10834). (1)
Sources	(1) Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets.
Location	National Grid Reference - TQ 5195 5601 (point) TQ55NW
Finds	None recorded
Designated	Locally Listed Building - 10792

HER Number	MKE72562
Record Type	Findspot
Site Name	Medieval copper alloy key (locking) Portable Antiquities Scheme find - Medieval copper alloy key (locking)
Description	Cast copper alloy chest key. Date: from Circa 1100 AD (Certain) to Circa 1500 AD (Certain) Period: Medieval Broad Period: Method of manufacture: Cast Length: 70.67 mm Width: 27.85 mm Thickness: 8.18 mm Weight: 20.4 grams OS GridRef: TQ518565 Easting: 551800 Northing: 156500 Date found: 03 February 1995 Methods of discovery: Metal detector Recorded by: Andrew Richardson Primary Identifier: Andrew Richardson Subsequent action: Returned to finder County: KENT District: SEVENOAKS Parish: SEVENOAKS Address: Bradbourne Riding School General landuse: Character undetermined Specific landuse: Cultivated land
Sources	(1) Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets.
Location	National Grid Reference - TQ 51800 56500 (point) TQ55NW
Finds	None recorded
Designated	Portable Antiquities Scheme - KENT-95D4A4

HER Number	MKE72561
Record Type	Findspot
Site Name	Medieval copper alloy finger ring Portable Antiquities Scheme find - Medieval copper alloy key (locking)
Description	Cast copper alloy finger-ring with empty setting on bezel. Date: from Circa 1100 AD (Certain) to Circa 1500 AD (Certain) Period: Medieval Broad Period:

	Method of manufacture: Cast Length: 27.73 mm Width: 18.86 mm Thickness: 10.88 mm Weight: 6.2 grams Completeness: Incomplete OS GridRef: TQ519565 Easting: 551900 Northing: 156500 Date found: 18 May 1997 Methods of discovery: Metal detector Recorded by: Andrew Richardson Primary Identifier: Andrew Richardson Subsequent action: Returned to finder County: KENT District: SEVENOAKS Parish: SEVENOAKS Address: Bradbourne Riding School General landuse: Character undetermined Specific landuse: Cultivated land
Sources	(1) Index: Sevenoaks District Council. Sevenoaks District Council Local List of Heritage Assets.
Location	National Grid Reference - TQ 51900 56500 (point) TQ55NW
Finds	None recorded
Designated	Portable Antiquities Scheme - KENT-95CA53

APPENDIX B - SITE GAZETTEER

Site No: 1	Name: Bettenson Avenue
Dimensions: length 6m, height is 3.5m from surface of water	NGR: 551835, 156201
Date first depicted: 1909-1938 but possibly 1769	HER no
Type: Bridge	Photos: B1.1 to B1.4

A bridge constructed across Bettenson Avenue, and is of the full width of Bettenson Avenue, and accordingly is quite wide. It is of stone construction with sub circular break waters and a later buttress supporting a parapet wall extending from the cut water, and which may have been subsequently added or repaired. It has similar construction techniques on either side of the road, so it would appear to relate directly to the construction of Bettenson Avenue. It has been relined with concrete and there are two channels on either side of the cut water. That to the west has a higher cement lined ceiling than that to the east. It is linked into the stone stream walling. The length of the bridge has been seemingly extended; the break water is not in the centre of the channel and the masonry above the western channel is different from that to the east. Bettenson Avenue was constructed between 1909 and 1938 according to OS maps and the bridge is presumed to be of the same date. It is clearly a modified structure from its early 20th century origins, but there was a bridge depicted on the 1833 sale map in approximately this location for an earlier road, and indeed the maps of 1801 and 1769 show a bridge in this location enabling the passage of the stream under the turnpike road, which was shown as being in the general location of Bettenson Avenue. As such there may be elements of the bridge that date back to the eighteenth century.



Site No: 2	Name: Lake 5
Dimensions: length c 19m	NGR: 552058, 156245
Date first depicted: Twentieth century	HER no

Type: Stream revetment wall	Photos: B2.1 to B2.2
The stream wall that extends on the western side of the stream that extends between the main stream channel and Lake 5. It is roughly constructed incorporating roughly dressed masonry with thick cementitious mortar joints. There is concrete edging constructed against the masonry edges. In places the masonry is undercut, showing it to be constructed on unfounded soil deposits. There is a distinct choke or narrowing of the stream constraint introduced after a modern wooden and concrete bridge, and the implication is that the narrowing of the channel is related to the construction of the bridge. Part of the Wall is supported by concrete. The wall construction is probably not of great antiquity and is essentially formalising an older earthen stream edge.	
	

Site No: 3	Name: Lake 5
Dimensions: length c 76m	NGR: 552045, 156272
Date first depicted: Twentieth century	HER no
Type: Stream revetment wall	Photos: B3.1 to B3.2
A stone constructed channel wall incorporating lime mortar with dressed mortar. It continues around the south eastern part of the lake. It has a different build, with more dressed masonry than its counterpart of the west side of the stream. It narrows as it extends up to the small island (Site 5). There is a couple of steps (Site 4) extending through this earth retaining wall to gain access to the stream edge. It reflects a formalising of the stream edge and is probably relatively recent.	
	

Site No: 4	Name: Lake 5
Dimensions: length c 76m	NGR: 552061, 156252
Date first depicted: Twentieth century	HER no
Type: Steps	Photos: B4.1 to B4.2
A set of stone steps set through wall 3. It has two steps and is constructed of dressed masonry. It is 1.3m in width and 0.35m in observable depth. It is probably contemporary with the construction of the wall, which is of later date.	
	

Site No: 5	Name: Lake 5
Dimensions: 5.9m x 4.6m	NGR: 552059, 156225
Date first depicted: 1966	HER no
Type: Island within stream	Photos: B5.1 to B5.4
A small island with a plane tree in the middle. It has a stone revetment around it and there are two channels leading around it from culvert 6. The island may have been intended to protect the tree when the culvert was put in. The outer wall is roughly constructed and is undermined by the roots of the plane tree. It is to be presumed that the retaining wall postdates the tree, and its formation was intended to allow the outfall from the culvert (Site 6) and to protect the tree. The conclusion can be drawn that the construction of the culverts and the island were part of pleasure grounds. As a feature it is first shown on the 1966 1:2500 map, but the tree is much older and it is possible that the island has an earlier, possibly nineteenth century date.	
	

Site No: 6	Name: Lake 5
Dimensions: Width 1.6m	NGR: 552046, 156253
Date first depicted: 1871 1 st edition map	HER no
Type: Culvert outfall	Photos: B6.1 to B6.3
A culvert outfall leading from a buried culvert that extends to the west. It is now blocked and has a concrete cap but was stone constructed. A foot path extends over the outfall of the culvert and there are two stone faced channels extending east from the outfall on either side of island (Site 5). These channels are 0.3m across and so was not intended for a large flow of traffic. The channel to the west is shown on 1871 6" mapping and the 1879-85 25" mapping as being an east/west broad channel which extends towards the main stream channel at this point. This east/west channel is depicted as extremely broad and may have been linear lakes that were part of the pleasure ground associated with Bradbourne house, and does not correspond with the very narrow underground outfall, in which case this may simply be a run off conduit leading into the main channel.	
	

Site No: 7	Name: Bradbourne Lake 5
Dimensions: unknown	NGR: 552067, 156288
Date first depicted: 1801	HER no
Type: Site of Building	Photos: B.1 to B7.2
The site of building shown on the 1801 map which is located immediately upslope and to the east from what is believed was a mill pond. It is shown as an east/west orientated building on the tithe map (1840) and on the 1833 sale map. By 1868 (OS 6" map) the area had been turned over as part of the pleasure ground with regularly planted trees, and Lake 5 had been reformed from the mill pond. Nothing is now visible.	
	

Site No: 8	Name: Bradbourne Lake 5
Dimensions: Length 27m	NGR: 552067, 156288
Date first depicted: 20 th century	HER no
Type: Revetment wall for stream	Photos: B8.1
A stone stream wall leading to Lake 5, which incorporates multiple types of masonry and may reflect that it has been subject to multiple repairs and modifications. It extends out from the Site 6 culvert outfall.	
	

Site No: 9	Name: Bradbourne Lake 5
Dimensions: Length 27m	NGR: 552047, 156264
Date first depicted: 1871	HER no
Type: Garden Wall	Photos: B9.1 to B9.3
A garden wall surviving only as a low foundation with an aperture for gate and which includes a hinge socket on its southern side. It is constructed of crudely dressed masonry and is orientated north north west / south south east parallel to the line of the main stream. It appears to be on the 6 th 1 st edition map (1871) but not on the tithe map, and had gone by the time of the 1945 1:2500 map.	
	

Site No: 10	Name: Bradbourne Lake 5
Dimensions: Length 48.3m	NGR: 552046, 156361
Date first depicted: 1897	HER no
Type: Open Culvert	Photos: B10.1 to B10.2
An open culvert extending east and which is stone faced in places. It extends north east/ south west from Lake 5, where there is an annotation of "SL" (sluice) on the 1909 map. On the latter map it is shown as straight, but now has a distinct curve which may reflect that the line of the overflow channel has migrated slightly. It is not shown on the 1879 mapping but is shown on the 1897 mapping.	
	

Site No: 11	Name: Bradbourne Lake 5
Dimensions: Length 5m x 2.6m	NGR: 551984, 156360
Date first depicted: 1801	HER no
Type: Outfall for Lake 5	Photos: B11.1 to B11.6

This is the original outfall for Lake 5, and the putative mill pond that preceded it. It has stone sides and a concrete cap supported by bricks. It has a raised platform leading to a 1m high level above the base of the channel, and this height difference is probably the reason for a reference to a waterfall on the 1909 25" map; on the same map is a very small structure adjacent to the outfall. The raised level of the outfall would have controlled the level of water in the lake, but could potentially have provided a height gradient for a water wheel. The wall extends directly out of it, but is broken to create a divergent side channel leading to the main channel (Site 15). In the original line of the channel there is an artificially raised embankment which could have supported the line of a leat at a raised level sufficient to have provided power further down the line. There is a substantial number of modifications visible in the outfall for the lake and may be an indication that it has had an extended active life.

From the OS 1st edition map of 1871, there are two channels leading out from the dam forming the northwest side of the lake. That on the eastern side extends to a primary stream that was the original line of the beck, the one to the west extending from this outfall extends up to the present road, and then runs along it for c110m and then crosses it, where there is a sluice before following a straight line channel for 300m, via a sluice, and then diverts again back to the main stream channel. This deliberate diversion of water flow would make sense as a mechanism for providing water for a mill, with the main eastern channel serving as an over flow channel. While this is a potential cause of the hydraulic diversion there is no mill labelled on any of the nineteenth century plans and no structures that could correspond to a mill on the line of the dog legged channel. The alternative is that these channels are a survival of a mill that was formerly in this location, but which is no longer in use. If that is the case the most likely locations are at the outfall of the lake (Site 11) where there is a channel deep enough to be a wheel pit, or at the location of the sluice marked on the 1897 25" map.

The location of the water mill is defined on the HER (No. MKE116484), but the depicted location is removed from the site of the original channel from the millpond and is probably false. There is nothing visible at the reported location of the water mill.



Site No: 12	Name: Bradbourne Lake 5
Dimensions: Length 56m	NGR: 551987, 156331
Date first depicted: 20 th century	HER no
Type: Revetment Wall	Photos: B12.1 to B12.2
A lake wall incorporating dressed stones extending around the western side of the lake. The gardens of the houses to the west extend up to this wall and the wall will have provided the boundary between the gardens and lake. The wall does not look particularly old and was probably repaired or constructed when the houses were established prior to the 1946 25" map. The lake dates to 1801, but the wall will be a later insertion to define the lake edge, probably in the 20th century.	
	

Site No: 13	Name: Bradbourne Lake 5
Dimensions: Length 17m	NGR: 551986, 156370
Date first depicted: 1966	HER no
Type: Cross feed between two outfalls of Lake 5	Photos: B13.1
A later channel between the western outfall (Site 11) and the main channel (site 15). It is very crudely constructed with irregular undressed field stones loosely bonded with modern mortar. It follows a straight course and extends under a recent concrete bridge and feeds into the modern concrete outfall for Lake 5 (Site 15). It is not depicted on the 1946 6" map, but this map only shows one channel (Site 15), and it must have been in place to divert the flow from the western outfall (Site 11). It is shown on the 1966 1:2500 map.	
	

Site No: 14	Name: Bradbourne Lake 5
Dimensions: Length 27m	NGR: 551978, 156375
Date first depicted: 1885	HER no
Type: Embankment on the line of a culvert	Photos: B14.1
An artificially raised bank extending northwest/south east from the Site 11 outfall, and corresponds to the line of a channel depicted on the 1885 25" map. It is significantly higher than the ground level to the east and may have been intended to accommodate a leat but if so, there is no indication of a wheel pit at its terminus or a water channel which was shown to have extended immediately south of the modern road for 104m.	
	

Site No: 15	Name: Bradbourne Lake 5
Dimensions: Length 40m	NGR: 551996, 156376
Date first depicted: 1871	HER no
Type: Secondary outfall from Lake 5	Photos: B15.1-B15.7
This is presently the main stream channel and outfall from Lake 5, but was originally an overflow channel. It has a rectangular catchment pond within the lake to capture the flow and control the level of the lake, and this leads to a concrete constructed channel that leads under the footpath. It is generally of modern concrete construction, but the channel has some stone edging and some concrete edging and also in places just an earthen bank it leads from the dam to the modern road. It is shown on the first edition 6" OS map (1871) and possibly also the 1833 sale map. The channel beneath the modern A25 road is a substantial concrete bridge which was intended to take heavy vehicle loads. It has a side ceramic drain set into the concrete structure. While the line of the channel may have some antiquity it has been heavily modified within the past 50-70 years.	
	

Site No: 16	Name: Betenson Avenue
Dimensions: 4m x 3m	NGR: 552057, 156214
Date first depicted: 1897 (in original location)	HER no: MKE115070 – TQ 55 NW 582 Locally Listed Building 10791
Type: Monolith from Stone Circle Folly	Photos: B16.1-B16.2
This is the re located monolith from a late 19th century folly. The original was located to the south west of Bradbourne Hall and was part of a stone circle with eight stones. It was shown in situ on the 1897 25" map and was still in place on the 1941 25" map.	
	

Site No: 18	Name: Bradbourne Lake 4
Dimensions: 14.5m	NGR: 552078, 156184
Date first depicted: 1833	HER no:
Type: Culvert	Photos: B18.1-B18.3
An underground channel that extends from an outfall of Lake 4 into the side stream culvert. It has a grill over the entrance and feeds from a stone and concrete pond that is part of the lake 4 outfall. It is an integral and presumably original of the complex outfall arrangement from Lake 4, and was probably a part of the original outfall arrangement of Lake 4 which was first depicted on the 1833 map, although this may have been substantially modified from its original form.	
	

Site No: 19	Name: Bradbourne Lake 4
Dimensions: 12.0m x 8.9m	NGR: 552076, 156175
Date first depicted: 1871	HER no:
Type: Culvert	Photos: B19.1-B19.5
An outfall weir feeds out from lake 4 down a ramp into a small rectangular pond. It controls the level of the pond and provides a controlled release of water to the stream. The level of the weir controls the level of the water in Lake 4 and there is a drop to a holding pond which then feeds through a culvert into the main side stream. The outfall has a distinctive shape and is evident on the 1871 OS map which is after the pond was landscaped subsequent to the 1840 tithe map; it is possible that the outfall arrangement dates back to 1833 as that map does not show any outfalls or weirs.	
	

Site No: 20	Name: Bradbourne Lake 4
Dimensions: length 52m	NGR: 552063, 156148
Date first depicted: 20 th century	HER no:
Type: Lake 4 revetment wall	Photos: B20.1-B20.2

This is the stone-faced wall of Lake 4 which has dressed stone and mortar, and extends between the Site 19 weir and the Site 21 outfall; it posts dates Site 21 weir. The revetment wall is a later element of the lake and is probably of 20th century date.



Site No: 21	Name: Bradbourne Lakes 3 / 4
Dimensions: length 8.2m width 2.6m	NGR: 552069, 156130
Date first depicted: 1871	HER no:
Type: Outfall Lake 3 to 4	Photos: B21.1-B21.2
A two-stage step weir outfall from Lake 3 to Lake 4, and which defines the water level in Lake 3; there is a drop of c 70cm between that of Lake 3 and Lake 4. There is a lip at the southern part of Lake 3 and then a level (pool) area before a further drop into Lake 4. There is a steady flow through it, and it is constructed of rough dressed stone. The outer facing wall (Site 20) butts up against the weir walling. There is a weir shown in this location on the OS first edition 6" (1871) and the 25" (1879-85) maps. Both maps show a spring immediately to the west of the outfall feeding into Lake 4. This has been blocked by the construction of the lake wall (Site 20) and there is no longer any indication of a spring here. The spring is not depicted on the 1897 map.	
	

Site No: 22	Name: Bradbourne Park
Dimensions: length 12.4m	NGR: 552142, 156142
Date first depicted: 1833	HER no:
Type: Building	Photos: B22.1-B22.3

This comprises a wall constructed on top of the main easterly stream wall. It is a surviving component of an unnamed building shown on the 1833 sale map but seemingly not on the 1801 1" to 1 mile map. This would indicate that the stream channel predates the 1833 sale map, and the building postdates the stream. It is clearly shown on the 1871 6" map and by 1897 was a sizeable domestic complex. It is still shown on the 1950 6 "mapping even though there has been considerable expansion of estates around the lakes. The building no longer survives, and this section of walling is all that survives.



Site No: 23	Name: Bradbourne Lake 3
Dimensions: length 7.8m width 2.5m	NGR: 552100, 156123
Date first depicted: 1833	HER no:
Type: Weir / Lake Outfall	Photos: B23.1-B23.3

This is an outfall from Lake 3 comprising a weir with a 1.3m drop that leads into a culvert beneath the path to lead into the main stream (Site 24). The large Lake 3 also has an outfall (Site 21) into Lake 4, but this outfall leads to the divert stream. This would have provided the overflow channel in times of flood to bypass the flow through Lake 4 and accordingly it is capable of taking considerable flow as is also the bypass stream channel (Site 24). At present there is a comparable flow through both weirs 23 and 21 which would indicate that both are set at the same level. The weir is well constructed in stone and is the bypass main channel leading from Lake 3. It is constructed of poorly dressed masonry with cement mortar and drops down onto a concrete ramp to flow into the channel which extends under a stone constructed bridge supporting the foot path. The channel diverts directly into the main divert stream channel (Site 24). There is seemingly a divert stream channel on the 1833 sale map, but the first definitive indicator of a weir from this point of Lake 3 is on the 1871 first edition 6" map.



Site No: 24	Name: Bradbourne Lakes 3 and 4
Dimensions: length 171m to Lake 5	NGR: 552090, 156179
Date first depicted: 1801	HER no:
Type: Stream channel	Photos: B24.1-B24.6

This is the main stream channel which is fed from the 23 outfalls. The channel has deep sides constructed of rough mortar bonded masonry. There is also a subterranean channel feeding into it which leads in from the south; however, there is only a very limited flow coming through this subterranean channel, but may have had a greater flow in the past or is a further flood bypass channel from Lake 1.

The channel dates back to at least the 1833 sale map which shows the line of a stream adjacent to the series of lakes. The 1801 1" to 1 mile map is fairly schematic but does show a stream that extends from a spring located somewhere in the area of Lake 1, although at this stage there were no lakes. Given that the lakes were subsequently established it is not possible to determine if the stream was in the current position or further to the west on the basis of this somewhat schematic mapping. Interestingly the 1769 map of the area shows that the stream channel extended further to the south and was not supplied by a spring. This raises the possibility that there has always been a stream channel from the south, but which was canalised and turned into a subterranean channel between 1769 and 1801 and as such reflects some hydrological modification.

The main stone-faced stream channel that extends along the eastern side of the four lakes now incorporates cement mortar (having been repointed) with poorly dressed field stones. The channel is also shown on the 1871 6" to 1 mil map and on the 1833 map.



Site No: 25	Name: Bradbourne Lake 1
Dimensions: length 23.9m width 3.1m	NGR: 552118, 156083
Date first depicted: 1871	HER no:
Type: Northern edge of Lake 1 defined by earthen bund	Photos: B25.1

There is a large earthen bund forming the north side of lake 1 and is evidently an artificial feature. It is slightly irregular but is not a recent feature as there are substantial trees growing from it and the make up of the bund is now dominated by roots. It was presumably a mechanism to prevent overflow of the lake in times of flood. It is not a feature that shows up on historic mapping, but probably was put in place when Lake 1 was contracted from its former extended shape form to its present form between the 1833 and 1871 maps. It is probable that there was formerly a channel extending between Lake 1 at this location towards the main stream channel (Site 24), but there is presently no indication of one.



Site No: 26	Name: Bradbourne Lake 1
Dimensions: length 17.2m	NGR: 552136, 156078
Date first depicted: Twentieth century	HER no:
Type: Northern eastern edge of Lake 1 defined by a stone revetment wall	Photos: B26.1
A section of stone wall edging Lake 1 at its north east perimeter. It incorporates well dressed masonry, almost ashlar and contrasts with the rougher constructed lake walling seen elsewhere. It is probably not of great antiquity.	
	

Site No: 27	Name: Bradbourne Lakes 1 and 3
Dimensions: length 6.5m x 2.8m	NGR: 552104, 156076
Date first depicted: 1871	HER no:
Type: weir between Lakes 1 and 3	Photos: B27.1
A stone constructed weir incorporating poorly dressed stone and some field stones. This is off set by a modern low brick wall, which has narrowed the aperture of the weir / outfall. It feeds under an 'I' beam constructed bridge and leads to a series of steps into Lake 3. It is higher than outfall 28 and is now dry and is presumably a high-level overflow. This is the weir / outflow shown on the 1871 first edition 6" map; that further to the west (Site 28) was not shown. Similarly, the 1941 OS 1:2500 map shows this as the only weir / outfall, so Site 28 is clearly a relatively recent feature.	
	

Site No: 28	Name: Bradbourne Lakes 1 and 3
Dimensions: length 12.4m x 4.1m	NGR: 552085, 156066
Date first depicted: later 20 th century	HER no:
Type: weir between Lakes 1 and 3	Photos: B28.1to B28.4
A stone constructed overflow with controlled weir level to define the level for lake 1. There is a blocked pipe at the base of the weir and a now redundant gate mechanism to the west having a concrete block inserted to the east. It was not in place in 1941 and is a later 20 th century modification to control the outfall from Lake 1.	
	

Site No: 29	Name: Bradbourne Lake 2
Dimensions: length 72m	NGR: 552046, 156084
Date first depicted: 1833	HER no:
Type: revetment wall of Lake 2	Photos: B29.1to B29.2
The Lake 2 brick constructed outer wall. It is relatively high by comparison with Lake 3 to the north. The use of mainly brick would suggest it is a later construction. However, the outline of the lake matches that on the 1833 mapping, and it may not have been significantly changed in outline since that date (even though the outer wall may have been rebuilt).	



Site No: 31	Name: Bradbourne Lake 3
Dimensions: length 60m	NGR: 552074, 156087
Date first depicted: 1871	HER no:
Type: revetment wall of Lake 3	Photos: B31.1
A brick topped stone structure or entirely brick wall around the perimeter of the western part of lake 3. The western part of the lake had a constricted outline in 1871 by comparison with that shown on the tithe map (1840) and the 1833 sale map and it is possible this western edge of the lake is a later modification of the lake and this wall also.	
	

Site No: 32	Name: Bradbourne Lake 3
Dimensions: length 32m	NGR: 552059, 156091
Date first depicted: 1871	HER no:
Type: Revetment wall of Lake 3	Photos: B31.1
The southern part of lake 3 is edged by stone masonry and appears to be older than the section to the west, and which would match up with the cartographic evidence which shows that the western edge was a later line.	
	

Site No: 33	Name: Bradbourne Lake 3 / 2
Dimensions: length 5.5m width 1.5m	NGR: 552044, 156086
Date first depicted: 1871	HER no:
Type: Weir	Photos: B33.1 to B33.3
A simple brick constructed weir or outfall between Lakes 2 and 3. It has a gently sloping ramp and then a series of four steps dropping into Lake 3. There is a low flow of water through the weir, which is up to 1.4m above the level of Lake 3. As such Lake 2 is an artificially high lake. There is a sluice marked on the OS 1st edition (1871) and subsequent maps in this location, but significantly there is no outfall shown from Lake 1 into Lake 2. There are a couple of modern pipes extending through the earthen banks separating the two lakes, but these have no flow of water through them at the time of survey and were presumably overflow pipes. Given that there is a low flow of water through the weir into Lake 3, it is presumed that there is a spring beneath Lake 2.	
	

Site No: 34	Name: Bradbourne Lake 1 / 3
Dimensions: length 15m width 3.3m	NGR: 552078, 156067
Date first depicted: unknown	HER no:
Type: outfall from Lake 1	Photos: B34.1 to B34.3
This is a section of overflow channel leading from an earthen outfall aperture to south and north and leads into Lake 3. However, it is not shown on any of the historic maps. The site has been landscaped to allow for the path and there is little sign of the channel, but there is an inlet to it from Lake 1 and an outfall point feeding into Lake 3. The inlet incorporates concrete, and it may not be that old.	
	

Site No: 35	Name: Bradbourne Lake 1
Dimensions: width 3m	NGR: 552101, 156024
Date first depicted: 1871	HER no:
Type: channel feeding Lake 1	Photos: B35.1 to B35.2
This is the primary inflow to Lake 1, and there is a very limited flow of water from it. This would raise the question where the majority of the water is coming from. The stream inflow channel is shown on the 1st edition OS map (1885) and also on the 1769 map as being the primary stream channel. Interestingly the 1871 OS 1st edition map shows this channel but also two springs immediately to the west of Lake 1. Given that there is very little flow into the Lake from the stream channel, but there is a considerable flow into Lake 3 from Lake 1, it is to be assumed that those two springs are still active and presumably under the present Lake. It is understood that the flow through this channel is mainly run off from the roads and the surrounding housing estate.	
	

Site No: 36	Name: Bradbourne Lake 3
Dimensions: width 11m	NGR: 552104, 156084
Date first depicted: 1909	HER no:
Type: revetment walling for Lake 3	Photos: B36.1
This is a section of stone walling on the east side of Lake 3.	
	

Site No: 37	Name: Bradbourne Hall Pleasure Ground
Dimensions: 41m diameter	NGR: 552039, 156190
Date first depicted: 1909	HER no:
Type: Former plantation	Photos:
The outline of a sub-circular feature that is evident from the LiDAR, but which was not evident from the ground. It is truncated by housing plots to the north west. It corresponds with the outline of a circular plantation that was depicted on the 1909 25" map.	
	

Site No: 38	Name: Bradbourne Watermill
Dimensions: 41m diameter	NGR: 552000, 156400
Date first depicted: Unknown	HER no: MKE116484
Type: Purported watermill	Photos: N/A
The location of a watermill from the HER, which does not provide the source of information and anything about the site. The coordinates are six figure and therefore accurate to +/- 100m at best. No eighteenth century or later mapping shows a watermill so any mill must have been abandoned by the time of the earliest map in 1769. It is close to the line of the Brad stream, and it is presumed that it would have been located on it or a separate feed from it.	

Site No: 39	Name: Bradbourne Hall Farm
Dimensions: 17m x 10m	NGR: 552160, 156060
Date first depicted: 1833	HER no: MKE83707
Type: Farmhouse	Photos: N/A
Bradbourne Hall Farm had a courtyard arrangement and was formerly shown on the 1833 mapping, immediately to the east of Lake 1. Near to it is the location of the clock house (outside the study area), which was not shown on the 1833 sales map. The farm house survives but the rest of the farm has gone, in part because of the straightening and expansion of Lombard Road.	

Site No: 40	Name: Robyns Way
Dimensions:	NGR: 552160, 156060
Date first depicted: 1933-36	HER no: MKE77819 (TQ 55 NW 352)
Type: Pillar Box	Photos: N/A
A George V pillar box, Robyns Way / Betenson Avenue. Letter Box Study Group Box Type: 27/2. Dates from 1933 to 1936.	

Site No: 41	Name: Bradbourne Hall
Dimensions:	NGR: 551942, 156179
Date: 1689	HER no: MKE78339 (TQ 55 NW 344)
Type: Site of Bradbourne Hall	Photos:
Bradbourne Hall was the mansion at the heart of Bradbourne Park. It was constructed in 1689 by William Bosville on the site of the medieval house. The building was demolished in 1937 as part of the development of the housing estate.	
	

Site No: 42	Name: Bradbourne Lake 5
Dimensions: 83m x 36m	NGR: 552018, 156325
Date: 1801	HER no: MKE115125 (TQ 55 NW 610)
Type: Artificial lake	Photos:
Lake 5 is the earliest of the lakes, and was shown on the 1801 Mudge map, and had at the time a trapezoidal shape, which reflects the construction of a dam but without any specific landscaping of the lake. It had been developed into its present form by the time of the 1833 sales map. The lake had an original weir (Site 11) intended to control the outfall of the lake and also seemingly had an overflow channel (15) feeding into the main stream. The adoption of two outfalls would suggest that from the outset it was intended to provide power or a controlled water supply, although there is no depiction of a mill on any of the maps.	
	

Site No: 43	Name: Bradbourne Lake 4 (Boating Pond)
Dimensions: 37m x 28m	NGR: 552077, 156151
Date: 1833	HER no: MKE115125 (TQ 55 NW 610)
Type: Artificial lake	Photos: B20.1 – B20.2
Lake 4 is one of the four rectangular lakes that had been formed by the time of the 1833 estate map. Their rectangular shape is potentially significant as they would not have been established to serve as part of pleasure grounds, which would have had a more irregular, natural shape conforming to the picturesque movement, emphasising naturalistic and romanticised landscapes. As such these would appear to be more functional, even though they were within an area of parkland. This lake has subsequently been adopted as a boating lake or pond. It is fed from Lake 3 (Site 21) and then has an outfall via a subterranean culvert (Site 18) into the side stream channel.	



Site No: 44	Name: Bradbourne Lake 3
Dimensions: 67m x 55m	NGR: 552090, 156073
Date: 1833	HER no: MKE115125 (TQ 55 NW 610)
Type: Artificial lake	Photos: Lake 3.2-3.4
Lake 3 is the combination of two of the rectangular lakes that had been formed by the time of the 1833 estate map. Their rectangular shape is potentially significant as they would not have been established to serve as part of pleasure grounds, which would have had a more irregular, natural shape conforming to the picturesque movement, emphasising naturalistic and romanticised landscapes. As such these would appear to be more functional, even though they were within an area of parkland. Lake 3 was merged from two of the original four rectangular lakes between 1840 and 1871, taking on a more irregular and rounded shape. It is possible that this modification was intended to give it a more naturalistic shape. The lake is presently fed by three weirs (Sites 27, 28, and 33), there was a further weir (Site 34), but this has been blocked. It has two outfalls, one an over flow weir (Site 23) into the stream channel and one Site 21) feeding into Lake 4.	
	

Site No: 45	Name: Bradbourne Lake 2
Dimensions: 67m x 55m	NGR: 552090, 156073
Date: 1833	HER no: MKE115125 (TQ 55 NW 610)
Type: Artificial lake	Photos: Lake 3.2
Lake 2 is one of the four rectangular lakes that had been formed by the time of the 1833 estate map. Their rectangular shape is potentially significant as they would not have been established to serve as part of pleasure grounds, which would have had a more irregular, natural shape conforming to the picturesque movement, emphasising naturalistic and romanticised landscapes. As such these would appear to be more functional, even though they were within an area of parkland. Lake 2 has not significantly changed in outline since it was first depicted on the 1833 sales map. It is defined by a brick outer wall and is above Lakes 3 and 4, but is separated by an earthen bank / bund from Lake 1. Significantly there is no indication of a feeder channel from Lake 1, and there is no visible evidence of any water flowing into it; yet there is an outflow from the weir (Site 33). This would indicate that the lake is entirely fed from springs extending through the base of the lake.	
	

Site No: 46	Name: Bradbourne Lake 1
Dimensions: 109m x 44m	NGR: 552098, 156050
Date: 1833 / 1801	HER no: MKE115125 (TQ 55 NW 610)
Type: Artificial lake	Photos:

Lake 1 is the large lake at the southern part of the lakes group. A spring is shown in the location of this lake on the 1801 map, and may have been a small pond at that time but was not a lake in the form that it subsequently became.

By the time of the 1833 map, it had expanded from a tiny pond into a curved lake which converges at its northern end into the main stream channel (Site 24), and this map shows it at its greatest extent. By the time of the 1971 map the link between the lake and the stream channel had been visually broken, although it's possible that there was a subterranean channel linking them. Its north eastern edge was instead defined by an earthen bund (Site 25) and a retaining wall (Site 26). There is a considerable outflow from this lake into Lake 3, but the inflow channel (Site 35) has almost no flow, and would indicate that the majority of the water entering the lake is from springs feeding through the base of the lake.



APPENDIX C ARBORICULTURAL IMPACT ASSESSMENT PLAN

Report prepared by: **PJC Consultancy Ltd**

Author: **Peter Davies**

PJC



ARBORICULTURAL IMPACT ASSESSMENT, METHOD STATEMENT AND TREE PROTECTION PLAN

**Bradbourne Lakes
Sevenoaks
Kent**

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1 INTRODUCTION

1.1 Instruction

1.1.1 PJC Consultancy has been instructed by Sevenoaks District Council to provide an arboricultural impact assessment and arboricultural method statement to support a full application for the de-silting of the ornamental lakes and conservation of the lake edges at Bradbourne Lakes.

1.1.2 This report complies with the recommendations of British Standard BS5837: 2012 Trees in relation to design, demolition and construction – Recommendations (the British Standard).

1.2 Objectives of report

1.2.1 This report has been undertaken with the following objectives:

- To survey all trees within and adjacent to the site with trunk diameters of 75mm or more at a height of 1.5m.
- To assess the quality and value of the existing tree stock in terms of arboricultural, landscape, historical/conservation, or public amenity value.
- To provide information relating to planning constraints that may restrict works to trees at the site.
- To identify the tree removals and pruning works that will be required as a result of the proposed development and to assess the impact of the tree works.
- To assess the potential impact the proposed construction works will have on retained trees and provide recommendations for mitigation measures to reduce the impact on the trees.
- To provide a protection methodology for retained trees throughout the demolition and construction period, including the above ground and below ground parts of the trees as well as their rooting medium.

1.3 Contents of report

1.3.1 This report includes:

- A tree constraints plan and tree survey schedule at Appendices 1 & 2 respectively.
- An arboricultural impact assessment at section 3 and a tree retention plan at Appendix 3.
- A preliminary arboricultural method statement at section 4.

1.4 Documents and information provided

1.4.1 The following documents were used to aid the preparation of this report:

- Topographical Survey ref: 6722-SITE_2D-R2
- General Arrangement Masterplan ref: 13362-LUC-XX-XX-DR-L-0111 Rev P01
- Topsoiling Plan North ref: 13362-LUC-XX-XX-DR-L-0311 Rev P01
- Topsoiling Plan South ref: 13362-LUC-XX-XX-DR-L-0312 Rev P01
- Soft Landscape Plan North ref: 13362-LUC-XX-XX-DR-L-0411 Rev P01
- Soft Landscape Plan South ref: 13362-LUC-XX-XX-DR-L-0412 Rev P01



1.5 Limitations of report

- 1.5.1 The following arboricultural impact assessment and method statement have been prepared for the proposal stated in section 1.1 and using the plans and information listed in section 1.4. The report should not be relied upon if the stated proposal or proposed design changes unless the author confirms the changes do not have a bearing on the arboricultural impacts or recommended mitigation measures.
- 1.5.2 The survey methodology was restricted to a visual tree assessment from ground level. No tree climbing or invasive ground investigation was carried out for this report. Where existing site constraints are present such as ivy covered trees, a very dense under-storey, or where trees are located on third party land to which access was not granted, tree dimensions were estimated by eye as accurately as possible.
- 1.5.3 The tree survey represents a preliminary overview of the condition and value of trees at the site. It is not a detailed assessment of any individual tree and although management recommendations are included, this report will not be sufficient to be used as a detailed condition and safety survey.
- 1.5.4 The information and measurements in this report are representative of the date of the site visit. The tree survey data will need to be updated to reflect tree growth and changes in the condition of the trees after prolonged periods.



2 INITIAL TREE SURVEY

2.1 Tree survey information

2.1.1 The following information was recorded in the tree survey schedule for each individual tree (average dimensions are recorded for groups):

- Tree reference number. (T=tree, G=group). Tree numbers suffixed with PA on the tree constraints plan indicate that the tree position is approximate.
- Species (common and scientific name).
- Overall tree height (m).
- Stem diameter (mm) per stem or average diameter for multi-stemmed trees with six or more stems.
- Branch spread (m) measured to the four cardinal points.
- Existing height (m) above ground level of lowest significant branch and direction of growth (for individual trees only).
- Existing height (m) above ground level of canopy.
- Age class (young, semi mature, early mature, mature, over mature or veteran).
- Physiological condition (good, fair, poor).
- Structural condition (good, fair, poor).
- Comments (general description of tree(s) including any notable features).
- Tree categorisation (see below).
- Root protection area (m²).
- Root protection radius (m).

2.2 Tree categorisation

2.2.1 The condition and value of each tree was evaluated based on the current land use. Each tree or tree group has been awarded either category A, B, C or U and a subcategory of either 1,2 or 3 or a combination of the subcategories.

2.2.2 Tree categorisation summary:

- A – Trees of good condition and high arboricultural, landscape or conservation value. Must have a potential life span in excess of forty years.
- B – Trees of moderate condition, with minor defects or sub-optimal form but are still of modest arboricultural, landscape or conservation value. Must have a potential life span in excess of twenty years.
- C – Unremarkable trees of poor condition or form with limited arboricultural, landscape or conservation value, or trees with a stem diameter under 150mm. Must have a potential life span in excess of ten years.
- U – Trees of such impaired condition that they cannot realistically be retained as living trees in the context of the current land use for more than ten years. These trees do not need to be removed if they are not dangerous and do not conflict with the proposed development, but should not be considered a constraint to development.



- 2.2.3 Tree sub categorisation summary:
- 1 – Trees have mainly arboricultural value, e.g. trees of good condition, form and vitality or rare tree species.
 - 2 – Trees have mainly landscape value, e.g. trees of landscape prominence, that serve to screen unsightly views or that are required for privacy. Also trees present in groups that attain higher collective rating that they would as individuals.
 - 3 – Trees with mainly cultural value including conservation, e.g. commemorative trees, trees of historical significance or veteran trees.
- 2.2.4 Each tree can only be categorised as A, B or C but may comply with more than one subcategory.

2.3 Root protection areas

- 2.3.1 A root protection area represents a calculation of the minimum volume of rooting medium required to support a tree. It is a standardised calculation based on the stem diameter(s) measured at 1.5m and is not necessarily representative of the actual root spread or total rooting area of a tree. The formulas used to calculate root protection areas are shown below:

Table 1: Root protection area formulas

Number of stems	Root protection area formula
Single stemmed trees	$\frac{(\text{stem diameter (mm)} \times 12)^2 \times \pi}{1000}$
Trees with more than five stems	$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$

- 2.3.2 The root protection areas are plotted onto the tree constraints plan in Appendix 1 and are recorded in the tree survey schedule in Appendix 2. These are represented as a circle on the plan (unless significant rooting constraints are present), and are colour coded depending on the category the tree has been awarded. Where existing site conditions/features are present that are deemed likely to have affected the root morphology, the root protection areas have been represented as a polygon of equivalent area.
- 2.3.3 The disturbance of a tree's root system can result in crown dieback and even death of the tree. Roots are used to support the tree structurally as well as the absorption of moisture and nutrients from the soil. They also act as storage and transport for water and nutrients. It is therefore important to protect roots and their ability to function during the construction period and post development.
- 2.3.4 The majority of root growth is usually found within the top 600mm of soil. As such, even a shallow disturbance within a root protection area can potentially have a significant impact on the tree.
- 2.4 Site visit
- 2.4.1 The tree survey was undertaken in April 2025. The weather conditions at the time were clear and dry. The visibility was adequate for visual tree inspection from ground level. Deciduous trees were in partial leaf.



2.5 Site layout

2.5.1 Bradbourne Lakes is a public park located between A25 Bradbourne Vale Road, Lambard Road, Lake View Road and Robyns Way is Sevenoaks. The park is intersected across the centre by Betenson Avenue. There are four lakes in the southern half of the park and one in the northern half, all of which are connected by streams. Public access is available throughout the majority of the park, with the exception of a storage area between Lake 1 and Lake 2, as well as narrow strips of land along the shore of Lake 1 and Lake 5, which are only accessible from private gardens.

2.6 Findings

2.6.1 A total of 374 individual trees and 30 tree groups were surveyed. Their locations are shown on the tree constraints plan at Appendix 1 and details and measurements are shown in the tree survey schedule at Appendix 2.

2.6.2 A summary of their British Standard categorisation is shown at Table 2 below.

Table 2: Tree categorisation summary

C	137	25

2.6.3 A check of 'MAGIC'¹ map showed there to be no woodland within/adjacent to the site that is designated as ancient woodland. Ancient woodland is any area that's been continuously wooded since at least 1600 AD.

2.6.4 One London plane (T403) is assessed to be a veteran tree due to its significant canopy size and stem diameter. As such, it has been afforded a larger root protection area (30.9m radius).

2.7 Statutory tree protection

2.7.1 Sevenoaks District Council's online mapping tool was used on 10th November 2025 to check whether there are any tree preservation orders (TPOs) within the site. No TPOs were shown within the site, however TPO No. 4 pf 1992 was shown to protect an offsite lime (T90 in this report) located outside the northern park boundary.

2.7.2 A persons proposing to undertake tree works within the site should still check the status of the trees with the local planning authority prior to undertaking any tree works. Failure to adhere to the TPO legislation could lead to prosecution and if convicted a fine and criminal record. The crown of a tree and its roots are protected. The person carrying out the works, the person instructing the works and the Directors of that company are potentially liable. Failure to check whether tree/s are the subject of TPO/s could not be used as mitigation.

2.7.3 The site is not in a Conservation Area.

¹ The DEFRA MAGIC map website provides authoritative geographic information about the natural environment across government: www.magic.defra.gov.uk



3 ARBORICULTURAL IMPACT ASSESSMENT

3.1 The proposals

- 3.1.1 The proposal that is the subject of this report is to de-silt all five lakes at the site, and where necessary make repairs to the banks of the lakes. The silt that is removed from the lakes will temporarily be stored within the site for circa six months to dry out, and then be removed offsite.
- 3.1.2 Further improvements are proposed to the park including the construction of a new play area, the installation of interpretation boards, re-surfacing of paths, installation of new seating, repair of waterfall walls, installation of an eco-toilet and installation of cycle racks. These additional works are not part of this planning application so are not assessed in this report.

3.2 Tree removals

- 3.2.1 Trees that are to be removed to facilitate the de-silting of the ponds are shown with dashed outlines on the tree retention plan at Appendix 3 and are shaded to indicate their BS5837 tree category. A summary is listed at Table 3 below.

Table 3: Tree removals summary

Tree category	Trees to be felled	Total
B		
C	T8, T15, T16, T44, T45, T47, T50, T74, T75, G111, T115, T135, T137, T138, T140, T143, T207, T208, T210, T211, T212, T213, T214, T215, T221, T222, T223, T226, G230, T235, G246, T261, T268, T272, T273, T276, T277, T279, T284, T288, G289, G292,	48x individual trees and six groups
U	T21, T24, T27, T206, G209, T217, T220, T228, T291, T297	x individual tree and one group

- 3.2.2 The above tree removals are proposed for a number of reasons including the following:
- To reduce canopy overhang above the lakes to minimise leaf detritus falling into the water.
 - To enable repairs to the banks of the lakes (access and ground works within root protection areas).
 - To prevent further damage to the banks of the lakes from secondary stem and root growth.
- 3.2.3 Site meetings were undertaken with the drainage and hydrology engineer as well as the local authority tree officer to determine an appropriate tree retention strategy that would provide a compromise between the proposed works to secure the long-term protection of the lakes, whilst having the minimum landscape impact and loss of canopy cover at the site.
- 3.2.4 The tree removals listed in table 3 are specifically tree removals required to enable the de-silting of the ponds. Further tree removals are proposed as part of the wider improvement works for the park that do not require permission from the local authority, however have been shown on the tree retention plan (trees with magenta dashed canopy outlines) and noted in the tree survey schedule to help assess the overall impact of the proposals.



3.3 Mitigation planting

- 3.3.1 The LUC General Arrangement Masterplan indicates that new tree planting will occur throughout the park, however the detailed soft landscape proposals for the proposed development are to be confirmed on the date of this report. These could readily be secured by a planning condition.

3.4 Access facilitation pruning

- 3.4.1 Based on the information currently available it is assessed that T106, T108 and T332 are likely to require access facilitation pruning to enable the proposed de-silting works to the ponds. The exact specifications for the above pruning works, along with any additional requirements for pruning that cannot be predicted at this stage in the design process (e.g. for contractor compound or movement of plant machinery throughout the park) shall be discussed at the pre-commencement meeting with the project arboriculturist and agreed with the local authority arboricultural officer.
- 3.4.2 All tree works are to be carried out in accordance with BS3998: 2010 Tree works – Recommendations.

3.5 Works within root protection areas

- 3.5.1 The detailed construction logistics plan is to be confirmed on the date of this report, however in essence it is proposed to temporarily drain the ponds and carefully use plant machinery to scrape out the slit down to the level of the clay lining and then remove the slit from the ponds. This will occur within the root protection areas of numerous trees, including the veteran London plane, however due to the anaerobic conditions beneath the ponds it is considered highly unlikely that roots will be revealed, particularly as the clay lining must be retained and undamaged. As a precaution, a banksman must be used at all times during these works to spot roots that are not visible to the machine operator. If roots are revealed, the use of the machine must immediately cease and the project arboriculturist contacted.
- 3.5.2 The slit that is removed is to be temporarily stored on site for circa six months to dry out, then it will be completely removed offsite. To dry the slit onsite, it will be necessary to spread it out throughout the park to a depth of up to circa 1.2m (this level will reduce as the slit dries out). Due to the extent of tree cover at the park, there is not enough space for the slit to be stored outside of all root protection areas. The slit will be contained by hay bales so there will be no excavation required to enable its storage on site. It will be spread over a permeable landscape membrane, which will help ensure the underlying soil is not damaged when the silt is eventually removed. It is important that the slit is not stored against tree stems or shallow buttress roots, as these could easily be damaged by plant machinery when the slit is removed.



4 PRELIMINARY ARBORICULTURAL METHOD STATEMENT

4.1 Initial tree works

- 4.1.1 The tree removals specified in the arboricultural impact assessment shall be carried out as the first stage of development. Any requirements for access facilitation pruning which have not been anticipated on the date of this report shall be discussed at the pre-commencement meeting with the project arboriculturist and be agreed with the local authority arboricultural officer.
- 4.1.2 Tree stumps and vegetation located within the root protection areas of retained trees shall be cleared with controlled hand tools (e.g. stump grinder/brush cutter). Plant machinery shall not be used to scrape vegetation or 'grub out' stumps within root protection areas.
- 4.1.3 If bonfires are lit to dispose of arisings from the vegetation or tree clearance works, an assessment of wind direction and strength shall be made to ensure flames cannot extend within 5m of any part of a retained tree. No bonfires shall be lit within a root protection area.
- 4.1.4 Trees should be checked for protected species before works are undertaken. It is against the law to disturb bats or their roosts under the Conservation of Habitat and Species Regulations. Nesting birds are protected by the Wildlife and Countryside Act. If protected species are discovered, Natural England should be contacted for advice.
- 4.1.5 The tree works contractors should carry out all tree works to BS3998: 2010 Tree works – recommendations as modified by research that is more recent. They should also carry relevant, adequate and up to date insurance.

4.2 Tree protection barriers

- 4.2.1 The proposed de-silting works and slit drying works will require plant movement to occur throughout the park, including within the root protection areas of retained trees. It will therefore not be anticipated to be feasible to use tree protection fencing as a method of creating construction exclusion zones around root protection areas, however the use of fencing or hoarding to protect tree stems may be appropriate (to be confirmed when construction logistics plan is available).
- 4.2.2 It is proposed for the de-siting works to begin in October time and to occur over winter. During this time of year, the ground (expected to be loamy according to <https://www.landis.org.uk/soilscapes/>) is likely to be wet and therefore more susceptible to compaction which will be damaging to root growth and function. It is therefore important to prevent plant machinery from driving over exposed ground within root protection areas by using temporary ground protection.
- 4.2.3 The specification for temporary ground protection will depend on the type and size of plant machinery required (to be confirmed on the date of this report). An example specification for ground protection suitable for loading up to 2 tonnes: would be interlocking proprietary ground protection boards (e.g. IsoTrack L Ground Protection Mat or equivalent product signed off by the project arboriculturist) on a compressible layer (150mm woodchip from the initial tree works or sharp sand), spread across a geotextile membrane.
- 4.2.4 If larger loads need to be supported, a more robust ground protection specification shall be agreed with the project arboriculturist based on one of the following:
 - A cellular confinement system such as CellWeb TRP or similar product agreed with the project arboriculturist and installed to the manufacturers specification, with a temporary surface such as plastic/metal road plates.
 - A heavy-duty proprietary ground protection system adequate to support the anticipated range of construction traffic (provided by IsoTrack or similar product).



- Pre-cast reinforced concrete slabs.
- A bespoke ground protection system made to an engineer's specification and signed off by the project arboriculturist.

4.3 Storage and handling of harmful chemicals

- 4.3.1 Provision must be taken to prevent the storage and handling of harmful chemicals within the root protection areas of retained trees. Harmful chemicals include fuels, oils, bitumen, builder's sand (which has a high salt content) and cement. Provision shall also be made to prevent the storage and handling of harmful chemicals in areas proposed for further planting if the existing soil is intended to be retained.
- 4.3.2 Cement mixing shall always occur outside the root protection areas. If cement mixing is to occur close to a root protection area, or there is the potential for cement washings to leech into a root protection area, adequate, bunded ground protection measures must be used. This could comprise impermeable plastic sheeting under wooden boards (to prevent tears) surrounded by a raised lip.
- 4.3.3 All other chemicals that are harmful to trees must be stowed in suitable containers and stored away from the root protection areas unless adequate, bunded ground protection measures are implemented to prevent spillages leeching into root protection areas.

4.4 Contractor facilities and site set up

- 4.4.1 A suitable location for site cabins, contractor parking and site facilities for operatives shall be agreed with the project arboriculturist during the pre-commencement meeting if not already specified in a construction management plan that has been signed off by the project arboriculturist. These facilities must be located outside the root protection areas of all retained trees unless on adequate ground protection measures that have been signed off with the project arboriculturist (potentially including existing hard standing). Provision must be taken to prevent exhaust fumes or hot air from generators or kitchen facilities from damaging foliage within the crowns of retained trees.
- 4.4.2 Care must be taken when unloading materials from flatbed lorries in proximity to retained trees to avoid damage to the crowns. A designated banksman must be utilised to ensure the crowns are not contacted when unloading with a vehicle mounted crane.

4.5 Pre-commencement arboricultural consultancy input

- 4.5.1 Prior to the commencement of works, arboricultural input will be required for the following aspects of development:
1. The construction logistics plan.
 2. The type and size of plant machinery required.
 3. The specification for temporary ground protection.
- 4.5.2 If these aspects of the project have a material impact on the guidance in this method statement, the arboricultural method statement shall be updated and the revised information submitted to the local authority tree officer for approval.

4.6 Pre-commencement meeting

- 4.6.1 A pre-commencement meeting shall be held between the contractors and the project arboriculturist. The local authority arboricultural officer shall be given reasonable notice of the pre-commencement meeting so they may also attend. The purpose of the pre-commencement meeting shall be:
1. To clarify the tree protection methodology with the site manager.



2. To discuss the chronology and phasing of the project with the site manager.
 3. To sign off that the pre-commencement tree works have been completed as specified in the arboricultural impact assessment, and to discuss any requirements for any pruning which have not been anticipated prior to the meeting.
 4. To sign off that temporary ground protection has been installed in appropriate locations and to the agreed specification.
 5. To agree with the local authority arboricultural officer the type and timings of arboricultural monitoring necessary.
- 4.6.2 Following this meeting, if the local authority arboricultural officer has not been able to attend, an email outlining the actions discussed will be sent to the tree officer for approval. If necessary, a revised tree protection plan and method statement will be issued for approval.
- 4.7 Arboricultural monitoring**
- 4.7.1 The site manager shall provide a monthly update to the project arboriculturist including photographic evidence that the temporary ground protection and tree protection methodology has been adhered to.
- 4.7.2 In addition to the above, a system and programme of onsite monitoring by the appointed arboricultural consultant shall be agreed with the Local Authority Arboricultural Officer. The form and frequency of site monitoring shall be agreed at the pre-commencement meeting.
- 4.7.3 Upon completion of the works including the improvement works to the park that are outside the scope of this report and the removal of the dry slit, a final inspection of all trees at the site should be made to check for potential damage that has occurred during the construction period, including soil compaction in root protection areas, so that recommendations for remedial actions can be made where appropriate.
- 4.8 Process if an unforeseen issue relating to trees arises**
- 4.8.1 If significant root growth is disturbed during construction activities that are not within the scope of this report, the work shall cease until the project arboriculturist has been consulted. Roots greater than 25mm in diameter or dense/matted fibrous roots shall be considered significant root growth. It should be remembered that whilst root protection areas are part of industry best practice, tree root growth is influenced by a number of factors and may not conform to expected ideals.
- 4.8.2 If at any time during the construction process, damage is inadvertently caused to a tree, the project arboriculturist shall be notified to assess the likely implications and to prescribe potential remedial measures to be implemented. Damage can be in the form of chemical or fuel spillage, mechanical damage to either the above ground parts of the tree or the roots, fire or any other unforeseen circumstance.
- 4.8.3 The supervising arboriculturist shall be appointed by the contractor. It will be necessary for the arboriculturist to report to the local planning authority on the outcome of the site visits as well as any unforeseen tree related issues.

