

South Cambridgeshire District Council and Cambridge City Council
**Greater Cambridge Green Infrastructure
Opportunity Mapping**

Baseline Report
Prepared by LUC
November 2020

South Cambridgeshire District Council and Cambridge City Council Greater Cambridge Green Infrastructure Opportunity Mapping

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Chapter 1 - Executive Summary

Introduction

1.1 A high quality and resilient natural environment is increasingly recognised as a ‘must have’, rather than ‘nice to have’. It helps to mitigate and adapt to climate change, to conserve and enhance biodiversity, to improve health and wellbeing, whilst restoring and maintaining local distinctiveness. The declaration of emissions targets and a climate emergency by South Cambridgeshire District Council and Cambridge City Council ('the Councils'), as well as the 'doubling nature vision', have increased the importance of these issues locally.

1.2 The Councils have committed to preparing a joint Local Plan for their combined area, to cover the period to 2041, and commissioned LUC to undertake a Green Infrastructure (GI) Opportunity Mapping project to ensure the forthcoming joint Local Plan is based on sound evidence; including deliverable interventions to enhance the GI network.

1.3 The overall aims of the study were twofold:

- to provide a robust evidence base on the quantity and quality of existing GI assets and networks within Greater Cambridge; and
- through analysis and consultation, identify specific and deliverable opportunities to enhance and expand the network, supported by appropriate local plan policies.

1.4 The National Planning Policy Framework (NPPF) provides the overarching rationale for the study, guiding what the study should comprise, and how the network of existing and new GI assets should be strategically planned. The study also draws upon a range of national, regional and local policies and was developed in close collaboration with existing initiatives and the wider evidence base for the Local Plan. The study was supported by a comprehensive stakeholder engagement programme with relevant officers of the Councils, neighbouring authorities and local stakeholders.

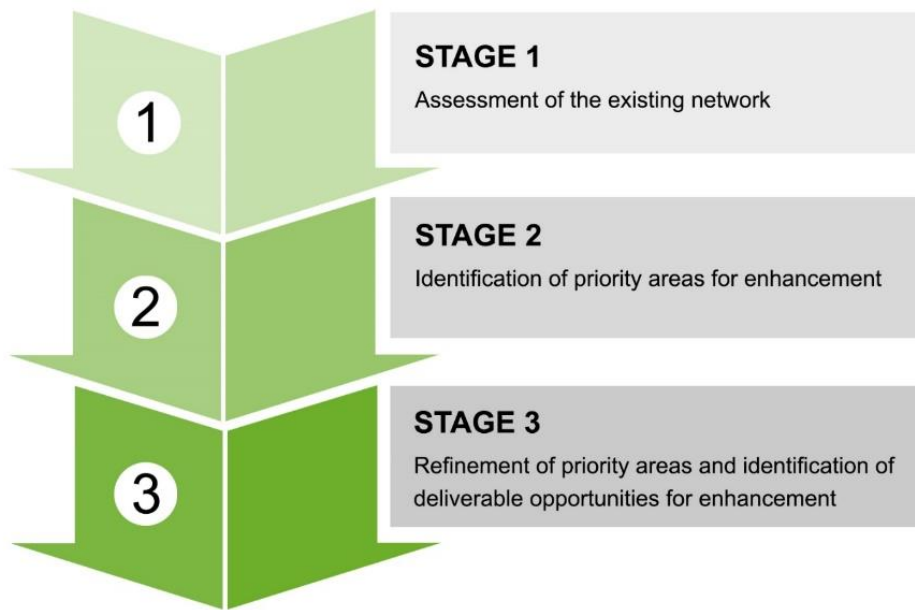
Methodology

1.5 This interim report covers Stages 1 and 2 of the three main stages set out in Figure 1.1. These stages include:

- a review of the relevant policy framework;
- a desk-based exercise to develop a comprehensive map of the GI network;
- a desk-based evaluation of the various functions of the GI network to identify issues and opportunities relating to GI in Greater Cambridge;
- a programme of stakeholder engagement; and
- the identification of broad opportunity zones for enhancing the GI network.

1.6 Stage 3 will follow on once a preferred strategic spatial option has been selected. This will include the refinement of the broad opportunity zones and the identification of a range of projects that could be delivered to enhance the GI network.

Figure 1.1: Methodology



1.7 GI assets provide ecosystem services (the benefits provided to people by ecosystems and the biodiversity they contain) for environmental, social and economic benefit. To provide a comprehensive baseline and evaluation of the GI network in Greater Cambridge, a 'themed' approach to the assessment was undertaken. This desk-based analysis was undertaken in order to understand the various functions and ecosystem services, including the multi-functional benefits, provided by the GI network. Ecosystem services were categorised into seven 'GI themes', as indicated below:

- Landscape, cultural heritage and sense of place;
- Biodiversity and geodiversity;
- The water environment;
- Access and connectivity;
- Recreation and play;
- Carbon sequestration; and
- Agriculture and community food growing.

1.8 In addition to these seven themes, the cross-cutting themes of climate change, wellbeing and social inclusion, and environmental factors (which includes, for example, air quality, rainfall, temperature regulation and noise) are considered throughout.

1.9 All of the information gleaned from the review of evidence and stakeholder consultation was brought together to support the identification of priority areas for enhancement, culminating in the mapping of 'broad opportunity zones' in Geographic Information Systems (GIS).

Mapping the GI network

1.10 In planning for the future, it is vital that there is an up-to-date understanding of the extent and condition of the GI network. Mapping the GI network was the focus of the initial stage of this study. In order to build up a map of the existing GI network, relevant GIS data sets were

collected from a range of open data sources as well as organisations who were able to contribute local data. The first draft of the combined layer was consulted upon through an interactive map. Stakeholder feedback was used to manually improve some areas of the map. This work was undertaken to understand the baseline GI position to support the Doubling Nature Vision. The GI network is shown in Figure 1.2.

1.11 Efforts to get a comprehensive understanding of the quality and accessibility of GI assets were hampered by lack of suitable data, but parallel mapping workstreams (ongoing) will add to our understanding of the quality and accessibility of GI assets.

GI themes

1.12 GI assets were assessed individually and collectively using a series of thematic maps to provide an indication of how the network is functioning against these GI themes. A desk-based review was undertaken of the non-development related risks posed by climate change, water stress, pests and diseases. Specific consideration was given to the vulnerability of international and national designated sites to recreational pressures, predicted population change and the current condition of Greater Cambridge's lowland peat resource.

1.13 The desk based assessment was supported by additional stakeholder engagement comprising an online survey and a series of technical stakeholder workshops.

1.14 The evaluation of the seven GI themes is structured in the following way:

- 'Why is the theme relevant to GI?' explains the importance of the theme in the context of GI and highlights how the theme links to climate change, wellbeing and social inclusion, and environmental factors;
- 'Existing and emerging evidence' summarises the relevant resources, strategy and policy documents that have been reviewed to provide the evidence and highlights emerging evidence that should be reviewed once published;
- 'Key GI assets' provides a detailed overview of the assets within Greater Cambridge that form part of the network. It should be noted that GI assets, due to their multifunctional nature, can often relate to more than one theme. Cross-boundary assets have also been included where relevant;
- 'Key issues' identifies the existing issues with regards to the quantity, quality, accessibility and potential future risks to the identified GI assets;
- 'Key opportunities' highlights areas where the GI network can be enhanced based upon the issues identified. At this stage, these opportunities do not reference specific project opportunities; this will be the focus of the next stage of this study.
- 'Broad opportunity zones' builds upon the identification of key issues and opportunities to identify a series of zones where opportunities could be realised. Where relevant, these are mapped.

1.15 Figures 1.3 and 1.4 show the individual GI theme broad opportunity zone maps as well as a cumulative view of all of the broad opportunity zones (on Figure 1.4). The cumulative view shows the areas where GI interventions might deliver a number of ecosystem services and related benefits. These broad enhancement zones will be refined in the next stage of this study (with reference to the preferred spatial option). Whilst there are locations where enhancement or creation of GI assets to support a single function will be important (for example biodiversity), it is anticipated that the areas where multiple opportunity zones overlap will inform the priority areas of search for more specific, deliverable GI project opportunities.

1.16 The mapping highlights river corridors as key areas where GI interventions could result in multiple benefits. There are large areas of multi-theme opportunity to the south east and south of Cambridge. North east of Cambridge presents multiple opportunities as do areas west of Cambridge around Bourn and Kingston. Opportunities associated with the northern fens, washes and wetlands feature in multiple themes.

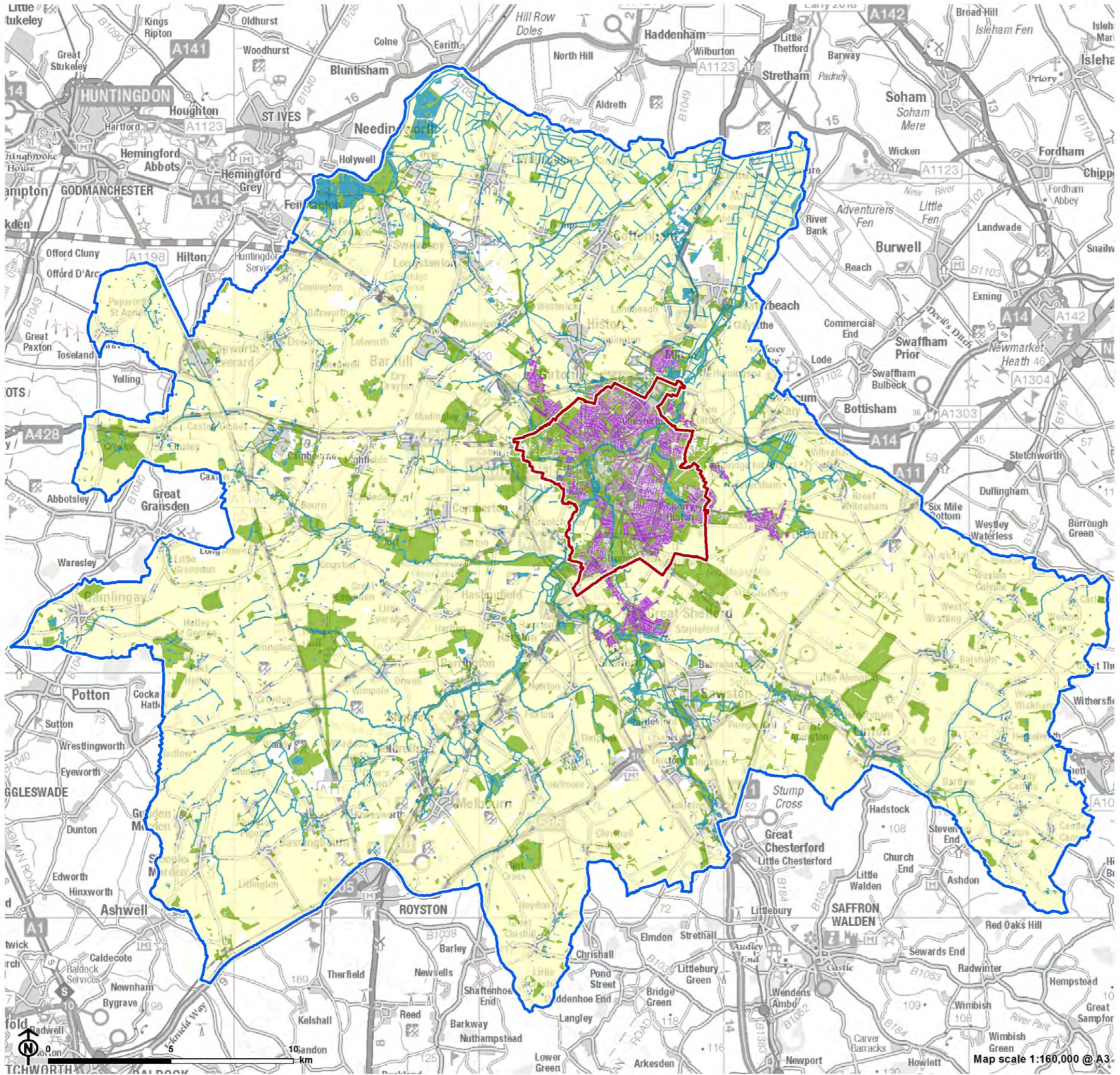


Figure 1.2: Extent of the GI Network

- Cambridge
- South Cambridgeshire
- Green infrastructure
- Water space
- Private garden
- Agricultural land

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 County Wildlife Sites were obtained from Cambridgeshire and Peterborough Environmental Records Office (CPERC). As the material shown on this layer does not go through an external consultation process the data is as was at Draft Submission July 2013. The most up to date County Wildlife Site Data can be obtained by contacting CPERC at <https://www.cperc.org.uk>



Map scale 1:160,000 @ A3



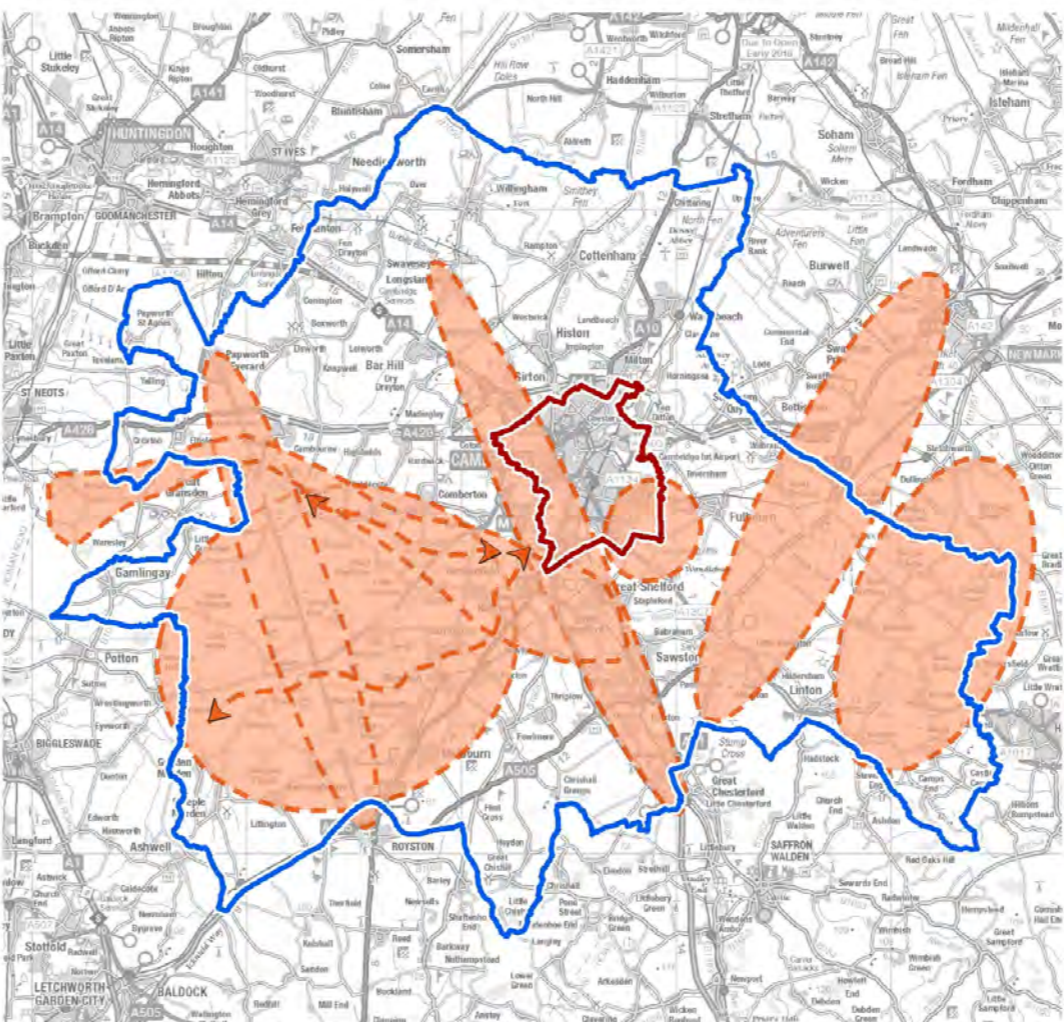
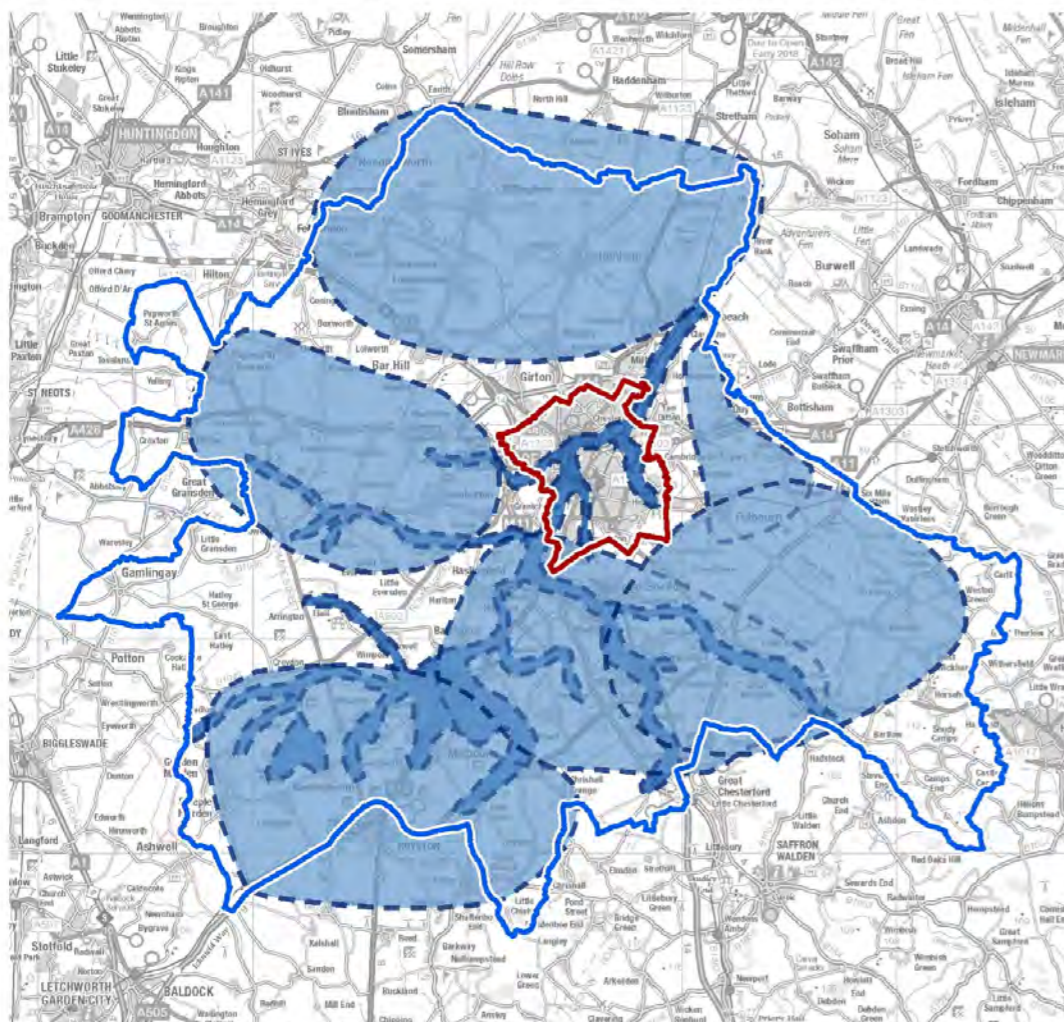
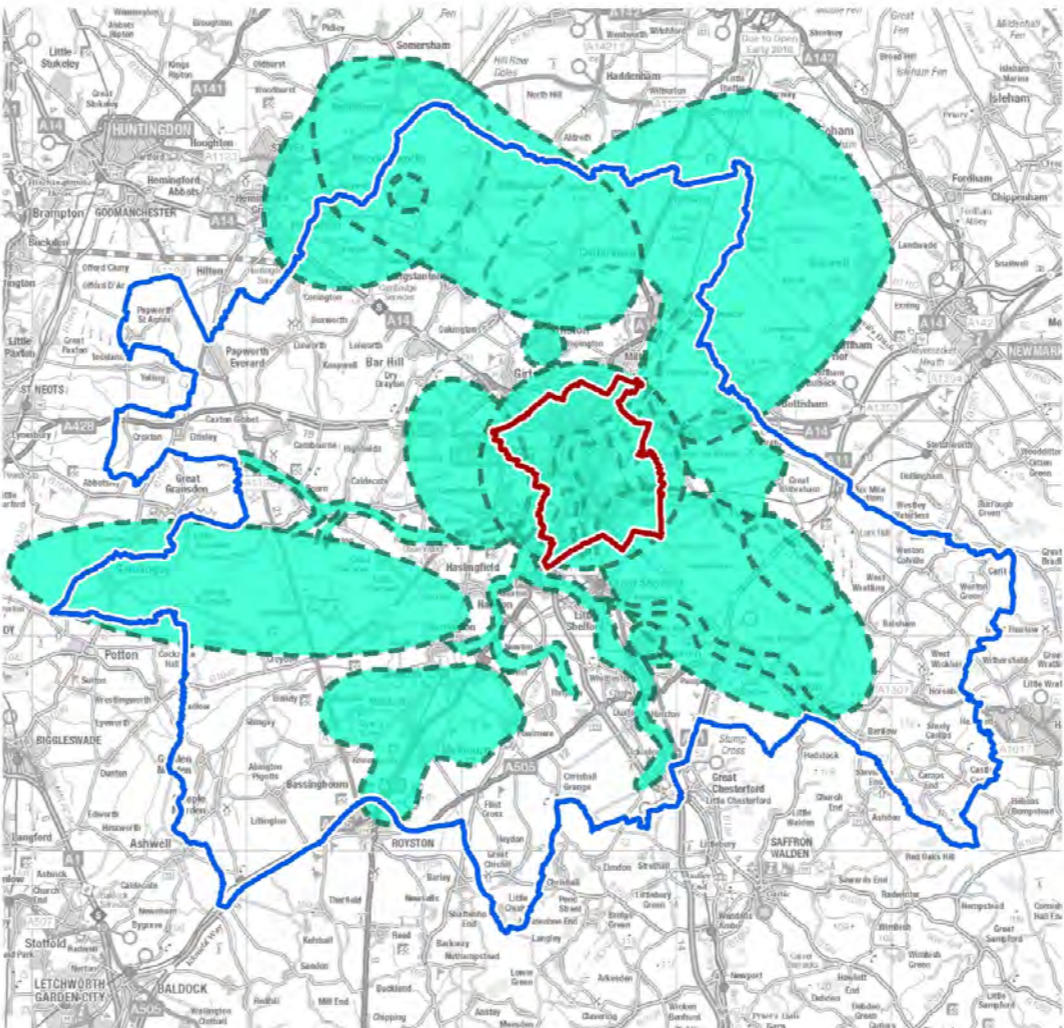
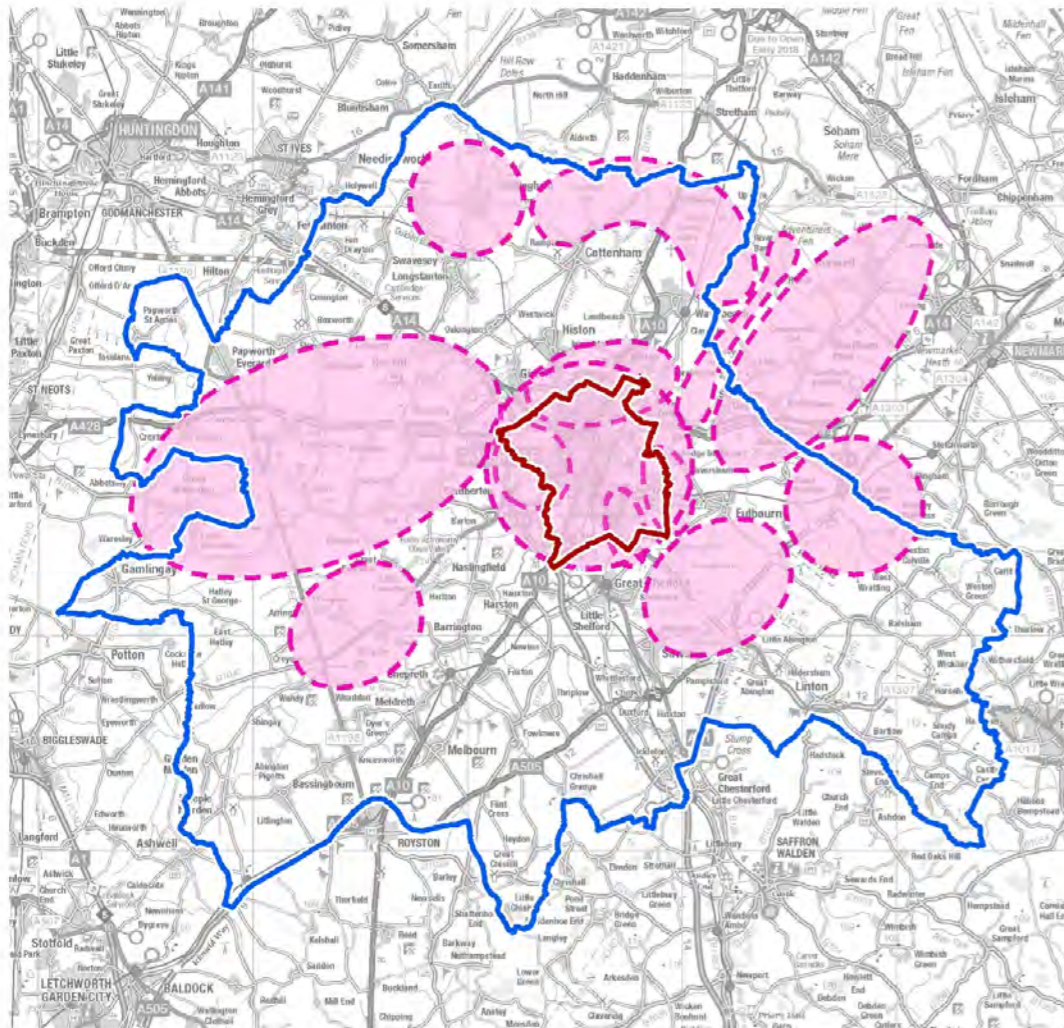


Figure 1.3: Broad Opportunity Zones for GI Themes 1 to 4

- Cambridge
- South Cambridgeshire
- Landscape, cultural heritage and sense of place broad opportunity zones
- Biodiversity and geodiversity broad opportunity areas
- Water environment broad opportunity areas
- Access and connectivity broad opportunity areas

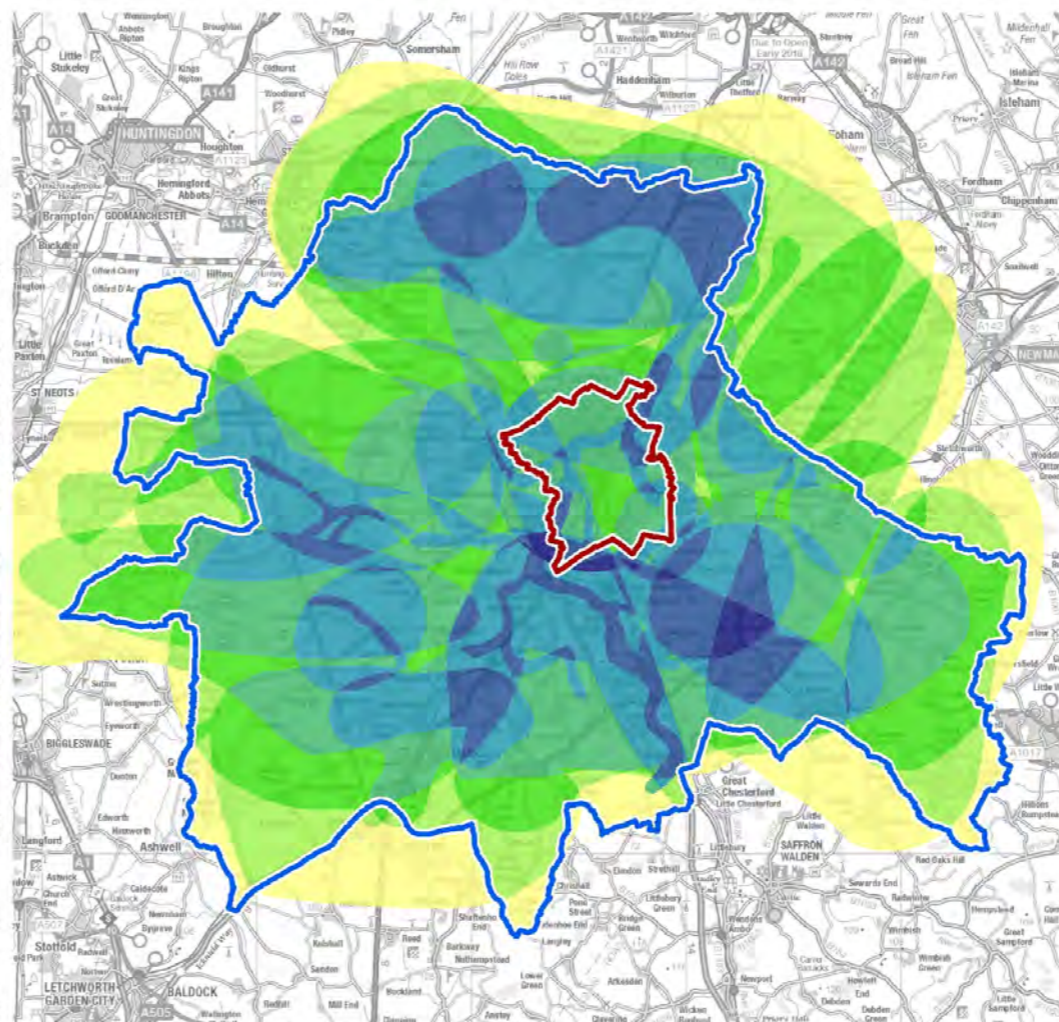
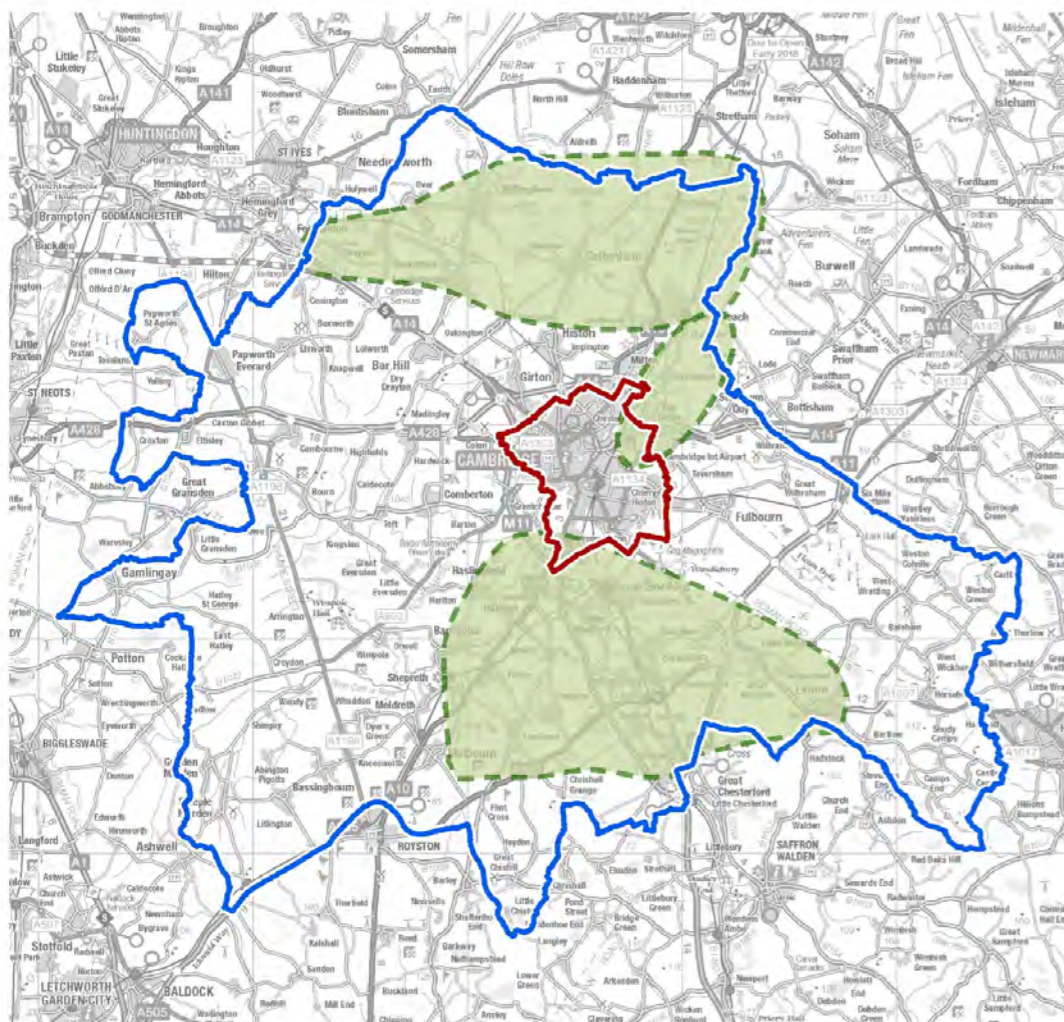
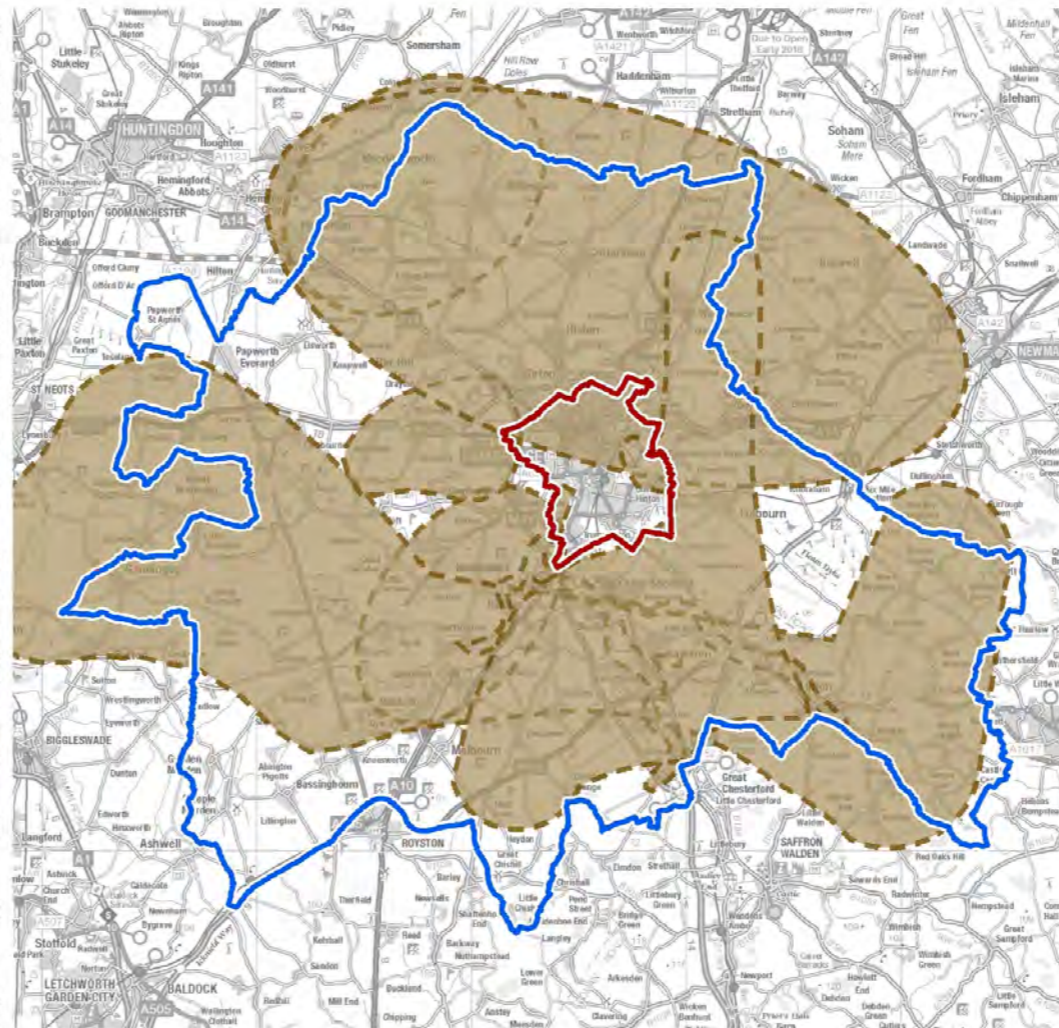
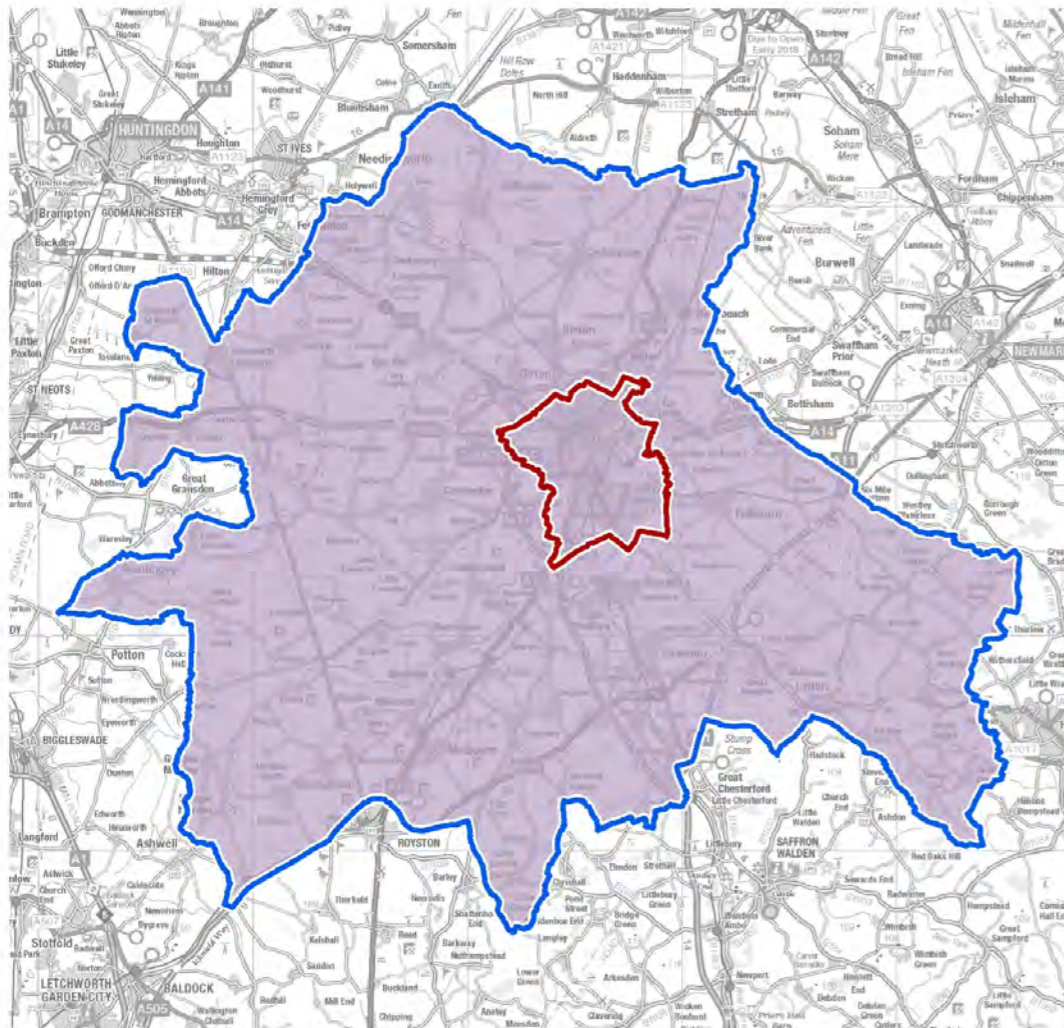


Figure 1.4: Broad Opportunity Zones for GI Themes 5 to 7 and Combined

- Cambridge
- South Cambridgeshire
- Recreation and play broad opportunity zones*
- Carbon sequestration broad opportunity areas
- Agriculture and community food growing broad opportunity zones

Combined broad opportunity zones map

Number of GI themes

- 1
- 2
- 3
- 4
- 5
- 6
- 7

*Please note: At this stage of the study, with ongoing work to develop evidence around open space and play provision, it is not possible to be more spatially specific. This map will be updated in later iterations.

Chapter 2 - Introduction

2.1 A high quality and resilient natural environment is increasingly recognised as a ‘must have’, rather than ‘nice to have’. It helps to mitigate and adapt to climate change, to conserve and enhance biodiversity, to improve health and wellbeing and can help maintain local distinctiveness.

2.2 The declaration of emissions targets and a climate emergency by South Cambridgeshire District Council and Cambridge City Council ('the Councils'), as well as the 'doubling nature vision', have increased the importance of these issues locally.

2.3 The Councils commissioned LUC to undertake a Green Infrastructure (GI) Opportunity Mapping project to ensure the forthcoming joint Local Plan is based on sound evidence and includes deliverable interventions to enhance the GI network.

2.4 GI Opportunity mapping is a process whereby opportunities for enhancing existing GI assets or creation of new GI assets are identified in a structured manner that explores the current state of the assets and the related risks and opportunities. This includes an assessment of demand and pressures that influence where GI is needed to increase the resilience of the natural environment now and into the future.

2.5 Some key definitions are included overleaf; and the study is supported by a glossary of terms and acronyms in Appendix 1.



Figure 2.2: View from Magog Down, South Cambridgeshire

Key definitions

Green Infrastructure

Green infrastructure is the term used to describe the network of natural and semi-natural spaces and corridors in a given area. These include open spaces such as parks and gardens, but also allotments, woodlands, fields, hedges, lakes, ponds, playing fields, coastal habitats, footpaths, cycle routes and water courses. Crucially, GI provision is not limited to traditional green spaces such as parks and other open spaces, but can involve various interventions to thread nature into streetscapes, or provide corridors of connectivity between the GI features described above, known as 'assets'.

Above all, GI is defined by its multifunctionality. A single GI asset can deliver a range of benefits to people (both physical and mental wellbeing), as well as biodiversity and landscape. GI can help to create high quality, attractive and functional places that will provide a setting for day-to-day living. It can also address the negative impact of habitat loss and fragmentation by promoting habitat creation, enhancement and connectivity (on site as part of development or through biodiversity off-setting), and plays an important role in reducing local temperatures, climate change adaptation and mitigation, and alleviating flood risk and soil erosion.

Green infrastructure is the tool by which ecosystem services can be planned and delivered through policy.

Ecosystem Services

Ecosystem services is the term used to describe the benefits provided to people by natural capital (ecosystems and the biodiversity they contain). Services broadly comprise:

- Provisioning services e.g. food, fibre, fuel and clean water;
- Regulating services e.g. climate control, flood regulation, carbon storage, pest control and pollination;
- Cultural services e.g. recreation, spiritual, educational, intrinsic and aesthetic value.
- Supporting services (e.g. soil formation, photosynthesis, biodiversity) originally distinguished are now typically seen as functions or processes associated with natural capital 'stocks'.

Ecosystem services may be described as 'flow', as explained below.

Natural Capital

Natural capital (as defined by the Natural Capital Coalition) is another term for the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people. All this means is that any part of the natural world that benefits people, or that underpins the provision of benefits to people, is a form of natural capital.

Natural capital is a stock, and from it flows ecosystem services or benefits. These services (where service is defined as 'a system supplying a public need') can provide economic, social, environmental, cultural and spiritual benefits. The value of these benefits can be understood in qualitative or quantitative (including economic) terms, depending on context.

Study Aims and Objectives

2.6 The overall aims of the study were twofold: to provide a robust evidence base on the quantity and quality of existing GI assets and networks within Greater Cambridge, and through analysis and consultation, identify specific and deliverable opportunities to enhance and expand the network, supported by appropriate policies. GI assets serve to provide a range of ecosystem services for environmental, social and economic benefit, and this study provides a clear understanding of strategic level opportunities to maximise these benefits, ensuring we have a resilient landscape; one that benefits both people and nature and is robust to external change such as climate change and flood risk.

2.7 Specifically, the study addresses the following questions:

Where

- are the existing GI assets in Greater Cambridge?
- are there gaps in provision, and which priority interventions can most effectively fill these?
- is there potential for GI assets to become more multifunctional, including capturing the physical/mental health and wellbeing benefits?
- is recreational pressure threatening the integrity of GI assets and how can this be mitigated against?
- can the recreational functions of biodiversity assets be enhanced?

What

- is the condition of the existing GI network?
- functions does it provide?
- is the role of existing GI in mitigating and adapting to climate change and boosting resilience to its impacts?

How

- can the existing GI network be optimised and enhanced?
- can GI contribute to placemaking through reinforcement and enhancement of landscape character?
- best to support the ambition of achieving Biodiversity Net Gain (BNG) and wider environmental net gain?
- can the role of existing GI in mitigating and adapting to climate change be enhanced?
- can GI priorities move beyond a strategic vision to delivery?
- should the GI Study inform the development of policies within the Local Plan?

2.8 The study was developed closely and collaboratively with existing initiatives and the wider evidence base for the Local Plan (including Infrastructure, Water cycle, Landscape, Sustainability Appraisal, Green Belt and other relevant studies) and with relevant officers of the Councils, neighbouring authorities and local stakeholders.

Report Structure

2.9 The remainder of this chapter provides an overview of the policy framework within which this study sits. The subsequent chapters of the report are structured as follows:

- Chapter 3: Methodology: sets out the approach followed to achieve the aims and objectives of the study; including how local stakeholders have been engaged throughout.
- Chapter 4: Greater Cambridge Context: provides information on the context and drivers for GI within Greater Cambridge; including population and housing growth, socio-economic factors, air quality and climate change.
- Chapter 5: Mapping of the GI Network: describes the process of collecting information on the GI assets that make up the network within Greater Cambridge. This is supported by mapping and quantitative analysis.
- Chapter 6: GI Themes: uses a theme-based approach to the evaluation of ecosystem services as the framework for the evidence base to evaluate existing GI assets, identify key issues, potential risks and forces for change. The seven themes are:
 - Landscape, cultural heritage and sense of place;
 - Biodiversity and geodiversity;
 - The water environment;
 - Access and connectivity;
 - Recreation and play;
 - Carbon sequestration; and
 - Agriculture and community food growing.

In addition to these seven themes, the cross-cutting themes of climate change, wellbeing and social inclusion, and environmental factors (which includes, for example, air quality, rainfall, temperature regulation and noise) are considered throughout.

- Chapter 7: Priority Areas for Enhancement: synthesis of all the evidence gathered through the desk-based review of strategies, initiatives, data and stakeholder consultation to identify priority areas for enhancement to inform the Local Plan.

2.10 Later stages of this Study will:

- Refine the Priority Areas: providing an evaluation of the priority areas for enhancement against the preferred development strategy within the Local Plan to identify potential conflicts or synergies; culminating in the development of a 'long list' of potential opportunities to expand and enhance the GI network.
- Identify specific opportunities to expand and enhance the GI network: looking in detail at the deliverability of these opportunities; drawing on stakeholder knowledge to explore site ownership, existing uses and current or planned adjacent land uses. This will culminate in the prioritisation and presentation of specific opportunities, setting out the benefits and potential mechanisms to deliver these.
- Make recommendations and provide policy development advice: bringing together all of the findings to make recommendations on policy direction and wording to ensure that the Local Plan provides a supportive and positive framework for delivering on the ambitions for GI in Greater Cambridge.

National, Regional and Local Policy Framework

2.11 The study draws upon a range of national, regional and local policies, a summary of which is provided in Table 2.1 and the following paragraphs. An understanding of the policy context provides the overall steer for the study and ensures that the study methodology responds positively to the policy framework.

2.12 The policy review was complemented by a review of a wide range of strategies and evidence studies (existing and emerging) to provide additional detail for the evaluation of the GI themes.

2.13 A comprehensive overview of existing and emerging evidence reviewed for the study is provided in Appendix 2. This evidence base informs the issues and opportunities within each theme.

Table 2.1 A summary of national, regional and local policies relevant to the study

National	Regional	Local
<p><u>National Planning Policy Framework (NPPF) 2012</u> (last updated February 2019)</p> <p><u>National Planning Practice Guidance (NPPG): Natural Environment 2016</u> (last updated July 2019)</p> <p><u>A Green Future: Our 25 Year Plan to Improve the Environment (25 Year Environment Plan 2018)</u></p> <p><u>Environment Bill 2019-21</u>, as introduced in January 2020 for its passage through Parliament. (Additional documents related to the <u>2020 Environment Bill</u> are also available).</p> <p><u>Natural Environment & Rural Communities (NERC) Act 2006</u></p> <p>Conservation of Habitats & Species Regulations 2010 (as amended)</p> <p><u>Climate Change Act 2008 (2050 Target Amendment) Order 2019</u></p>	<p><u>The Oxford-Cambridge Arc workstreams</u></p> <p><u>Cambridgeshire and Peterborough Doubling Nature Vision</u></p>	<p>Local Plans: <u>South Cambridgeshire Local Plan (2018)</u> and <u>Cambridge Local Plan (2018)</u></p>

National

National Planning Policy Framework (2012, updated 2019)

2.14 The National Planning Policy Framework (NPPF) provides the overarching rationale for the study, what the study should comprise, and how the network of existing and new GI assets should be strategically planned.

2.15 Paragraph 20 states that there should be sufficient provision for conservation and enhancement of the natural, built and historic environment, including landscapes and green infrastructure and planning measures to address climate change mitigation and adaptation.

2.16 It also highlights the duty to cooperate on strategic matters that cross administrative boundaries, including green infrastructure (Paragraphs 24-27).

2.17 The importance of open space provision is highlighted in Paragraphs 91, 92, 96 and 97, whilst Local Green Space designation requirements and the protection afforded to these spaces is addressed in Paragraphs 99, 100 and 101.

2.18 The NPPF recognises the role GI plays in climate change (Paragraph 150), conserving and enhancing the natural environment (Paragraph 171) and historic environment (Paragraph 185) as well as for air quality (Paragraph 181).

2.19 The strategic approach required to ensure ecological networks are resilient to pressures is discussed in Paragraph 170, and Paragraph 174 goes on to highlight the need for Local Plans to map and safeguard wildlife and ecological networks, promote restoration and deliver net gains for biodiversity.

National Planning Practice Guidance

2.20 National Planning Practice Guidance (NPPG) adds further context to the NPPF; to understand what the government expects of local authorities. The two documents should be read alongside each other.

2.21 The guidance highlights the multiple benefits that GI can provide for individuals, society as a whole, the economy and the environment. The guidance highlights the need for a strategic approach to GI which is essential for identifying, protecting and enhancing existing and proposed GI networks. The guidance clearly states the importance of a district-wide scale (or wider) and collaborative approach with neighbouring authorities and stakeholders.

2.22 It highlights the importance of ecological networks and development with a "need to consider the opportunities that individual development proposals may provide to conserve and enhance biodiversity and geodiversity, and contribute to habitat connectivity in the wider area including as part of the Nature Recovery Network", as described in the 25 Year Environment Plan (see below).

2.23 Features of the natural environment to be considered within the network range from the underpinning geological and bio-geographical character to the location and extent of designated, priority and irreplaceable habitats; from existing landscape features and potential new corridors that support migration, dispersal and gene flow, to areas identified for habitat enhancement or restoration. By its nature, such a network would help biodiversity adapt to, and increase resilience against, climate change.

2.24 Regarding the network of locally designated sites, the guidance recognises Local Wildlife Sites (LWS) as "areas of substantive nature conservation value", important for their contribution to ecological networks and nature's recovery, as well as wider benefits including climate

mitigation and ecosystem services. “National planning policy expects plans to identify and map these sites, and to include policies that not only secure their protection from harm or loss but also help to enhance them and their connection to wider ecological networks”.

A Green Future: Our 25 Year Plan to Improve the Environment

2.25 The DEFRA 25 Year Environment Plan sets long-term targets for environmental improvement to which Government will be legally bound. It recognises the social, economic and environmental benefits of the provision of GI and the importance of recovering nature and enhancing the beauty of landscapes.

2.26 The Plan sets out how it will connect people with the environment to improve health and wellbeing, aiming to 'help people improve their health and wellbeing by using green spaces' and to 'Green' our towns and cities by creating GI and planting one million urban trees.

2.27 The Plan also commits to embed the principle of 'environmental net gain' to development, such as housing and infrastructure, and calls for 'nature recovery areas' as important parts of developing ecological networks. Ambitions of the Plan include the creation or restoration of 500,000ha of wildlife-rich habitat outside the protected site network.

2.28 When given Royal Assent, the Environment (Principles and Governance) Bill will give the 25 Year Environment Plan Statutory status and support the delivery of the Government's manifesto commitments relating to the environment.

Draft Environment Bill

2.29 The provisions of the draft Environment Bill require Biodiversity Net Gain (BNG) to be demonstrated, and emerging metrics such as the DEFRA 2.0 will become commonly used when assessing planning applications. There is also provision for off-site provision of biodiversity enhancements, which may provide an additional funding mechanism for GI improvements within the area.

2.30 The Bill mandates BNG for development; under Schedule 7A, developers would need to submit a biodiversity gain plan to the local authority before seeking planning permission. This comes ahead of a future intention to "expand the net gain approaches used for biodiversity to include wider natural capital benefits, such as flood protection, recreation and improved water and air quality". The draft Bill sets BNG for development at 10%, and requires this to be maintained for 30 years. It is anticipated that these requirements will become mandatory in late 2022 (assuming Royal assent of the Bill late 2020 plus two year transition period).

2.31 The Bill will mandate the creation of Local Nature Recovery Strategies (LNRS) across England – local component to support the Government's Nature Recovery Network, which will be delivered through partnership working and supported by investment from development incentivised by BNG. LNRS benefit biodiversity as well as wider environmental benefits or services; five pilots are underway 2020/21. This integrated benefit and the requirement for an LNRS to include a Local Habitat Map is reflected in the methodology for this study.

Other Legislation and Policy Drivers for Biodiversity

2.32 The Wildlife & Countryside Act 1981 (as amended) forms the backbone to nature conservation legislation, transposing the European Habitats and Birds Directives into UK law. The Conservation of Habitats & Species Regulations 2010 (as amended) additionally address the designation and protection of European sites and the protection of European species.

2.33 Further protection for habitats and species is set out, for example, in the Natural Environment & Rural Communities (NERC) Act 2006, Countryside & Rights of Way (CROW) Act 2000, Protection of Badgers Act 1992, and Hedgerows Regulations 1992.

Natural Environment & Rural Communities (NERC) Act 2006

2.34 The NERC Act 2006 requires planning authorities to consider impacts on “species of principal importance for the conservation of biodiversity” when determining planning applications. The Council has an obligation to ensure that in exercising its functions, it has “regard... to the purpose of conserving biodiversity” (Section 40(1)).

2.35 Section 41 lists habitats and species of principal importance in England (‘S41’ habitats and species), which are to be considered, irrespective of whether they are covered by other legislation. Section 42 (3)(a) requires that the Council “take such steps as appear to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section” or, Section 42(3)(b), “promote the taking by others of such steps”.

Climate Change Act 2008 (2050 Target Amendment) Order 2019

2.36 The Climate Change Act 2008 (2050 Target Amendment) Order 2019 commits UK government to ensure that the net UK carbon account for the year 2050 is net zero. While specific measurable actions to achieve this have not been worked through at all levels of government, GI has the potential to mitigate climate change by providing carbon sequestration opportunities, as well as providing wider climate adaptation benefits.

Regional

The Oxford-Cambridge Arc workstreams

2.37 Ambitions for the Oxford-Cambridge Arc provide a framework for significant growth for Greater Cambridge, with local natural capital, habitat connectivity and health and wellbeing highlighted as key priorities.

2.38 Plans for the Arc highlight the importance of planning for natural capital, working with partners and harnessing nature to adapt to climate change, manage flood risk, create great places for people and attract investment.

Cambridgeshire and Peterborough Doubling Nature Vision

2.39 The overarching vision is to double the area of rich wildlife habitats and natural greenspace within Cambridgeshire and Peterborough; a vision to which the GI opportunity mapping seeks to contribute. The emerging natural capital doubling nature investment plan (DNIP) which is to follow on from this vision is highly relevant to the delivery mechanisms proposed as part of the study, alongside Natural England’s national nature recovery network mapping project.

Local

Local Plans

2.40 South Cambridgeshire District Council and Cambridge City Council have committed to preparing a joint Local Plan for their combined area, to cover the period to 2041. This will replace policies within the existing Cambridge Local Plan (2018) and the South Cambridgeshire

Local Plan (2018). The decision for an early review of local plans was taken in part to help to manage the anticipated major changes to the infrastructure landscape and economic growth in the region. This project will form a key part of the evidence base for the emerging joint Plan.

2.41 Both Cambridge City Council and South Cambridgeshire District Council have declared biodiversity emergencies and have supported the Local Nature Partnership's doubling nature vision. Both Councils have also declared climate emergencies and have committed to supporting the transition to net zero carbon by 2050.

2.42 The declaration was followed by the formation of the Cambridge Climate Charter, which calls on all organisations, businesses and individuals in the City to each establish their own carbon reduction plans to work toward achieving the city's net carbon-zero aspiration.

2.43 Furthermore, South Cambridgeshire's [Zero Carbon Strategy](#) (adopted May 2020) and accompanying action plan outlines how the council will support the District to halve carbon emissions by 2030 and reduce them to zero by 2050.

2.44 Not only have the councils set climate change targets, but national policy (NPPF) states that all Local Development Plans must take a proactive approach to mitigating and adapting to climate change and ensuring resilience to climate change impacts, and ensure that new development avoids increased vulnerability to the impacts of climate change. The role the GI network plays in meeting these criteria is substantial and is not to be overlooked.

Summary

2.45 In summary, national legislation and policy ambitions relating to net zero carbon, mandatory biodiversity net gain and environmental net gain provide an ambitious framework for this work. The NPPF provides the overarching rationale for the study, what the study should comprise, and how the network of existing and new GI assets should be strategically planned. National planning policy recognises the multi-functional ecosystem services benefits of green infrastructure and the goal of biodiversity and wider environmental net gain. It requires plan-making authorities to take a strategic approach to protecting and enhancing the natural environment.

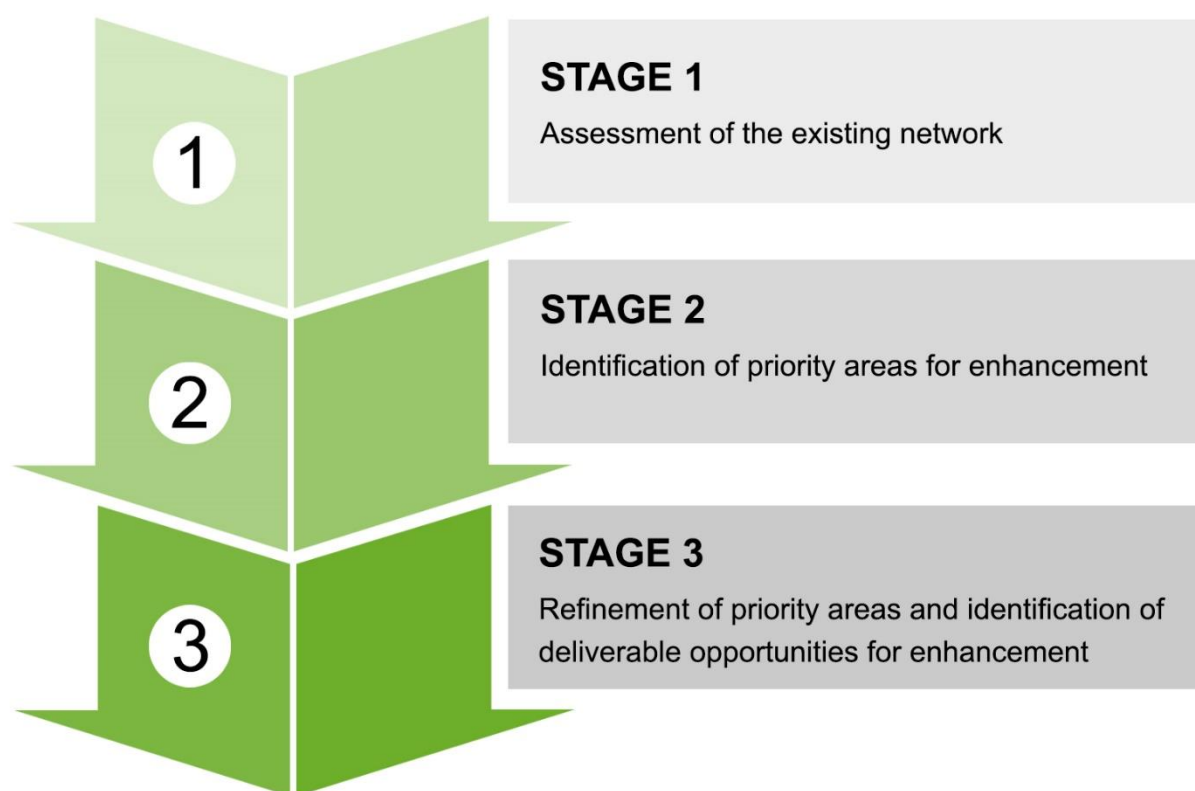
2.46 At a regional level, there are stated ambitions to produce a natural capital investment plan and to double the area of rich wildlife habitats and natural greenspace. At a local level, both Cambridge City Council and South Cambridgeshire District Council have declared biodiversity emergencies and have supported the Local Nature Partnership's doubling nature vision. Both Councils have also declared climate emergencies and have committed to supporting the transition to net zero carbon by 2050.

2.47 This review has informed the development of the methodology, as set out in the next chapter. The policy review was complemented by a review of a wide range of strategies and evidence studies (existing and emerging) to provide additional detail for the evaluation of the GI themes, set out in chapter 6.

Chapter 3 - Methodology

3.1 The study has three main stages as set out in Figure 3.1. This chapter describes these stages. This report sets out the findings to Stage 2, with Stage 3 to follow later in the project programme.

Figure 3.3: Methodology



Stage 1: Assessment of the existing green infrastructure network

3.2 The study commenced with a systematic review of relevant strategies, projects, evidence bases and initiatives that have been, or are currently being undertaken in Greater Cambridge and surrounds. This included the review of over 40 evidence studies and the identification of over 100 existing, upcoming or previous initiatives in the area.

3.3 Spatial data was sourced from a range of organisations that produce and manage data relating to environmental, social and economic factors. All of these layers were brought into a Geographic Information System (GIS) and organised by 'theme'. In addition to producing a series of maps by theme, the data was used to generate a single layer of all GI assets. The types of sites and assets drawn into this GI assets dataset is described in detail in Chapter 5 of this report. The mapping considered assets within an agreed buffer beyond the boundaries of Greater Cambridge to ensure a cohesive regional approach.

3.4 Given the importance of this dataset as the 'baseline' extent of the GI network that would underpin the rest of the study, a wide group of local stakeholders and organisations were invited to test and validate the emerging dataset through an online map consultation. Consultees were invited to place pins on the mapping to identify any missing assets, correct out of date or incorrect information or supplement existing information with additional information such as the quality or accessibility of the asset. Over 150 representations were made in the four week period during which the mapping was available.

3.5 The GI network map was subsequently updated in response to representations received. The network was then analysed in GIS to develop an understanding of a range of 'metrics' relating to the overall extent, the level of designation and the types of asset.

3.6 GI assets serve to provide ecosystem services for environmental, social and economic benefit. To provide a comprehensive baseline and evaluation of the GI network in Greater Cambridge, a themed approach was undertaken. This desk-based analysis was undertaken in order to understand the various functions and ecosystem services, including the multi-functional benefits, provided by the GI network. Figure 3.2 illustrates the multi-functional benefits of green infrastructure in Greater Cambridge.

3.7 As set out in the Key definitions (on page 7), ecosystem services are the benefits provided to people by natural capital (ecosystems and the biodiversity they contain). Services broadly comprise:

- Provisioning services e.g. food, fibre, fuel and clean water;
- Regulating services e.g. climate control, flood regulation, carbon storage, pest control and pollination;
- Cultural services e.g. recreation, spiritual, educational, intrinsic and aesthetic value.
- Supporting services (e.g. soil formation, photosynthesis, biodiversity) originally distinguished are now typically seen as functions or processes associated with natural capital 'stocks'.

3.8 Ecosystem services were categorised into seven 'GI themes', as indicated below:

- Landscape, cultural heritage and sense of place;
- Biodiversity and geodiversity;
- The water environment;
- Access and connectivity;
- Recreation and play;
- Carbon sequestration; and
- Agriculture and community food growing.

3.9 In addition to these seven themes, the cross-cutting themes of climate change, wellbeing and social inclusion, and environmental factors (which includes, for example, air quality, rainfall, temperature regulation and noise) are considered throughout.

3.10 The quality of the GI assets was assessed individually and collectively using a series of thematic maps to provide an indication of how the network is functioning against these GI themes. A desk-based review was undertaken of the non-development related risks posed by climate change, water stress, pests and diseases. Specific consideration was given to the

vulnerability of international and national designated sites to recreational pressures, predicted population change and the current condition of Greater Cambridge's lowland peat resource.

Benefits of Green Infrastructure in Greater Cambridge



Figure 3.4: The multi-functional and cross-cutting benefits of green infrastructure in Greater Cambridge

3.11 A second stage of stakeholder consultation was undertaken in July 2020. This took the form of an online survey inviting stakeholders to answer a series of questions relating to GI in Greater Cambridge. Examples of questions included:

- Which green infrastructure sites are thriving and provide the most value to people and wildlife in Greater Cambridge?
- Which green infrastructure sites need intervention to enable them to provide more value to people and wildlife in Greater Cambridge?
- What are the main pressures and threats to green infrastructure in Greater Cambridge in the future?
- Where do you consider the key opportunities for green infrastructure creation and enhancement in Greater Cambridge to be over the next 5 years and beyond?
- What are the major challenges in delivering green infrastructure schemes?
- Are you aware of any innovative approaches to date in Greater Cambridge or elsewhere in delivering and funding green infrastructure assets?
- Are there certain geographical areas that are particularly poorly served by green infrastructure in Greater Cambridge?
- Are there certain geographical areas in Greater Cambridge that are completely lacking green infrastructure?
- Are there certain communities (e.g. the elderly, children etc) that are particularly poorly served by green infrastructure in Greater Cambridge?

3.12 The survey additionally provided stakeholders with an opportunity to highlight specific open space and recreation projects and initiatives for consideration within the emerging Infrastructure Delivery Plan – a separate evidence base supporting the Local Plan. In relation to this LUC are aware of the Green Space sites submitted to the Greater Cambridge Local Plan First Conversation consultation in early 2020. These specific sites and projects will be considered within the Stage 3 of the project described below.

3.13 The desk-based study was supplemented with a series of technical stakeholder workshops in order to obtain further information on accessibility, quality and function of the GI network. The workshops provided a 'sense check' of the emerging evidence base as well as identification of limitations and opportunities to strengthen the existing GI network. A summary of all of the consultation that has informed this study is included in Appendix 3.

3.14 For each theme, the analysis was undertaken using the same structure, culminating in the identification of issues and opportunities (by theme) that have informed the identification of priority areas for enhancement.

Stage 2: Identification of priority areas for enhancement

3.15 All of the information gleaned from the review of evidence and stakeholder consultation was brought together to support the identification of priority areas for enhancement, culminating in the mapping of 'broad opportunity zones' in GIS. These areas were superimposed on the existing network mapping in order to identify areas where multiple benefits could be provided in the same location. Areas where the multi-functional benefits of GI could be achieved were also highlighted.

Stage 3: Refinement of opportunity areas and identification of deliverable opportunities

3.16 Later stages of this Study will:

- Refine the priority areas: providing an evaluation of the priority areas for enhancement against the preferred development strategy within the Local Plan to identify potential conflicts or synergies; culminating in the development of a 'long list' of potential opportunities to expand and enhance the GI network.
- Identify specific opportunities to expand and enhance the GI network: looking in detail at the deliverability of these opportunities; drawing on stakeholder knowledge to explore site ownership, existing uses and current or planned adjacent land uses. This culminates in the prioritisation and presentation of specific opportunities, setting out the benefits and potential mechanisms to deliver these.
- Make recommendations and provide policy development advice: bringing together all of the findings to make recommendations on policy direction and wording to ensure that the Local Plan provides a supportive and positive framework for delivering on the ambitions for GI in Greater Cambridge.

Chapter 4 - Greater Cambridge Context

4.1 It is critical to ensure that this evidence base and the opportunities identified respond to the prevalent deficiencies and issues within Greater Cambridge. To this end, a range of GI 'needs indicators' were examined in order to better understand the context for the study. This included an examination of data relating to population, housing, socio-demographics, air quality and climate change.

Population and Demographic profile^{1,2,3,4,5}

4.2 The total population of Greater Cambridge is 294,320, made up of 136,850 people in Cambridge and 157,470 in South Cambridgeshire (2018 data). The population is expected to increase by 2036 to 155,250 (13%) in Cambridge and 201,850 (28%) in South Cambridgeshire, a total of 357,100 in Greater Cambridge (21% increase upon 2018 population). The demographic profile of the population is changing. The proportion of those aged over 65 is significantly increasing, especially within South Cambridgeshire where, by 2036, 24% of the population are expected to be over 65 (up from 19.4% in 2018). In Cambridge, this will be 16.4% of the population (up from 12.3% in 2018).

4.3 The average age of people in South Cambridgeshire is 40, compared to 36 in Cambridge. Cambridge has one of the 'youngest' populations in the country: people aged 24 and under, including students, make up around 37% of the City's population. This is higher than the 28% in South Cambridgeshire and 30% county-wide.

4.4 Ethnic minorities constitute around 17.5% of the total population of Cambridge. People of Asian ethnicity are the largest group in the city (7.4%) next to those of white ethnicity, followed by Chinese (3.6%), those of mixed ethnicity (3.2%) and those of black ethnicity (1.7%). In South Cambridgeshire, there is a very high proportion of white ethnicity (93.3%). Some 5% of the population is mixed ethnicity, 3.7% is of Asian ethnicity and 0.9% is of black ethnicity.

4.5 A functional and resilient GI network can support wellbeing and social inclusion through the provision of opportunities for people to interact and engage with nature and with other members of the community. Equality of provision and access to GI and the multifunctional benefits it provides are a necessity, meaning planning the GI network must consider equally the requirements of people of various ages, abilities and ethnicities.

Housing and Housing Development^{5,6}

4.6 The current dwelling stock in Cambridge is 54,460 and 66,540 in South Cambridgeshire. Sustained population and employment growth has led to a housing shortage within Cambridge; with high house prices and low levels of housing affordability. Cambridge is frequently ranked as one of the most unaffordable places to live within the UK, with housing affordability

¹ South Cambridgeshire District Council and Cambridge City Council (2019) Greater Cambridge Local Plan: Sustainability Appraisal Scoping Report

² Cambridgeshire Insight. Local Population and Dwelling Stock Estimates and Forecasts.

³ Census demographics for East of England

⁴ Cambridge City Council (2019). Authority Monitoring Report 2018

⁵ NOMIS (2011) Local Area Report

⁶ Savills Research Report to Greater Cambridge Partnership (2017). Detailed affordability analysis: Cambridge and South Cambridgeshire

decreasing since the late 1990s. Average prices of 'real' sales is well above other districts in the county, and significantly higher than the regional and national averages.

4.7 In Cambridge, the median house price is now 12.2 times the median income of those working in the area, compared with 9.3 in South Cambridgeshire and 7.5 nationally. Although the level of new market supply is high, it is not well aligned with local incomes, with most homes only affordable for those with incomes of £45,000 or more which leaves a large portion of demand un-catered for.

4.8 The Greater Cambridge Local Plan First Conversation (Issues and Options) consultation for Greater Cambridge identifies that according to the Government's 'standard method' there is a need for 1,800 homes per year or 40,900 homes for the suggested Plan period of 2017-2040. More detailed evidence about the requirement for homes is being developed to support the Local Plan which will impact on these figures.

4.9 However, the 'standard method' does not attempt to predict changing economic circumstances or other factors, and there may be circumstances where it is appropriate to consider making provision for more homes than the standard method minimum.

4.10 A high quality and resilient natural environment within and near to new and existing homes is key in supporting thriving communities, and needs to be considered in this GI study as well as the joint Local Plan.

Socio-Economic context⁷

4.11 Greater Cambridge as a whole is not a deprived area, but there are disparities between the least and the most deprived areas as shown in Figure 4.1. According to the Index of Multiple Deprivation (IMD), two wards within Cambridge are within 20% of the most deprived in the UK, but the majority of wards are within some of the least deprived nationally.

4.12 One of the seven domains of deprivation that make up the overall IMD, the Living Environment Deprivation score, considers the indoor living environment (quality of housing) and the outdoor living environment (levels of road accidents and air quality). In 2019, the score was 28.653 for Cambridge and 13.177 for South Cambridgeshire. Cambridge is more deprived than many other eastern local authorities which have an average score of 15.884.

4.13 Health in Greater Cambridge is generally recorded as being at a reasonably good level or higher, with between 86-87% of the population reporting themselves to be in very good or good health. However, there are inequalities displayed between the most and least deprived areas of Greater Cambridge in terms of health.

4.14 Public Health England note that child obesity (based on Year 6 students) in Greater Cambridge is better than the average for England ranging between 11.2-13.3%. Levels of GCSE attainment is also better than the England average. Similarly, estimated levels of adult excess weight and physical activity are better than the England average.

4.15 Average life expectancy within Greater Cambridge is slightly above the national average, and is higher in South Cambridgeshire than in Cambridge at 82.3 for males and 85.2 for females. However, there is health inequality present with life expectancy lower in the most deprived areas compared to the least deprived areas.

⁷ Public Health England Local Authority Health Profiles 2019 for [Cambridge](#) and [South Cambridgeshire](#)

4.16 The ability of the GI network to support healthy communities and address disparities needs to be considered in this GI study.

Air Quality^{8,9,10}

4.17 Air quality is an issue in Greater Cambridge, predominantly within the busy central streets in Cambridge City Centre and along the A14 between Milton and Bar Hill in South Cambridgeshire.

4.18 Both areas are designated as an Air Quality Management Area because the level of nitrogen dioxide (NO₂) is above the National Air Quality Objectives (NAQO). The levels of PM₁₀ in Cambridge City are below the legal limits, but exceed legal limits within the A14 area in South Cambridgeshire. NO₂ levels are shown in Figure 4.2.

4.19 Air quality is a key cause for concern given the detrimental human health impacts and associated costs to the health care system. The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion. Air quality in Cambridge may deteriorate as a result of projected increases in population and housing and associated traffic. Continued increases in the number of jobs in the Cambridge urban area has led to increased commuting into the city, including by car, leading to increases in congestion and pollution. Proactive planning is fundamental to ensure these pressures do not allow air quality to deteriorate further.

4.20 Enhancing the sustainable transport network and opportunities for active transport (walking and cycling) together with public transport improvements is fundamental to tackle air quality issues, and has been highlighted within the adopted Local Plans. The Greater Cambridge Partnership (GCP) is receiving funding from central government to help address pollution arising from adverse impacts of travel demand from new communities.

4.21 It is therefore critical that this GI study considers and evaluates the accessibility and connectivity of the active transport network and identifies areas for enhancement based upon existing deficiencies and likely future pressure points.

Climate Change

4.22 The impacts of climate change are being felt worldwide, seeing higher temperatures, increased risk of flooding, water quality and availability issues, and vulnerable habitats and species at threat. These impacts pose a threat to the functionality and resilience of the GI network within Greater Cambridge. Equally however, the GI network can play a substantial role in mitigating and adapting to climate change impacts through, for example, careful management of the water environment and enhancing the role of wetlands and trees in carbon sequestration, as well as the role of green infrastructure in mitigating the urban heat island effect.

4.23 It is important to consider the opportunities to enhance the network to ensure Greater Cambridge is resilient to climate change and to help achieve the council's ambitious climate change targets.

⁸ [Cambridge City Council \(2018\) Air Quality Action Plan 2018-2023](#)

⁹ [South Cambridgeshire District Council \(2008\) Local Air Quality Strategy 2008-2013](#)

¹⁰ [Air Quality Annual Status Report \(ASR\) 2019 for Cambridge and South Cambridgeshire](#)

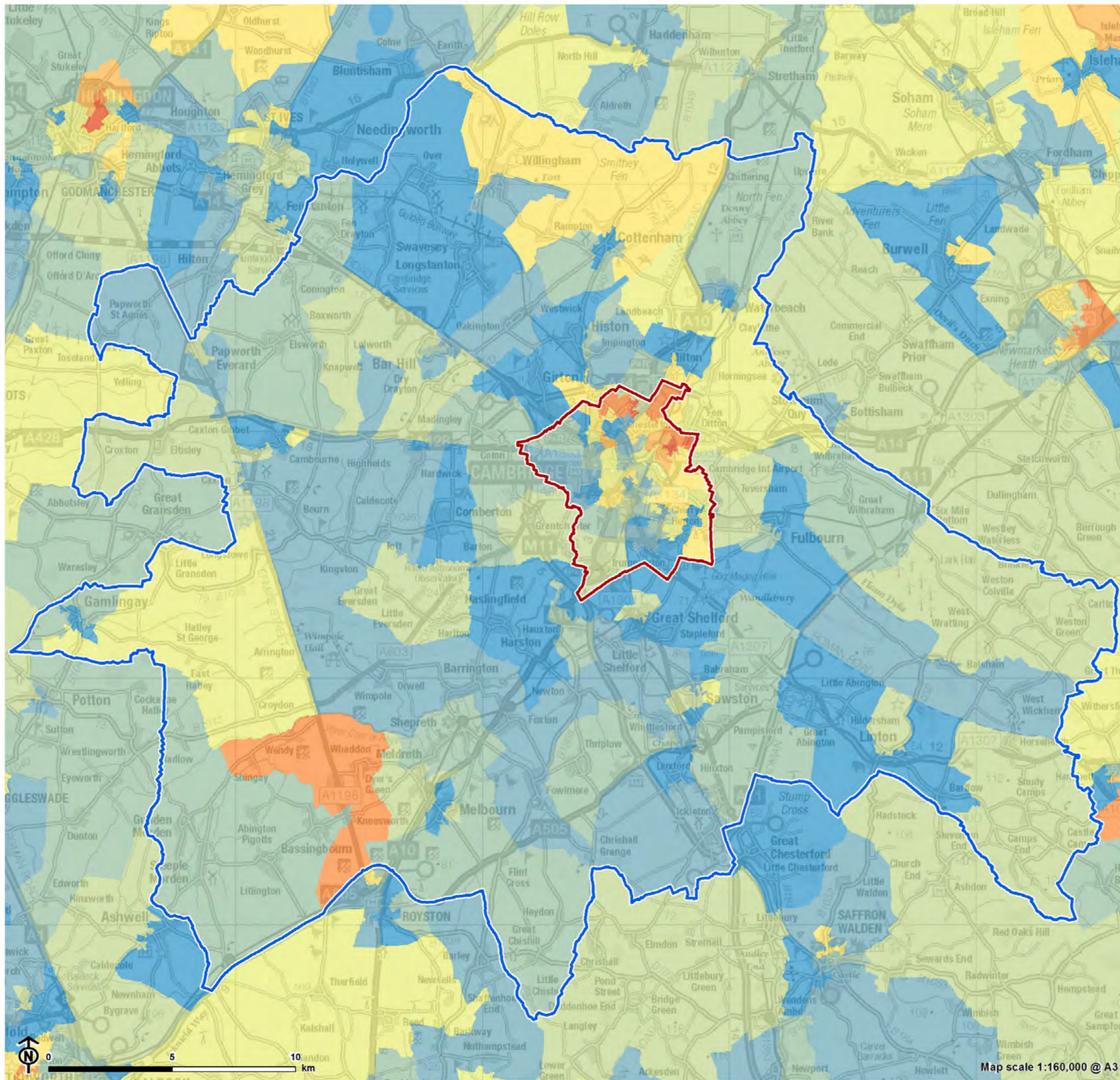


Figure 4.1: Index of Multiple Deprivation

- Cambridge
- South Cambridgeshire
- IMD decile**
- 0 - 10% (most deprived)
- 10 - 20%
- 20 - 30%
- 30 - 40%
- 40 - 50%
- 50 - 60%
- 60 - 70%
- 70 - 80%
- 80 - 90%
- 90 - 100% (least deprived)

Chapter 5 - Mapping the GI Network

5.1 In planning for the future, it is vital that there is an up-to-date understanding of the extent and condition of the GI network. This was the focus of the initial stage of this study.

5.2 The 2019 Doubling Nature Vision sets the vision for the natural future of Cambridgeshire and Peterborough in 2050. The Vision recognises that as one of the fastest growing economies in the UK, economic growth in the cross-county area will “need to be matched by one of the fastest nature recovery programmes. To achieve this step-change we will double the area of rich wildlife habitats and greenspace from 8.5% to 17%”. Whilst the delivery of the doubling target may vary spatially across the Cambridgeshire and Peterborough area, to reflect the distribution of natural assets, landscape typologies or foci for development, for the purposes of this study, the role of Greater Cambridge in delivering this target is taken to be a proportion equal to 17%. The land area of Greater Cambridge totals 942km²; the Vision target (being 17% of that total) would therefore be 160km². The analysis that follows has been undertaken with a view to provide an understanding of the baseline position.

Developing a map of the GI network

Understanding the spatial extent of the GI network

5.3 In order to build up a map of the existing GI network, relevant GIS data sets were collected from a range of open data sources as well as organisations who were able to contribute local data (under licence). Data was extracted to build up a 'master' GI data set. Further information about the GIS data sets that make up the master GI data set is outlined in Appendix 4.

5.4 A data matrix was created, recording the following details for each layer:

- Data name
- Data source
- Data age
- Data reliability/confidence: ranked 1 (least confident) to 5 (most confident)
- Does the data have access information?
- Does the data have quality/condition data?

5.5 Wherever available in the source data, metadata was examined and information on site names, site access, site type, site condition and habitat type were pulled through into the combined 'master' GI dataset. This information was not available in all of the datasets.

5.6 A summary of the types of sites and features drawn into this dataset is included below:

- | | |
|--|--|
| ■ Ancient Woodland Inventory | ■ National Trust land: limited access |
| ■ City and County Wildlife Sites (CWS) | ■ National Trust land: open access |
| ■ Country Park | ■ Ordnance Survey: green space |
| ■ CRoW: access all areas (open country and registered common land) | ■ Ordnance Survey Mastermap: green space |
| ■ Local Nature Reserve (LNR) | ■ Ordnance Survey Mastermap: water |
| ■ National Forest Inventory | ■ Priority Habitat Inventory (PHI) |
| ■ National Nature Reserve (NNR) | |

- Priority Habitat Inventory: wood pasture and parkland
- Protected Roadside Verges (PRV)
- Ramsar
- RSPB reserves
- Schedule Monuments
- Site of Special Scientific Interest (SSSI)
- South Cambridgeshire District Council Open space
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Wildlife Trust sites
- Woodland Trust sites

5.7 Given the data used is a mix of sites, land cover types, habitat information and designations, the dataset included multiple overlaps where a site was captured in more than one of these data sources.

5.8 The first draft of the combined layer was consulted upon through an interactive map. Stakeholder feedback was used to manually augment some areas of the map.

5.9 It has not been possible to eliminate the multiple overlaps between different source datasets for this study. However, it has been possible to 'dissolve' the layers into a single flattened layer in GIS to undertake quantitative analysis for this study.

A note on data confidence

5.10 Data has been collected from sources such as South Cambridge District Council, Cambridge City Council, Natural England and Ordnance Survey. Based upon age, source and professional judgement, each data set was given a 'confidence' rating between 1 (lower confidence) and 5 (higher confidence) in relation to the specific exercise being undertaken; to create a comprehensive GI network layer. The ratings are shown in Appendix 4. None of the data sets collected were rated as 1 or 2. This reflects the sources of data being the 'definitive' source for such sites in many cases and that the age of most data sets was less than two years.

5.11 Given the varied attributes captured in the range of datasets, and the limited information on accessibility and quality, at this time, use of the GI layer must be heavily caveated. There are a number of parallel workstreams working to achieve a clear and definitive understanding of various aspects of the GI network, such as open space and accessible natural greenspace, and in later stages of this study, it will be possible to identify whether any data improvements can be made as a result of information gathered and verified as part of those parallel studies.

5.12 One such workstream is ongoing work by the Bedfordshire, Cambridgeshire, Northamptonshire (BCN) Wildlife Trust to undertake Phase 1 habitat survey of parts of the Greater Cambridge area. Emerging findings from this work (still in draft) indicate that some of the habitat areas captured in the Natural England Priority Habitat Inventory (particularly grassland habitats) may be over-representing the actual extent of these habitats.

Understanding the accessibility of the GI network

5.13 Accessibility data was harvested from existing data and included in the master GI data set where available. This included:

- Access data captured within the source data sets;
- Online research to ascertain accessibility of individual sites;
- Assumptions based upon land use type;
- Data on accessible natural green spaces provided by the BCN Wildlife Trust;

- Access information collected during stakeholder consultation on the GI mapping; and
- Examination of Public Rights of Way (PRoW) data where it overlapped sites.

Understanding the quality of the GI network

5.14 Information showing the quality/condition of GI assets and sites is harder to find. Some quality/condition data was available within the following data sets, and this was included in the master GI data set:

- Protected Roadside Verges
- Sites of Special Scientific Interest (units)

5.15 In addition, some quality/condition information was collected during stakeholder consultation on the GI mapping and this was added to the master GI data set.

Quantifying the GI network

5.16 As identified above, many sites and assets in the GI mapping overlap as they have been drawn from different sources or a site of one type is covered by a designation. For example, a park could also be designated as a CWS and contain a water body. The following findings are a summary of the different categories of GI in Greater Cambridge. As a result of the overlaps in sites, the total area of the constituent parts is greater than 100%.

All green infrastructure

5.17 As shown in Figure 5.1 and summarised in Table 5.1, GI (including water) accounts for approximately 19% of Greater Cambridge's land area (of which 5% is water space), whilst agriculture accounts for 74% of the Greater Cambridge area. Private gardens account for a little over 1% of Greater Cambridge.

Table 5.1: Green infrastructure coverage in Greater Cambridge

Type	Area (ha)
Greater Cambridge land area	94,240
Green infrastructure	12,500
Water spaces	880
Agricultural land	70,010
Private gardens	1,290
Urban area	8,280

Nature and heritage designations

Nature designations

5.18 The following designations for nature conservation cover 3.1% of Greater Cambridge's land area and account for 24% of the green infrastructure:

- Sites of Special Scientific Interest
- Special Protection Area
- Special Area of Conservation
- Ramsar
- Local Nature Reserve
- County Wildlife Sites
- City Wildlife Sites

5.19 Those areas of green infrastructure that are protected by a nature designation are shown in Figure 5.2 and summarised in Table 5.2.

Table 5.2: Green infrastructure designated for nature conservation

Type	Area (ha)	% of Green infrastructure
Nature designations	2,980	24%
No nature designations	9,520	76%
Green infrastructure	12,500	100%

Heritage designations

5.20 The following heritage designations have been considered as green infrastructure:

- Scheduled Monuments
- Registered Parks and Gardens

5.21 Over and above these assets that have been included in the master GI data layer, other assets may lie within Conservation Areas. Table 5.3 shows the amount of GI subject to a heritage designation and their distribution is shown in Figure 5.3. In addition to this, there are 239 Listed Buildings on GI.

Table 5.3: Green infrastructure designated for heritage

Type	Area (ha)	% of Green infrastructure
Heritage designations	2,340	19%
No heritage designations	10,160	81%
Green infrastructure	12,500	100%

Access

5.22 Where it was possible to gather information on accessibility, this has been mapped on Figure 5.4. Table 5.4 summarises the types of PRow in Greater Cambridge. 61% of all PRow are located on GI or agricultural land and 39% are located on roads or on land classified as urban.

Table 5.4: Public Rights of Way in Greater Cambridge

Type of PRow	Total length of PRow in Greater Cambridge (km)	PRow on GI or agricultural land (km)	PRow on roads/tracks or in urban areas (km)
Bridleway	250.5	95.9	154.7
Byway	116.6	27.3	89.3
Footpath	706.5	536.2	170.4
Restricted Byway	1.8	1.2	0.6
Total	1,075.4	660.4	415.0

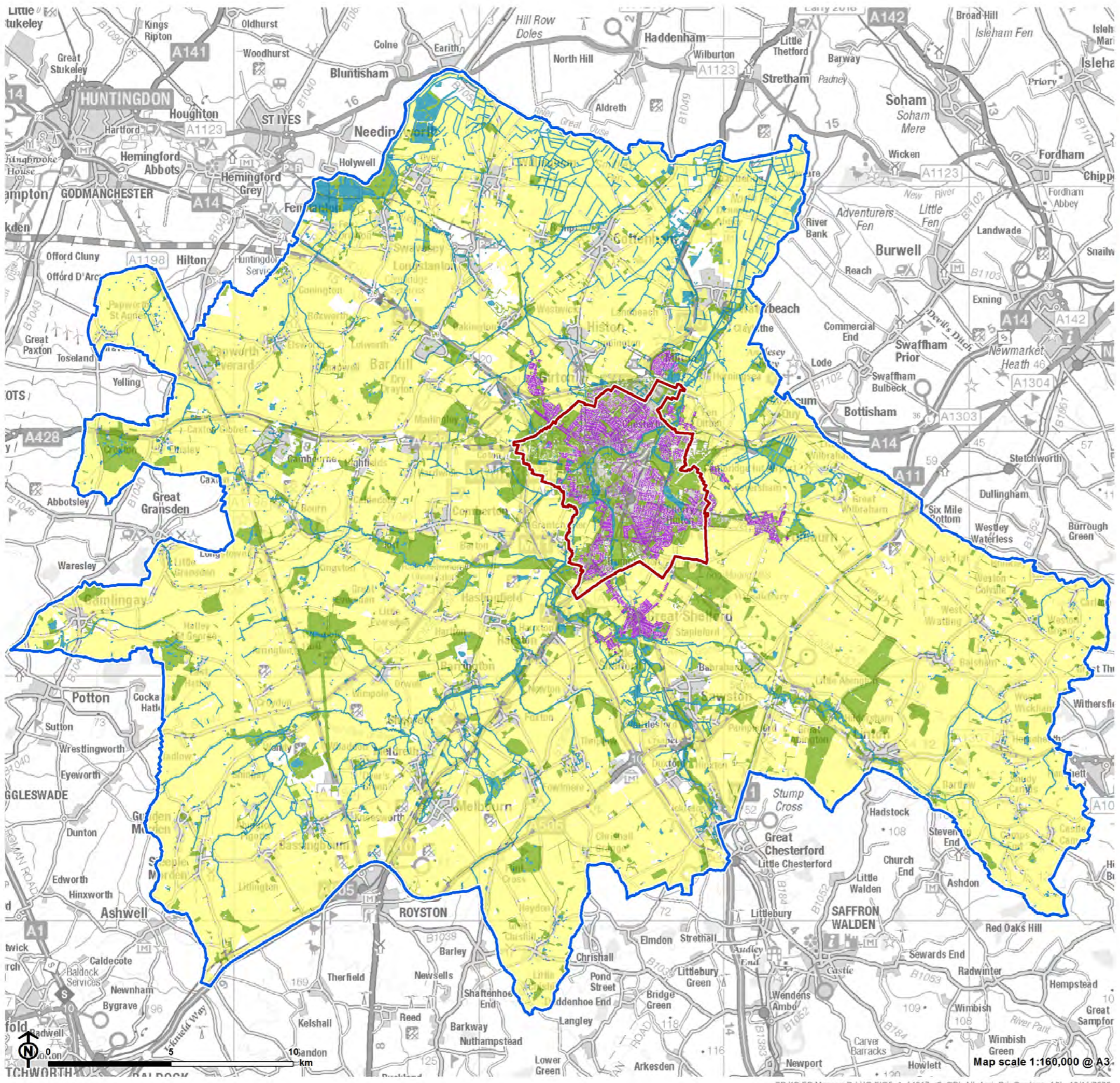


Figure 5.1: Green Infrastructure, Water Spaces, Agricultural Land and Private Gardens

- Cambridge
- South Cambridgeshire
- Green infrastructure
- Water space
- Agricultural land
- Private garden

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 County Wildlife Sites were obtained from Cambridgeshire and Peterborough Environmental Records Office (CPERC). As the material shown on this layer does not go through an external consultation process the data is as was at Draft Submission July 2013. The most up to date County Wildlife Site Data can be obtained by contacting CPERC at <https://www.cperc.org.uk>

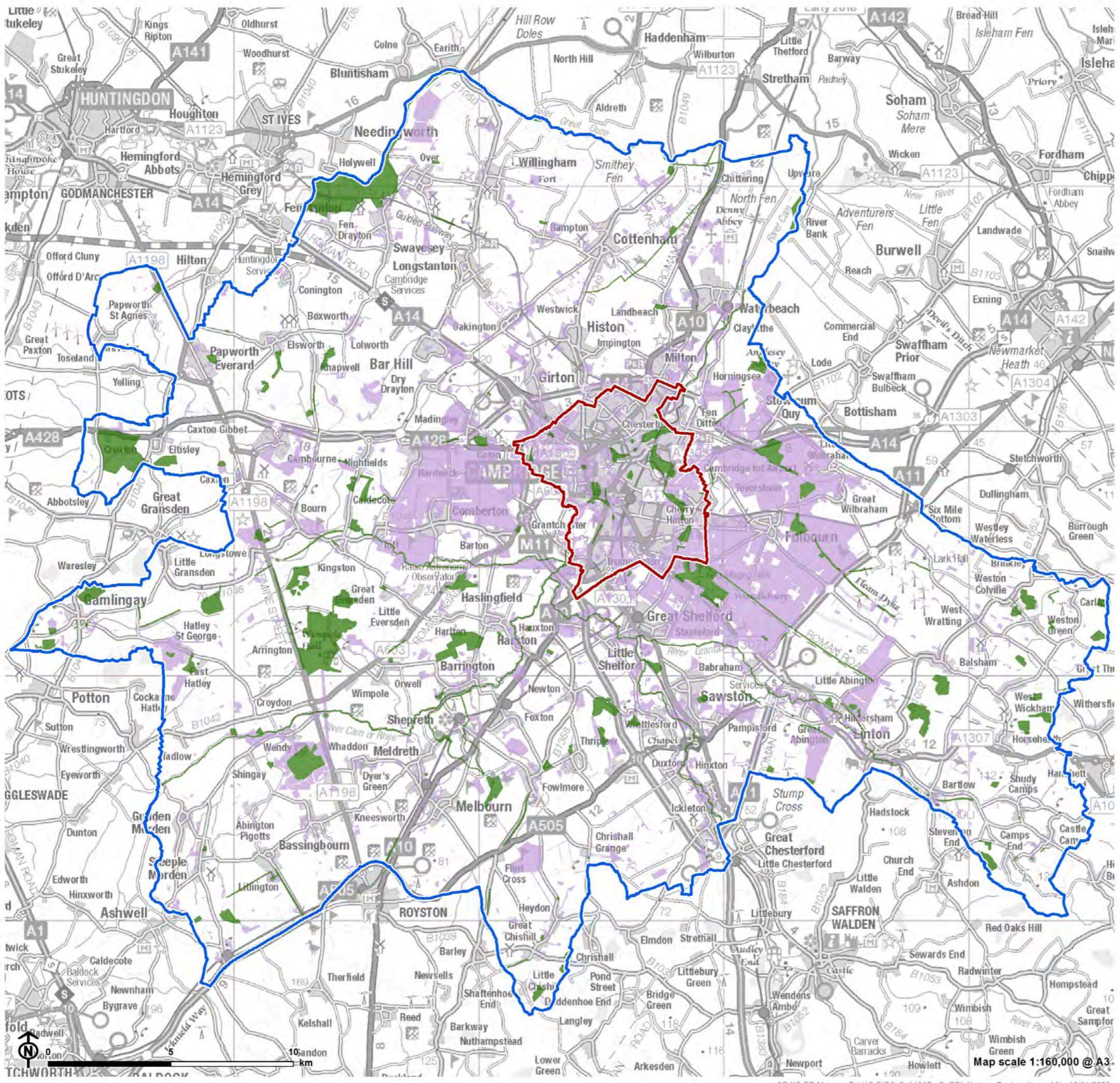


Figure 5.2: Green Infrastructure with Nature Designations

- Cambridge
- South Cambridgeshire
- Green infrastructure with nature designations
- Green infrastructure (undesignated)

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Map scale 1:160,000 @ A3



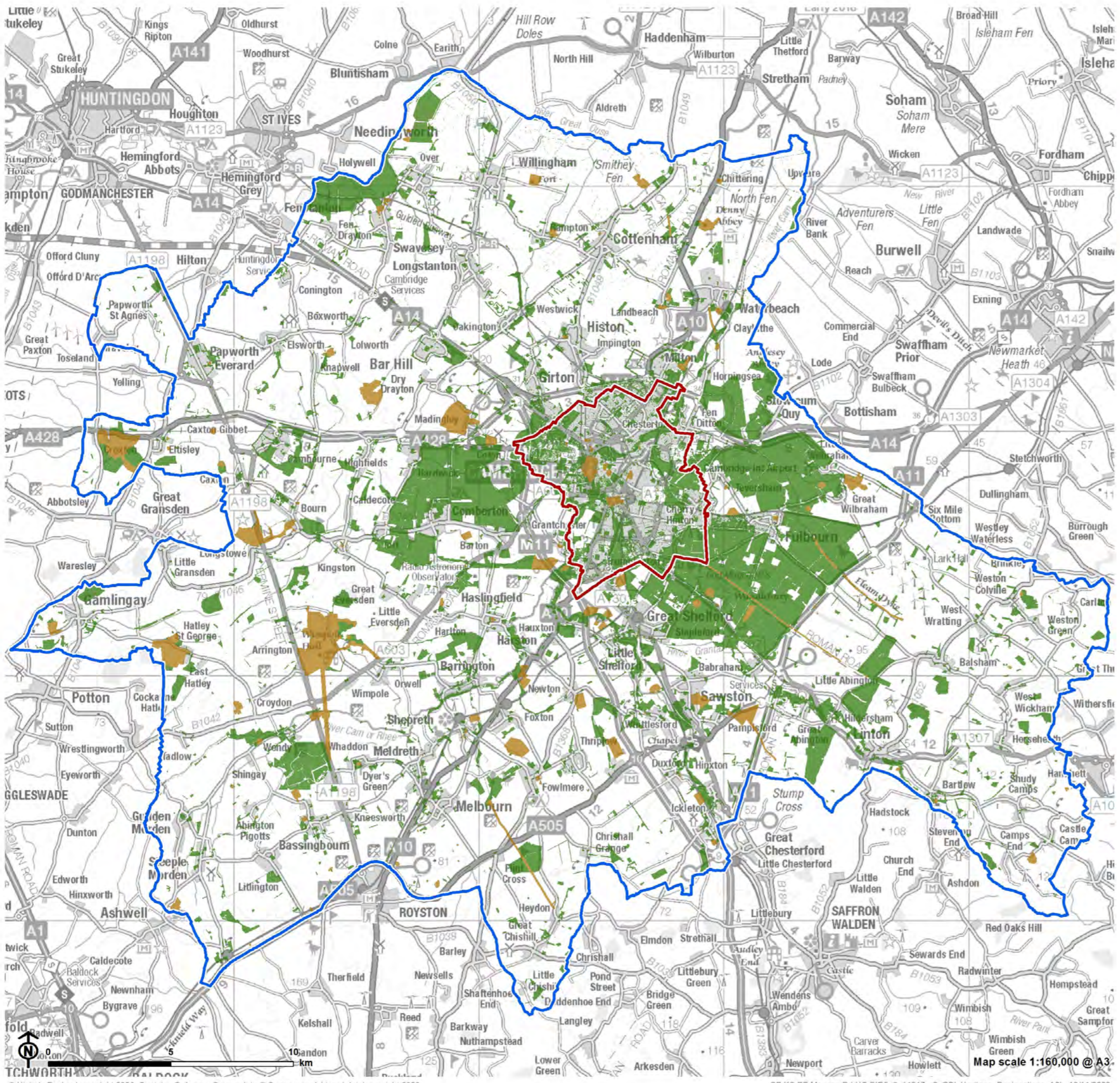


Figure 5.3: Green Infrastructure with Heritage Designation

- Cambridge
- South Cambridgeshire
- Green infrastructure with heritage designation
- Green infrastructure (undesigned)



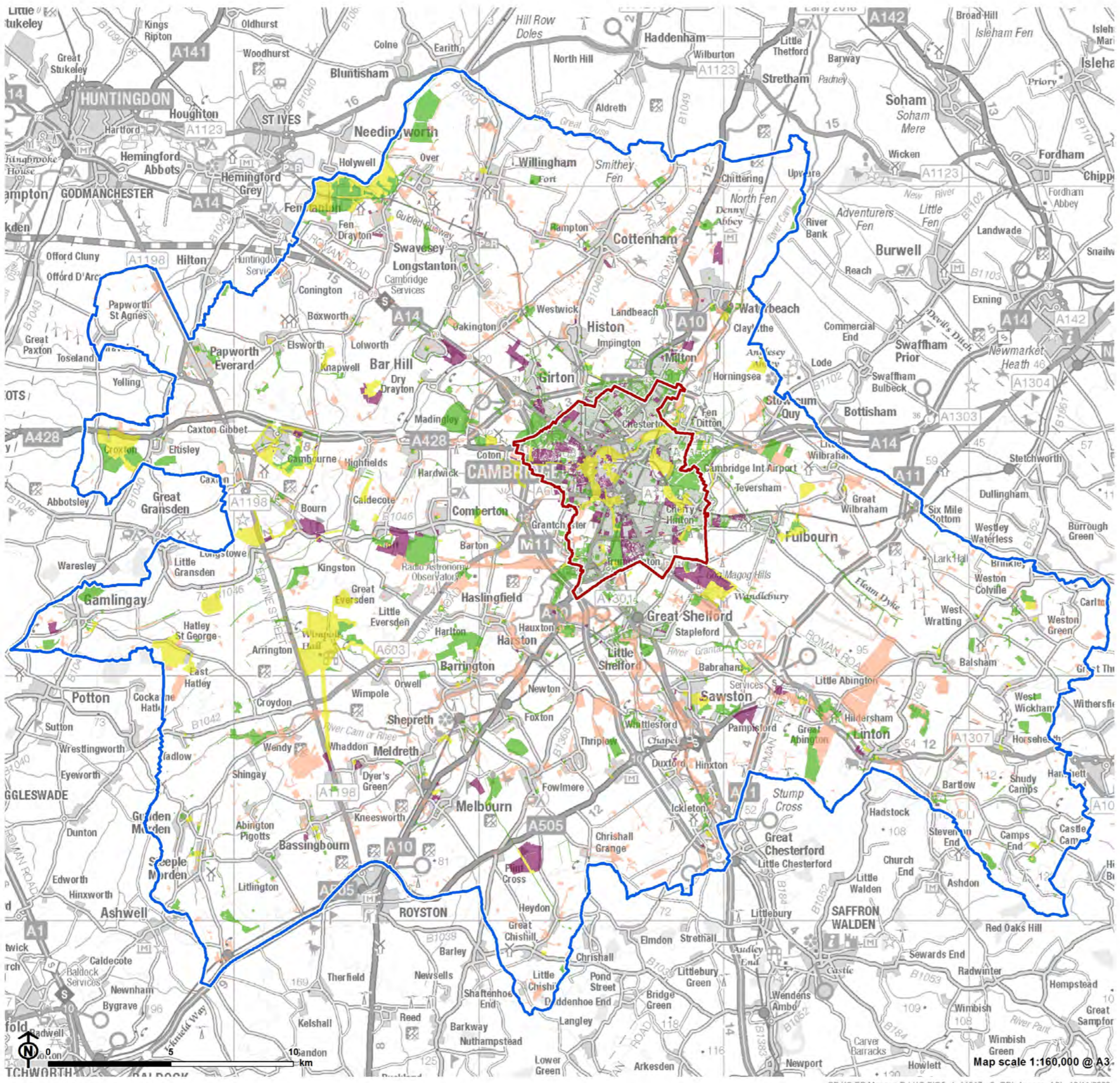


Figure 5.4: Green Infrastructure Accessibility

- Cambridge
- South Cambridgeshire
- Free access or access via PRoW
- No or restricted access
- Access information conflict
- No access information

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Chapter 6 - GI Themes

6.1 Greater Cambridge has a wealth of GI assets which serve to provide ecosystem services for environmental, social and economic gain. To provide a comprehensive baseline and evaluation of the GI network in Greater Cambridge, a themed approach has been taken. The seven themes identified are:

- Theme 1: Landscape, cultural heritage and sense of place;
- Theme 2: Biodiversity and geodiversity;
- Theme 3: The water environment;
- Theme 4: Access and connectivity;
- Theme 5: Recreation and play;
- Theme 6: Carbon sequestration;
- Theme 7: Agriculture and community food growing.

6.2 In addition to these seven themes, the cross-cutting themes of climate change, wellbeing and social inclusion, and environmental factors (which includes, for example, air quality, rainfall, temperature regulation and noise) are considered throughout.

6.3 The structure of each theme is consistent and addresses the following in turn:

- 'Why is the theme relevant to GI?' explains the importance of the theme in the context of GI and highlights how the theme links to climate change, wellbeing and social inclusion, and environmental factors;
- 'Existing and emerging evidence' summarises the relevant resources, strategy and policy documents that have been reviewed to provide the evidence and highlights emerging evidence that should be reviewed once published. This is supported by Appendix 2;
- 'Key GI assets' provides a detailed overview of the assets within Greater Cambridge that form part of the network. It should be noted that GI assets, due to their multifunctional nature, can often relate to more than one theme. Where this is the case, the assets are mentioned against each relevant theme in turn. Cross-boundary assets have also been included where relevant;
- 'Key issues' identifies the existing issues with regards to the quantity, quality, accessibility and potential future risks to the identified GI assets. This is supported by Appendix 3 which provides an overview of stakeholder input;
- 'Key opportunities' highlights areas where the GI network can be enhanced based upon the issues identified. This is supported by Appendix 3; and
- 'Broad opportunity zones' builds upon the identification of key issues and opportunities to identify a series of zones where opportunities could be realised. Where relevant, these are mapped.

Theme 1: Landscape, cultural heritage and sense of place

Why is this theme relevant to GI?

Climate Change

Unique landscapes and heritage assets are inherently sensitive to the impacts of climate change. A well-planned GI network considers those assets most at risk and seeks to ameliorate detrimental impacts such as degradation and decay, ensuring the assets unique to an area continue to provide the valuable ecosystem services for which they are known.

Wellbeing and Social Inclusion

Urban and rural historic and archaeological sites, as well as the broader historic environment (such as routeways); make an important contribution to sense of place, time depth, local identity and distinctiveness. They also contribute to quality of life parameters and promote healthy access to the countryside by making available places to visit.

Environmental Factors

A large part of Greater Cambridge's identity links to its predominantly rural landscape and agricultural heritage. The soil underpinning this agricultural landscape provides a critical life support system; not only for the benefits they provide for people and wildlife, but for their role in improving air quality, absorbing noise pollution and influencing water quality.

6.4 GI contributes to the wider setting of open spaces; helping to restore areas of degraded landscape character, enhancing the condition and setting of historic features and promoting a sense of place. The identification of GI opportunities aims to conserve, enhance and increase the enjoyment of the environment as well as increase the accessibility of these assets to residents and visitors. These assets provide important areas of interest which require evaluation when considering the wider GI network.

Existing and emerging evidence

6.5 The list below summarises the relevant resources, strategies and policy documents that have been reviewed to provide the evidence presented in this section. Full details of each document and their relevance can be found in Appendix 2:

- Natural England National Character Area profiles 46, 86, 87, 88 and 90 (2013-2015)
- Greater Cambridge Sustainability Appraisal Scoping Report (2019)
- Greater Cambridge Landscape Character Assessment (emerging)
- Greater Cambridge Green Belt study (emerging)
- Cambridgeshire Green Infrastructure Strategy (2011)
- Greater Cambridge Local Plan HRA Scoping Report (2019)

Key assets

Landscape

6.6 Whilst land lying within the administrative boundary of Cambridge City is predominantly urban, the landscape of South Cambridgeshire is mainly rural with the population dispersed across 100 villages and smaller settlements. Land use and the underlying geology have combined to produce a very diverse landscape; including the distinctive Chalklands to the south, rolling Clay Hills across the centre and west, and the wide expanses of the Fens to the north.

6.7 Greater Cambridge is characterised by a historic city centre with ‘borrowed landscapes’ of college gardens and cemeteries, surrounded by a mixed residential landscape and some ancient villages. This is followed by a ‘rural lowland mosaic’, all dissected by the corridor of the River Cam and rail and road corridors. Many villages are prominent in the landscape, comprising an historic core and remnants of early enclosure. These features provide a local landscape setting and opportunity for people to experience biodiversity and open space. However, some of the outer parts of Cambridge City are characterised by poorer quality suburban housing developments as well as former industrial land use.

6.8 The landscape of Greater Cambridge does not contain any designated landscape areas (e.g. National Parks or Areas of Outstanding Natural Beauty (AONB)). Although Chilterns AONB lies around 15 km from the westernmost boundary and is considered an important asset, it lies beyond the extent considered for GI opportunities.

National Character Areas

6.9 As shown in Figure 6.1, the landscape of Greater Cambridge is encompassed within five distinct National Character Areas (NCAs), as defined below:

- NCA 46 The Fens on the north eastern border;
- NCA 86 South Suffolk and North Essex Clayland in the far south east;
- NCA 87 East Anglian Chalk extending across a large area of the east and south, stretching into the southern parts of Cambridge City;
- NCA 88 Bedfordshire and Cambridgeshire Claylands across the majority of the north and west, including much of Cambridge City; and
- NCA 90 Bedfordshire Greensand Ridge on the far western boundary.

6.10 The majority of the landscape in Greater Cambridge is within NCA 87 and NCA 88.

6.11 NCA 87 East Anglian Chalk is characterised by the narrow continuation of the chalk ridge that runs south-west–north-east across southern England. The underlying geology is Upper Cretaceous Chalk, which is covered in a surface deposit of ice and river-deposited material laid down during the last ice age. This creates a visually simple and uninterrupted landscape of smooth, rolling chalkland hills with large regular fields enclosed by low hawthorn hedges, with few trees, straight roads and expansive views to the north. The vast majority of its landscape is open countryside, under cereal production. Sustainable farming practices are required to help to manage the thin chalk soils and support wildlife in the wider countryside. The smooth, rolling chalkland hills are dissected by the two gentle valleys of the rivers Granta and Rhee, which converge to form the River Cam just south of Cambridge.

6.12 NCA 88 Bedfordshire and Cambridgeshire Claylands is a broad, gently undulating, lowland plateau dissected by shallow river valleys that gradually widen as they approach the Fens NCA to the east. The NCA is characterised predominantly by large-scale arable farmland, yet wide diversity of seminatural habitats are also present. This includes a number of internationally important and designated sites that support a range of species. There is a history of clay extraction for brick making, but subsequent restoration has provided opportunities for recreation and biodiversity aided by new woodland planting and other GI initiatives.

Local Landscape Assessment

6.13 The Greater Cambridge Landscape Character Assessment (LCA) is currently emerging and not yet published. The findings will be taken into account in the final version of this report.

Historic Features

6.14 Greater Cambridge has a rich and varied historic environment and hosts a number of heritage assets as shown in Figure 6.2. The area comprises over 4,000 Listed Buildings, 24 Registered Parks and Gardens, 113 Scheduled Monuments and 102 Conservation Areas across Cambridge City and South Cambridgeshire. The following assets are identified by Historic England as being 'at risk':

- 5 Conservation Areas: Duxford Airfield, Duxford/Whittlesford; Papworth Everard; Sawston; Fullburn Hospital; Waterbeach.
- 7 Listed Buildings: Church of St Giles; Little Chishill Mill; Large tannery building at Hutchins and Harding Ltd; Church of St Andrew the Less; Church of St Andrew, Burgoynes Road; Parish Church of St Andrew; Church of St Andrew
- 21 Scheduled Monuments at risk including several Bowl Barrow's and Roman sites e.g. Roman Road and Fleam Dyke.

6.15 The city of Cambridge is renowned worldwide for its historic environment, which defines the character of the city and makes it a popular tourist destination. The 'historic core' is a large conservation area deemed to be of particular historic interest, with over 1,000 listed buildings largely clustered in the central and western parts of the city centre.

6.16 Cambridge City Council has also designated over 1,000 buildings of local interest which are more evenly spread across the whole city centre. Although they do not meet the criteria for statutory listing, these are identified as of local interest for their architectural merit or historical associations. They include remains of Roman buildings to medieval and Gothic churches, college grounds, historic townhouses and shopping parades, and offices built in the 1970's. Furthermore, large parts of the floodplain and the setting of the River Cam are highly significant to the historic environment, together with Jesus Green and Midsummer Common.

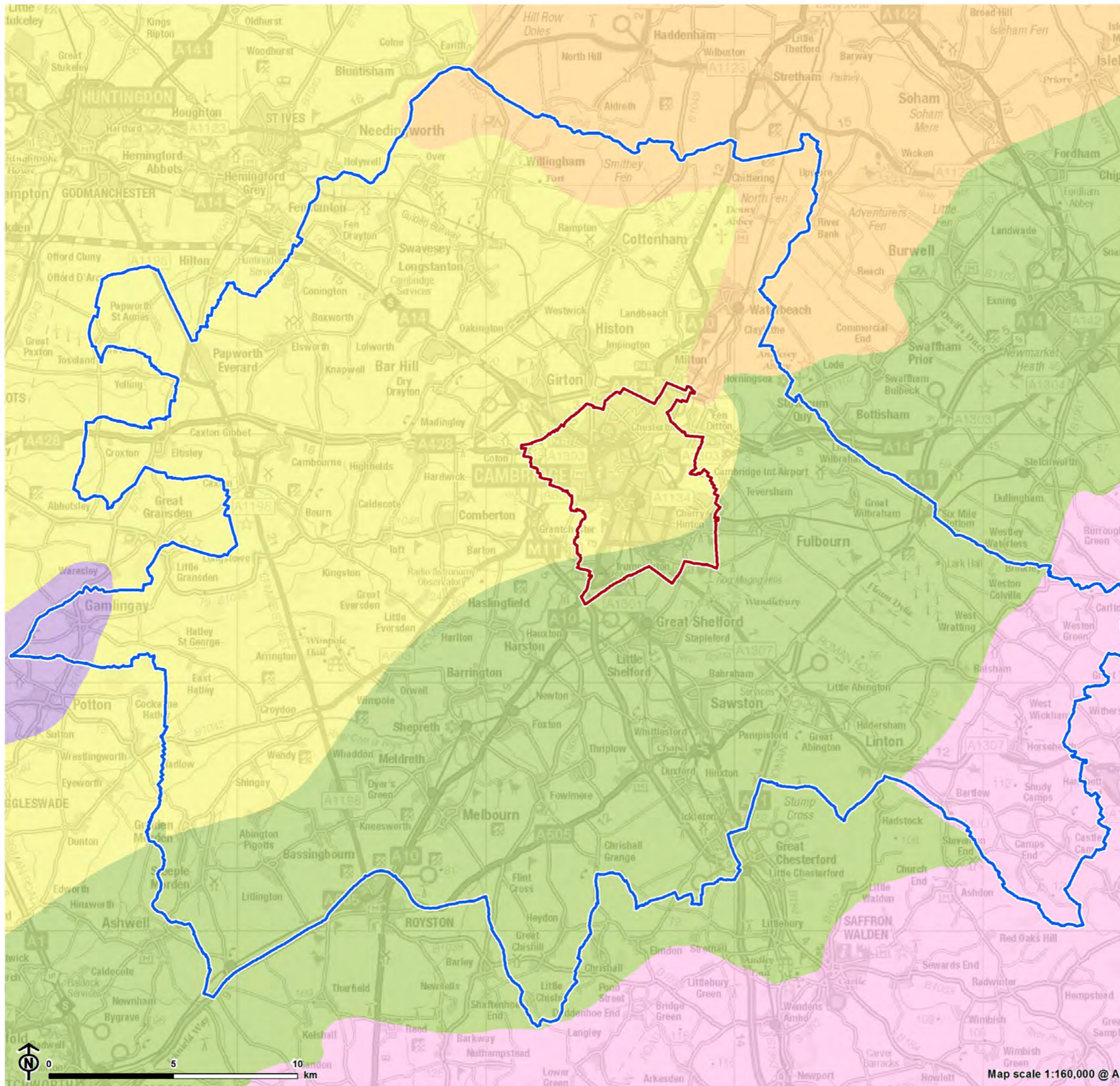
6.17 In the wider historic landscape of South Cambridgeshire, features such as Roman roads and ancient Dykes contribute interest and variety to an intensively farmed countryside. Important visitor attractions with historic links include Wimpole Hall, Denny Abbey and the Imperial War Museum. The historical development of South Cambridgeshire has been closely associated with Cambridge and the communication network (river crossings and road junctions), the avoidance of flooding, and developments in agriculture. South Cambridgeshire was a key location on east-west trading routes, with the Icknield Way to the south of Greater Cambridge a particularly notable historic routeway and a distinctive landscape feature today. The market towns and historic villages are mostly linear in form, despite modern infilling in some villages, particularly in villages close to the city.

Green Belt

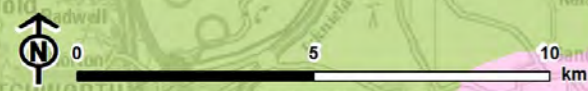
6.18 Cambridge City is enveloped by Green Belt, lying predominantly within South Cambridgeshire District. This land comprises 23,000 hectares (ha) and covers 25% of the District. The purposes of the Cambridge Green Belt are to: preserve the unique character of Cambridge as a compact, dynamic city with a thriving historic centre; maintain and enhance the quality of its setting; and restrict urban sprawl and the city physically merging with neighbouring towns and villages.

6.19 The Councils have commissioned a Green Belt study as part of the updated evidence base for the Local Plan. This GI Study will provide clarity on the strategic GI context and where enhancements to the Green Belt could be focused.

Figure 6.1: National Character Areas (NCA)



- Cambridge
- South Cambridgeshire
- NCA**
- 46: The Fens
- 86: South Suffolk and North Essex Clayland
- 87: East Anglian Chalk
- 88: Bedfordshire and Cambridgeshire Claylands
- 90: Bedfordshire Greensand Ridge



Map scale 1:160,000 @ A3

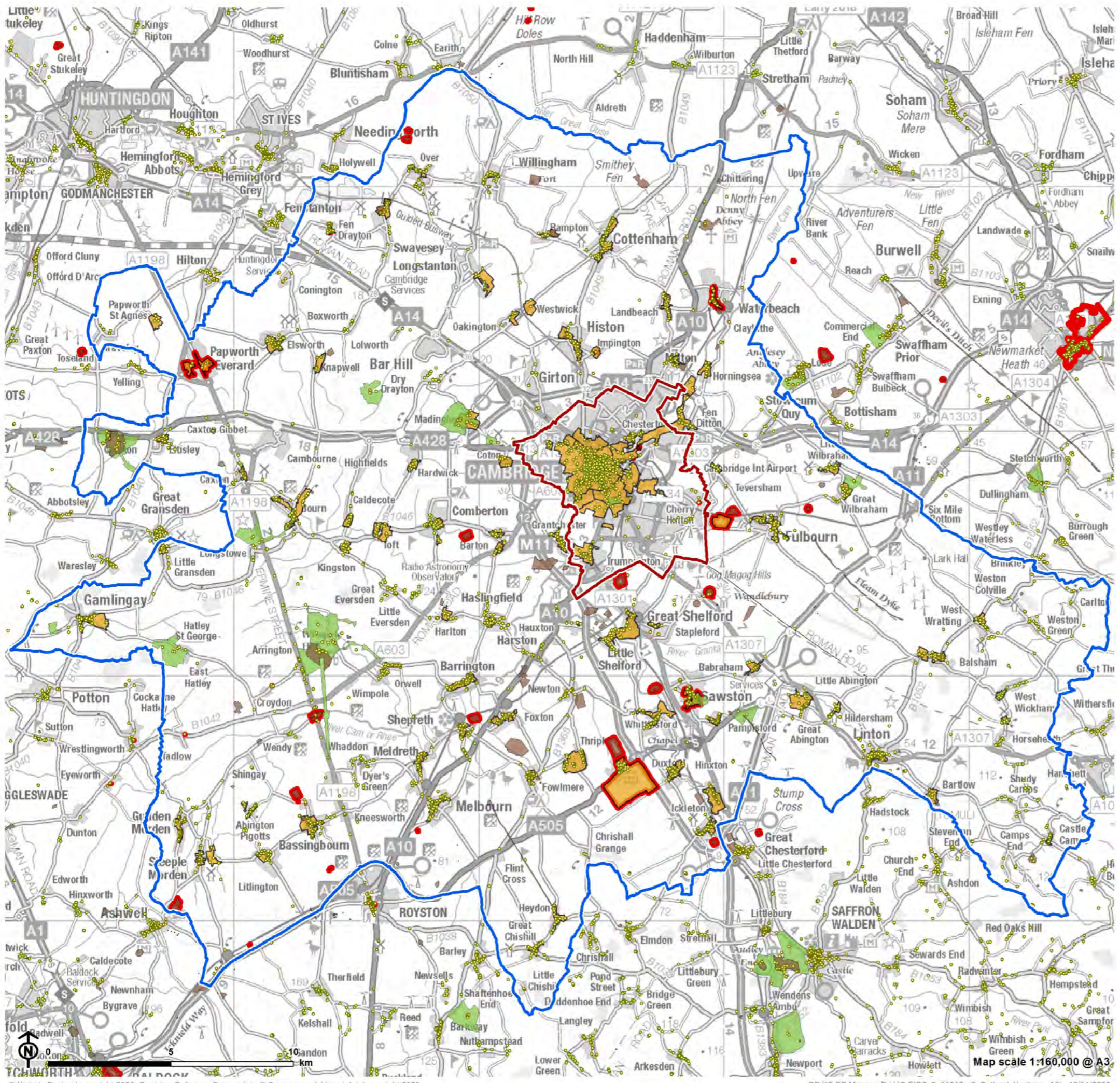


Figure 6.2: Cultural Heritage

- Cambridge
- South Cambridgeshire
- Listed Building
- Scheduled Monument
- Registered Park and Garden
- Conservation Area
- Heritage at risk

Key issues

6.20 Table 6.1 sets out key issues organised by 'forces for change'; noting the sources that have led to their identification. Where an issue was identified through more than one source, the issue has not been duplicated, but the range of sources have been noted in the 'Source' column. Appendices 2 and 3 provide an overview of stakeholder feedback that has informed this assessment.

Table 6.1: Key issues for landscape, cultural heritage and sense of place

Force for change	Issue	Source
Future development pressures	<p>Major developments including transport links, residential expansion and employment hubs particularly in the urban fringe and growth area south-east of Cambridge may have an adverse impact on landscape and settlement character.</p> <p>The potential also exists for detrimental effects on the setting of designated heritage assets due to the erosion of architectural and historic character within Fenland villages.</p>	<p>NCA 46 The Fens</p> <p>Stakeholder consultation</p>
Landscape condition	Landscape degradation due to the legacy of sand and gravel quarrying, resulting in a series of restored and flooded waterbodies. There is potential for future integration of biodiversity and recreational benefits to improve these post- industrial / -mining landscapes.	<p>NCA 88 Bedfordshire and Cambridgeshire Claylands</p>
Habitat loss and fragmentation	Reduced size and increased fragmentation of semi-natural priority habitats due to intensive agricultural use to support increasing demand.	<p>Cambridgeshire Green Infrastructure Strategy <small>Error! Bookmark not defined.</small></p>
Recreational pressures	Recreational pressures may pose a risk to landscape and heritage assets e.g. Wimpole and Anglesey Abbey, particularly where there is intensive use and lack of awareness of the value assets provide. These pressures may increase with population growth resulting in increased demand for outdoor recreation.	<p>Greater Cambridge Local Plan HRA Scoping Report</p> <p>NCA 88 Bedfordshire and Cambridgeshire Claylands</p> <p>Stakeholder consultation</p>
Air and noise pollution	<p>Assets already at risk of decay and neglect may be adversely affected by an increase in air or noise pollution.</p> <p>Air pollution is an issue along key transport corridors as a result of vehicular emissions: GI assets along such routes</p>	Stakeholder consultation

Force for change	Issue	Source
	need appropriate buffering and mitigation especially where new transport infrastructure and residential developments are planned.	
Climate change	<p>Environmental pressures present a direct risk to designated heritage assets, and landscape character and quality through extreme weather including flooding and drought.</p> <p>The impacts of drought and a reduced water table have already impacted green space assets including hedges, verges, mature trees and newly planted trees.</p>	<p>Climate Change Act 2008 (2050 Target Amendment) Order 2019</p> <p>Stakeholder consultation</p>
Future development pressures	<p>Development threatens to erode the areas of best landscape and views without their formal recognition /designation and careful planning. Most of the area's heritage assets (namely buildings) are, generally, well-protected by the planning system. Other important buildings, streets, views and their landscape setting are often not 'designated', yet still provide character and value. The evolution and history of the landscape and heritage assets needs to be truly understood and valued to ensure they are protected from development.</p> <p>Some of the important views / areas at risk include: Gog Magog Hills; green spaces between the Biomedical Campus and Nine Wells Nature Reserve; Coton corridor; Ely Cathedral; King's College Chapel; and, iconic views of The Backs, the Commons and meadows within Cambridge City.</p>	Stakeholder consultation

Key opportunities

6.21 Considering the issues noted above, and the range of evidence reviewed, Table 6.2 sets out the key opportunities that have been identified. Opportunities have been categorised as one or both of the following:

- A: Overarching principles/considerations for the emerging Local Plan; and/or
- B: Partnership opportunities.

6.22 At this stage of the study, project or site-specific opportunities have not been identified in these tables. The next stage of this study will provide more detail on potential projects using the information captured in Appendix 3 (consultation outputs).

Table 6.2: Key opportunities for landscape, cultural heritage and sense of place

Code	Opportunity summary	Opportunity description	A	B
1i	Maintain, enhance and promote unique historic and landscape assets	Maintain, enhance and promote unique historic and landscape assets e.g. the Commons, Parks and Gardens, cemeteries, green corridors, wedges and fingers as well as the Green Belt; all of which are important components of the landscape setting of the historic city.	Yes	Yes
1ii	Conserve and promote landscape and historical features of East Anglian chalklands	As defined within <u>NCA 87</u> , conserve and promote the landscape character, geodiversity, historic environment and historical assets of the East Anglian chalklands, including the open views of undulating chalkland, large rectilinear field pattern and linear ditches, strong equine association and the Icknield Way prehistoric route. Improve opportunities to enhance people's enjoyment of the area while protecting levels of tranquillity.	Yes	Yes
1iii	Increase access to and enjoyment of landscape and heritage assets	Promote and increase the enjoyment, appreciation and knowledge of Greater Cambridge's unique landscape character and wealth of heritage assets by increasing access, providing recreational opportunities, improving interpretation and educational opportunities.	Yes	Yes
1iv	Restore and promote historic landscapes of fens and wetlands	In balance with conserving biodiversity, promote the heritage of historic landscapes such as the fens and wetlands through restoration, enhanced access, and interpretation.	Yes	Yes
1v	Use GI to improve resilience of heritage and landscape features to climate change	Use GI to improve the resilience of heritage assets and landscape features to climate change and likely changes to temperature and the frequency and severity of extreme weather events.	Yes	Yes
1vi	Sensitively plan development with integrated GI to enhance historic and landscape assets	Sensitively plan development with GI as an integral component to enhance the historic environment and landscape setting, including its role in creating a sense of place, promoting tourism and promoting innovative re-use of building stock. Ensure equal focus on protecting key landscape views into and out of the city and low- /human- level views e.g. wetlands, rural agricultural areas, and paths and byways.	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
1vii	Ensure SuDS and GI incorporated into new development, particularly in urban fringe and growth areas	As defined within <u>NCA 87</u> , incorporate SuDS and GI into new developments, particularly in relation to the urban fringe and growth areas such as southeast Cambridge to increase soil and water quality and enhance landscape character.	Yes	Yes
1viii	Consider developing public realm strategy	Consider developing a public realm strategy that is tailored to the Cambridge “rural style” of natural open spaces, which should set the precedent for sustainable management and stewardship of the land.	Yes	Yes
1ix	Encourage grant funded schemes to manage and protect landscape and heritage assets	Encourage community heritage schemes, agri-environment schemes and other grants across the large area of rural agricultural land in South Cambridgeshire to sensitively manage and protect landscape and heritage assets; particularly in areas where there are conflicting land uses.		Yes
1x	Improve multi-functional GI links of urban fringe	Improve multi-functional GI links and the design of the urban fringe to promote landscape character and improve access to the countryside for local communities.	Yes	Yes
1xi	Regenerate and restore post-industrial / mining landscapes with poor landscape quality	As defined within <u>NCA 88</u> , regenerate and restore post- industrial / mining landscapes with poor landscape quality, integrating GI to retain the geodiversity whilst ensuring multifunctional benefits are achieved e.g. for biodiversity, recreation and leisure, landscape character, connectivity of assets, timber and biomass provision, strengthening sense of place and tranquillity, and ensuring resilience to climate change.	Yes	Yes
1xii	Protect key trees through TPOs	Ensure significant individual trees, tree-lined ways and groups of trees through the city and rural villages (for example Barnwell) which provide value to the landscape character and quality are protected through Tree Preservation Orders (TPOs).	Yes	Yes
1xiii	Explore and utilise historic assets as gateways to countryside	Some historic assets already act as gateways to the countryside, particularly Registered Parks and Gardens like Wimpole Hall and Denny Abbey and Farmland Museum. Consider exploring and utilising other potential gateways within the GI network to increase access and connectivity.	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
1xiv	Improve interpretation and educational opportunities of historic assets in NCA88	As defined within <u>NCA 88</u> , protect, conserve and enhance the cultural heritage and tranquillity, including important geodiversity, archaeology, historic houses, parkland, and Second World War and industrial heritage, by improving interpretation and educational opportunities to increase people's enjoyment and understanding of historic assets.	Yes	Yes
1xv	Enhance biodiversity value of historic assets	Enhance biodiversity value of historic assets e.g. ancient woodlands and Registered Parks and Gardens.	Yes	Yes
1xvi	Consider developing Historic Environment Strategy	Consider developing a Historic Environment Strategy for Greater Cambridge (as required by the NPPF) to ensure the city retains the essential character of its streets, public spaces and GI assets. Where feasible, important views into and out of the city should be listed to ensure they are retained.	Yes	Yes

Identifying broad opportunity zones

6.23 Drawing together all of the evidence presented in this section, Table 6.3 sets out the broad opportunity zones identified under this theme. This is supported by Figure 6.3.

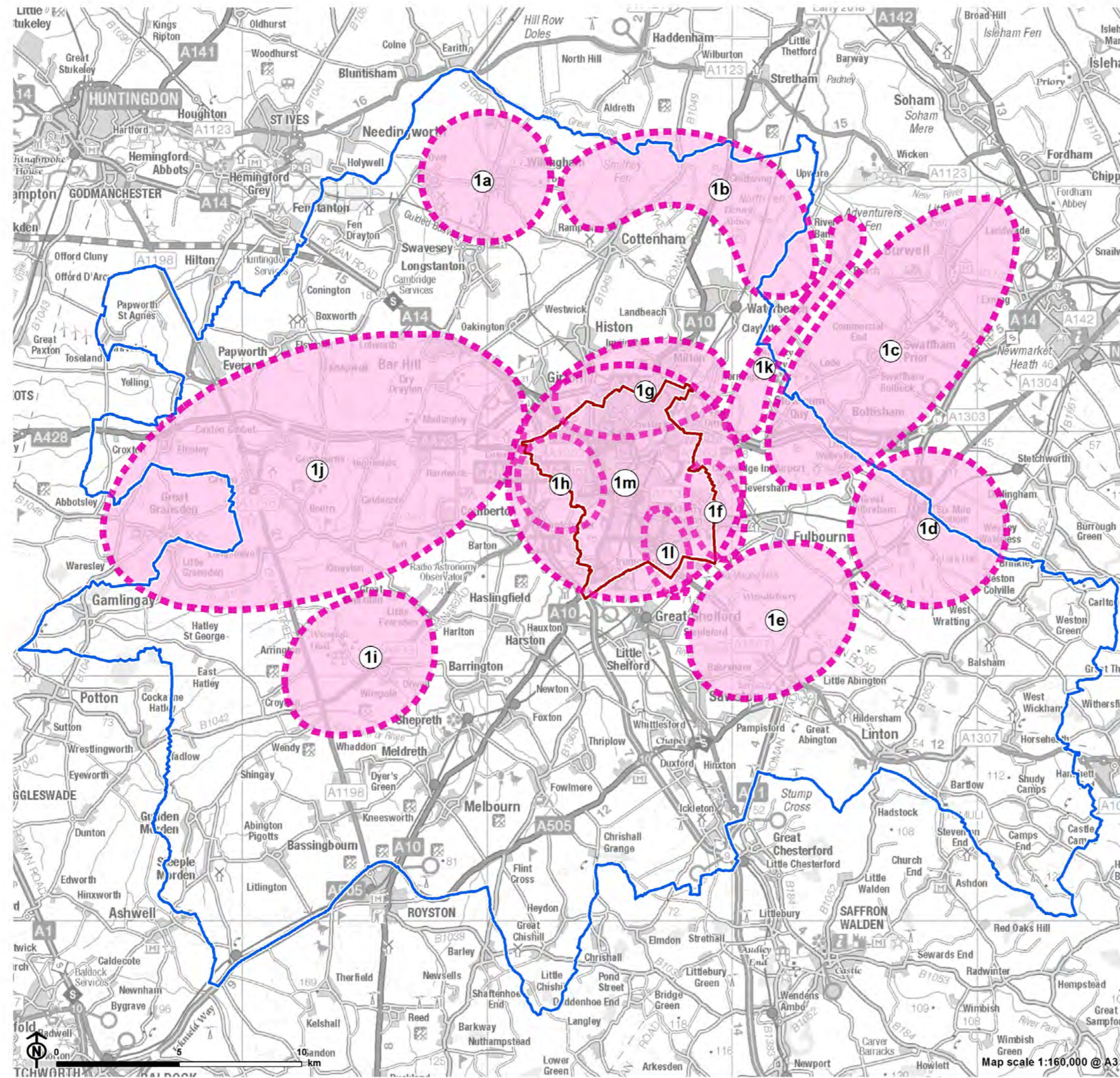
Table 6.3: Broad opportunity zones for landscape, cultural heritage and sense of place




Opportunity map reference	Description	Code
1a – Ouse Valley gateway	Explore the opportunity to enhance the Ouse Valley as a gateway to the countryside, providing access and connectivity improvements. Expansion work to Ouse Fen offers the potential to create wider habitat linkages including riparian woodland planting.	1iii, 1iv
1b – North east fen arc	Enhance the key north east arc within the GI network which forms a wider connection linking Wicken Fen and Ouse Fen.	1iv
1c – Wicken Fen vision	Key opportunity to combine fen restoration and active travel improvements in order to tackle development pressures in Cambridge East.	1ii, 1iv, 1x
1d – Eastern Fen restoration and expansion	Fenland extension and restoration to the east offers landscape and biodiversity benefits, as well as the opportunity for the expansion of grassland habitat at Great Wilbraham Fen and Fulbourn Fen.	1iv

Opportunity map reference	Description	Code
1e – Gog Magog Hills and South Cambridge urban fringe	Key opportunity to expand high-quality GI to help accommodate growth and absorb recreational pressure, enhancing existing landscape features within the fringes of south Cambridge towards the Gog Magog Hills.	1i, 1v,
1f – Cherry Hinton corridor	Introduce landscape enhancements and habitat restoration to help alleviate recreational and development pressures along the Cherry Hinton corridor.	1i,
1g – North Cambridge urban fringe	Improve the urban fringe to provide recreation opportunities and promote landscape character whilst improving access to the countryside for local communities.	1i, 1iii, 1x
1h – Coton corridor	Key opportunity for expansion / enhancement for both landscape and recreational benefits given the development pressures in the west of Cambridge.	1i, 1iii, 1x
1i – West Cambridgeshire Hundreds woodland expansion	Enhance the landscape value of the West Cambridgeshire Hundreds, linking and enhancing the existing semi-natural habitat to create new opportunities for biodiversity and recreation.	1i, 1iii
1j – West Cambridgeshire recreational buffer	Utilise GI to promote west Cambridgeshire as a recreational buffer, creating linkages to recreational assets from the settlement edge of local villages. The opportunity exists to increase soil and water quality whilst enhancing landscape character.	1i, 1iii
1k – North east Cambridge to Waterbeach corridor	Key opportunity for landscape and recreational functions along the section of the River Cam linking north east Cambridge and Waterbeach due to adjacent development pressures.	1i, 1iii, 1iv, 1x
1l – Chalk rivers corridor	Enhancement of the Hobson's and Vicar's Brook forming the chalk river corridor and the creation of a link from the city's southern fringes into the Gog Magog Hills.	1i, 1ii, 1iii,
1m - Cambridge city urban greening and public realm improvements	Develop a public realm strategy to include urban greening interventions e.g. street trees, SuDS and green roofs, ensuring it enhances the historic character of streets, public spaces and GI assets. Also, seek to protect existing significant trees and tree-lined ways in the urban environment and list important views out of the city where feasible.	1viii, 1xii, 1xvi



Figure 6.3: Landscape, Cultural Heritage and Sense of Place Broad Opportunity Zones



-  Cambridge
-  South Cambridgeshire
-  Landscape, cultural heritage and sense of place broad opportunity zones
- 1a: Ouse Valley gateway
- 1b: North east fen arc
- 1c: Wicken Fen vision
- 1d: Eastern Fen restoration and expansion
- 1e: Gog Magog Hills and South Cambridge urban fringe
- 1f: Cherry Hinton corridor
- 1g: North Cambridge urban fringe
- 1h: Coton corridor
- 1i: West Cambridgeshire Hundreds woodland expansion
- 1j: West Cambridgeshire recreational buffer
- 1k: North east Cambridge to Waterbeach corridor
- 1l: Chalk rivers corridor
- 1m: Cambridge city urban greening and public realm improvements



Theme 2: Biodiversity and geodiversity

Why is this theme relevant to GI?

6.24 Biodiversity – the variety of life, of our flora and fauna – reflects the landscape in which it sits. Geodiversity – the variety of geological and physical elements of nature (such as minerals, rocks, soils, fossils and landforms), and the active geological and geomorphological processes that create them – underpins the more superficial habitats we encounter.

6.25 The geology and soils, and the habitats and species they support together create a natural diversity that is locally characteristic to Greater Cambridge. It tells the current story of the land from which it evolved.

6.26 The need to create a functional, resilient network which supports thriving wildlife is essential, not only for the inherent value of biodiversity, but to support carbon sequestration, address flood risk and air quality pressures, maintain healthy food production, and to inspire and educate residents through accessing nature. GI acknowledges these interwoven benefits and ensures that the conservation of a functional ecological network can be delivered as a fundamental consideration in sustainable development.

6.27 Note that, whilst integral to this theme, ecological resources such as peatland habitats, are also addressed in Theme 6: Carbon sequestration.

Climate Change

The impacts of climate change have already affected biodiversity with changes to species distribution and composition, growing seasons and habitat condition. The magnitude, frequency and duration of these impacts is predicted to increase in the future. Whilst this threatens our most vulnerable indicators and ecosystems, it is recognised that it may also provide new opportunities for others, where sufficient habitat connectivity exists to permit dispersal and a shift in range.

Integrating biodiversity and geodiversity into GI planning and the resultant land management decisions serves to mitigate detrimental impacts of climate change on habitats and species as well as to enhance the resilience of the wider network to unavoidable changes.

Wellbeing and Social Inclusion

A functional and resilient ecological network, that is species-rich and structurally diverse, can optimise the opportunities for people to access nature, whilst accommodating the need for our more sensitive species to remain undisturbed. It inspires interaction, education and appreciation of the area's unique assets, ultimately serving people's wellbeing in return.

Environmental Factors

Habitats serve to benefit a range of environmental factors, from air quality to flood alleviation and temperature regulation. The extent of these benefits typically increases alongside the naturalness of habitat form and habitat function. Examples range from wetlands offering greater flood alleviation capacity alongside habitat diversity, to trees offering greater carbon storage alongside expanded, interconnecting woodlands or more diverse hedgerow structure. So too, 'artificial' habitats have a significant role to play, particularly in urban and peri-urban areas, serving to benefit air quality, rainfall and temperature regulation as well as bringing biodiversity into the fabric of the built environment.

Existing and emerging evidence

6.28 The list below summarises the relevant resources, strategies and policy documents that have been reviewed to provide the evidence presented in this section. Full details of each document and their relevance can be found in Appendix 2:

- [A Green Future: Our 25 Year Plan to Improve the Environment](#) (2018)
- [Planning Practice Guidance: Natural Environment – How Do Local Ecological Networks Relate to the Nature Recovery Network?](#) (2019)
- [Natural England National Habitat Network Mapping](#) (updated 2020)
- [Cambridge Nature Network: A Nature Recovery Network for Cambridge – Stage 2 Report](#) (Draft, July 2020)
- [Mapping Natural Capital and Opportunities for Habitat Creation in Cambridgeshire](#) (2019)
- [Natural Cambridge LNP Developing with Nature Toolkit](#) (2018)
- [Cambridgeshire Fens Biosphere](#) (submission to IUCN under consideration 2020)
- [Fens for the Future Partnership proposed Wildlife Network Mapping](#) (2012)
- [East Anglia Fens Peat Pilot](#) (emerging)
- [Great Crested Newt \(GCN\) District Licensing](#) (2020)
- [Gog Magogs Countryside Project](#) (ongoing)
- [West Cambridgeshire Hundreds Living Landscape](#) (ongoing)
- [Cambridge Canopy Project](#) (ongoing)
- [Natural England National Character Area profiles 87 and 88](#) (2013-2015)
- [Cambridgeshire & Peterborough Minerals & Waste Core Strategy Development Plan Document Submission Plan](#) (2010)

Key assets

Geodiversity

6.29 The underlying geology of [NCA 88 Bedfordshire and Cambridgeshire Claylands](#) across the majority of the west and north west of Greater Cambridge is of Jurassic and Cretaceous clays, overlain by more recent Quaternary glacial deposits of chalky boulder clay (till) and sand and gravel river terrace deposits within the river valleys. Lime rich, loamy and clayey soils with impeded drainage predominate, with better-drained soils in the river valleys. [NCA 87 East Anglian Chalk](#) by comparison is dominated by Upper Cretaceous Chalk geology which gives rise to nutrient-poor and shallow soils.

6.30 The vast majority of the land area in Greater Cambridge is arable farmland or managed grassland. The underlying soils give rise to a mix of classified agricultural land, the majority being of Grades 1, 2 and 3, with small areas designated as urban and non-agricultural; almost entirely the City of Cambridge.

6.31 A variety of mineral resources are found in the area including sand, gravel, limestone, chalk, chalk marl and clay. There are extensive deposits often occurring under high quality agricultural land or in areas valued for their biodiversity and landscapes, e.g. river valleys.

6.32 There are six Minerals Safeguarding Areas (MSAs) and seven Mineral Consultation Areas (MCAs) within the study area. There are also a small number of minerals site allocations, which are extensions to existing minerals sites. The mineral resource of primary interest is sand and gravel and crushed rock aggregate (limestone). Sand and gravel resources occur mainly within superficial or 'drift' deposits, subdivided into river sand and gravel, glacial deposits, head deposits and bedrock sand. There are sand and gravel deposits around Cambridge City, particularly to the north but also stretching out into the southern part of the Plan area. There are also deposits of chalk in the southern and eastern parts of Greater Cambridge. Upware Limestone is quarried on a small scale for use as an agricultural lime and asphalt filler.

Biodiversity

➤ International and National Nature Conservation Designations

6.33 Eversden and Wimpole Woods Special Area of Conservation (SAC) is the sole international nature conservation designation within the study area; an ancient woodland supporting barbastelle bat. The Ouse Washes SAC, Special Protection Area (SPA) and Ramsar, supporting important wetland flora and fauna, lies immediately north of the study boundary. The wider network of designations is summarised in Table 6.4 below. With the exception of Portholme SAC (lowland hay meadows) to the north west and Devils Dyke (grassland and scrubland facies on calcareous substrates) to the north east, the remainder extend north east, encompassing the southern extent of the East Anglian Fens. National and international nature designations are shown in Figure 6.4. Local nature conservation designations are shown in Figure 6.5.

Table 6.4: Summary of international nature conservation designations scoped into the Habitats Regulations Assessment (HRA) for the Greater Cambridge Local Plan (listed in order of proximity to Greater Cambridge)

Designation	Location within study area	Key Sensitivities
Eversden and Wimpole Woods SAC	Within the boundary of the study area, lying to the east of the A1198	Habitat loss or damage, non-physical disturbance, non-toxic contamination and recreational pressure; and Fragmentation, loss, degradation and disturbance of functionally linked habitat for barbastelle.
Fenland SAC	1km north east	Air pollution and changes to the pattern of hydrology; and The fen habitat is dependent on distinctive and influential species (in part maintained by grazers and surface borers), underlying hydrological conditions, habitat connectivity and active on-going management.
Wicken Fen Ramsar	1km north east	Broadly as described for Fenland SAC.
Ouse Washes	1.7km north east	Habitat loss or damage, non-physical disturbance, non-toxic contamination, air pollution, recreational pressure and changes to hydrology;

Designation	Location within study area	Key Sensitivities
SAC, SPA and Ramsar		<p>Loss of, or damage to, functionally linked habitat for spined loach, noting that potentially suitable waterbodies within Greater Cambridge share hydrological connectivity with the Ouse Washes;</p> <p>The washes are dependent on the long-term tidal strategy. Regular problem of summer flooding may result from severe siltation of Great Ouse River; and</p> <p>Loss of, or damage to, functionally linked habitat for wetland birds.</p>
Portholme SAC	4km north west	<p>Air pollution, recreational pressure and changes to hydrology; and</p> <p>Lowland hay meadows are dependent on seasonal inundation by flood waters and therefore dependent upon the maintenance of historic conditions without notable changes in levels of pollutants, nutrients or silt. Severe prolonged flooding has previously caused shift away from the characteristic lowland hay meadow community as a result of inundation and elevated phosphate levels.</p>
Devils Dyke SAC	5.8km north east	<p>Air pollution and changes to the pattern of hydrology; and</p> <p>The qualifying calcareous and semi-dry grasslands are reliant on soil structure and condition (in part maintained by grazers and surface borers), habitat connectivity and active, on-going management.</p>
Chippenham Fen Ramsar	10.3km north east	Broadly as described for Fenland SAC.

6.34 The North East Cambridge Area Action Plan (AAP) HRA Final Report concluded that likely significant effects could not be ruled out on select European designations as a result of the following specific potential impacts: Eversden and Wimpole Woods SAC (physical damage and loss, non-physical disturbance), Devils Dyke SAC (air pollution), Ouse Washes SAC, SPA Ramsar (air pollution and water quality) and Wicken Fen Ramsar / Fenland SAC (recreation, water quality and quantity). Recommendations to avoid risk of significant effect, and which should be considered in the identification of GI opportunities, are included as Key issues in Table 6.8 below.

6.35 The network of 42 national Site of Special Scientific Interest (SSSI) designations (excluding the Ouse Washes which lie immediately adjacent) supporting the international sites described above reflect the local character of Greater Cambridge. The northern belt supports relatively few designations, although the River Cam and adjacent Ouse Washes are expansive features which extend north east. The remaining sites, in broad terms, include the most valued woodland (often ancient or wet woodland), fen, chalk grassland, species-rich neutral grassland and hay meadow habitats of the county or indeed region. Of the SSSI network in Greater

Cambridge, 49.2% of the SSSI management units record favourable condition, 46.5% unfavourable recovering, 1.1% unfavourable no change and 3.2% unfavourable declining.

➤ Notable Habitats and Local Nature Conservation Designations

6.36 Cambridge City Council reporting to DEFRA in 2018/19 identified that, of the 421 County and City Wildlife Sites within Cambridge City area, 49.8% (208) were in positive conservation management at that time. Survey of the Local Nature Reserves and Wildlife Site network across the city and immediate hinterland is underway to inform a review of the City Council site management plans. This will inform an update of the Nature Conservation Strategy, identification of enhancement measures, and future project delivery opportunities to 2026. Once available, this information should be considered within any future GI evidence and related delivery documents.

6.37 Protected Roadside Verges (PRV) typically support neutral or calcareous grassland, often species-rich and/or supporting rare species such as moon carrot. PRV may extend adjacent areas of nature conservation value (as at Cherry Hinton Pits) or provide connectivity within the ecological network. Their linear nature and position within the mosaic however, leaves these vulnerable to scrub encroachment and salt deposition, for example. Closest to the city, PRV include those flanking the road network through Cherry Hinton, in the west around Wimpole (A603 and A1198), Knapwell and Gamlingay, and through the southern belt at Litlington, Melbourn, Duxford and Ickleton.

6.38 Ancient woodland habitats principally occur in the south east of the study area across the South Suffolk and North Essex Claylands, and west of Cambridge across the Bedfordshire and Cambridgeshire Claylands. Wood park and pasture is relatively widespread across the study area, with the exception of the northern belt, reflecting the historic estates such as Wimpole, Madingley and, within the city, straddling Queens Road and the Cam west of the centre, at Christ's Pieces and at Newtown. Large areas also occur out at Croxton, Gamlingay, Sawston and Great Wilbraham.

➤ Priority Habitats

6.39 The 2019 Natural Capital and Opportunities for Habitat Creation mapping identified the broad habitat types of grassland, wetland and woodland, as summarised below. These form the cross-county networks within which the current Greater Cambridge study area sits.

- Semi-natural grassland – the River Great Ouse corridor around Huntingdon and St Ives provides a near-continuous habitat network. Large networks also occur around Newmarket to the east of Cambridgeshire, with other smaller patches spread across the county. Numerous areas, spread fairly evenly across Cambridgeshire, occur where semi-natural grassland could be created to considerably enlarge and connect existing networks.
- Wet grassland and wetland – current distribution is concentrated in three locations - the Nene Washes, the Ouse Washes and to a lesser extent on the River Great Ouse between Wicken Fen and Ely. Field scale habitat creation could consolidate and enlarge these existing networks.
- Broadleaved and mixed woodland – the most significant networks occur west of Peterborough and in Huntingdonshire, although many patches of woodland remain ecologically isolated and there are no large patches of continuous habitat. Opportunities to create a more resilient network, as mapped in the 2019 study, exist throughout the current

study area (with the exception of fenland), where field-scale habitat creation could connect isolated woodland fragments.

6.40 Within these three broad categories, 11 Priority Habitat Inventory (PHI) types mapped by Natural England occur in the study area (see Figure 6.6). Areas identified for the restoration and expansion of priority habitats are captured in the NE National Network Mapping (see ‘Existing and emerging evidence’ above). Stakeholder consultation highlighted that there may be some inaccuracies in the priority habitat data, particularly in relation to floodplain grazing marsh, as some mapped habitat areas may no longer meet the habitat description as a result of intensive grazing (although the precise locations of discrepancy are not known). As noted in the note on data confidence in Chapter 5 of this report, work is currently being undertaken to verify this data (through Phase 1 survey) for parts of Greater Cambridge. The priority habitat data remains important to inform opportunity mapping as habitat existing and of the recent past.

6.41 To cross-compare with the 2019 Cambridge mapping study, the priority habitat types have been divided into:

- Grassland habitat types
- Wetlands habitat types
- Woodland and trees
- Areas recorded as 'No main habitat but additional habitats present'

6.42 The areas of each are summarised in Tables 6.5 to 6.7. Alongside the total area (measured from the Natural England PHI dataset), a fragmentation index is listed. The index is a comparable indicator of fragmentation derived from the number of constituent land parcels per equivalent 10ha. Note that whilst a lower index score reflects the fact that the total area of habitat is comprised of fewer parcels (i.e. is less fragmented), this may also be a result of restricted area or distribution (i.e. more rare habitat type).

Table 6.5: Grassland habitat types

Priority Habitat Type	Area (ha)	Fragmentation Index
Lowland meadows	121.1	3.9
Lowland calcareous grassland	198.2	8.5
Lowland dry acid grassland	0	-
Lowland heaths	0	-
Purple moor-grass and rush pasture	3.5	2.9
Good quality semi-improved grassland	112.4	7.9

Table 6.6: Wetland habitat types

Priority Habitat Type	Area (ha/km)	Fragmentation Index
Lowland fens	226.2 ha	13.5
Reedbeds	0 ha	-
Coastal and floodplain grazing marsh	1,131.9 ha	5.9
Chalk streams (km)	41.8 km	N/A

Table 6.7: Woodland and tree types

Priority Habitat Type	Area (ha)	Fragmentation Index
Deciduous woodland	2,974.5	13.6
Traditional orchard	199.2	16.3
Wood-pasture	3.7	8.2
Parkland	1,026.5	0.5

6.43 In addition to the above, the PHI category 'No main habitat but additional habitats present' accounts for 1,023.6ha with a fragmentation index of 2.7.

6.44 Additional habitat types of conservation priority within Greater Cambridge include chalk streams, rivers, ponds and standing water bodies, hedgerows and farmland.

➤ Network Summary

6.45 The network encompasses sites of biodiversity importance and provide routes or stepping stones for the migration, dispersal and genetic exchange of species in the wider environment. "An ecological network can be understood as a number of core, well connected, high quality areas of well-functioning ecosystems, together with those parts of the intervening landscape that are 'wildlife-friendly' and which, collectively, allow wildlife to thrive" ([Natural England, 2020](#)). In South Cambridgeshire such networks may include PRow, important roadside verges which need to be protected from road improvements or new access points, watercourses, ponds, moats, marshes and ditches that can be adversely affected by changes in local hydrology, woodlands, copses, pollarded willow and hedgerows, semi-natural grasslands and disused gravel, chalk or clunch pits. The management of such features is crucial to maintaining the existing biodiversity interest and to assisting further colonisation of habitats by various species. To have an overarching network for nature provides a framework within which future BNG can be planned and managed, thereby ensuring the benefits to biodiversity are optimised and reflect local character.

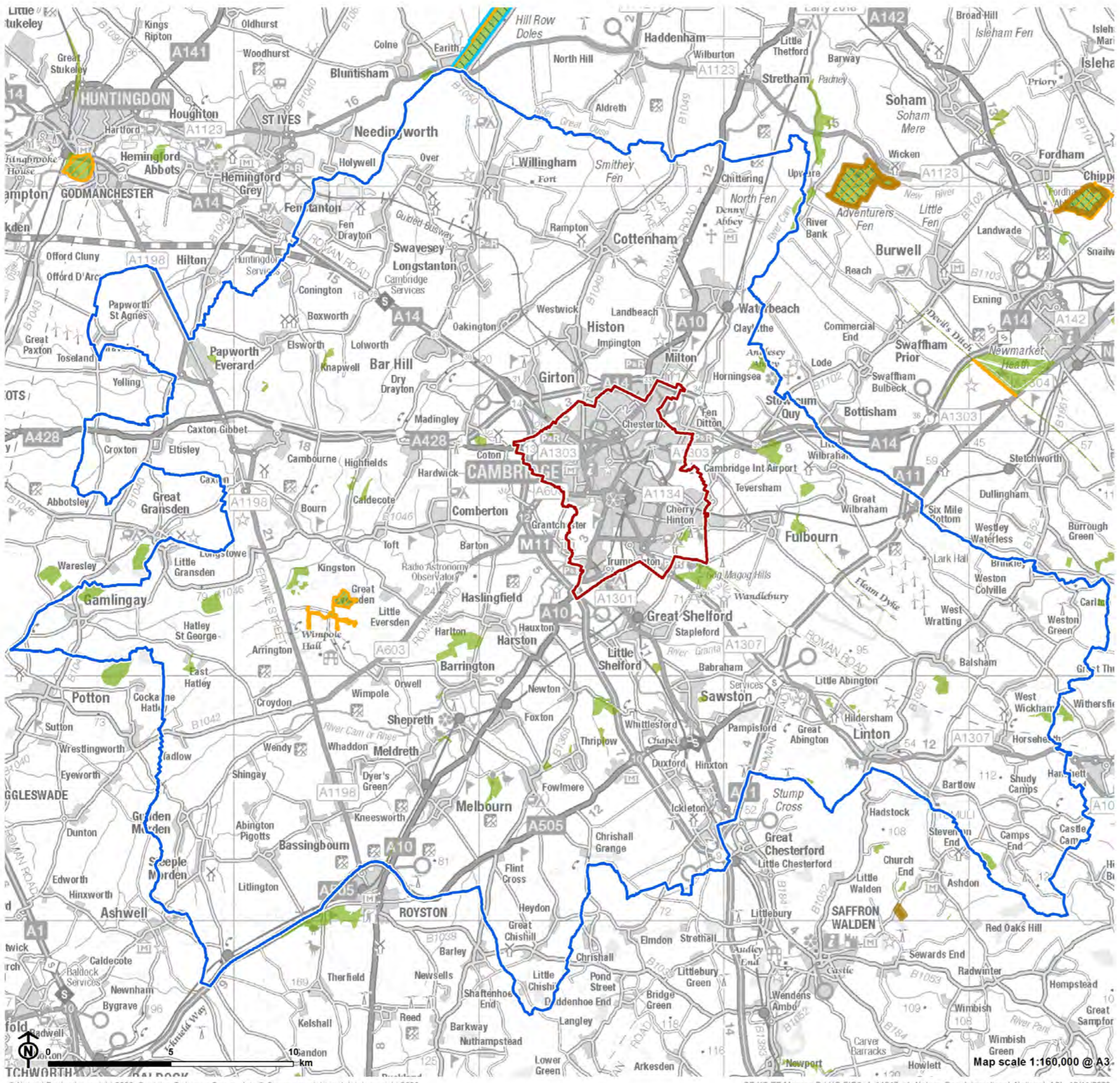


Figure 6.4: International and National Nature Conservation Designations

- Cambridge
- South Cambridgeshire
- Special Protection Area
- Special Area of Conservation
- Ramsar
- Site of Special Scientific Interest
- National Nature Reserve

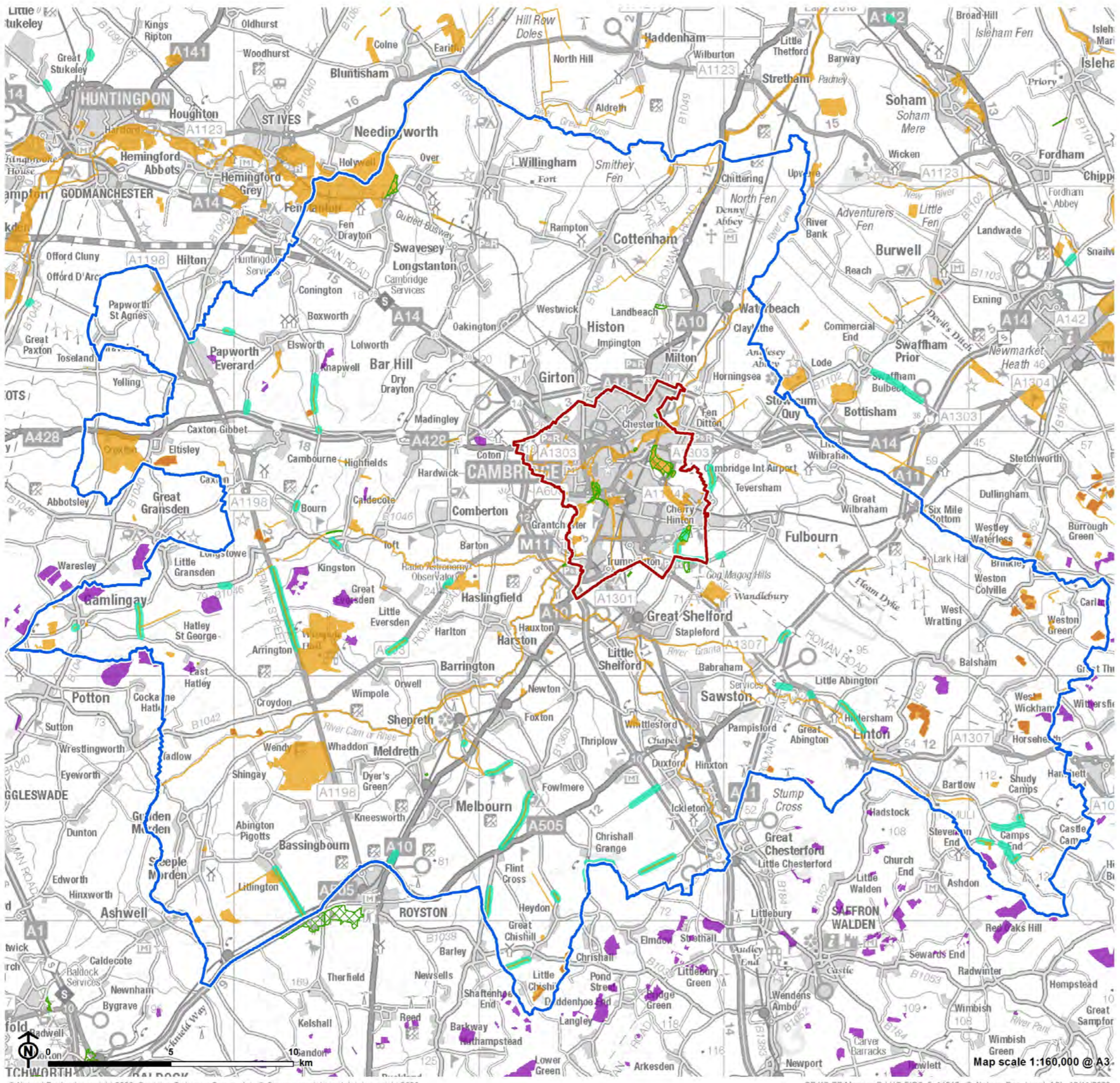
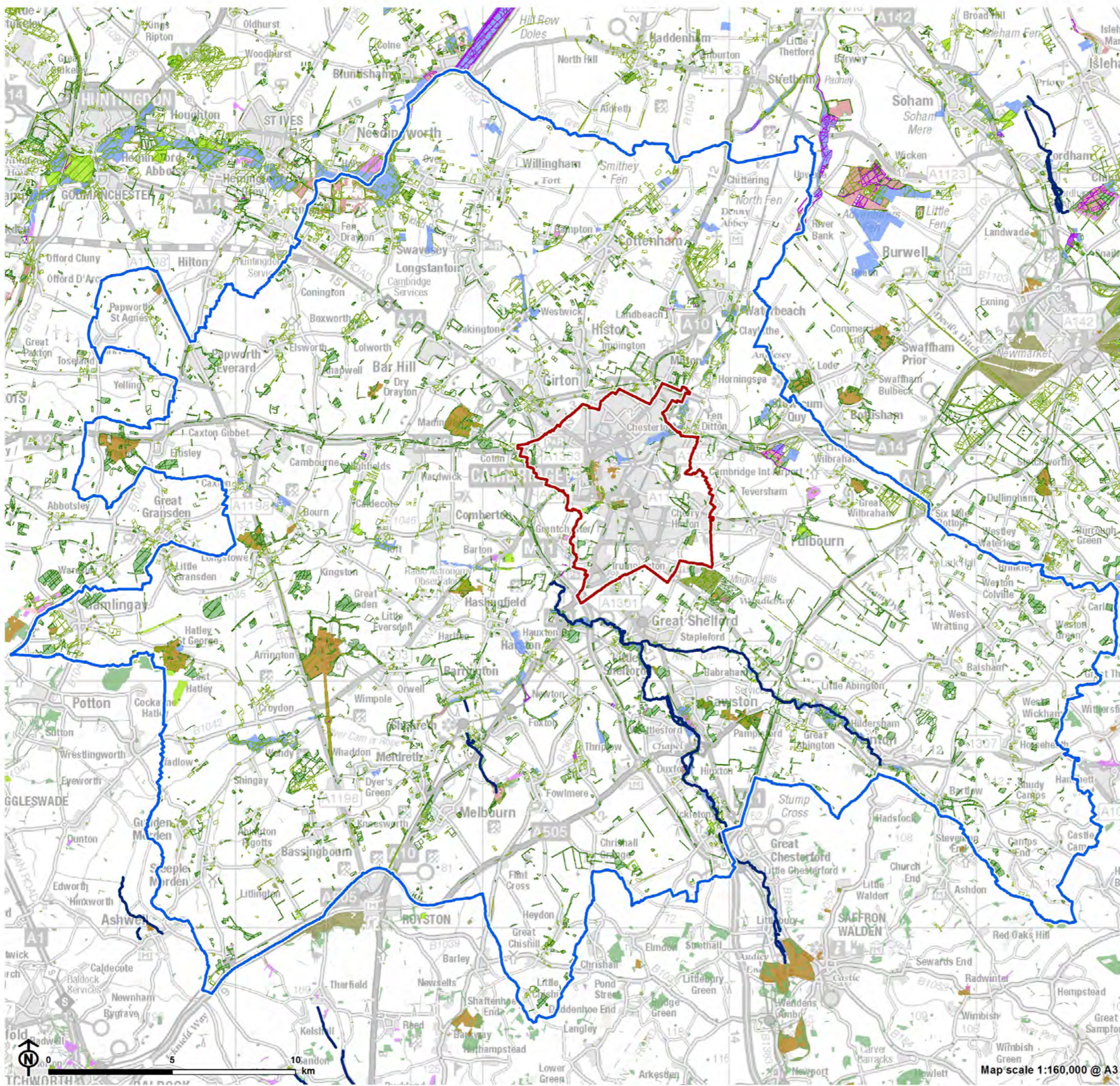


Figure 6.5: Notable Habitats and Local Nature Conservation Designations

- Cambridge
- South Cambridgeshire
- Local Nature Reserve
- City or County Wildlife Site
- Ancient woodland
- Protected Roadside Verge

Figure 6.6: Notable and Priority Habitats



- Cambridge
- South Cambridgeshire
- Priority habitat**
- Coastal and floodplain grazing marsh
- Deciduous woodland
- Good quality semi-improved grassland
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland meadows
- Purple moor grass and rush pastures
- Reedbeds
- Traditional orchard
- Chalk rivers
- Wood pasture and parkland
- Natural capital mapping (2019)**
- Existing grassland
- Existing wetland
- Existing woodland



Map scale 1:160,000 @ A3

Key issues

6.46 This section is described by the force for change (impact type), making it compatible with parallel studies such as the [UK Biodiversity Indicators](#) and the [Greater Cambridge Local Plan HRA Scoping Report](#). Where an issue was identified through more than one source, the issue has not been duplicated, but the range of sources have been noted in the 'Source' column. Appendices 2 and 3 provide an overview of stakeholder feedback that has informed this assessment.

Table 6.8: Key issues for biodiversity and geodiversity

Force for change	Issue	Source
Habitat loss and fragmentation	<p>Habitat loss and severance pose risk to terrestrial and aquatic habitats. At the highest level of designation, Eversden and Wimpole Woods SAC and the Ouse Washes SAC, SPA & Ramsar were each flagged as susceptible within the HRA Scoping report.</p> <p>Non-physical disturbance, e.g. as a result of artificial lighting impacting nocturnal and crepuscular species, and noise or vibration impacting certain bird species. At the highest level, Eversden and Wimpole Woods SAC and the Ouse Washes SPA and Ramsar were all flagged in the HRA Scoping Report.</p> <p>Pressures are exerted from new development, recreation, agricultural intensification and infrastructure.</p> <p>Fragmented and isolated habitats are more vulnerable to extreme climatic events.</p>	<p>Greater Cambridge Local Plan HRA Scoping Report</p> <p>Stakeholder consultation</p>
Climate change	<p>A warming climate is recognised to impact the distribution and extent of habitats and species, generally bringing a shift of warmer conditions north and incurring higher fluctuations within the annual weather cycles. This may incur loss of habitats and species, particularly those already close to the limit of their range, those which are cut off (by lack of habitat connectivity) from migrating with climatic conditions, those of narrow niche which are especially sensitive to change in environmental parameters and/or are reliant on such species (e.g. as prey).</p> <p>The implications of sea level rise on pumped drainage fenland habitats are discussed under Theme 6.</p>	<p>Biodiversity Climate Change Impacts Report Card</p>

Force for change	Issue	Source
Air and noise pollution	<p>Road traffic is the key source of nitrogen compounds, of which, nitrogen oxides (NO_x, i.e. NO and NO₂) are the key pollutants. Deposition of nitrogen compounds may lead to both soil and freshwater acidification, and NO_x can cause eutrophication of soils and water.</p> <p>Grassland and wetland habitats are recognised as particularly sensitive to nitrogen deposition. At the highest level, Devils Dyke SAC Ouse Washes SAC, SPA and Ramsar, Portholme SAC, Wicken Fen Ramsar, Chippenham Fen Ramsar and Fenland SAC were all identified as of particular sensitivity.</p>	<p>Greater Cambridge Local Plan HRA Scoping Report</p>
Water quality	<p>Changes in environmental or biotic conditions, water chemistry will influence the extent and distribution of favourable habitat conditions for flora and fauna. Sources may include agricultural, road or urban runoff which can incur pollution, herb/pesticide, fertiliser or siltation. The Environment Agency response to the Sustainability Appraisal Scoping Report flagged the risk associated specifically from phosphates and nitrates arising from growth and development and those from agriculture.</p> <p>Hydrological connectivity provides a potential pathway to ecological features at distance from the pollution source, including those beyond the study area boundary. For example, the Portholme, Ouse Washes, Fenland, Devils Dyke and Wicken Fen international designations are each hydrologically linked to waterbodies in Greater Cambridge, hence flagged as sensitive to this issue. Therefore, hydrological connectivity between sites or habitats must be considered to determine a holistic solution.</p>	<p>Sustainability Appraisal Scoping Report</p> <p>Greater Cambridge Local Plan HRA Scoping Report</p>
Water quantity (increased demand)	<p>Greater Cambridge is in one of the driest parts of the country with limited water resources. Future increase in the demand for water abstraction and treatment is associated with future housing and economic growth. Depletion of the aquifers and reduced flows put water habitats and fisheries under stress and can lead to local extinctions and long-term habitat damage. The chalk stream network is of particular concern given the generally high abstraction rates and reduced recharge. Low water levels at the Cam Washes reportedly impacts bird numbers.</p>	<p>Cambridgeshire and Peterborough Doubling Nature Vision</p> <p>Greater Cambridge Local Plan HRA Scoping Report</p> <p>Written response to the Greater Cambridge Local Plan Issues &</p>

Force for change	Issue	Source
	<p>Note that water quantity issues are principally addressed under Theme 3: The water environment.</p>	<p>Options 2020 (February 2020)</p> <p>Let It Flow: Proposals from the Cam Valley Forum for an Integrated Water Resource Management Plan for the Cam Valley</p> <p>Stakeholder consultation</p>
<p>Water quantity (reduced availability)</p>	<p>The risk of water shortage as the UK population grows and climate change accelerates (temperature rises incurring greater evaporation from exposed, farmed soils in particular) is recognised to exacerbate local water quantity constraints.</p> <p>Chalk streams are drying as a result of increased water abstraction coupled with flashy run-off, reduced recharge and wider climate change. Those at risk include the Rivers Granta, Mel and the Shep.</p> <p>In May 2020 the lowest flows were recorded in the River Cam for that month since records began in 1949.</p>	<p>Water Climate Change Impacts Report Card 2016</p>
<p>Soil degradation</p>	<p>Soil degradation principally results from insensitive agricultural practices. Adverse impacts may include soil erosion, soil drying, loss of soil biota and structural collapse.</p> <p>Impacts may also occur downstream where the arising silt load may be carried. Silt load is contaminated with pesticide, herbicide or fertiliser will have knock on effect to receiving aquatic habitats and the associated flora and fauna.</p> <p>Note that the issue of soil degradation is principally addressed within Theme 6.</p>	<p>Cambridgeshire and Peterborough Doubling Nature Vision</p>
<p>Low tree and grassland cover</p>	<p>The low tree and grassland (of conservation value) cover are recognised as weakness within the ecological network of Greater Cambridge, both in the rural agricultural areas typified by large open fields lacking boundary features, and in more urban</p>	<p>Cambridgeshire and Peterborough Doubling Nature Vision</p>

Force for change	Issue	Source
	<p>areas which pre-date the current requirements for ecological enhancement above no net loss.</p> <p>Note that the issue of tree cover is principally addressed within Theme 6.</p>	<p>Natural England National Habitat Network Mapping</p>
<p>Lack of land management</p>	<p>A relatively low proportion of land lies under positive management for nature conservation.</p> <p>At Fleam Dyke SSSI, for example, management is required to restore the chalk grassland. Sawston Hall Meadow SSSI (calcareous grassland) is noted to be sensitive to scrub encroachment and the application of pesticides, including herbicides, or fertiliser.</p>	<p>Cambridgeshire and Peterborough Doubling Nature Vision</p> <p>Natural England SSSI condition monitoring reports</p> <p>Stakeholder consultation</p>
<p>Recreational pressure</p>	<p>There is conflict between biodiversity and recreational functions of sites and a need to avoid exceedance of ecological capacity. It is understood that provision of high quality recreation sites has not kept pace with residential population growth, meaning that natural sites including nature reserves and SSSIs are subject to pressure by people using them as greenspaces to the detriment of the habitats and species for which they are designated. Sites, such as Wimpole and Wandlebury, are subject to pressure generated by additional population associated with development some distance away.</p> <p>Physical damage to terrestrial habitats occurs as a result of trampling (excess damage or compaction, path widening, soil erosion particularly bankside habitats), introduction of desire lines, vehicle use and nutrient enrichment (associated with dog walking). To aquatic habitats, additional impacts may result from boat wash, direct damage and erosion.</p> <p>Disturbance to fauna is of particular risk for species or assemblages reliant on roosting, nesting or foraging e.g. ground nesting and wetland birds where a localised impact can have widespread effect.</p> <p>Risk of impact, particularly relating to recreational pressure across Greater Cambridge should be</p>	<p>Cambridgeshire and Peterborough Doubling Nature Vision</p> <p>Greater Cambridge Local Plan HRA Scoping Report</p> <p>Natural England's Impact Risk Zones for Sites of Special Scientific Interest database</p> <p>Stakeholder consultation</p>

Force for change	Issue	Source
	considered in light of the most up to date Natural England SSSI Impact Risk Zones.	
Future development pressures	<p>Cumulative or in-combination development pressure as a result of the future population and economic growth of Great Cambridge and the surrounding authorities.</p> <p>Population growth associated with new housing will lead to increased demands on GI in terms of visitor pressure which in the case of nature sites will need to be managed so as to maintain their nature value, whilst providing recreational and educational experience.</p>	<p>Greater Cambridge Local Plan HRA Scoping Report</p> <p>Stakeholder consultation</p>
Invasive species, pests and diseases	<p>Presence of invasive species may include terrestrial or aquatic, plants or animals. Examples taken from local SSSI unit condition monitoring reports include Stow-cum-Quay Fen SSSI (unfavourable recovering condition) where bottom feeding coarse fish are listed as invasive.</p> <p>More widely, aquatic and marginal invasive plants, such as Himalayan balsam and floating pennywort, continue to spread through local watercourse corridors.</p> <p>The likelihood of arrival of pests and diseases, such as ash-die back, increases with climate change.</p>	<p>Natural England SSSI condition monitoring reports</p> <p>Stakeholder consultation</p>
Climate change	<p>Wetland sites are particularly vulnerable to inadequate surface water flows resulting from the impacts of climate change on rainfall levels, but also increased groundwater abstraction. RSPB Fowlmere is already suffering from, and at further future risk from low surface water flows, which threaten its nature and visitor values. Fen Drayton Lakes is prone to winter flooding, which may increase in severity/duration in future, although this can be mitigated through improved and appropriate visitor infrastructure.</p>	<p>Stakeholder consultation</p>

Key opportunities

6.47 Considering the issues noted above, and the range of evidence reviewed, Table 6.9 sets out the key opportunities that have been identified. Opportunities have been categorised as one or both of the following:

- A: Overarching principles/considerations for the emerging Local Plan; and/or

■ B: Partnership opportunities.

6.48 At this stage of the study, project or site-specific opportunities have not been identified in these tables. The next stage of this study will provide more detail on potential projects using the information captured in Appendix 3 (consultation outputs).

Table 6.9: Key opportunities for biodiversity and geodiversity

Code	Opportunity summary	Opportunity description	A	B
2i	Ensure opportunities follow Lawton principles	<p>Ensure opportunities for delivering a functional, resilient ecological network broadly follow the fundamental principles of being 'bigger, better and more joined up' (Lawton, 2010), i.e. which is of greater area, more diverse, more interconnected and yet remains locally appropriate to soils, landscape and ecological character.</p> <p>Overarching is the need to be ambitious and largescale, and to secure additional or enhanced habitats for perpetuity, in order to successfully deliver a Doubling of Nature.</p>	Yes	Yes
2ii	Encourage delivery of targets for doubling nature	<p>Encourage delivery of targets within Doubling Nature Vision. Those within and connecting to Greater Cambridge include:</p> <ul style="list-style-type: none"> - Enlarge two areas of existing natural fen (Great Fen & Wicken Fen Vision) as the core of a UNESCO Biosphere; - Increase tree cover and the network of woodlands, hedgerows, within and around towns and cities, and on the clay lands of South Cambridgeshire; - Expand the flower-rich grasslands on the chalk downs at the southern fringes of Cambridge; - Enhance and extend the meadows of the Cam, Ouse and Nene river valleys; - Extend wetlands either side of the Ouse and Nene Washes; - Create natural habitats by restoring mineral workings, including the gravel workings in the fens; - Ensure at least 90% of the richest wildlife areas are in good ecological condition. 	Yes	Yes
2iii	Follow rules of thumb for delivery of	<p>The general 'rules of thumbs' for delivery of <u>nature networks identified by Natural England</u> include an increase in the cover of semi-natural habitat in the landscape to at least 20%, creation of corridors of</p>	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
	nature networks	minimum 100m width, buffering of sites by minimum 50m width, enlarging sites to >40ha and, for poorly dispersing species, provision of sites <1km apart (<200m for highly specialised species within a habitat). Whilst these recommendations relate to future, larger-scale nature networks, the current opportunity mapping could accommodate such design principles.		
2iv	Integrate biodiversity and tree planting in transport infrastructure projects	Encourage transport infrastructure projects to place a greater emphasis on the integration of biodiversity and tree planting as part of the <u>Doubling Nature Vision</u> . Opportunities to optimise habitat creation and connectivity can complement cross-boundary networks such as the Buglife B-Lines.	Yes	Yes
2v	Use ELMS to improve ecological value of intensively farmed agricultural land	The emerging Environmental Land Management Scheme offers an opportunity to improve the ecological health of current intensively farmed agricultural land, placing focus on enhancing natural capital and diversifying the farmed landscape. A good example of arable transformation has been demonstrated by Trumpington Farm Company who have transformed arable land adjoining part of the upper river north of Grantchester into a wetland nature reserve (Trumpington Fen Wetlands).		Yes
2vi	Monitor and positively manage nature conservation areas	Monitoring and positive management of areas identified for nature conservation will underpin funding and ensure target habitats or species objectives are most efficiently achieved. This may include thinning of young woodland to maintain optimal growth and structural diversity (including ground flora) or the use of grazers (livestock or deer) to support the large-scale natural regeneration of grasslands and wetlands through the river corridors. Positive management should allow for 'messiness' within the habitat mosaic i.e. areas of low intensity or periodically absent of management to make space for natural regeneration.	Yes	Yes
2vii	Encourage landscape scale connectivity	Landscape-scale connectivity could be encouraged to extend habitats currently fragmented or at risk of losing favourable status. This applies similarly to species, as exemplified by the barbastelle, which is reliant on habitats	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
		functionally connected to the primary roost and foraging grounds at Wimpole. Connectivity may be considered for the mosaic of different, cross-complementary habitat types, as an entire functioning unit. Habitats of lower conservation status may serve well to buffer or delineate more sensitive features, for example from recreational pressure. The <u>Doubling Nature Vision</u> gives particular consideration to the potential for increased ecology along major waterways and extensive fenland drainage channels.		
2viii	Optimise opportunities for habitat creation as part of increasing flood storage capacity	Opportunities for habitat creation as part of increasing flood storage capacity could be optimised, particularly where this serves to retain water levels within or in habitats surrounding the chalk stream network. This may be delivered hand in hand with enhancement of the flood plain grazing marsh network. The ability to hold winter water can appease the effects of over-abstraction.	Yes	Yes
2ix	Use WWNP to inform strategy for habitat creation, reconnection and management	Where hydrological connectivity is a key issue, Working with Natural Processes (WWNP) <u>Floodplain Reconnection Potential spatial data</u> can be used to inform a holistic strategy for habitat creation, reconnection and management. As defined by the Environment Agency, floodplain reconnection potential is identified along the Cam throughout the study area, from its southern stretch at Great Chesterford. Stretches of its tributaries, the Granta (in the south), the Rhee and Wardington Bottom (south west) and Bourn Brook (west) are also highlighted.	Yes	Yes
2x	Focus tree-planting in suitable areas	Regarding tree planting, WWNP 'Wider catchment woodland potential' is more widespread, encompassing fenland in the north east and large areas of low lying and ditch-determined habitat across the northern belt. 'Riparian woodland potential' is generally widespread along the watercourse network of the study area. 'Wider catchment woodland potential' is identified in the west between A14 and A0603, and south east of the A11 and A505. Suitability of these broad zones would need to be refined in light of local conservation priorities, such as fen or grassland habitats at which planting would be counter-productive.	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
2xi	Use new woodland to extend or link habitats	The Forestry Commission gives local priority to new woodland that extends and or links ancient woodlands such as those in the West Cambridgeshire Hundreds (including Gamlingay, Hayley and Hardwick Woods in the vicinity of Eversden and Wimpole SAC). The value of linear woodlands is recognised, particularly along watercourses where biodiversity benefits extend to shading, amelioration of storm run-off rates and filtration of silt-load.	Yes	Yes
2xii	Prioritise GI opportunities for barbastelle bats within 6km of roost sites	Note that whilst barbastelle bat is known to forage 20km from a roost site ¹¹ ; a distance used to scope potential impacts in the North East Cambridge AAP HRA, the Core Sustenance Zone (CSZ) identified for barbastelle has a radius of 6km from each roost ¹² . Opportunities for delivering GI targeted to benefit barbastelle could be prioritised within 6km.	Yes	Yes
2xiii	Encourage public engagement with ecological network	Public engagement is required to ensure proactive 'ownership' and respectful use of the ecological network. This is particularly true where assets are under pressure from recreational impact or, conversely, require local community management (also refer to Theme 7: Community food growing). As defined within Research Report NERR082 Nature Networks ¹³ , "a nature network should enhance natural beauty, conserve geodiversity and opportunities should be taken to deliver benefits for people, such as flood alleviation, recreational opportunities and climate change adaptation and mitigation. These joint aims, for nature and people, are at the heart of nature networks and they are inter-dependent: networks for wildlife that also deliver benefits to people also tend to be more valued by people. Thus, they are likely to receive greater investment and protection by society and consequently provide more for nature and be more sustainable in the long term".		Yes

¹¹ English Nature Research Reports, (2004), Advice for the management of flightlines and foraging habitats of the barbastelle bat *Barbastella barbastellus*

¹² BCT (2020) Core Sustenance Zones & Habitats of Importance for Designing Biodiversity Net Gain for Bats

¹³ Natural England (2020) Research Paper NERR082 Nature Networks: A Summary for Practitioners

Code	Opportunity summary	Opportunity description	A	B
2xiv	Engage with agricultural and equestrian communities	Within rural areas, engagement is key with the agricultural (e.g. regarding peatland habitats) and equestrian communities (e.g. regarding chalk downland). This is explored further under Theme 6.		Yes
2xv	Enhance the network of chalk grasslands hand-in-hand with sustainable agricultural production	Expand and connect the chalkland assemblage of semi-natural grasslands whilst maintaining sustainable but productive agricultural land use across <u>NCA 87 East Anglian Chalk</u> in the south east. Example interventions include sensitive management of road verges and extending buffer strips along field margins, to benefit soil and water quality, reduce soil erosion, strengthen landscape character and enhance biodiversity and pollinator networks. The targeting of enhancement along linear features, such as Fleam Dyke, can offer particular benefit to species dispersal, such as for pollinators.	Yes	Yes
2xvi	Support the recognition and delivery of cross-boundary habitat networks with appropriate waymarking through rural areas	Larger scale habitat extension and creation explored through stewardship options could be considered for appropriate signposting (e.g. at parish boundaries and access routes) to aid regional connectivity. This is relevant to both private landowners (typically associated with defined recreational access routes and public or charitable landowners (typically associated with roaming access).	Yes	Yes
2xvii	Plan for flexibility in recreational access to ensure target habitats can establish and be maintained	Recreational access to areas of planting or sowing may need to be flexible to respect establishment periods, sensitive seasons, periodic waterlogging (particularly on clay soils), etc. Changing access may be considered a feature of interest and serve to promote sustainability in the 'end-user market' (as is the case for cycle trails), particularly if recreation has paid entry.		Yes
2xviii	Provide or reinstate beneficial management	Provision or reinstatement of beneficial management could be encouraged to ensure a 'better' ecological network, and one where at least 90% of the richest wildlife areas are in good condition. SSSI which are known to be in need of beneficial management include, for example, Wilbraham Common and Holland Hall (railway cutting). Extension of favourable management	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
		along transport infrastructure (vehicular, cycle and pedestrian routes) can build on the positive examples of the PRV network.		
2xix	Incorporate high quality GI in new development	Targets of the <u>Doubling Nature Vision</u> include ensuring that new developments incorporate high quality GI and encouraging at least 25% of existing property owners to incorporate wildlife friendly features, buildings and land. BNG could recognise local conservation priorities and targets (as may be set out in a LNRS and serve to augment the local ecological network. Both resilience to, and mitigation of the impacts of climate change can be optimised through delivery of BNG. GI enhancement zones will need to accommodate sufficient area and cross-boundary connection to ensure BNG can be delivered coherently across authority boundaries, representing local character whilst maintaining heterogeneity.	Yes	Yes
2xx	Provision of greenspace within new development must accommodate the needs of the future population	<p>Green space recommendations, for development specifically at <u>North East Cambridge</u> to avoid risk of significant impact on European nature conservation sites, include, for example:</p> <ul style="list-style-type: none"> - Regarding green space provision, the extent of accessible natural greenspace provision should be proportionate to the scale of development i.e. including 8ha/1000 population as advocated through the SANGS Guidance, achieving the ANGSt minimum standard of 2ha informal open space within 300m of everyone's home, and contributing towards the delivery of the objectives of habitat enhancement and improved connectivity. - Regarding green space provision - provision should not rely on existing green spaces, such as Milton Park but should seek to provide additional open spaces that complement and connect to the Country Park. - Regarding potential recreational impact/s - discussions to be undertaken with the National Trust to determine exact measures that will be required to mitigate for impacts from increased recreation. 	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
		Further recommendations relating to Greater Cambridge will be identified, in due course, in the in the final AAP HRA.		
2xxi	Support opportunities for urban greening, including retrofitting on or alongside buildings, public and private spaces	Urban greening measures range widely from green roofs, walls and screens, to street tree planting as part of the urban forest, provision of rain gardens as part of traffic calming measures, to diversification of habitats around sports pitches through targeted planting or natural regeneration and beneficial management,	Yes	Yes

Identifying broad opportunity zones

6.49 Drawing together all of the evidence presented in this section, Table 6.10 sets out the broad opportunity zones identified under this theme. This is supported by Figure 6.7.

Table 6.10: Broad opportunity zones for landscape, cultural heritage and sense of place

Opportunity map reference	Description	Code
2a - North Eastern Fen-Peatland Complex.	Capturing the Wicken Fen Vision and the 'heartlands' of the proposed Biosphere that overlap the study area. Importantly this provides connectivity between the Ouse, Cam and Wicken wetlands. Connectivity also to the 2b South East Fen Complex and 2c River Cam Corridors.	2i, 2ii, 2iii, 2v, 2vi, 2vii, 2viii, 2ix, 2x, 2xiii, 2xiv, 2xvi, 2xvii, 2xix,
2b - South Eastern Fen Complex.	Capturing Wilbraham Fen SSSI, Great Wilbraham Common SSSI, Fulbourn Fen SSSI and associated water courses, distinct to the fenland and peatland habitats farther north east. An extension to the Wicken Fen Vision, capturing the south eastern portion of the proposed biosphere. This large area of fenland lies close to the city and within the main A-roads which circumnavigate Cambridge.	2i, 2ii, 2iii, 2v, 2vi, 2vii, 2viii, 2ix, 2x, 2xiii, 2xiv, 2xvi, 2xvii, 2xvii, 2xix,
2c - River Cam Corridors.	Reaching through the study area, ensuring connectivity through and extending from the city. This captures Hobson's Brook and Vicar's Brook, as well as the more far-reaching Coldhams Common-Cherry Hinton Urban Country Park. Capturing the WWNP floodplain reconnection potential as well as woodland, grassland and	2i, 2ii, 2iii, 2vi, 2vii, 2ix, 2x, 2xi, 2xiii, 2xvi, 2xvii, 2xvii, 2xix,

Opportunity map reference	Description	Code
	wetland habitat opportunities. Of particular local importance include opportunities for chalk streams and floodplain grazing marsh. To be considered in conjunction with the other river corridor opportunity areas.	
2d - Fleam Dyke & Chalklands Gateway.	Capturing Fleam Dyke SSSI, surrounding grassland and woodlands, opening to the wider chalklands that fan out to the south east.	2i, 2ii, 2iii, 2v, 2vi, 2vii, 2viii, 2x, 2xiii, 2xiv, 2xv, 2xvi, 2xvii, 2xviii, 2xix,
2e - Gog Magog Hills.	Capturing the grassland, woodland and elements of parkland habitat to span from the urban edge out to the surrounding rural countryside, and spanning key transport corridors.	2i, 2ii, 2iii, 2iv, 2v, 2vi, 2vii, 2viii, 2x, 2xiii, 2xv, 2xvi, 2xvii, 2xviii, 2xix,
2f - River Granta Corridor - Stapleford to Linton	Capturing the WWNP floodplain reconnection potential as well as woodland, grassland and wetland habitat opportunities. To be considered in conjunction with the other river corridor opportunity areas.	2i, 2ii, 2iii, 2vi, 2vii, 2viii, 2ix, 2x, 2xiii, 2xvi, 2xvii, 2xviii, 2xix,
2g - South West Lowland Chalklands - centred, approximately, at Melbourn	Extending along key transport corridor to offer cross-boundary opportunities. Connecting to Area 2c River Cam Corridors and the lowland claylands of the Rhee Valley.	2i, 2ii, 2iii, 2v, 2vi, 2vii, 2ix, 2x, 2xiii, 2xvii, 2xiv, 2xv, 2xvi, 2xvii, 2xviii, 2xix,
2h - West Cambridge Woodland-Hedgerow-Wetland Network	West Cambridge Woodland-Hedgerow-Wetland Network - foci spanning Barrington-Wimpole-Gamlingay. Capturing the central swathe of the 6km radius CSZ around Wimpole and Eversden SAC within which woodland, hedgerow and wetland creation favourable to barbastelle is recommended as part of the current HRA.	2i, 2ii, 2iii, 2v, 2vi, 2vii, 2viii, 2x, 2xi, 2xii, 2xiii, 2xvi, 2xvii, 2xviii, 2xix,
2i - Bourn Brook Corridor	Capturing the WWNP floodplain reconnection potential as well as woodland, grassland and wetland habitat opportunities. To be considered in	2i, 2ii, 2iii, 2vi, 2vii, 2viii, 2ix, 2x, 2xi, 2xii,

Opportunity map reference	Description	Code
	conjunction with the other river corridor opportunity areas.	2xiii, 2xvi, 2xvii, 2xviii, 2xix,
2j - West Cambridge Woodlands	West Cambridge Woodlands - foci capturing Madingley and Coton, extending south around the urban edge to connect with the Area 2i Bourn Brook, hugging the M11 corridor.	2i, 2ii, 2iii, 2v, 2vi, 2vii, 2viii, 2x, 2xi, 2xii, 2xiii, 2xvi, 2xvii, 2xviii, 2xix,
2k - Northern Washes and Wetland: Gateway to the Ouse	Northern Washes and Wetland: Gateway to the Ouse. Capturing the principal open water and wetland habitats, such as floodplain grazing marsh. Capturing the north western distribution of peatland soils.	2i, 2ii, 2iii, 2v, 2vi, 2vii, 2viii, 2ix, 2x, 2xiii, 2xiv, 2xvi, 2xvii, 2xviii, 2xix,
2l – Orchards and fenland fringe	Captures focus of traditional orchard habitats connecting to the urban areas/villages north of Cambridge. Falls within the Fens Biosphere.	2i, 2ii, 2iii, 2v, 2vi, 2vii, 2viii, 2ix, 2x, 2xi, 2xiii, 2xiv, 2xvi, 2xvii, 2xviii, 2xix,
2m – Urban greening	Established urban centres within which urban greening measures could optimise habitat connectivity whilst also serving to sequester carbon and maximise health and wellbeing benefits.	2i, 2ii, 2iii, 2iv, 2vi, 2vii, 2viii, 2ix, 2x, 2xiii, 2xvii, 2xix, 2xx, 2xxi

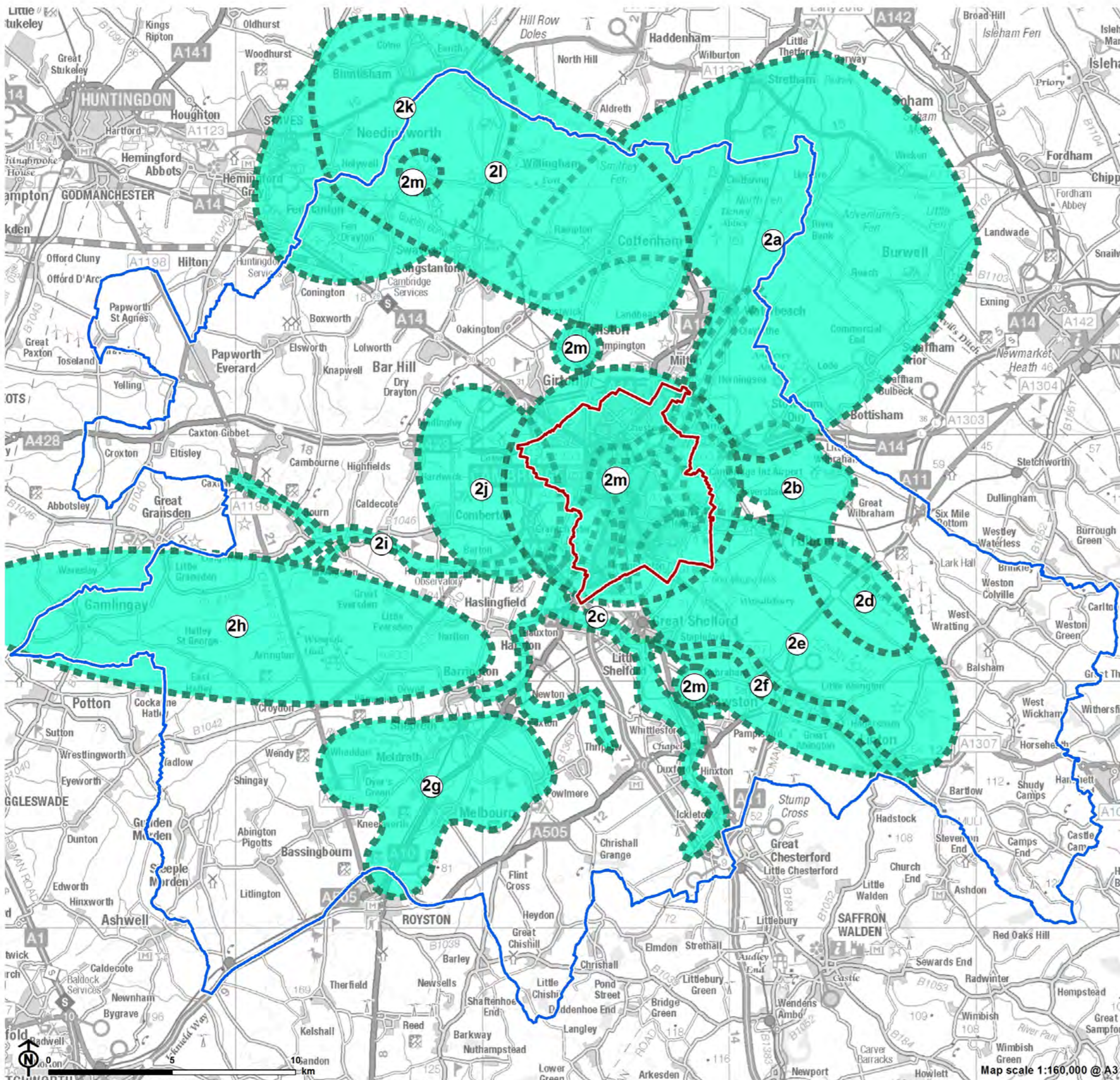





Figure 6.7: Biodiversity and Geodiversity Broad Opportunity Zones

-  Cambridge
-  South Cambridgeshire
-  Biodiversity and geodiversity broad opportunity areas
- 2a: North Eastern Fen-Peatland Complex
- 2b: South Eastern Fen Complex
- 2c: River Cam Corridors
- 2d: Fleam Dyke & Chalk Gateway
- 2e: Gog Magog Hills
- 2f: River Granta Corridors
- 2g: South west lowland chalklands centred at Melbourne
- 2h: West Cambridge Woodland-Hedgerow-Wetland Network
- 2i: Bourn Brook Corridor
- 2j: West Cambridge Woodlands
- 2k: Northern washes and wetlands
- 2l: Orchards and fenland fringe
- 2m: Urban greening

Theme 3: The water environment

Why is this theme relevant to GI?

6.50 The water environment is an integral component of GI networks. Assets and evidence considered within this theme include rivers, streams, brooks and other watercourses; lakes and ponds; flood risk from fluvial and surface water sources; areas sensitive to water pollution such as Source Protection Zones and Nitrate Vulnerable Zones; and, Sustainable Drainage Systems (SuDS).

6.51 Water features provide a fundamental role in managing flooding, improving or maintaining good water quality, improving surface water drainage, improving air quality and enjoyment of public open space both for recreational and aesthetic value, as well as helping to cool urban environments. Water bodies are also important for biodiversity acting as valuable wildlife corridors that host a variety of habitats and species of local and national importance. It is important to consider these within the GI network to ensure future development does not result in fragmented habitats and resultant biodiversity loss.

6.52 A well-planned, functional and resilient GI network inclusive of all water resources is paramount to achieve the multiple benefits described above and even more so due to climate change.

Climate Change

Climate change projections show increased temperatures, variability in rainfall and increased frequency and magnitude of extreme weather events. These changes will impact the water environment whether through drought during long dry summers and/or higher risk of flooding as a result of intense storms. It is important to plan for changes and implement measures that increase the resilience of our water environment to extreme weather events and future warming.

Wellbeing and Social Inclusion

Water features contribute to health and wellbeing in several ways. They provide opportunities for water-based recreation, often being the site of enabling people to come together and experience nature. Active travel routes and greenways tend to follow the course of waterways and river corridors, providing enhanced connectivity between urban and rural areas and the opportunity to undertake healthy physical activity for both commuting and pleasure.

Environmental Factors

River corridors can enhance air flow and filter out pollutants, contributing to improved air quality. Waterways and aquifers are at threat from a legacy of water quality issues from a range of pollutants. However, careful management of waterways and their associated habitats (e.g. wetlands and floodplains) can seek to reverse declining trends and incorporate measures to enhance their role in filtering harmful pollutants.

Existing and emerging evidence

6.53 The list below summarises the relevant resources, strategies and policy documents that have been reviewed to provide the evidence presented in this section. Full details of each document and their relevance can be found in Appendix 2:

- Water Cycle Study and Strategic Flood Risk Assessment (SFRA) (emerging)
- Anglia River Basin District River Basin Management Plan (2015)
- West Cambridgeshire Hundreds
- Water Ambition Project: Cam & Ely Ouse (CamEO) and Broadlands catchments (East Anglia) (2012)
- Cambridgeshire Green Infrastructure Strategy (2011)

Key assets

6.1 The emerging Water Cycle Study and Strategic Flood Risk Assessment are not yet published. However, initial findings have been reflected in the evidence base below and will be updated as necessary.

Watercourses

6.2 River Cam dissects South Cambridgeshire and the City of Cambridge from the south west to the north east where it eventually joins the Great River Ouse. The watercourse forms a major green corridor and contributes to the character of the city. The two principal tributaries of the Cam, the Granta and the Rhee, also flow through South Cambridgeshire. Small tributaries and brooks characterise the wider area, including Bourn Brook which forms a minor tributary to the River Cam, Cherry Hinton Brook and Hobson's Brook which runs from Nine Wells to the city. These watercourses and waterbodies shown in Figure 6.8. Together, the network of rivers, streams and watercourses form vital green corridors within Greater Cambridge which offer value to both people and wildlife.

6.3 Greater Cambridge lies within the study area of the River Basin Management Plan for the Anglian River Basin District. The landscape is characterised by several catchments; including the Broadland Rivers catchment, Cam and Ely Ouse catchment, Combined Essex catchment, East Suffolk catchment, Nene catchment, North Norfolk catchment, North West Norfolk catchment, Old Bedford including the Middle Level catchment, Upper and Bedford Ouse catchment, Welland catchment and the Witham catchment.

Flood risk

6.4 Greater Cambridge is at risk of flooding from a range of sources; including surface water, groundwater, sewers, reservoirs and fluvial sources. Although the flood risk zone extends across Greater Cambridge, low-lying land to the north associated with the Great River Ouse is at the greatest risk of flooding (see Figure 6.9). The need for holistic management of watercourses and flood risk reduction through the reconnection of rivers with their floodplains is highlighted within Doubling Nature. The document forms a future vision for Cambridgeshire and Peterborough and aims to increase groundwater protection through the creation of new wetlands, water storage and filtration options within the landscape.

6.5 The Cambridgeshire Surface Water Management Plan (SWMP) considers Cambridge City and Milton as a single wetspot (area at risk of surface water flooding) with several discrete wetspots within. Four of the top ten wetspots across the whole of Cambridgeshire are within

Cambridge City and include Cherry Hinton, Kings Hedges and Arbury, North Chesterton and Coldham's Common. The document provides detailed SWMPs for some areas; including Cambridge and Milton, Histon and Impington, and Girton. South Cambridgeshire also includes several wetspots; including Elsworth, Bourn, Histon/Impington, Oakington, Papworth Everard, Linton, Haslingfield. The highest historic flooding frequency per 1,000 population within Cambridgeshire is recorded at Bourn and Elsworth.

Water quality

6.6 The geographical extent of Greater Cambridge is a surface water Nitrate Vulnerable Zone (NVZ) and includes the Ely Ouse and cut-off channel NVZ, Great Ouse NVZ, Huntingdon River Gravels NVZ and Anglian Chalk NVZ. NVZs are designated where nitrate concentrations in water bodies are high or increasing, or water bodies are, or may become, eutrophic due to agricultural nitrate pollution. The classification dictates that measures are in place to reduce pollution and improve water quality.

6.7 There are several groundwater Source Protection Zones (SPZs) scattered across Greater Cambridge with a notably large area being in the south-east over East Anglian Chalk. The porous chalk that underlies the landscape here results in limited surface water. SPZs are non-statutory areas identified for 'at risk' abstractions where land use management practices and other activities can affect the quality of the untreated water. Measures to prevent and reduce pollution are targeted within these zones.

6.8 The [Environment Agency Catchment Data Explorer](#) details the water quality data for management and operational catchments. The majority of Greater Cambridge falls within the Cam and Ely Ouse management catchment, within which there are several operational catchments including Cam Lower, Cam Rhee and Granta, and a small part of the South Level and cut off channel catchment to the north of Greater Cambridge. A summary of each including their water quality status and reasons for not achieving good status (RNAGs) are included below. The data is not mapped, however, Figure 6.7 shows the locations of consented discharges to controlled waters across the study area (a form a point source pollution).

- **Cam Lower:** The River Cam flows through the city of Cambridge, popular for punting, canoeing and rowing, to its confluence with the Ely Ouse within the South Level. Tributaries include the Bourn, Bin, Hobsons and Cherry Hinton Brooks and the water level managed New River and the Burwell, Soham, Bottisham and Swaffham Bulbeck Lodes. There is significant growth around the Cambridge conurbation. Elsewhere the catchment is mainly rural. The catchment is important for wetland species and habitats. Although some water courses are embanked, there are good examples of important fenland habitat, notably Wicken Fen and Chippenham Fen. There are a total of 11 water bodies. In terms of chemical status, ten are good and one has failed, while all have moderate ecological status. The predominant sectors that contribute to the RNAGs are industry, agriculture and rural land management, and urban and transport. Physical modifications are the main issue.
- **Cam Rhee and Granta:** The Cam, Rhee and Granta catchment covers the region south of Cambridge. It comprises the upper reaches of the River Cam, flowing north from Saffron Waldon, and its major tributaries the River Rhee, which rises at Ashwell springs in Hertfordshire, and the River Granta between Saffron Waldon and Haverhill. Rivers are characterised by their base flow from the underlying chalk geology. The catchment is predominantly rural with an agricultural land use. The catchment has important wetland SSSIs. The rivers and tributaries are important for priority biodiversity species including white-clawed crayfish, otter, water vole and brown trout. There are a total of 18 water bodies. All have good chemical status while in terms of ecological status, three are good,

twelve are moderate and three are poor. The RNAGs are from both the water industry and agriculture and rural land management. The main issues are pollution from wastewater, physical modifications, and changes to the natural flow and levels of water.

- South Level and cut off channel: The South Level is a level dependent environment and consists of a series of high level rivers and low level drains. The Internal Drainage Boards are responsible for managing the water in the low level network of drains. During wet periods, water is pumped into the high level system to help land drainage and prevent flooding, and during the summer, water is transferred back into the low level system for irrigation. The water body within Greater Cambridge, 'Old West River', has good chemical status and moderate ecological status. The main RNAGs are agriculture and rural land management and the water industry which contribute to both diffuse and point source pollution.

6.9 There are a total five groundwater bodies that intersect the Greater Cambridge area. The groundwater aquifers are Cam and Ely Ouse Chalk to the south and east and Cam and Ely Ouse Woburn Sands on the western boundary. The aquifers are utilised for public water supplies and businesses, as well as industrial, agricultural and small private domestic supplies. The Cam and Ely Ouse Chalk is more intensively utilised and this is reflected in it having poor quantitative status. Both aquifers have poor chemical status. In the Cam and Ely Ouse Chalk groundwater body, this is due to diffuse pollution (agriculture and transport runoff), point source pollution (sewage discharge mainly from water industry), and flow (groundwater abstraction). In the Cam and Ely Ouse Woburn Sands groundwater body, the poor status is due to diffuse pollution only (agricultural runoff).

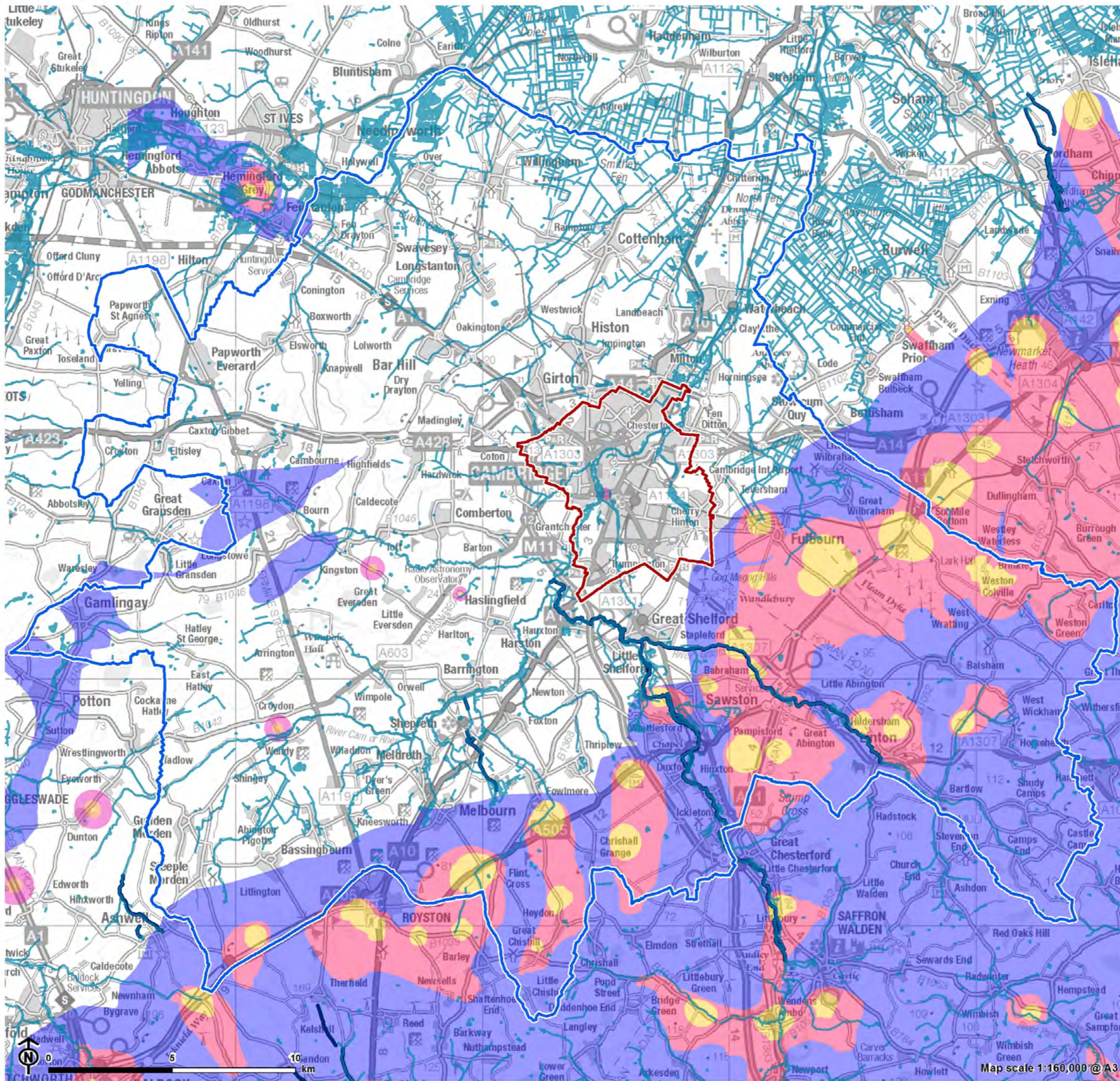
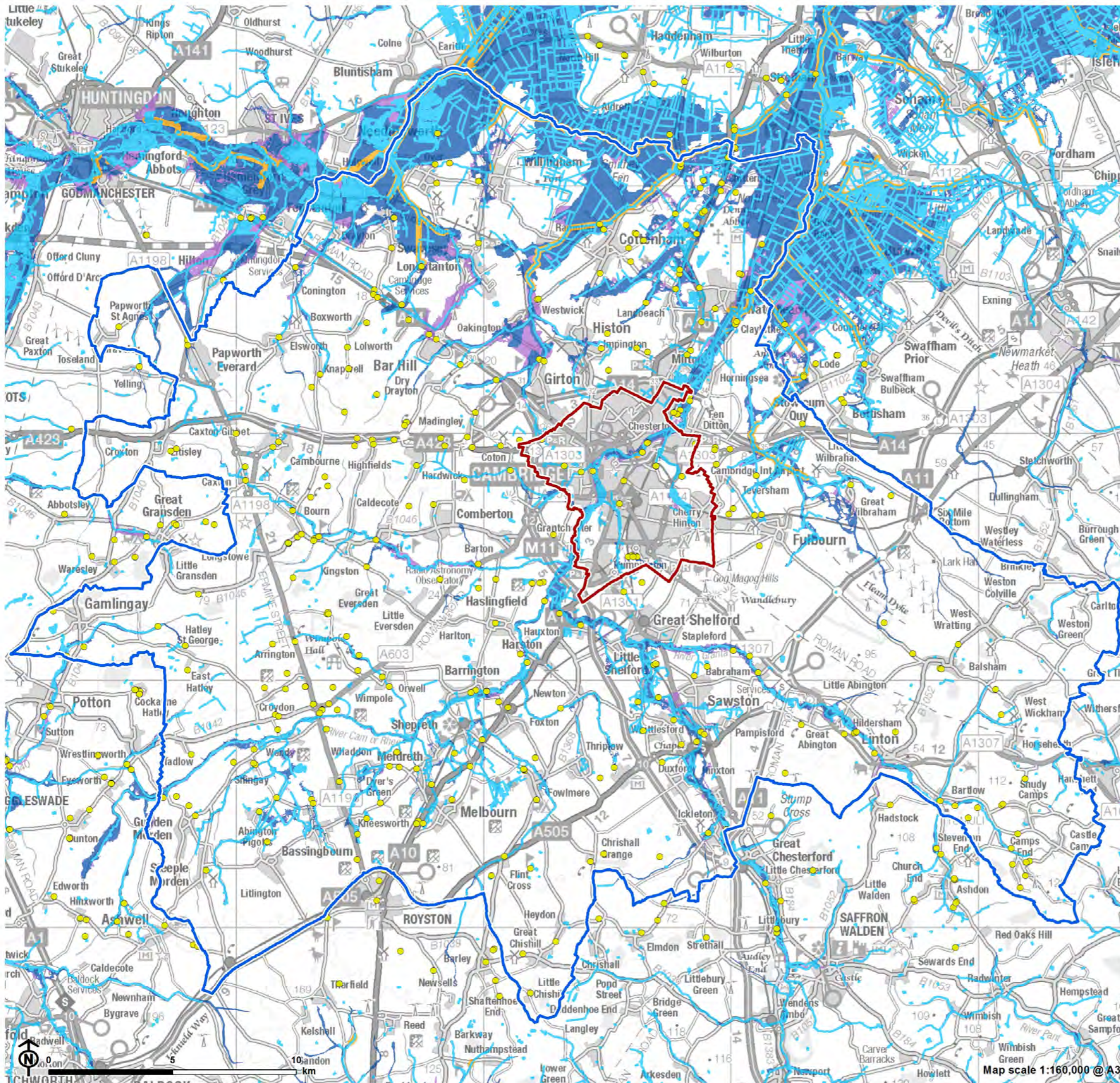


Figure 6.8: Watercourses and Waterbodies

- Cambridge
 - South Cambridgeshire
 - Chalk rivers
 - Rivers, canals, streams, lakes
- Source Protection Zone
- 1
 - 1c
 - 2
 - 2c
 - 3

Figure 6.9: Flood Risk



- Cambridge
- South Cambridgeshire
- Rivers, canals, streams, lakes
- Flood zone 3
- Flood zone 2
- Flood defence
- Consented discharges

Key issues

6.10 Table 6.11 sets out key issues organised by 'forces for change'; noting the sources that have led to their identification. Where an issue was identified through more than one source, the issue has not been duplicated, but the range of sources have been noted in the 'Source' column. Appendices 2 and 3 provide an overview of stakeholder feedback that has informed this assessment.

Table 6.11: Key issues for the water environment

Force for change	Issue	Source
Management pressures	Rivers, streams and drainage networks are important features that require careful management to balance the often-competing benefits they provide for water resources, biodiversity, landscape character, recreation and tourism.	Cambridgeshire Green Infrastructure Strategy
Water quality	<p>Priority issues that impact water quality include diffuse pollution, biological impacts of low flow rates and over abstraction, and nutrient loading e.g. treated sewage effluent.</p> <p>Water quality issues are also exacerbated by reduced flows due to less dilution of treated sewage discharges and of nutrients in urban and rural run-off.</p> <p>The physical modification of water courses, invasive non-native plant and animal species also contribute to statutory compliance issues. The relationship of the water environment to peat habitats and their ability to sequester carbon is also key.</p>	<p>Anglian River Basin District River Basin Management Plan <small>Error! Bookmark not defined.</small></p> <p>Environment Agency Catchment Data Explorer</p> <p>Stakeholder consultation</p> <p>Let It Flow: Proposals from the Cam Valley Forum for an Integrated Water Resource Management Plan for the Cam Valley</p>
Water quantity and abstraction	A finite supply of water exists in the region, and irrespective of climate change, action is required to ensure the availability of water for future uses. This includes potable water supply and food production, avoiding detrimental impacts on the environment. Over abstraction and resultant water scarcity are exacerbated by growing population pressures, development and climate change impacts e.g. drought and changes to natural flow regimes. The effect of freshwater abstraction on the condition of habitats dependent on site hydrology could also be considered.	<p>Sustainability Appraisal Scoping Report</p> <p>Anglian River Basin District River Basin Management Plan</p> <p>Environment Agency Catchment Data Explorer</p> <p>Stakeholder consultation</p>

Force for change	Issue	Source
	The East Anglian chalk aquifer already has poor quantitative status reflecting that pressures are likely to be greater in groundwater chalk aquifers and upper chalk streams which are groundwater-fed.	
Agricultural intensification	Increasing pressures on water resources will come from demands for water for agriculture, spray irrigation, industrial use and power generation (in addition to public water supply). Nutrient pollution (phosphates and nitrates) arising from farming practices and the water industry also has detrimental impacts on water quality.	Greater Cambridge Local Plan HRA Scoping Report Environment Agency Catchment Data Explorer
Development pressures	Local changes in runoff, drainage and water quantity / quality through increased demand for water supply and increased wastewater discharges associated with population growth and development may have detrimental impacts on river water quality and river ecosystems. Impacts on habitats and associated biodiversity are particularly problematic at designated sites that are hydrologically linked (Portholme SAC, Ouse Washes SAC, SPA and Ramsar, Fenland SAC, Devils Dyke SAC and Wicken Fen Ramsar site).	Greater Cambridge Local Plan - HRA Scoping Report Stakeholder consultation
Climate change	Climate change projections suggest there will be changes to rainfall and an increase in extreme weather events, with associated increases in surface and fluvial flood risk in low lying areas. This may also result in increases in the occurrences of rural pollution due to the frequency of high intensity rainfall as more intense rainfall is likely to occur that can transport pollutants. Climate change induced sea level rise will also impact fenland drainage. Fens will need to be protected as they will become increasingly vital for storing water.	Sustainability Appraisal Scoping Report Anglian River Basin District River Basin Management Plan Stakeholder consultation
Biodiversity	The function of the waterways (rivers, streams and brooks) as green corridors requires environmental improvement.	Stakeholder consultation
Catchment partnerships	Given the distribution of responsibilities and influences on water quantity and quality in the Cam Valley catchment, there is a need for the relevant partners to work in partnership to determine how GI can help tackle water quantity and quality issues prevalent in the catchment. The newly commissioned chalk stream study by Cambridge City Council and Cambridge Water is an	Stakeholder consultation

Force for change	Issue	Source
	example of how partnership working could deliver improvements for the water environment by furthering research and understanding. The project aims to see how much pressure is being put on the streams which emerge from the aquifer to the south and east of Cambridge and then provide a programme of actions for local groups and stakeholders to fund and implement in partnership.	

Key opportunities

6.11 Considering the issues noted above, and the range of evidence reviewed, Table 6.12 sets out the key opportunities that have been identified. Opportunities have been categorised as one or both of the following:

- A: Overarching principles/considerations for the emerging Local Plan; and/or
- B: Partnership opportunities.

6.12 At this stage of the study, project or site-specific opportunities have not been identified in these tables. The next stage of this study will provide more detail on potential projects using the information captured in Appendix 3 (consultation outputs).

Table 6.12: Key opportunities for the water environment

Code	Opportunity summary	Opportunity description	A	B
3i	Protect aquifers and enhance quality, condition and structure of River Great Ouse	As noted within <u>NCA 88</u> , protect aquifers and enhance the quality, condition and structure of the River Great Ouse; including its valley and tributaries, habitats, waterbodies and floodplain. This could be achieved through enhancement of the river's ecological, historical and recreational character which contributes to water regulation, quality and availability.	Yes	Yes
3ii	Conserve East Anglian chalk groundwater resource	Conserve the regionally important East Anglian chalk groundwater resource, by working in partnership to ensure that an integrated catchment-scale approach is secured for its enhanced long-term management, as described within <u>NCA 87</u> . GI features could be incorporated into the landscape-scale management of these sensitive systems.	Yes	Yes
3iii	Protect water resources from pollution and contamination	Protect water resources from pollution and contamination particularly near wastewater treatment works, urban areas (as a result of surface water runoff), and in rural areas as a result of rural pollution sources.	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
3iv	Protect communities at greatest risk of flooding	<p>Protect communities at greatest risk of flooding through effective management of water resources. GI can reduce the impacts of flood risk through:</p> <ul style="list-style-type: none"> - Restoration of natural floodplains along river valleys and/or the creation of SuDS as part of development proposals and within existing streets. - Restoration projects on water bodies (e.g. Bourn Brook as part of the West Cambridgeshire Hundreds). Such projects not only improve habitats for a variety of species, but also improve water quality and restore natural floodplain function. - Building upon existing policy, ensure all developments include appropriately placed GI-related SuDS (e.g. rain gardens and swales) to help mitigate water quality issues by filtering and reducing pollutants entering river systems. Although development can be part of the solution to remediating pollution issues, effective planning policies are essential to avoid acute development impacts on water resources. - Use of SuDS to transport water to ground to facilitate groundwater recharge. Focus could be within the chalk landscape and on downstream areas within the catchment where water is currently diverted away (out to sea). It is recommended that the SuDS network include at least some permanent water to optimise benefit to biodiversity and contribute to maintaining soil moisture year-round (see also Theme 6). 	Yes	Yes
3v	Provide natural flood management	<p>Restore and improve the function of green corridors on the network of waterways including rivers, streams and brooks to provide natural flood management, improve water quality and recharge to groundwater. Green corridors would benefit from formal definition and recognition as opportunity areas by the council (suggested as Riverscape Opportunity Areas), with associated environmental improvements sought alongside the corridors and the immediate area that extends inland each side (at least 50m). The designation would provide a common shared vision which could be reflected in</p>	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
		local planning policy, BAPs, estate management and identified as focus areas for agri-environment scheme uptake.		
3vi	Develop River Cam landscape strategy	Consider the entirety of the River Cam and its tributaries in developing a River Cam landscape strategy that recognises and responds to the multidimensional pressures it faces, the value of the river and its chalk streams to people and wildlife, and the importance of river group and community stewardship in management. Consider introducing a regulatory framework to enforce protection.	Yes	Yes
3vii	Consider opportunity to plant wet woodlands.	Consider potential to plant wet woodlands to offset increases in nutrient loads, improve water quality, slow rates of runoff and increase recharge to groundwater, as well as potentially contribute towards carbon neutrality.	Yes	Yes
3viii	Carefully improve accessibility to lakes, watercourses and floodplains	Carefully balance improvements to the accessibility of lakes, watercourses and floodplains for walking and cycling and as amenity space, with nature conservation and enhancement objectives.	Yes	Yes
3ix	Promote partnership working between various stakeholders	Promote partnership working between various stakeholders involved in the water environment at the catchment scale to ensure opportunities for enhancement are both practical and deliverable e.g. water companies, wildlife organisations, landowners and managers, and local authority.		Yes
3x	Develop vision of water neutrality	Develop a vision of water neutrality with the mapping and designation of groundwater recharge areas to ensure they become a material consideration for planning zones. Collaboration between developers, water companies and councillors could help to ensure recharge is maximised.	Yes	Yes
3xi	Encourage grey / green water recycling	Grey / green water recycling is extremely important not only to reduce demand on water supplies. New developments should incorporate grey / green water recycling and rainwater harvesting systems wherever possible (e.g. site wide water recycling system at Eddington in Cambridge).	Yes	Yes
3xii	Educate public on impacts of	Ensure GI projects incorporate opportunities to educate the public on the detrimental impacts of		Yes

Code	Opportunity summary	Opportunity description	A	B
	excessive water use	excessive water use to the sensitive chalk streams and aquifers that are integral to the environment they enjoy for recreation and leisure. Links with new residents, schools, youth and community groups should be sought.		

Identifying broad opportunity zones

6.13 Drawing together all of the evidence presented in this section, Table 6.13 sets out the broad opportunity zones identified under this theme. This is supported by Figure 6.10.

Table 6.13: Broad opportunity zones for the water environment

Opportunity map reference	Description	Code
3a – River Cam and tributaries restoration	Restore natural floodplains and incorporate GI to protect communities at risk of flooding, as well as restore and improve the function of green corridors to provide natural flood management, improve water quality and recharge to groundwater.	3iii, 3v, 3vi, 3viii, 3ix
3b – Chalk river catchment protection and recharge area	Protect the East Anglian chalk groundwater resource through GI features within landscape-scale management, and the quality of the resource by reducing pollution and contamination. Develop a chalk streams strategy to deliver necessary actions. Promote groundwater recharge, mapping these areas to ensure they become a material consideration for planning zones.	3ii, 3iii, 3iv, 3v, 3vi, 3ix, 3x, 3xii
3c – Southeast source protection and recharge area	Protect the East Anglian chalk groundwater resource through GI features within landscape-scale management, and the quality of the resource by reducing pollution and contamination. Promote groundwater recharge, mapping these areas to ensure they become a material consideration for planning zones.	3ii, 3iii, 3v, 3ix, 3x, 3xi, 3xii
3d – South source protection and recharge area	Protect the East Anglian chalk groundwater resource through GI features within landscape-scale management, and the quality of the resource by reducing pollution and contamination. Promote groundwater recharge, mapping these areas to ensure they become a material consideration for planning zones.	3ii, 3iii, 3v, 3ix, 3x, 3xi, 3xii
3e – Clay catchment natural flood management	Promote natural flood management and incorporate GI to protect communities at risk of flooding, as well as restore and improve the function of green	3i, 3iii, 3iv, 3v,

Opportunity map reference	Description	Code
	corridors to provide natural flood management, improve water quality and recharge to groundwater.	3ix, 3x, 3xii
3f – Lowland fen flood mitigation	Incorporate GI to protect communities at greatest risk of flooding, as well as restore and improve the function of green corridors to provide natural flood management and improve water quality.	3i, 3iv, 3v, 3ix, 3x
3g – SuDS (not spatially specific)	Protect communities at greatest risk of flooding e.g. through creation of SuDS as part of development proposals and within existing streets. SuDS should transport water to ground to facilitate groundwater recharge.	3iii, 3iv, 3v, 3ix, 3x,
3h – Water recycling and efficiency (not spatially specific)	Make it mandatory for new developments to incorporate grey / green water recycling and rainwater harvesting systems.	3iv, 3x, 3xi, 3xii
3i – Wet woodland planting (not spatially specific)	Plant wet woodland along water corridors.	3iii, 3v, 3vii, 3ix
3j – Improve accessibility to waterways (not spatially specific)	Carefully balance improvements to the accessibility of lakes, watercourses and floodplains for walking and cycling and as amenity space, with nature conservation and enhancement objectives. (See Theme 4: Access and Connectivity for further detail).	3vi, 3viii
3k – Public education on water use (not spatially specific)	Ensure GI projects make provisions to educate the public on the detrimental impacts of excessive water use to the sensitive chalk streams and aquifers that are integral to the environment they enjoy for recreation and leisure.	3xii
3l – Catchment scale partnership working (not spatially specific)	Promote partnership working between various stakeholders involved in the water environment at the catchment scale.	3ix, 3x

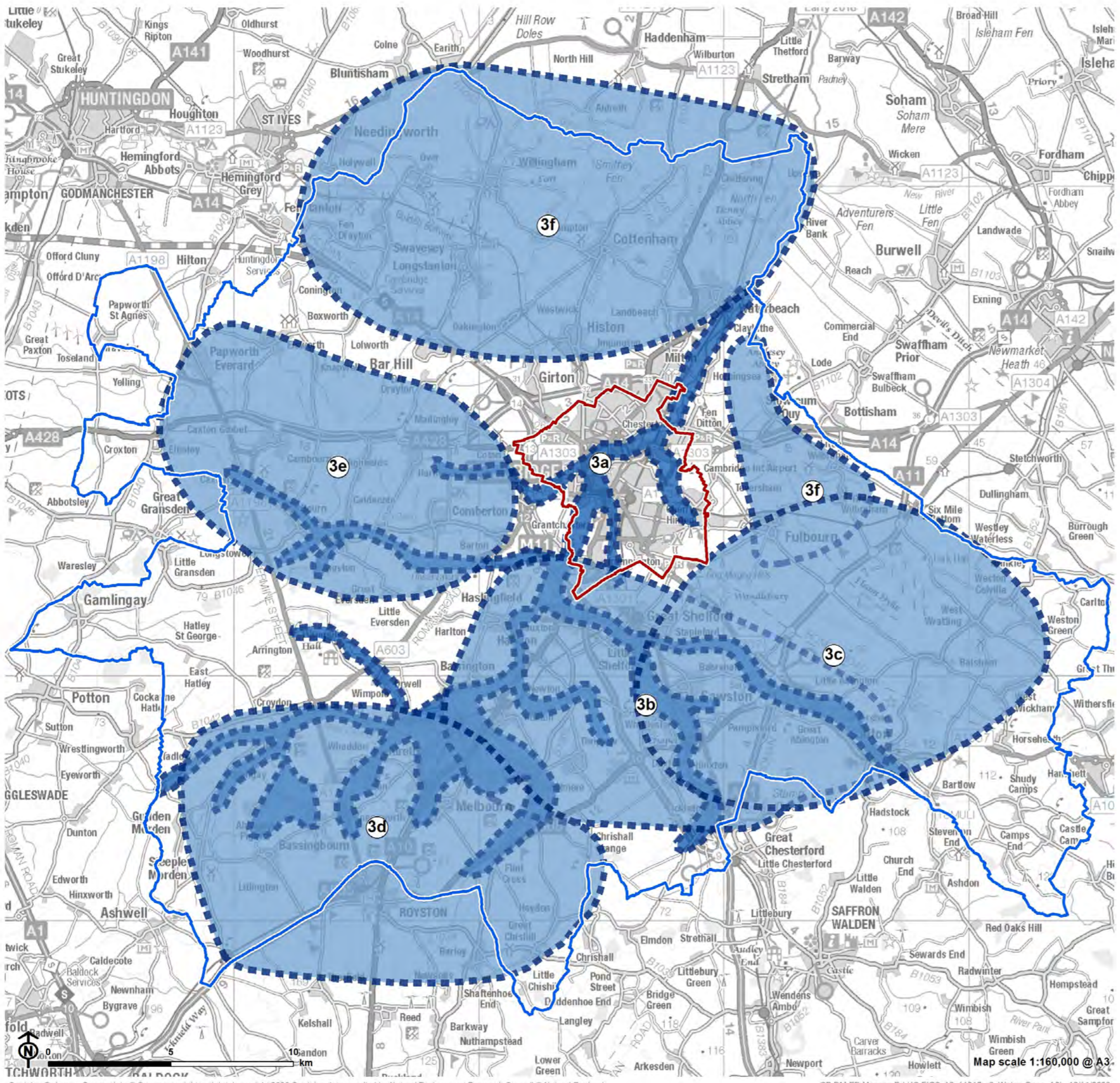





Figure 6.10: Water Environment Broad Opportunity Zones

-  Cambridge
-  South Cambridgeshire
-  Water environment broad opportunity areas
- 3a: River Cam and tributaries restoration
- 3b: Chalk river catchment protection and recharge area
- 3c: Southeast source protection and recharge area
- 3d: South source protection and recharge area
- 3e: Clay catchment natural flood management
- 3f: Lowland fen flood mitigation
- 3g: SuDS (not spatially specific)
- 3h: Water recycling and efficiency (not spatially specific)
- 3i: Wet woodland planting (not spatially specific)
- 3j: Improve accessibility to waterways (not spatially specific)
- 3k: Public education on water use (not spatially specific)
- 3l: Catchment scale partnership working (not spatially specific)

Theme 4: Access and connectivity

Why is this theme relevant to GI?

6.14 Access to open space and areas for recreation, together with good connectivity between assets and employment hubs, provides a host of benefits to health and wellbeing, air quality, climate change and biodiversity.

6.15 GI can help to facilitate sustainable active travel, with a network designed to improve accessibility and enhance recreational opportunities. Providing and promoting safe active travel routes, be it through walking, running or cycling, can maximise the benefits provided by open spaces, especially in areas where they are small or few in number. It increases the potential for residents to make healthier lifestyle choices whilst also supporting economic growth, sustainable tourism and, if well planned, can enhance the network of connected habitats to enhance biodiversity.

6.16 Assets and evidence considered under this theme include national and locally promoted walking and cycling routes, Public Rights of Way (PRoW) and public transport routes including roads. Accessibility of sites for recreation is discussed in Theme 5.

Climate Change

Public transport and active travel routes are low-carbon transport methods which can effectively reduce carbon emissions. This is particularly important to meet net zero targets by 2050, balancing economic growth (and likely increases in traffic and congestion) with a reduction in emissions.

Wellbeing and Social Inclusion

Active travel has notable benefits for health and wellbeing through encouraging people to lead healthy lifestyles, exercise outdoors and access nature whilst also being a less costly means of travel. Sustainable modes of travel can enhance social inclusion through car sharing, running groups and cycle buddy groups.

Environmental Factors

A reduction in car use can effectively improve air quality, ease congestion and reduce noise pollution. Such environmental benefits are notable where active travel routes are used by commuters and if they replace car journeys that are often made to visit larger, more distant open spaces.

Existing and emerging evidence

6.17 The list below summarises the relevant resources, strategies and policy documents that have been reviewed to provide the evidence presented in this section. Full details of each document and their relevance can be found in Appendix 2:

- [Cambridgeshire and Peterborough Local Transport Plan \(2020\)](#)
- [The Transport Strategy for Cambridge and South Cambridgeshire: Transport Strategy and High Level Programme \(2014\)](#)
- [Greater Cambridge Local Plan - Habitats Regulations Assessment \(HRA\) Scoping Report \(2019\)](#)
- [Making Space for People Supplementary Planning Document - \(SPD\) Baseline Report \(2019\)](#)
- [Cambridgeshire Rights of Way Improvement Plan \(ROWIP\) Update \(2016\)](#)
- [Partnering for Prosperity: A New Deal for the Cambridge-Milton Keynes-Oxford Arc \(2017\)](#)
- [Greater Cambridge Partnership – transport schemes](#)
- [Weber et al. \(2019\) \(CUSPE\). Net Zero Cambridgeshire: What actions must Cambridgeshire County Council take to reach net zero carbon emissions by 2050?](#)
- Greater Cambridge Zero Carbon Evidence Base (emerging)

Key assets

Public transport and roads

6.18 The city of Cambridge plays a key functional access role as the dominant centre in Cambridgeshire and as a main nodal point of the Oxford-Cambridge Arc and M11 corridor. Other major transport corridors include the A14, A11, A428, A10, A603 and A1307. There are strong north-south transport links to London with nearly 24,000 people in South Cambridgeshire commuting daily.

6.19 Cambridge is situated on several main rail lines: the East Coast mainline, Great Northern line (King's Cross-Cambridge) and West Anglia mainline. There are two railway stations in the city; Cambridge and Cambridge North, which provide connections to the Cambridgeshire Guided Busway and as an interchange with the Park and Ride and local bus services. The Busway provides a high-quality link between Cambridge and South Cambridgeshire including the new town of Northstowe, and St Ives, with connections on to Huntingdon and Alconbury.

6.20 The main rail lines extend out from the city through the northeast, east and south of South Cambridgeshire, with stations at Foxton, Shepreth, Meldreth on the line to London Kings Cross, Shelford and Whittlesford Parkway on the line to London Liverpool Street, and Waterbeach on the line north. There are, however, no stations on the line that runs east within South Cambridgeshire district.

6.21 Greater Cambridge also has direct links to a number of international transport gateways with the Felixstowe to Nuneaton rail freight route, and direct road and rail links to international gateways including several London airports and St Pancras international station. Cambridge is within an hours' drive of the international airports of Stansted and Luton, and less than two hours from Gatwick, East Midlands and Birmingham Airports. Cambridge also houses its own International Airport which is privately owned. The nearest major ports to Cambridge are Felixstowe, Great Yarmouth, Lowestoft, Ipswich and Harwich in Essex.

Planned improvements

6.22 Nationally significant transport projects identified within the Oxford-Cambridge arc include the East-West Rail line connecting Oxford and Cambridge which will improve the connectivity between Cambridge city and some of the rural villages and large open spaces in South Cambridgeshire, as well as the A428 Black Cat to Caxton Gibbet improvement project. There are also emerging proposals to improve rail infrastructure and services between Cambridge, Ipswich and Norwich.

6.23 Some of the key aspects of the Cambridgeshire and Peterborough Combined Authority Local Transport Plan include:

- the Cambridgeshire Autonomous Metro (CAM), a new 'metro-style' system connecting the city of Cambridge with the surrounding region with high-frequency services unaffected by traffic congestion;
- comprehensive, high quality Dutch-standard walking and cycling infrastructure;
- better public bus services;
- improvements to the rail network, including a new Cambridge South railway station; and
- highway demand management.

6.24 Greater Cambridge Partnership have several projects to improve the public transport network including, but not limited to the list below. It is envisaged that these radial public transport schemes will form the first phase of the CAM referred to above:

- Cambourne to Cambridge public transport route;
- Cambridge South East Transport project which proposes a new travel hub, public transport route and new walking, cycling and horse-riding links;
- Waterbeach to Cambridge north public transport route; and
- Cambridge Eastern Access sustainable transport route.

Cycling and walking

6.25 The Rights of Way network, including promoted 'long distance' routes and permissive routes, forms a pervasive network of linear sustainable access routes across Cambridgeshire. The network of routes (approximately 1,075 km), shown in Figure 6.8 help to link villages and towns with the city, the wider countryside and a range of GI assets. The network provides green corridors throughout the open arable countryside which often co-exist with designated sites e.g. SSSI's, LNR's and Scheduled Monuments.

6.26 Icknield Way in the south of Greater Cambridge, near the border with Uttlesford, is a long-distance footpath that traverses the south east corner of South Cambridgeshire.

6.27 Cambridge has the highest level of cycling in the country with one in three residents cycling to work. Being a compact and flat city, cycling and walking are quick, cheap and pollution-free methods of travel. The pro-cycling culture has also been supported by council-implemented schemes including restrictions on car-parking permits, busy areas where cyclists have road priority as well as business incentives to establish bike hire and parking facilities in the city.

6.28 There are several National Cycle Network routes totalling 41.8km within Greater Cambridge; including routes 11, 24 and 51. The network serving the wider South Cambridgeshire area is fairly limited. Route 51 extends from Huntingdon to the north west

through St Ives and the city to Bottisham and Wicken Fen. Part of route 51 is a dedicated cycle route built alongside the Busway between St Ives and north Cambridge. Route 11 runs north to south connecting Wicken Fen and Waterbeach to the city and through to Duxford and Great Chesterford in the south. The proportions of routes 11, 24 and 51 within Greater Cambridge are summarised in Table 6.14.

Table 6.14: National Cycle Network routes in Greater Cambridge

National Cycle Network route	Total length of route (km)	Percentage of route in Cambridge %	Percentage of route in South Cambridgeshire %
11	244,569	5.0	9.4
24	150,833	1.5	12.4
51	427,997	0.9	5.5

Planned Improvements

6.29 The Cambridgeshire Rights of Way Improvement Plan Update identifies Statements of Action which are grouped into eight categories, with notable importance for GI networks in several of these. This includes making the countryside more accessible, a safer and health-enhancing activity, better land management and a better countryside environment.

6.30 The following routes have been identified as projects within the Cross City Cycling project, an £8 million scheme aimed to improve walking and cycling links to schools and employment centres, reducing congestion and improving air quality, health and road safety:

1. Arbury Road Route
2. Links to Cambridge North station and the Science Park
3. Ditton Lane and Links to East Cambridge
4. Fulbourn/Cherry Hinton Eastern Access
5. Hills Road and Addenbrooke's Route

6.31 The Chisholm Trail is a new 3.5km walking and cycling route, creating a mostly off-road and traffic-free route between Cambridge Station and the new Cambridge North Station. The route will be part of the 26km full trail route.

6.32 There are currently twelve Greenway projects proposed which extend from Cambridge City towards surrounding villages. These are intended to provide local travel routes for cyclists, walkers and equestrians, and to serve as valuable corridors for wildlife. Two routes, Waterbeach (extending to the north-east) and Fulbourn (extending to the east), have approval to be taken forward with current funding. These routes are to be taken account of when mapping opportunities.

6.33 Other ongoing projects include proposals for a series of new Controlled Parking Zones (CPZs) as part of a wider regional strategy to disincentivise private vehicle use across the city of Cambridge. Furthermore, as a result of Covid-19, the Council's have developed a series of plans to support efforts enabling people to cycle and walk safely around Greater Cambridge.

6.34 There are a number of other schemes aimed at encouraging cycling and walking in Greater Cambridge including Bikeability (cycle training for primary school children), Camcycle (campaign for the rights of cyclists and promoting cycling) and Walkit (shows all walking routes around Cambridge, fitness information and events).

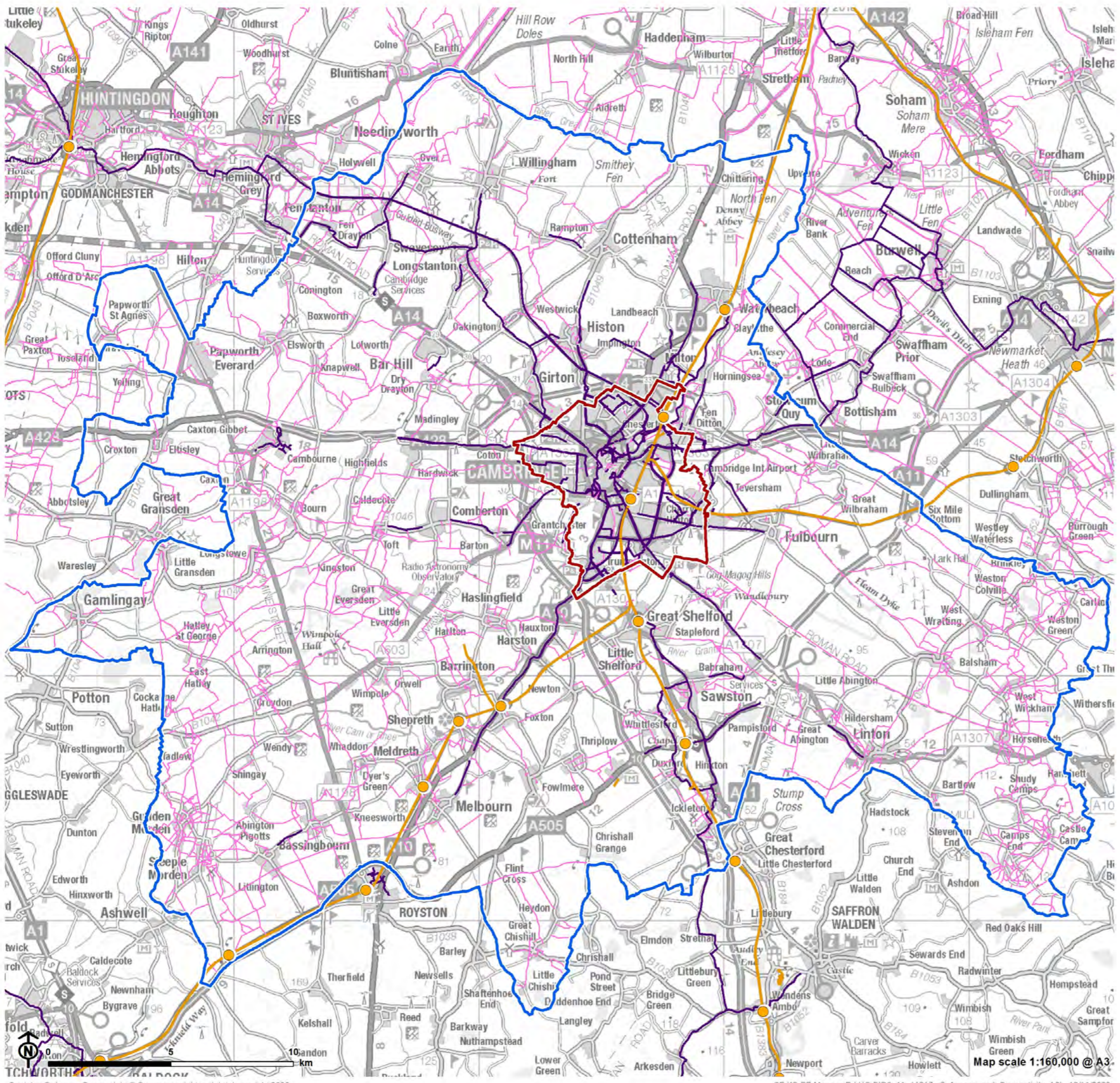


Figure 6.11: Access and Connectivity

- Cambridge
- South Cambridgeshire
- Railway Station
- Railway
- Public Rights of Way
- Cycle route



Key issues

6.35 Table 6.15 sets out key issues organised by 'forces for change'; noting the sources that have led to their identification. Where an issue was identified through more than one source, the issue has not been duplicated, but the range of sources have been noted in the 'Source' column. Appendices 2 and 3 provide an overview of stakeholder feedback that has informed this assessment.

Table 6.15: Key issues for access and connectivity

Force for change	Issue	Source
Population growth	Population growth means trips on the transport network will increase by 25,000 by 2031 (from 101,000 in 2011 to 126,000). This will result in increased pressure on the existing network with 30-40% increases in traffic in the morning peak. There is a need to promote and provide new routes to accommodate demand.	<u>Greater Cambridge Partnership website</u>
Traffic congestion	Traffic congestion is a significant issue associated with radial routes and public transport capacity in the city centre. Both the highway and bus networks suffer from limited capacity, which is unlikely to be able to cater for significant increases in traffic volumes.	<u>Cambridgeshire and Peterborough Local Transport Plan</u>
Sustainable transport	<p>South Cambridgeshire, with its population dispersed across rural villages and settlements, currently has limited access to bus services and other more sustainable modes of transport. This is especially prevalent in the more remote west and eastern parts of Greater Cambridge which are not served by the main radial corridors and associated public transport. Consequently, there is a reliance on cars as the only available method of transport. Emissions from transport contribute to South Cambridgeshire having the highest levels of CO² emissions per capita in the county.</p> <p>Traditional approaches to GI have centred on car use to access GI assets (e.g. through car parks). A more sustainable approach is now required to encourage more people to access the countryside using PRow, permissive paths or other multi-user pathways, without having to drive. Carefully managed parking areas for visitors at destination sites is also needed.</p>	<p><u>Sustainability Appraisal Scoping Report</u></p> <p><u>Cambridgeshire Green Infrastructure Strategy</u></p> <p>Stakeholder consultation</p>

Force for change	Issue	Source
Cycleway provision	<p>Local villages lack safe, attractive pavements and cycleways. Concerns around cycling amongst traffic, particularly on congested and polluted roads, acts as a key deterrent to active travel. Large vehicles and poor visibility at bends can also create an environment which is not perceived as safe for cyclists, making it very difficult to travel sustainably to/ between villages or towns. The west of Greater Cambridge is particularly poorly served by public transport and offers limited opportunities for safe cycling with narrow, heavily used roads.</p> <p>The opportunity exists to address gaps in the continuity of cycleway provision within Greater Cambridge, investing in improved infrastructure to make cycling an attractive option for short trips that are currently taken by car. An expanded cycle network offers the potential to provide sustainable connections between new development and dispersed rural settlements. However, the relatively high traffic speeds and constraints of carriageway width dictate that space on the carriageway is limited for cycleway provision.</p>	<p><u>Cambridgeshire and Peterborough Local Transport Plan</u></p> <p>Stakeholder consultation</p>
Recreational pressure	<p>Expansion and increased use of PRow, green corridors and waterways requires careful management to balance their biodiversity value and statutory designations with which they tend to co-exist including SSSI's, Local Nature Reserves and Scheduled Monuments.</p>	<p><u>Greater Cambridge Local Plan HRA Scoping Report</u></p>
Sustainable transport	<p>There are gaps in the existing PRow and permissive access route network, resulting in limited access to several large accessible green spaces and a resultant reliance on using a car to travel short distances. For example, Wandlebury / Magog Down.</p>	<p>Stakeholder consultation</p> <p>Cambridge Nature Network: A Nature Recovery Network for Cambridge Stage 2 Report (Draft, July 2020)</p>
Transport infrastructure	<p>Proposed transport developments e.g. CAM and the busway may serve to increase the accessibility through Greater Cambridge. However, it is essential to preserve the existing landscape setting and ensure infrastructure does not increase severance issues for both the movement of people and wildlife (along ecological corridors).</p>	<p>Stakeholder consultation</p>

Force for change	Issue	Source
Public Rights of Way	<p>The existing PRow network suffers from lack of maintenance in some areas.</p> <p>There are significant gaps in the network particularly to connect necklace villages in South Cambridgeshire (east to west) with one another and to major green spaces. Severance features (roads and railways) also restrict access.</p> <p>Safety is a concern given some paths are not wide enough to allow use by multimodal users (walkers, cyclists and horse riders).</p>	<p>Stakeholder consultation</p> <p><u>Cambridgeshire Rights of Way Improvement Plan Update</u></p>
Public bridleways	<p>The bridleway network is inadequate (accounts for 15-20% of the PRow network), fragmented and in need of improvement. Notable lack of bridleways north of the A14 corridor.</p>	<p>Stakeholder consultation</p> <p><u>Cambridgeshire Rights of Way Improvement Plan Update</u></p>

Key opportunities

6.36 Considering the issues noted above, and the range of evidence reviewed, Table 6.16 sets out the key opportunities that have been identified. Opportunities have been categorised as one or both of the following:

- A: Overarching principles/considerations for the emerging Local Plan; and/or
- B: Partnership opportunities.

6.37 At this stage of the study, project or site-specific opportunities have not been identified in these tables. The next stage of this study will provide more detail on potential projects using the information captured in Appendix 3 (consultation outputs).

Table 6.16: Key opportunities for access and connectivity

Code	Opportunity summary	Opportunity description	A	B
4i	Plan and integrate GI into existing / proposed transport strategies and projects.	<p>Strategically plan and integrate GI into existing and proposed transport strategies and projects. GI complements objectives within the Transport Strategy to:</p> <ul style="list-style-type: none"> - green transport infrastructure both literally and by facilitating behavioural change; - promote health and wellbeing by increasing the amount of physical activity undertaken; - reduce air pollution; 	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
		<ul style="list-style-type: none"> - improve the public and urban realm; - meet air quality and net zero carbon targets; - protect the natural, historic and built environment. <p>Likewise, GI supports the objectives of the Cambridge-Milton Keynes-Oxford Arc to enhance productivity, contribute to place-making, improve connectivity and enhance the natural and built environment.</p>		
4ii	Promote patterns of development that enable travel by low-carbon modes such as walking, cycling and public transport.	Promote patterns of development that enable travel by low-carbon modes such as walking, cycling and public transport. All new developments should promote sustainable active transport, integrating with the wider network of residential areas, places of work and GI assets. Communities should be discouraged from using private cars where possible. For example, in residential areas that suffer from high car usage and few safe active transport routes, low traffic neighbourhoods may discourage car use and enable residents of all ages to feel safer travelling on foot or by bicycle. This aligns with the Transport Strategy objective to provide 'healthy streets' and high quality public realm that puts people first and promotes active lifestyles. The North East Cambridge AAP provides a good case study which Local Planning policies could replicate elsewhere.	Yes	Yes
4iii	Create/enhance safe active travel routes along desire lines, between key settlements and villages	Create and enhance safe active travel routes along key desire lines, between key settlements and villages (both existing and proposed), to the business and research parks and to the city. Routes could be multifunctional, providing a recreational experience as well as connecting settlements with one another and to the city centre.	Yes	Yes
4iv	Enhance PROW network	Enhance the PROW network: <ul style="list-style-type: none"> – Identify gaps in existing PROW provision and help deliver an enhanced network, providing routes to and between key destinations, together with circular routes close to settlements. – Navigable waterways and river crossings can help to overcome issues of creating a linked-up GI network by providing links along river 	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
		<p>corridors. River corridors could be connected to the wider PRow network to increase accessibility for both commuting and leisure. The Rivers Rhee and Bourn Brook are examples of this variable access.</p> <ul style="list-style-type: none"> – Expand the existing PRow, quiet lanes, greenways, and other green spaces and corridors to provide a cohesive non-motorised transport network that links homes to schools, places of employment, recreational areas and the countryside. These could be developed alongside any infrastructure or enhancement projects. – Ensure that the PRow network is integrated with wider transport networks, to provide a means of sustainable, active travel, particularly for short journeys, in both urban and rural areas. 		
4v	Enhance connectivity between open spaces	Address deficits in accessibility to green space (discussed further in GI Theme 5) by using GI to enhance connectivity between, and to, open spaces. Interventions could be focussed where there are severance features (roads, rail or waterways) or in areas where green spaces are currently inaccessible to the public. Appropriate signage and wayfinding are essential alongside any accessibility improvements to ensure residents are fully aware of their local network and the ability to walk and cycle to underused or unknown sites.	Yes	Yes
4vi	Distribute pressures on over-used / or sensitive open spaces by improving access and active travel routes to less well used sites.	Following on from the above, distribute pressures on over-used or inherently sensitive open spaces by improving access and active travel routes to less frequented or known-about sites. Improving and expanding GI assets and their connectivity can help to address health inequalities (as highlighted in Figure 4.1) as well as overcome the inherently poor 'green' connectivity to the countryside and between towns and villages across Greater Cambridge.	Yes	Yes
4vii	Embed principles of GI and network planning within	Embed principles of GI and network planning within existing projects aimed at encouraging cycling and walking, to maximise benefits.	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
	existing cycling and walking projects			
4viii	Improve permissive access to countryside as part of agri-environment schemes	Seek opportunities to improve permissive access to the countryside in South Cambridgeshire via agri-environment schemes. However, barriers need to be overcome as the vast majority of landowners are reluctant to include access options, instead being more inclined to take up options for improving the biodiversity value of their holdings.		Yes
4ix	Consider opportunities for alternative funding for PRow maintenance	Funding for maintenance of the PRow network by existing public funding is insufficient, therefore expanding the network beyond new development sites must consider alternative methods of funding. Additional funding could be accessed if PRow are considered as essential local transport infrastructure needed for a development.	Yes	Yes
4x	Enhance GI along and adjacent to East West rail link	The proposed East West rail link provides an opportunity to improve accessibility between rural villages and to key open spaces. GI enhancements along and adjacent to this route and at key arrival gateways are necessary.	Yes	Yes

Identifying broad opportunity zones

6.38 Drawing together all of the evidence presented in this section, Table 6.17 sets out the broad opportunity zones identified under this theme. This is supported by Figure 6.12.

Table 6.17: Broad opportunity zones for the water environment

Opportunity map reference	Description	Code
4a – East West rail link corridor	Key opportunity to improve accessibility between rural villages and open spaces, incorporating GI enhancements at arrival gateways along the route.	4i, 4x
4b – Access improvements - Dispersed villages in the west	Address deficiencies in access to green space using GI to enhance connectivity between open spaces and dispersed villages in the west.	4iii, 4iv, 4v, 4vii
4c – Address severance - A1198 corridor	Enhance GI along the existing infrastructure corridor of the A1198 to address severance issues and introduce improvements for the movement of people and wildlife.	4i, 4ii, 4iii, 4v, 4vii

Opportunity map reference	Description	Code
4d – Bourn Brook corridor	Utilise GI enhancements to create links along the corridor of the Bourn Brook to provide wider connections to the PRow network and increase accessibility.	4iv, 4v
4e – Access improvements - Dispersed villages in the east	Address deficiencies in access to green space through the use of GI to enhance connectivity between open spaces and dispersed villages in the east.	4iii, 4iv, 4v, 4vii
4f – River Rhee corridor	Promote the River Rhee as a navigable waterway and river crossing with improved access to the PRow network.	4iv
4g – Address severance - A14/M11 corridor	Utilise GI to address issues of inaccessibility due to the severance features of the A14 and M11.	4i, 4ii, 4iii, 4v, 4vii
4h – Gaps in PRow provision - South Cambridge	Enhance the existing PRow network to address gaps and provide multi-user connections between green spaces and necklace villages in South Cambridgeshire.	4iv, 4v, 4vi, 4viii
4i – Address severance - A11 corridor	Enhance the network of active travel routes east-west along the corridor of the A11, providing multifunctional linkages to key settlements and villages.	4i, 4ii, 4iii, 4v, 4vii

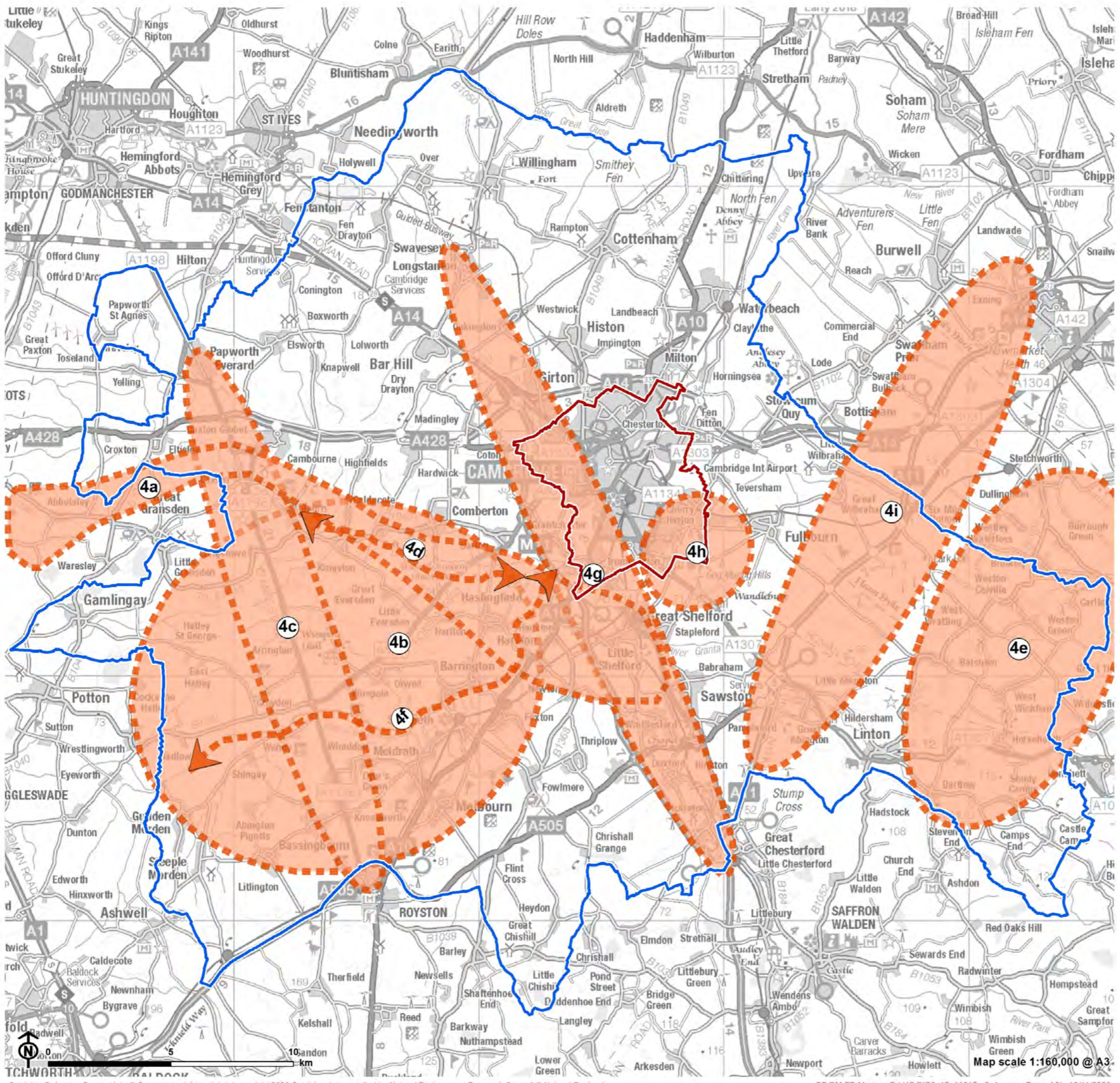





Figure 6.12: Access and Connectivity Broad Opportunity Zones

-  Cambridge
-  South Cambridgeshire
-  Access and connectivity broad opportunity areas
 - 4a: East West rail link corridor
 - 4b: Access improvements - Dispersed villages in the west
 - 4c: Address severance - A1198 corridor
 - 4d: Bourn Brook corridor
 - 4e: Access improvements - Dispersed villages in the east
 - 4f: River Rhee corridor
 - 4g: Address severance - A14/M11 corridor
 - 4h: Gaps in PRoW provision - South Cambridge
 - 4i: Address severance - A11 corridor

Theme 5: Recreation and play

Why is this theme relevant to GI?

6.39 Open spaces perform a multifunctional role in society providing a range of benefits. There are notable benefits for health and wellbeing by providing opportunities for healthy exercise, informal recreation, amenity space for formal and informal play, social interaction and community enterprise. Furthermore, there are benefits to biodiversity, for climate change adaptation, enhancing landscape character and creating a sense of place.

6.40 Planned GI networks can take advantage of opportunities to enhance these multifunctional benefits both in terms of improving the quantity and quality of open and green spaces, and in addressing deficiencies in access to them.

6.41 Open spaces considered within this theme include parks and gardens, natural and semi-natural green space, amenity green space, outdoor sports facilities, provision for children and teenagers, allotments and community gardens, civic spaces, and cemeteries and churchyards.

Climate Change

Open spaces may be degraded through the impacts of climate change. However, well planned and managed spaces can help to ameliorate climate changes through sequestering carbon as well as reducing the urban heat island effect for example by providing shade during hotter, drier summers and helping to reduce flood risk through the integration of SuDS.

Wellbeing and Social Inclusion

There are notable benefits for health and wellbeing as open spaces provide opportunities for healthy exercise, sport and leisure, amenity space, recreation (including formal and informal play), social inclusion and community enterprise e.g. through allotments.

Environmental Factors

Open spaces can contribute to reductions in air pollution particularly where strategic tree planting (for example adjacent to busy roads) provides an effective filter for pollutants. Similarly, open spaces can help to mitigate noise pollution especially where they act as buffers between residential development and busy transport corridors.

Existing and emerging evidence

6.42 The list below summarises the relevant resources, strategies and policy documents that have been reviewed to provide the evidence presented in this section. Full details of each document and their relevance can be found in Appendix 2:

- [Analysis of Accessible Natural Greenspace Provision for Cambridgeshire and Peterborough \(2011\)](#)
- [Cambridge City Council Open Space and Recreation Strategy \(2011\)](#)
- [South Cambridgeshire Recreation and Open Space Study \(2013\)](#)
- [The Greater Cambridge Area encompassing Cambridge City and South Cambridgeshire District Council Revised Playing Pitch Strategy 2015-2031 \(2016\)](#)
- [Cambridgeshire Green Infrastructure Strategy \(2011\)](#)
- [Making Space for People Supplementary Planning Document \(SPD\) Baseline Report \(2019\)](#)
- [Cambridgeshire Future Parks Accelerator \(FPA\) \(emerging\)](#)
- [Greater Cambridge Local Plan - Habitats Regulations Assessment \(HRA\) Scoping Report \(2019\)](#)
- [Fields in Trust Green Space Index \(online tool\)](#)
- [National Framework of Green Infrastructure Standards \(emerging\)](#)

6.43 At the time of this study, a number of parallel workstreams are developing evidence that will contribute to the understanding of the overall quantity, quality and accessibility of open space in Greater Cambridge. Of particular relevance, Greater Cambridge falls within the Cambridgeshire Future Parks project area and is a pilot area for trialling the emerging National Framework of Green Infrastructure Standards led by Natural England. A Greater Cambridge Open Spaces and Recreation Study is also getting underway.

6.44 All of these significant workstreams will deliver GIS mapping that will support a greater understanding of deficiencies in access to, and quantity of open space.

Key assets

6.45 The emerging Greater Cambridge Open Space and Recreation Study will provide an up-to-date evidence base for the Local Plan, including an evaluation of the provision and quality of open space, and a review of the standards used by the Council's considering the local development context. However, to provide a baseline understanding of open spaces in Greater Cambridge for the purposes of this study, the existing 2011-2013 Accessible Natural Greenspace (ANG) and Open Space studies have been used to develop an understanding of the key issues and opportunities in relation to recreation and play. This has been supplemented by other resources and tools such as the Fields in Trust Green Space Index. Figure 6.13 shows the distribution of open spaces across Greater Cambridge.

6.46 The 2011 Natural England ANG study provides information on access to local natural greenspace close to people's homes. The findings provide a useful measure to identify broad deficits within Greater Cambridge when compared to the rest of the County, although they need to be heavily caveated as the Council's did not support the findings. The Council's argued that there are limitations to this method as a result of the classification used, existing land resources and catchment areas.

6.47 The study found that South Cambridgeshire (along with Fenland) is the most deficient area for the combined ANG, with the southeast the most deficient area. The number of households not meeting any of the ANG standards was significantly above the Cambridgeshire and Peterborough average. The study found that ANG provision is below the Cambridgeshire and Peterborough averages at all levels except for sites greater than 500ha. Provision at this highest level is provided by the Great Ouse and wetland sites at Fen Drayton. With regards to the provision of smaller open spaces, the predominant issue within South Cambridgeshire's villages is that these spaces are mainly dedicated to sport and recreation so cannot be classified as natural greenspace thus are excluded from the ANG analysis.

6.48 Within Cambridge City, parks and gardens are the predominant open space typology. Cambridge City has a fairly high provision of ANG compared to South Cambridgeshire, exceeding the Cambridgeshire and Peterborough averages for all ANG categories except for 'within 10km of a 500ha+ site'. The 500+ha catchment only just clips the north of the district resulting in only 3.9% of households meeting this criterion, far below the 30.8% area-wide average.

6.49 Large sites (20ha+) include Coldham's Common to the east of the city centre, Midsummer Common along the south bank of the River Cam, and Sheep's Green and Coe Fen surrounding the River Cam to the south west of the city centre. Coton Country Park lies just beyond the western boundary of Cambridge City and is the only 100ha+ ANG in Greater Cambridge. The 5km catchment extends across a large part of Greater Cambridge but those households towards the east and south-east fall outside of the buffer. Other large country parks in Greater Cambridge include Wandlebury Country Park to the south east of the city, Milton Country Park and Play Area to the north east, as well as large park spaces provided in and around developments on the Cambridge Southern Fringe e.g. Trumpington Meadows Nature Reserve to the south west, and Cambourne Nature Reserve/Country Park to the west. Gog Magog Down, a ridge of low chalk hills extending for several miles to the southeast of the city, and Cow Hollow Wood at Waterbeach are additional large areas of open space.

6.50 The Fields in Trust Green Space Index (GSI) is a barometer of publicly accessible park and green space provision and provides supplementary evidence to the ANG and Open Space studies. Indicators include: the GSI Score, where a score of 1 indicates a minimum standard of provision; the total provision of parks and green space; the provision per person; the number of people who are not within a ten-minute walk of a park or green space; the total provision of parks and green space protected in perpetuity with Fields in Trust. The indicators provide an up-to-date spatial analysis of green space deficiency in the study area and enable comparison to the wider area. The majority of the population in Cambridge City live within a 10-minute walk of green space. People living within the south west and south east areas of South Cambridgeshire as well as Bar Hill and Cottenham in the north, live more than 10-minute walk from a local green space. In terms of green space provision per person, Cambridge City is below the East of England average of 39m² due to the high population density in the city. This is largely the case across South Cambridgeshire given the low quantity of publicly accessible green space, except for the immediate surrounds of Coton Country Park (mainly footpath access) and Gog Magog Downs.

6.51 In terms of outdoor sport provision, Greater Cambridge largely has a good range of existing sport and leisure facilities which are well-located. However, the rurality of villages in South Cambridgeshire results in 53% of villages failing to meet the standard for provision of 1.6 ha per 1000 population and 28 villages (mainly the smallest) having no formal outdoor sport provision at all. The vision for future provision of sport and leisure facilities to support the planned growth to 2031 in Greater Cambridge is outlined in the 2016 Playing Pitch Strategy and

the 2016 Indoor Sports Facility Strategy. The document aims to guide the development of good quality, accessible facilities to increase participation in physical activity for community health benefits. Key issues highlighted include the age, condition and quality of some facilities as well as the reliance on education sites for community accessible facilities. The need to address increased demand for sport and leisure provision due to long term population growth is also highlighted. To address issues of quantity, physical inactivity, deprivation disparity and pressures from population growth there is need to: address quantity deficiencies with provision of new outdoor sports facilities where possible; replace and/or refurbish ageing facilities e.g. Melbourn, Impington, Frank Lee, along with Abbey &, Parkside Pools and Kelsey Kerridge; optimise and increase the capacity for community use of sports facilities on education sites; develop new sports halls, swimming pools, and health and fitness facilities; develop cycling provision, and that for walking and running; and, improve informal recreational activities. The opportunity to work in partnership with the range of facility providers to develop and deliver future provision is also emphasised. Additional facility provision / capacity should also be developed where need is evidenced.

6.52 South Cambridgeshire is also deficient in play space. In comparison with the Fields in Trust (FIT) 0.8 ha per 1000 target, few villages have sufficient play space with 75% failing to meet the standard. This has much to do with the rural nature of the district and historic development of villages. Informal open space, which includes formally planted parks and gardens to less formal green linkages, covers a total of 217.6 ha in South Cambridgeshire. These spaces are required in any new developments and allow recreational use in safe locations close to where people live. Although there can be conflicts between use, they provide a huge opportunity to enhance community cohesion. However, the availability of informal play space in housing areas varies greatly across the District at present: 50 villages lack any kind of informal play space provision, and the majority of villages fall short of meeting the existing standard of 0.4 ha per 1,000 population. Despite play and informal open space deficiencies, South Cambridgeshire performs well in terms of allotments and has a higher standard for allotment provision of 0.4 ha per 1000 population than the National Allotment Association standard of 0.2 ha per 1000 population. Although there is a surplus quantity above the standard when all villages are considered together, 53% of villages do not meet the standard and 50 individual villages have no allotment provision at all. There is a high demand for allotments with the majority of sites well used and a waiting list existing for many sites, and a large variation in the quality of provision (scores range from 35% to 85%). Allotment provision is discussed further in Theme 7: Agriculture and community food growing.

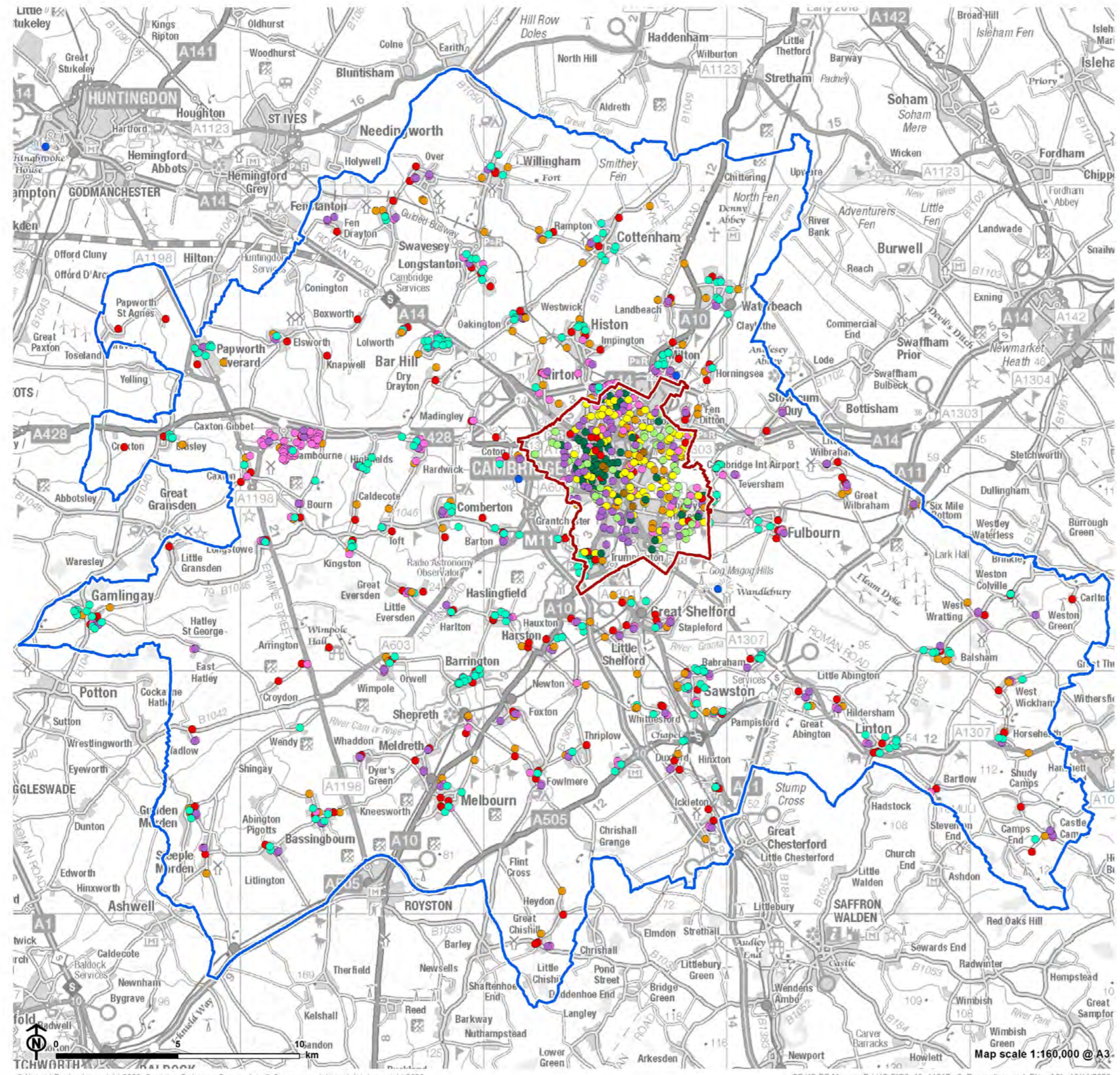
Proposals for open space and improved accessibility

6.53 North East Cambridge is a 182ha area of brownfield land, that lies just a 15-minute cycle ride from the city centre. The [Area Action Plan](#) provides the planning framework to guide development within the area. It includes new and improved crossings across Milton Road to Milton Country Park and the planned Waterbeach Greenway, the A14, the Guided Busway and other major routes, which will effectively link surrounding neighbourhoods with the new ones that will be forming.

6.54 There is a longstanding ambition to develop the sports lakes adjacent to Milton Country Park into a [220-acre multi-use Country Park](#), although planning permission is not yet granted. The proposals would offer facilities suitable for international competition while at the same time providing a landscaped public park free to people on foot and bicycle. The new Country Park would be combined with Milton Country park to form over 300 acres of green space on Cambridge's doorstep.



Figure 6.13: Recreation and Play



- Cambridge
- South Cambridgeshire
- Country park
- Open space**
- Park and garden
- Natural and semi natural green space
- Allotment or community orchard
- Amenity green space
- Cemeteries and churchyards
- Outdoor sports facility
- Provision for children and teenagers
- Civic space
- Informal Open Space



Key issues

6.56 Table 6.18 sets out key issues organised by 'forces for change'; noting the sources that have led to their identification. Where an issue was identified through more than one source, the issue has not been duplicated, but the range of sources have been noted in the 'Source' column. Appendices 2 and 3 provide an overview of stakeholder feedback that has informed this assessment.

6.57 It must be noted that evidence to support the identification of opportunities under this theme in particular is currently being prepared through other workstreams. As a result, it is likely that the broad opportunities mapping may need to be revisited in later stages of this study as the findings of those workstreams emerge.

6.58

Table 6.18: Key issues for recreation and play

Force for change	Issue	Source
Open space provision	<p>Many villages in South Cambridgeshire are deficient in almost all types of open space and accessible natural greenspace.</p> <p>Future development driven by population growth is likely to exacerbate this pattern by adversely affecting how an area performs against the quantity standards. Consequently, there is a need for more open spaces of all typologies to meet current standards.</p>	<p>Cambridgeshire Green Infrastructure Strategy</p> <p>Sustainability Appraisal Scoping Report</p> <p>Analysis of Accessible Natural Greenspace Provision for Cambridgeshire and Peterborough</p> <p>Cambridge City Council Open Space and Recreation Strategy</p> <p>South Cambridgeshire Recreation and Open Space Study</p> <p>Stakeholder consultation</p>
Available data	<p>There is a lack of a single evidence base to identify deficiencies and understand the quality of Greater Cambridge's open spaces. This is being addressed through the development of further evidence.</p>	<p>Stakeholder consultation</p>
Recreational pressures	<p>Recreational activities can result in significant effects on conservation sites; including erosion due to trampling, fire, vandalism or disturbance of sensitive features. These pressures are evident as a result of terrestrial and water-based forms of</p>	<p>Greater Cambridge Local Plan HRA Scoping Report</p>

Force for change	Issue	Source
	<p>recreation. Eversden and Wimpole Woods, Ouse Washes, Portholme, and Fenland and Wicken Fen have been identified as sites at significant risk.</p> <p>Other sites that are frequently at visitor capacity or over-crowded include Milton Country Park, Wandlebury Country Park, Cherry Hinton Hall Park and several central Cambridge City open spaces e.g. Cambridge Commons.</p>	
Poor accessibility	Cambridge city centre has a good quantity of green space, however, a significant amount of this space is privately owned, particularly to the west of the city centre.	Making Space for People Supplementary Planning Document - (SPD) Baseline Report
Development pressures	Development pressures on sites, particularly the expansion of the city north and east toward large green spaces including Coldhams Common, Stourbridge Common, and Ditton Meadows.	Stakeholder consultation
Open space provision	There are existing areas lacking in access to open space and nature. New development and associated new green space will not sufficiently address quantity deficiencies across the whole of Greater Cambridge. Alternative delivery methods will be needed in areas unlikely to experience development e.g. Gog Magogs, including transforming existing brownfield sites, expanding existing assets and improving accessibility to sites.	Stakeholder consultation
Management	<p>In South Cambridgeshire, Parish Councils are responsible for green spaces. Those for formal recreation and sport tend to be well managed, whilst there are few managed natural green spaces with a poorly connected Public Rights of Way network between assets.</p> <p>Thriving sites providing the most value to users include those managed by partners such as the Wildlife Trust, Cambridge PPF and National Trust.</p>	Stakeholder consultation
Development pressures	Delivery of open space as part of new development has not been consistent: some smaller development sites are not delivering the quantity of open space and play facilities as necessary to support the additional residents, therefore increasing quantity deficiencies.	Stakeholder consultation

Key opportunities

6.59 Considering the issues noted above, and the range of evidence reviewed, Table 6.19 sets out the key opportunities that have been identified. Opportunities have been categorised as one or both of the following:

- A: Overarching principles/considerations for the emerging Local Plan; and/or
- B: Partnership opportunities.

6.60 At this stage of the study, project or site-specific opportunities have not been identified in these tables. The next stage of this study will provide more detail on potential projects using the information captured in Appendix 3 (consultation outputs).

Table 6.19: Key issues for recreation and play

Code	Opportunity summary	Opportunity description	A	B
5i	Create long term vision for open spaces in Greater Cambridge	A long-term, ambitious vision for open spaces in Greater Cambridge would be beneficial to guide decision making. The vision could form a guiding principle for all planning policy in the future.	Yes	Yes
5ii	Increase quantity and quality of local green space to address existing areas of deficit	<p>Increase the quantity and quality of local green space to address existing areas of deficit and mitigate increasing pressure where population growth is concentrated. Methods to achieve this could include:</p> <ul style="list-style-type: none"> – Create new greenspaces at a range of scales (largely to be provided by new development, and possibly the sale and subsequent conversion of agricultural land); – Increase the function of existing amenity greenspaces and natural / semi-natural provision if surplus to requirements; – Upgrade private spaces to afford public access; and – Improve the quality of sites that meet the definition of accessible natural greenspace. – Ensure sufficient investment in existing sport and leisure facilities to meet future demand; – Improve and increase community accessibility to a range of formal sports facilities and informal spaces; and – Ensure all new and improved facility provision is fully inclusive to optimise participation opportunities within communities. 	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
5iii	Create /promote additional green spaces to alleviate recreational pressures	Create and promote additional green spaces to alleviate increasing recreational pressures and the number of visitors. This is particularly important in sensitive areas with significant heritage, landscape and biodiversity value.	Yes	Yes
5iv	Explore alternative funding methods for green spaces	Expanding or creating green spaces needs to consider the current issues surrounding local authority budget cuts and the resultant impacts facing parks management, by exploring alternative methods of funding to ensure they are viably managed long-term. Options include: paid access to green spaces, of which there is demand in Greater Cambridge as shown by the number of users of the Botanic Gardens; and, endowments, Trumpington Meadows being an exemplar case study for this. Innovative funding models are a key output anticipated from the Future Parks Accelerator workstream.	Yes	Yes
5v	Enhance role of small informal open spaces	Enhance the role of small informal open spaces including pocket parks and village greens in providing valuable open space to residents, particularly where there are limited opportunities to expand or create new large open spaces. This is important to address deficiencies in and around villages and will require working with Parish councils to determine the location of such assets, how to overcome existing quality and access issues, and to increase the capacity and opportunities to enhance their function.	Yes	Yes

Identifying broad opportunity zones

6.61 Drawing together all of the evidence presented in this section, Table 6.20 sets out the broad opportunity zones identified under this theme. This is supported by Figure 6.14. At this stage of the study, with ongoing work to develop evidence around open space and play provision, it is not possible to be more spatially specific. This map will be updated in later iterations.

Table 6.20: Broad opportunity zones for recreation and play

Opportunity map reference	Description	Code
5a - Pocket park / village green creation and enhancement (not spatially specific)	Adopt an overarching vision for green spaces within Greater Cambridge to tackle the deficiency in open space provision and community access to natural greenspace. The opportunity exists to enhance and create pocket parks and village greens within the settlement edge of Cambridge and South Cambridgeshire villages.	5i, 5ii, 5iii
5b - Alleviation of recreational pressure in the east and west (not spatially specific)	Key opportunity exists to create or enhance existing sites to alleviate recreational pressures on sensitive locations which exhibit heritage, landscape and biodiversity value or those at visitor capacity within the east and west of South Cambridgeshire. These sites include terrestrial and water based recreation sites which are often at visitor capacity.	5iii
5c - Local green space quality and quantity improvement (not spatially specific)	Improve the quality, quantity and accessibility of local open space and sports facilities. The opportunity exists to create new greenspaces at a range of scales by exploring various alternative funding mechanisms.	5i, 5ii, 5iii, 5iv
5d - Access improvements between natural green spaces in South Cambridgeshire (not spatially specific)	Introduce access improvements from local settlements to recreational sites, providing a renewed focus on sustainable modes of transport and a reduced reliance on car travel.	5v

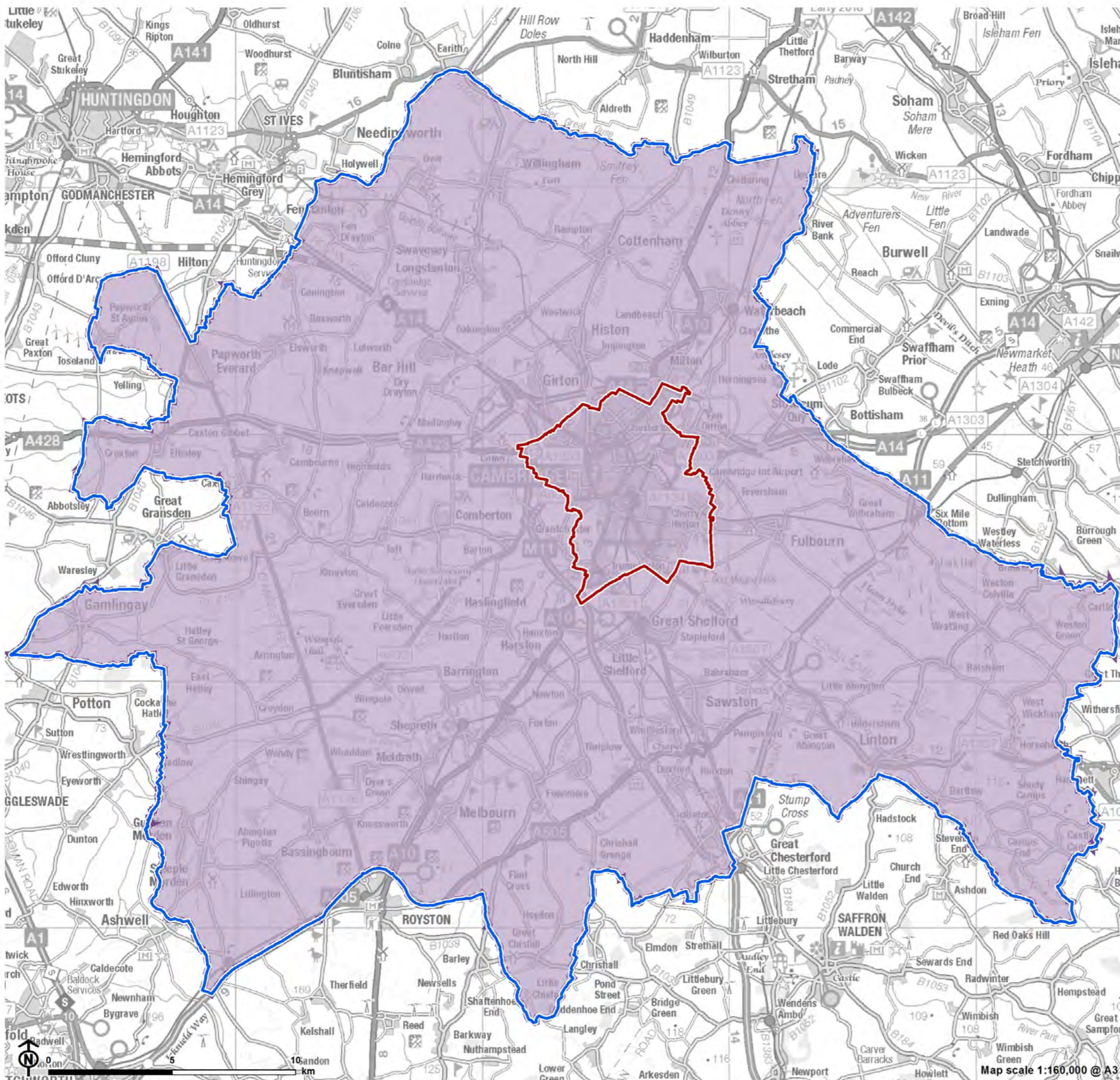


Figure 6.14: Recreation and Play Broad Opportunity Zones

-  Cambridge
-  South Cambridgeshire
-  Recreation and play broad opportunity zones
 - 5a: Pocket parks/village greens creation and enhancement
 - 5b: Alleviation of recreational pressure in the east and west
 - 5c: Local green space quality and quantity improvement
 - 5d: Access improvements between natural green spaces in South Cambridgeshire

Please note: At this stage of the study, with ongoing work to develop evidence around open space and play provision, it is not possible to be more spatially specific. This map will be updated in later iterations.



Theme 6: Carbon sequestration

Why is this theme relevant to GI?

6.62 The benefit of GI to sequester carbon serves as an important adjunct to the necessary process of reducing carbon emissions at source, in order to meet the UK's carbon target of net zero carbon by 2050.

6.63 Carbon may be stored in above-ground biomass, below-ground biomass, soil and dead organic matter, but across all habitat types, the majority of carbon is held in the soil. As one of the key areas in England which enjoy peatland habitats, the characteristic fenlands and associated farmland of East Anglia have a significant role in contributing to the national carbon balance. The decline in carbon storage capacity poses a particular challenge to net zero; 33.9% of CO₂ emissions from UK farming comes from the East Anglian peat soil with 12cm of peat soils lost in the fens every year. Soils mismanaged, exposed or dried ('fen-blow') release significant volumes of carbon.

6.64 Land management to ensure our carbon-storing soils remain intact, coupled with planting and management of trees is essential for the health of the environment and inherently linked to the delivery of functional habitats (Theme 2), hydrological management at the landscape-scale (Theme 3), and agricultural land use (Theme 7). GI offers the opportunity to support the conservation and restoration of a functional peatland network, whilst accommodating compatible sustainable management.

6.65 This section, supported by Figure 6.15, focuses on optimising the opportunities for carbon sequestration and storage within the GI network as part of ecosystem function. It is drafted in parallel with the emerging Greater Cambridge Zero Carbon Evidence Report.

Climate Change

Alongside measures to reduce carbon emissions at source, maintaining the ability of the natural environment to store the existing carbon load is paramount to bringing the carbon balance under control. Together with an increased capacity to sequester additional carbon, net zero targets become more attainable. The land has an inherent ability to store carbon in soils and trees, when in the right condition. GI offers opportunity to better maintain existing stores, and to sequester additional carbon through sensitive planning and management of land and water resources. In addition, GI offers opportunity to reduce carbon production, for example, through active travel and sensitive agricultural practices.

Wellbeing and Social Inclusion

The GI network reaches both urban and rural populations. GI assets that are widely recognised as beneficial to wellbeing, and that perform significant role in carbon sequestration and storage, include tree cover and associated biodiversity.

Environmental Factors

Mechanisms to optimise carbon storage and sequestration that can be delivered through GI also bring benefits to environmental quality, such as improved air quality, greater biodiversity and urban greening.

Existing and emerging evidence

6.66 The list below summarises the relevant resources, strategies and policy documents that have been reviewed to provide the evidence presented in this section. Full details of each document and their relevance can be found in Appendix 2:

- [The Cambridgeshire & Peterborough Independent Climate Change Commission \(emerging\)](#)
- [Cambridgeshire County Council and CUSPE Net Zero Cambridgeshire: What actions must Cambridgeshire take to reach net zero carbon emissions by 2050? \(2019\)](#)
- [Regional Report for East of England / Cambridge \(2020\)](#)
- [UK Peatland Strategy 2018-2040 \(2018\)](#)
- Natural England [England's Peatlands: Carbon storage and greenhouse gases \(2010\)](#)
- [Fens for the Future Strategy: A Proposal for an Enhanced Ecological Network \(2012\)](#)
- [Forestry Commission Forest Research Group Urban Tree Manual v15 \(Undated\)](#)
- [Forestry Commission Managing England's Woodlands in a Climate Emergency: A guide to help foresters & agents implement adaptation actions \(2019\)](#)
- [Poulton, P.R. et al., Accumulation of Carbon & Nitrogen by Old Arable Land Reverting to Woodland \(2013\)](#)
- [Forestry Commission Understanding the Carbon and Greenhouse Gas Balance of Forests in Britain \(2012\)](#)
- [Natural England Carbon Storage by Habitat: Review of the evidence of the impacts of management decision and condition of carbon stores and sources \(2012\)](#)
- [Water Works Wet Farming Project \(ongoing\)](#)
- [Proposed UNESCO Fens Biosphere \(emerging\)](#)
- [Environmental Stewardship \(ES\) and Countryside Stewardship \(CS\)](#)
- [Cambridge City Council Citywide Tree Strategy \(2016-2026\)](#)
- [Cambridge Tree Canopy Project \(emerging\)](#)
- [Greater Cambridge Zero Carbon Evidence Report \(emerging\)](#)

Key assets

Peatlands and wetlands

6.67 Peatlands are the most carbon-dense habitat type, a capacity which is protected by ensuring the habitats remain permanently wet. Peat soils data has been sourced from the British Geological Survey (BGS) 1:50k data which tallies with that used by Natural England in the [UK carbon storage vision](#). Peatland soils occur in the north of the study area (at the southern end of the Ouse Washes, east of St Ives) and north east of the study area (Waterbeach and Chittering).

6.68 'Peatland habitats' refer to the surface habitats we see established above peat soils. These may be considered distinct from peat soils which may occur at depth and are formed from partially decomposed plant material under anaerobic water saturated conditions. Peat soil

maps, for example, help to inform where peatland habitats occur, historically occurred and/or may be restored or created.

6.69 Peatland habitats are broadly subdivided into two main types - bogs and fens. Bogs are rain-fed (ombrotrophic) where almost all inputs of water are derived from precipitation whereas fens are also fed by groundwater or moving surface waters (minerotrophic). Both develop on permanently water-logged soils.

6.70 Peatland priority habitat within Greater Cambridge is principally lowland fen. Fen is a transitional habitat type that would, in the absence of management, develop into wet woodland (carr) or, if the growth of peat is sufficient to isolate the vegetation from the groundwater, into raised bog. Management of fen habitat is therefore essential to maintain its viability long-term. Fen habitat is marsh; the vegetation generally comprises typical wetland species such as reeds, rushes and sedges, including either tall robust species such as great fen-sedge and common reed, or a suite of small sedges such as common sedge and yellow sedges. Lowland fen occurs alongside the Cam in the heart of Cambridge (Coe Fen and Paradise Nature Reserve), south of the centre at Trumpington (Old Mill Plantation and Byrons's Pool Nature Reserve) and, to the north at the Cam Washes toward Wicken. A substantial area occurs in the north west of the study area at Fenstanton and, east of Cambridge, at Little Wilbraham Fen, with smaller parcels at Barnwell East LNR and Cherry Hinton Brook Lakes.

6.71 The area referred to as 'fenlands' extends north east along the Cam from Greater Cambridge. As described by Natural England NE257, "Almost all of the peatland in the East Anglian Fens remains under cultivation although most former deep peat has become thin and patchy through peat wastage¹⁴. Uncultivated deep peat areas are associated with nature reserves and washlands". Within Greater Cambridge, peatland is mapped as 'soils with peaty pockets' but may serve a role of buffering or connectivity to the more distant, valued peat habitats.

6.72 Along with lowland fen, reedbed as a priority habitat is considered to form part of the peatland habitat resource within the study area given its close association spatially, ecologically and overlapping land management practices as a wetland. Reedbeds are typically permanently waterlogged and may be freshwater, brackish or tidal. Reedbeds are also transitional habitat but dominated by stands of one plant, Common reed *Phragmites australis*. Reedbed habitat is not mapped in the MAGIC Map dataset within Cambridge (below the minimum mappable unit captured), although the habitat is known to occur in narrow linear belts and small patches alongside lowland fen and open watercourses.

6.73 Agricultural Stewardship options which may be considered part of the peatland dataset include Environmental Stewardship options HQ6 & HQ7 (fen management and creation), and HQ3 to HQ5 (reedbed). Countryside Stewardship option WT7 (reedbed) can also be considered part of the peatland dataset.

6.74 It is recognised that some areas mapped as agricultural may overlie remnant peat substrate, which is not captured in the 'peatland' dataset. This may result from historic drainage for arable cultivation and/or liming and fertilizer application to convert wet grassland and heath

¹⁴ 'Wasted peat' refers to the remnant peat substrate which resulted from historic drainage and cultivation. This both destroyed surface fen habitat and degraded the peat itself by removing natural waterlogging, causing the peat to 'waste' i.e. shrink, decompose and become eroded by exposure to weather and during harvesting. Wasted peat is typically dominated by the underlying mineral material, with little deep peat remaining.

into species-poor improved grassland for livestock farming. These areas are considered under the subheading 'Key opportunities' below.

6.75 National SSSI supporting peatland habitat types include Alder Carr SSSI (wet valley alderwood on fen peat), Cam Washes SSSI, Fowlmere Watercress Beds SSSI, Berry Fen SSSI, Wilbraham Fen SSSI, and to a lesser degree, Ouse Washes SSSI (all support lowland fen), Dernford Fen SSSI and Fulbourn Fen SSSI (both relic sites of fen and carr), Thirplow Peat Holes SSSI (relic fen), and Sawston Hall Meadows SSSI (spring-fed peat over chalk).

Trees, woodland, wood pasture and parkland

6.76 The City of Cambridge has set a target for tree cover of 19% by 2030; important for mitigating the effects of climate change including reducing the urban heat island effect. Woody habitat types are beneficial in storing carbon as the capacity to do so within the vegetation builds over time. Depending on management, there is also, arguably, lower risk of degradation of the soil storage capacity e.g. by erosion, addition of fertiliser or other means.

6.77 During the early phase of woodland establishment, carbon capacity may be adversely affected by the change in soil moisture and condition, but this can be minimised by appropriately siting planting, and by beneficial management. Sequestration rates typically increase with growth rates through 'initial phase' and 'full vigour', before slowing as the trees reach maturity. Old growth continues to show net sequestration with a build-up of litter and dead wood (of particular relevance where secondary woodland has colonised agricultural land, (Poulton et al, 2003). The soil processes slow down and continue sequestering carbon for longer periods, although greatly influenced by the management choices (Forestry Commission 2012, Natural England 2012). The benefit of nurturing a tree population of varied age-class (both within a site and within a local area) is therefore of importance from a carbon sequestration and well as biodiversity perspective.

6.78 Ancient woodland habitats occur in scattered distribution, typically west of Cambridge (from Coton toward Potton and toward Papworth Everard) and across the south east swathe of Greater Cambridge (generally south of the B1052). In line with the national trend, ancient woodlands typically occur in mosaic with other, predominantly broadleaved, woodlands, although fragmentation and lack of connectivity remains a key sensitivity at several sites, including Wimpole and Eversden Woods SAC SSSI.

6.79 Wood pasture and parkland is relatively widespread across Greater Cambridge, reflecting the distribution of historic estates. The city centre enjoys relatively high cover, particularly at Christ's Piece, along the Backs and at Newtown. Further greenspace and street tree planting may reflect this traditional layout and management, for example at the periphery of Parker Piece (where public events permit).

6.80 In 2013 analysis of tree data for Cambridge revealed that the majority of tree canopy within Cambridge city was in private ownership, approximately 16.3% within Council land and approximately 9.6% within highways land. Accordingly, one of the city's tree strategy objectives is to engage with, and galvanise action by, the local community. This goal is currently being developed as part of the Cambridge Canopy Project 2018-2022.

6.81 It is recognised that sustainably harvested wood offers opportunity to reduce carbon emissions, by replacing building materials with higher embodied carbon and by replacing fossil fuel.

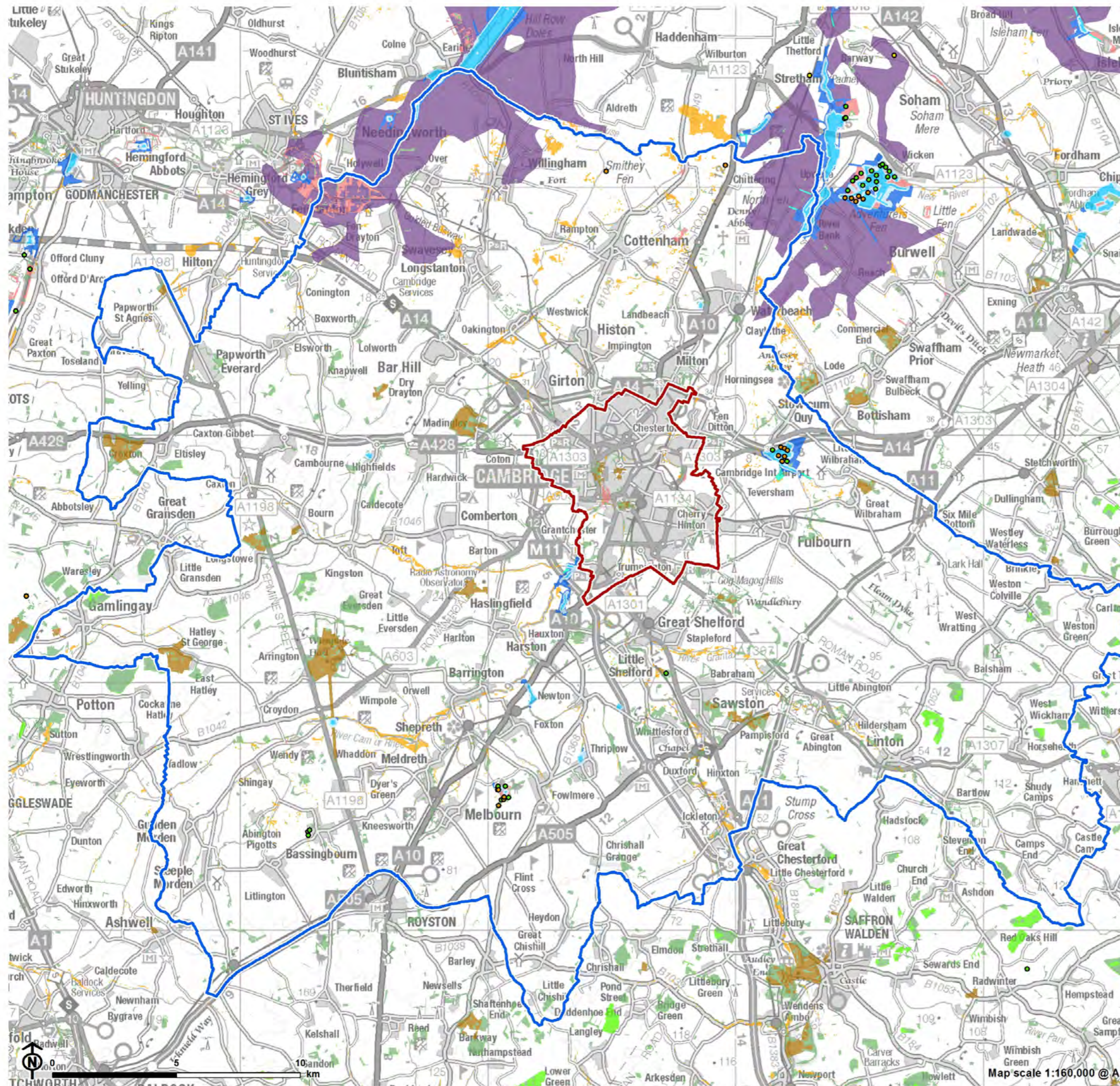
Grasslands

6.82 Grassland soils have the highest carbon stock of any UK broad habitat type (). Semi-natural and semi-improved grasslands are associated with soils less disturbed than that of improved grasslands. Within Greater Cambridge, these soil types include the priority habitats of lowland calcareous grassland, lowland meadows, good quality semi-improved grassland, and coastal and floodplain grazing marsh. Those with wet or ephemerally wet soils may be subject to relatively higher carbon losses during dry periods as a result of the oxidation of organic matter (Natural England, 2012). Mean estimates of carbon density in topsoil for Greater Cambridge are shown in Figure 6.16.

6.83 Different management options will produce different rates of carbon exchange (i.e. the exchange between the major reservoirs of air, vegetation and soil), for example, grazing by animals (particularly ruminants) in contrast to mowing, and indeed the end destination of any mown arisings. The Natural England data illustrates that for all grassland types assessed, those which are restored provide higher carbon exchange (both annually and by area) than those that are degraded. The need to minimise carbon production would need to be balanced with the need to manage for a low nutrient, high diversity sward or for a specific resident invertebrate population.

6.84 It has been shown that inclusion of red clover within red clover UK grassland restoration sites has incurred an increase in soil carbon sequestration ([De Deyn, 2010](#)). The role of other leguminous plants in grasslands may have similar impact.

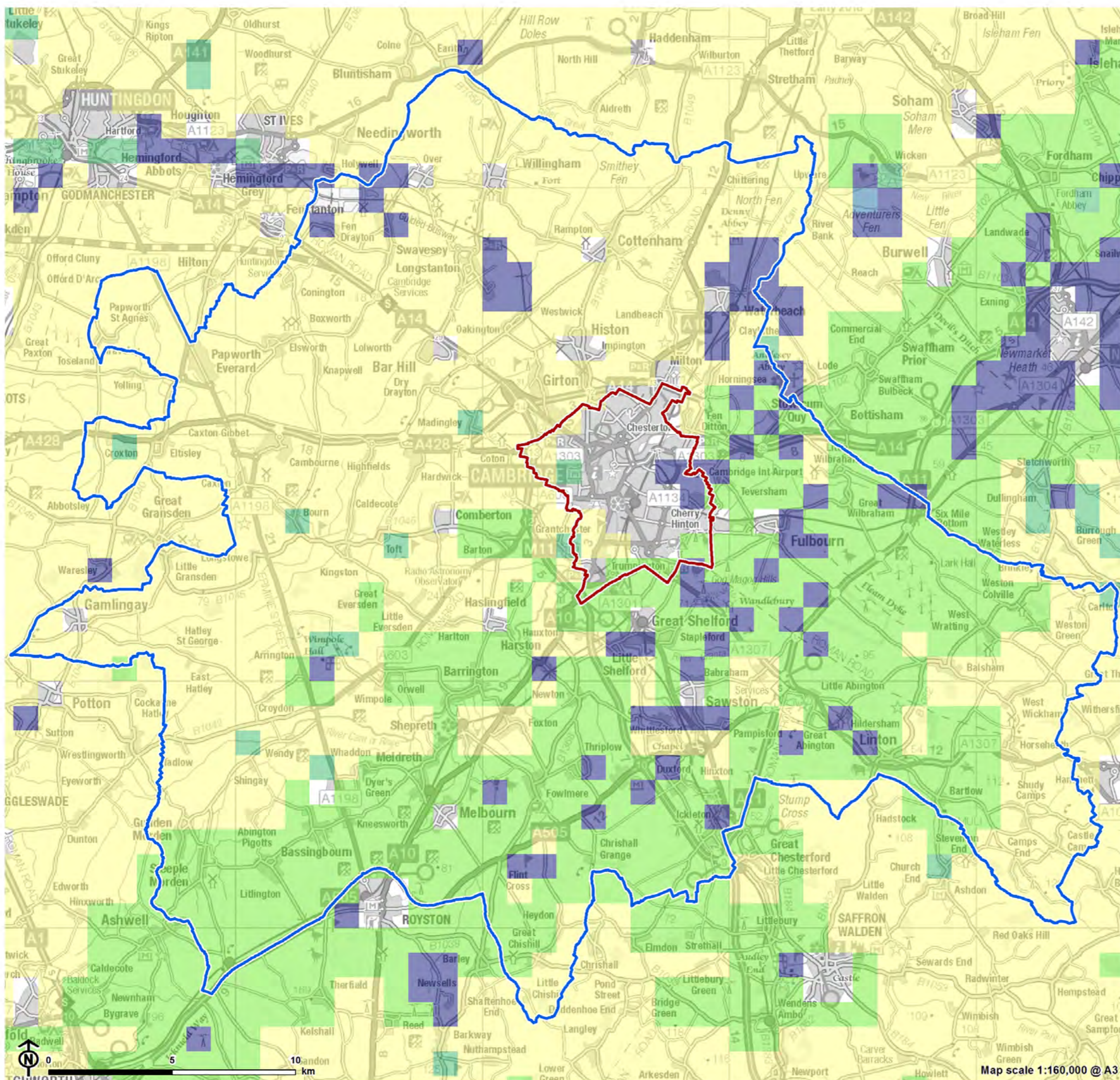
Figure 6.15: Carbon Storage and Sequestration



- Cambridge
- South Cambridgeshire
- Selected Countryside Stewardship options**
 - WT7 (reedbed)
- Selected Environmental Stewardship option**
 - HQ3, HQ4, HQ5 (reedbed)
 - HQ6, HQ7 (fen)
- Peat soils
- Floodplain reconnection potential*
- Ancient woodland
- Selected priority habitats**
 - Deciduous woodland
 - Lowland fens
 - Reedbeds
 - Wood pasture and parkland
- Wetland network and opportunities****
 - Existing wetland
 - Wetland network
 - Stepping stone
 - Wetland opportunity buffer

*From the Environment Agency's working with natural processes data
 **From the Natural Capital Solution's natural capital mapping

Figure 6.16: Carbon Density in Topsoil



Cambridge
 South Cambridgeshire

Mean estimates of carbon density in topsoil (0-15cm depth) (t/ha)

	45.7 - 49.7
	49.8 - 64.6
	64.7 - 70.5
	70.6 - 72.4
	72.5 - 74.9

Key issues

6.85 Table 6.21 sets out key issues organised by 'forces for change'; noting the sources that have led to their identification. Where an issue was identified through more than one source, the issue has not been duplicated, but the range of sources have been noted in the 'Source' column. Appendices 2 and 3 provide an overview of stakeholder feedback that has informed this assessment.

Table 6.21: Key issues for carbon sequestration

Force for change	Issue	Source
Soil degradation	<p>Soil degradation – soil erosion, soil drying ('fen-blow'), loss of soil biota and structural collapse – may result from intense or inappropriate agricultural land management.</p> <p>“Areas of lowland peat soils such as the East Anglian Fens produce some of our most valuable agricultural crops, but in order to use them for conventional agriculture it is necessary to drain, plough and fertilise them, leading to high rates of CO₂ emission. As a result, despite only occupying around 15% of the UK's total peat area, agricultural peat soils are estimated to emit over half of total peatland greenhouse gas emissions” (Centre for Ecology and Hydrology).</p>	<p>Report for Defra by Evans et al, (2017) Implementation of an Emissions Inventory for UK Peatlands</p> <p>Fens for the Future Strategy: A Proposal for an Enhanced Ecological Network</p>
Monitoring and understanding	<p>Great Fen, Wicken Vision, Willow Tree Fen, Ouse Fen are transforming arable land to a more traditional fenland landscape, but the challenge is that the actual area of these projects is having very limited impact, if any on reducing CO₂ emissions in the whole fenland area.</p> <p>Note that whilst Greater Cambridge holds a relatively small proportion of the East Anglian peatlands, The Committee on Climate Change will include peatland emissions in carbon calculations from 2020 and these will also be included in the UK national inventory. This will significantly affect places with lowland peat such as the Fens: this is likely to increase Cambridgeshire's reported GHG emissions by 60% to 90%, highlighting the need for concerted and swift action.</p>	<p>Fens for the Future Partnership</p> <p>Weber et al. (2019) (CUSPE). Net Zero Cambridgeshire: What actions must Cambridgeshire County Council take to reach net zero carbon emissions by 2050?</p>
Monitoring and understanding: Wider	<p>Selection of land management options will impact on the sequestration or loss of carbon, by both vegetation and soils. Globally, soils contain about</p>	<p>Natural England (2012) Carbon Storage by Habitat NERR043</p>

Force for change	Issue	Source
habitat opportunities	<p>three times the amount of carbon in vegetation and twice that in the atmosphere.</p> <p>Review of management options across a range of habitat types includes those relevant to Greater Cambridge – of peatland and wetlands, woodlands, heaths and select grasslands, agriculture and horticulture.</p>	
Food production	<p>Peatland soils contribute to the productive agricultural land of the fens. The fens produce more than 7% of England’s total agricultural production, worth £1.23 billion. Less than 50 years of peat are estimated to remain, posing knock-on implication on future productivity.</p>	<p>Fens Biosphere Bid</p> <p>Fens for the Future Partnership</p>
Peat loss to agriculture	<p>Whilst the East Anglian Fens are highly valuable for agriculture, the continuing loss of peat means that much of the land is now below sea-level, increasing flood risk and threatening the long-term viability of agriculture. Reducing CO₂ emissions from these areas by raising water levels could therefore also benefit landowners by extending the productive lifetime of the soil, one of their key assets.</p>	<p>Fens Biosphere Bid</p> <p>Fens for the Future Partnership</p>
Agricultural land management	<p>In drained or sub-irrigated fields, carbon emission and peat mineralisation will vary seasonally.</p> <p>To maintain the mid-field water table in dry years, recommendations made for ditch spacing and ditch water regimes can usefully inform decisions around intensification of agricultural land use.</p> <p>The need to engage landowners, particularly across the agriculture sector, is recognised to be critical to successfully design, coordinate and implement sustainable management of soils and associated carbon capacity.</p>	<p>Cranfield University research - Estimate of Peat Reserves and Loss in the East Anglian Fens (2009 & 2011)</p> <p>Stakeholder consultation</p>
Water quantity	<p>Greater Cambridge faces the challenge of being in the driest part of the country with limited water resources, whilst also needing to secure a sustainable future for the fens and peat soils.</p> <p>Wilbraham Fen SSSI is in unfavourable declining condition owing to the water management. In contrast, Thriplow Peat Holes SSSI is unfavourable recovering following water level control.</p>	<p>Cambridgeshire and Peterborough Doubling Nature Vision</p> <p>Natural England SSSI condition monitoring reports</p>

Force for change	Issue	Source
Climate change	<p>Climate change brings warmer and more fluctuating temperatures, increasingly sporadic and intense rainfall, and in association, challenges the stress tolerance of flora. Land which is intensively, artificially managed may be at increased risk of erosion and degradation.</p> <p>The need for and extent of pump-drained fenland will need to be revised to take account of climate change and sea level rise. Existing pump rates maintain low water levels across the fens. Fluvial discharge from the fens to the Wash is approximately 60% by gravity. Initial model outputs allowing for sea level rise indicate this will reduce to approximately 40% by 2060 and 30% by 2080. Additional pump capacity and/or alternative land use to accommodate higher water levels will therefore be required.</p> <p>The risk of gradual saline incursion inland along the tidal river as a result of sea level rise, and in turn the risk to groundwater, is indicated by initial modelling to be beyond 2040.</p> <p>In respect of the tree population, climate change will bring associated changes in canopy, shrub layer and ground flora composition, increase in mortality of older trees, etc.</p> <p>Calculation of carbon and of requisite future tree planting should make allowance for predicted loss to ash die-back.</p>	<p>Climate Change Act 2008 (2050 Target Amendment) Order 2019</p> <p>Forestry Commission Managing England's Woodlands in a Climate Emergency</p> <p>Stakeholder consultation, including discussion with the EA to share the initial findings of Cambridgeshire Fens hydrological interaction modelling currently in progress.</p>
Lack of tree cover	<p>Lack of tree cover is recognised as a weakness within the ecological network of Greater Cambridge, both in the rural agricultural areas typified by large open fields lacking boundary features, and in more urban areas which predate the current requirements for ecological enhancement above no net loss.</p> <p>Urban densification is recognised to be a constraint to urban habitats and tree cover. The poor quality and high compaction of soils in urban areas may also restrict habitat condition and carbon sequestration.</p>	<p>Cambridgeshire and Peterborough Doubling Nature Vision</p> <p>Mapping Natural Capital and Opportunities for Habitat Creation in Cambridgeshire</p>

Force for change	Issue	Source
Lack of sensitive land management	<p>Lowland fen is a transitional habitat and requires management to maintain species assemblage and prevent natural colonisation to scrub or woodland. Balsham Wood SSSI (unfavourable recovering) is under management for sycamore encroachment of peatland and other higher value habitats.</p> <p>The need to engage landowners, particularly the agricultural community (regarding peatlands) and equestrian community (regarding chalk downland).</p>	<p>Cambridgeshire and Peterborough Doubling Nature Vision</p> <p>Natural England SSSI condition monitoring reports</p> <p>Stakeholder consultation</p>
Fragmentation	Fragmentation of peatland habitats by direct habitat loss or lack of hydrological connectivity, increases vulnerability of the remnant small and isolated patches to extreme climatic events.	Stakeholder consultation

Key opportunities

6.86 Research suggests that carbon sequestration and storage vary considerably within given habitat types, reflecting soil type and conditions, climate, latitude and altitude. Habitat age and condition also have a significant bearing on the rate of sequestration and storage. GI can increase the amount of carbon stored in the landscape, enhancing the capacity for existing and new carbon sinks in areas where natural geography and land use allows.

6.87 The designation of important carbon sequestration assets across Greater Cambridge is vital to ensure these areas are preserved to maximise their carbon sequestration function now and into the future. Recommendation for the GI network to be ambitious in scale, maintained in perpetuity and supported by integrated planning, in order to robustly address climate change was reiterated throughout the stakeholder consultation process.

6.88 Opportunities have been categorised as one or both of the following:

- A: Overarching principles/considerations for the emerging Local Plan; and/or
- B: Partnership opportunities.

6.89 At this stage of the study, project or site-specific opportunities have not been identified in these tables. The next stage of this study will provide more detail on potential projects using the information captured in Appendix 3 (consultation outputs).

6.90 Table 6.21 sets out the opportunities for peatlands and associated wetlands have been identified.

Table 6.22: Key issues for carbon sequestration

Code	Opportunity summary	Opportunity description	A	B
6i	Protect and manage peatlands to	Maintain existing carbon storage capacity in agricultural land. This relies on sensitive land management to maintain soil wetting and minimise soil disturbance. This	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
	maintain existing carbon storage	can be supported by GI through provision of buffers and potentially, a strategic approach to managing hydrological regimes which allow peatland habitats to remain wet. This strategic approach may also offer opportunity for remnant peat soils beneath land intensively managed agriculture to remain available for future rehabilitation as part of the rethinking of future land uses compatible with higher water levels in the fens as a result of sea level rise. Wetland habitat creation, as exemplified at the Great Fen, offers a significant opportunity for biodiversity and potentially the delivery of BNG in low-lying areas.		
6ii	Identify and protect a sustainable land use buffer around the candidate UNESCO biosphere	Identify and protect a sustainable land use buffer around the candidate UNESCO biosphere to minimise the risk of adverse effects of intensive farming on the peatland habitats and carbon storage capacity (a current point of research under the Fens Peat Project). Until this buffer is identified, best practice guidance and consultation with the project should be used to determine an appropriate radius.	Yes	Yes
6iii	Ensure land uses in peatland areas are agreed with Fens Peat Project	Ensure cross-compatible land uses in areas of peat or otherwise sensitive soil are agreed with the Fens Peat Project as the multifunctional uses of GI may be constrained at these locations. Examples of multiple use include solar farms, where wetting of the soil can be carried out below the infrastructure.	Yes	Yes
6iv	Create reedbed and floodplain grazing marsh.	Create reedbed and floodplain grazing marsh. This is far easier to achieve than fenland or bog habitats (Natural England, 2016) owing to factors such as the hydrological regime, trophic status and management needs. Widespread creation of wetlands with high carbon capacity, that are fitting with the local land use and character could include linear reedbeds along field margins, potentially as an extension of the measures already supported through stewardship schemes. An accurate approach to mapping and monitoring these, often narrow, linear features (potentially through the biodiversity metric), which may not otherwise be captured centrally in Priority Habitat mapping for example, could support this.	Yes	Yes
6v	Consult research partnerships on emerging	Consult with collaborative research partnerships between conservation and agricultural bodies to ensure emerging best practice for managing soils and peatlands can be accommodated, such as the fenland Water		Yes

Code	Opportunity summary	Opportunity description	A	B
	best practice for managing soils and peatlands	Works project. <u>Natural England's Carbon Storage by Habitat report</u> sets out recommendations for land managers which apply across a range of habitat types, at a range of scales and can be considered when planning the delivery of target GI habitat types. Recommendations include, for example, steadier changes to habitats and soils to minimise disturbance, damage and accidental loss of carbon capacity.		
6vi	Share successful projects and partnership examples	Share successful projects and partnership examples, of lessons learnt around challenging issues such as natural regeneration (may be referred to as 'rewilding'). This should optimise knowledge across the region as well as locally (as exist in the Cambridge Fens Priority Area, for example). Existing collaborations between research institutions, County Council Farms and the wider farm community could be encouraged. Explore marrying financially viable sustainable land uses – such as renewable energy with wetland habitat creation. This conversation may also inform the debate around the imbalance between stewardship payments in contrast to the comparatively high value of intense agricultural production across the fens.		Yes
6vii	Conserve regionally important East Anglian chalk groundwater resource	Conserve the regionally important East Anglian chalk groundwater resource (Theme 3), by working in partnership to ensure that an integrated catchment-scale approach is secured for its enhanced long-term management (ensuring hydrological connectivity is addressed holistically).	Yes	Yes
6viii	Encourage 'right tree' in 'right place' planting approach	Ensure future planting within the urban and peri-urban realm is informed the Cambridge Canopy Project. The principal of ' <u>right tree, right place</u> ' could underpin policy and decision making for future planting to ensure the longevity of trees and optimisation of the carbon stock. Species selection should take into account not only the locally characteristic assemblages but include species recognised to offer greater resilience to climate change and drought tolerance to create a locally appropriate mix dependent on soil type and local site objectives ¹⁵ . Species diversity is key to maintain the carbon stock whilst climate change poses threat of new pests and	Yes	Yes

¹⁵ Forestry Commission (2019) Managing England's Woodlands in a Climate Emergency: A guide to help foresters & agents implement adaptation actions

Code	Opportunity summary	Opportunity description	A	B
		<p>diseases. Cambridge City Council <u>reports</u> a steady increase in planting since 2015, totaling 89 varieties of 75 species. Forward planning of the target tree mixes desired with local nursery growers could help to streamline supply of trees to be planted, given the large areas of tree planting recommended nationally (<u>Committee on Climate Change, 2020</u>).</p> <p>'Right tree, right place', also protects habitat types that would be diminished by tree planting. These include peatlands, wetlands, and grasslands and heaths supporting ground flora of value or which may dry as a result of tree planting. GI should however maintain flexibility for localised planting, identified at the site level, which may be complimentary to the wider habitat mosaic. Examples include further potential at Coldhams Common which is considerate to the chalk grassland, planting of tall growing specimens within select urban park spaces and planting of fruit trees along droves and field boundaries, particularly in their historic heartland north of Cambridge city.</p> <p>The retention of key landscape views should be considered when developing landscape-scale proposals for tree planting.</p>		
6ix	Plant trees in urban areas to assist with urban cooling	Tree planting within and around urban areas can optimise urban cooling. Preliminary findings of the Tree Canopy Project (publication anticipated late 2020), for example, indicates that planting with consideration of the prevailing wind direction (in Cambridge from the south west) can increase urban cooling effects.	Yes	Yes
6x	Ensure adequate soil for tree planting in urban areas	It is recognised that urban soils in particular can be poor and compacted. Tree planting in urban areas must be provided with appropriate soil volumes to ensure longevity of planted specimens.	Yes	Yes
6xi	Plant trees in rural areas at appropriate sites	<p>Planning of woodland creation is important to ensure proposed planting does not impact upon other priority habitats such as deep peat or features of archaeological interest. Priority should be given to new woodland that extends and or links ancient woodlands such as those in Huntingdon, West Cambridgeshire Hundreds, south of the Great Fen and Grafham Water.</p> <p>Sites may be prioritised to reflect financial incentives for sustainable land use. The Forestry Commission recognises that woodland creation on the County Farms</p>	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
		estate offers opportunity for capture of atmospheric carbon (option to trade as carbon credits), and/or for income from wood fuel.		
6xii	Encourage good woodland management	Encourage good woodland management. <u>Forestry Commission research</u> provides information on the carbon stored by different tree species including birch, oak and scots pine within soils and forest litter. The research also underlines the importance of good woodland management, indicating that sequestration rates are higher for thinned than for unthinned woodlands, reflecting the more vigorous growth that results.	Yes	Yes
6xiii	Optimise reconnection of fragmented woodlands through tree planting	Tree planting offers the opportunity to optimise reconnection of fragmented woodlands. A further benefit to biodiversity may be gained by planting woody shrubs to increase diversity of the woodland structure and, potentially, to minimise trampling associated with informal recreation paths. It is recognised that retention of deadwood – a valuable invertebrate habitat type – will emit carbon during the decomposition process. Balanced decision making by land managers should be based on clear targets and comprehensive information.	Yes	Yes
6xiv	Use tree planting where appropriate to deliver local replacement or off-set BNG	Green infrastructure within urban, peri-urban and rural areas could help to deliver replacement or off-set (BNG) planting that may be required through the planning system, as well as additional planting as enhancement. Preliminary findings of the Tree Canopy Project (pers. comm.) identify 49.7% of the city area as having 'potential for planting' (i.e. outside of built development and existing canopy cover). Replacement planting policies reflect the time lag between the loss of a tree and the establishment of any replacement to maturity; it takes time for the carbon storage capacity and biodiversity value of a lost mature tree to be realised. Examples of replacement planting ratios required by other Local Planning Authorities include 4:1 replacement in Manchester City Council and 3:1 in Leeds. Opportunities for tree planting as BNG sit alongside the government's recently launched Woodland Carbon Guarantee. The Guarantee allows participating landowners to sell Woodland Carbon Units to the government for tree planting with the purpose of carbon sequestration over a period of 35 years.	Yes	Yes
6xv	Use strategic tree planting	Strategic tree planting could provide an opportunity to offset impacts from infrastructure schemes (e.g.	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
	to offset impacts from infrastructure schemes	highways) that are planned within or adjacent to the study area or from development within growth areas.		
6xvi	Set ambitious tree canopy cover targets for all new housing development.	Tree canopy cover targets for all new housing development should be ambitious; the Woodland Trust suggest a target of at least 30% canopy cover is ambitious yet deliverable.	Yes	Yes
6xvii	Recognise wider benefits of tree planting for water quality and reducing flood risk	The benefits derived from new tree and woodland planting need not be at the expense of taking up large areas of agricultural land. Narrow woodland shelter belts beside rivers are effective as they filter agricultural run-off and spray drift thus improving water quality, and the shade provided by the canopy keeps rivers cool, essential for fish populations during the increased summer temperatures associated with climate change. In addition, working in partnership with the Environment Agency, new woodlands can hold back storm water surges when targeted in the right position within a drainage network.	Yes	Yes
6xviii	Prioritise the use of home-grown timber in new development	Prioritise the use of home-grown timber in new developments over imported timber; vital for sustainable development as it effectively stores atmospheric carbon over long periods of time.	Yes	Yes
6xix	Covert arable land to permanent grassland or other semi-natural habitat where appropriate	Where appropriate, convert arable land to permanent grassland or other semi-natural habitat, which has less soil erosion ¹⁶ and supports increased, retained soil moisture throughout the year. Appropriate timescales for successful reversion must be planned - examples at Wandlebury and the Magog Downs require variously 20-40 years (in contrast to the 30 years legacy required for BNG, for example).		Yes
6xx	Recognise the requirement for carbon neutrality alongside	It is recognised that grassland or heath restoration (e.g. as part of Theme 2) may require removal of trees, which arguably reduces carbon capacity. As with the retention of dead and decaying wood habitat, decision making should be based on clear targets and comprehensive information.	Yes	Yes

¹⁶ Natural England (2012) NERR043 Carbon Storage by Habitat: Review of the evidence of the impacts of management decisions and condition of carbon stores and sources

Code	Opportunity summary	Opportunity description	A	B
	other habitat priorities			
6xxi	Provide grasslands as part of the habitat mosaic recognised to be of value for carbon storage	Grasslands form a key component within the woodpasture and parklands of Greater Cambridge, as well as within the mosaic of watercourse corridors. Opportunities to increase connectivity between these habitats around, and leading through, the city include the woodland and grassland priority habitats flanking the River Cam, Fleam Dyke (east of Fulbourn) and Brent Ditch (Pampisford). Toward the northern Ouse wetlands, enhancement of areas of improved grassland, potentially coupled with reedbed, could also benefit sequestration of carbon in vegetation and soils, whilst capitalising on the 'bigger and better' landscape-scale projects already underway.	Yes	Yes
6xxii	Maximise carbon absorbing potential of green roofs	Green roofs can again store carbon in vegetation and soils. Research suggests that sequestration can be maximised by designing a deeper substrate (dependent on structural feasibility) and selecting plant species, such as some grasses, that are particularly efficient at absorbing carbon. Taking account of carbon involved in their component manufacture and installation, a well-designed and managed green roof can achieve carbon neutrality within 6 to 16 years, suggesting they can make a significant positive contribution to sequestration over their lifetime ¹⁶ . Green roofs can also contribute to the reduction of carbon emissions by improving the heat efficiency of a building and reducing cooling loads.	Yes	Yes

Identifying broad opportunity zones

6.91 Drawing together all of the evidence presented in this section, Table 6.23 sets out the broad opportunity zones identified under this theme. This is supported by Figure 6.17.

Table 6.23: Broad opportunity zones for carbon sequestration

Opportunity map reference	Description	Code
6a - Carbon-rich habitats: Madingly-Caldercote-Knapwell	Opportunity area centred around the foci of peak estimated carbon density in existing habitats and reflects the opportunity to expand and connect these features.	6xi, 6xii, 6xiii, 6xiv, 6xvi, 6xvii, 6xix, 6xxi
6b - Carbon-rich soils: City-Barrington-Wimpole	Opportunity area centred around the foci of peak estimated carbon density in soils and reflects the opportunity to manage these to maximise retention and overlay with sequestration interventions such	6xi, 6xii, 6xiii, 6xiv, 6xvi, 6xvii, 6xix, 6xxi

Opportunity map reference	Description	Code
	as planting or sowing 'high carbon capacity' habitats.	
6c - Carbon-rich habitats: West to south east swathe	Opportunity area centred around the foci of peak estimated carbon density in existing habitats and reflects the opportunity to expand and connect these features Note this area captures a range of soil types and underlying geologies and accordingly, may support a range of target surface habitat types, cross-compatible with other themes (most notably Theme 2).	6vii, 6xi, 6xii, 6xiii, 6xiv, 6xvi, 6xvii, 6xviii, 6xix, 6xxi
6d - Carbon-rich soils: Principal north east to south west swathe	Opportunity area centred around the foci of peak estimated carbon density in soils and reflects the opportunity to manage these to maximise retention and overlay with sequestration interventions such as planting or sowing 'high carbon capacity' habitats.	6viii, 6ix, 6x, 6xi, 6xii, 6xiii, 6xiv, 6xv, 6xvi. 6xvii, 6xviii, 6xix, 6xxi, 6xxii
6e - Carbon sequestration around wetlands: Southern Cam Corridors	Opportunity area capturing the WWNP foci for riparian woodland, for wider catchment woodland and for floodplain connectivity i.e. offering potential benefit both in terms of tree planting and long-term management to optimise carbon sequestration and storage.	6iv, 6vi, 6ix, 6xii, 6xiii, 6xvii, 6xix, 6xxi
6f - Carbon sequestration around wetlands: Northern Cam Corridors, Fenland and Peatland	Opportunity area capturing the WWNP foci for floodplain connectivity, for riparian woodland and for wider catchment woodland i.e. offering potential benefit both in terms of tree planting and long-term management to optimise carbon sequestration and storage. Area 6f also captures the north east area of peat soils within the study area and a significant proportion of the proposed Biosphere.	6i, 6ii, 6iii, 6iv, 6v, 6vi, 6viii, 6xi, 6xii, 6xvii, 6xix, 6xxi
6g - Carbon-rich soils: north from Longstanton	Captures the north western distribution of peatland soils and wider foci of 'peak estimated carbon density in soils'. This area reflects the opportunity to manage these to maximise retention and overlay with sequestration interventions such as planting or sowing 'high carbon capacity' habitats.	6i, 6ii, 6iii, 6iv, 6v, 6vi, 6viii, 6xi, 6xii, 6xvii, 6xix, 6xxi

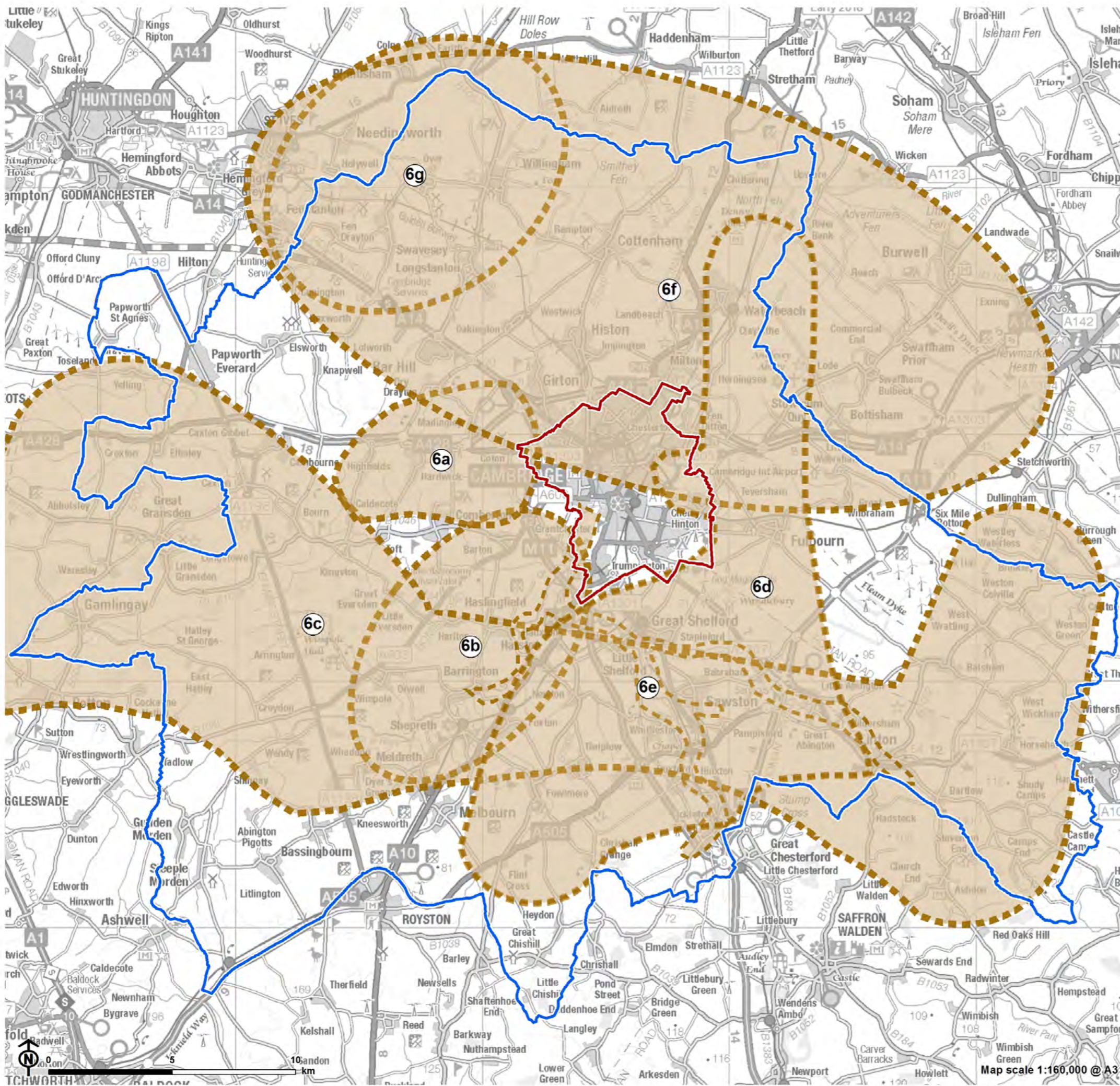


Figure 6.17: Carbon Sequestration Broad Opportunity Zones

- Cambridge
- South Cambridgeshire
- Carbon sequestration broad opportunity areas
 - 6a: Carbon-rich habitats: Madingly-Caldecote-Knapwell
 - 6b: Carbon-rich soils: City-Barrington-Wimpole
 - 6c: Carbon-rich habitats: West to south east swathe
 - 6d: Carbon-rich soils: Principal north east to south west swathe
 - 6e: Carbon sequestration around wetlands: Southern Cam Corridors
 - 6f: Carbon sequestration around wetlands: Northern Cam Corridors, Fenland and Peatland
 - 6g: Carbon-rich soils: north from Longstanton

Theme 7: Agriculture and community food growing

Why is this theme relevant to GI?

6.92 Agriculture and community food growing are essential elements for feeding the population, regardless of the scale of operation. Agriculture plays an important role in supporting the rural economy and is the predominant land use across Greater Cambridge, making it an essential component of the wider GI network. A healthy and diverse natural environment is essential for food security, sustainable livelihoods, adapting and mitigating increased resistance to natural disasters and ability to recover from them, adequate nutritional requirements and to obtaining long-term benefits from agricultural practices.

6.93 By integrating these assets into the GI network, it will ensure the network delivers across the wider landscape context supporting the connectivity between urban and rural areas. It will increase the connectivity between assets, the health and wellbeing benefits and promote sense of place through enabling residents to connect and learn about the unique landscape character and agricultural history.

6.94 Integrating GI with agriculture has benefits for biodiversity by providing suitable habitats and corridors which connect these habitats. Furthermore, it can enhance the profitability of farming activities and provide extra sources of income for rural communities. Both are important given that the impacts of climate change are expected to affect biodiversity, species movements and agricultural productivity.

Climate Change

Growing and consuming locally grown produce offers the opportunity to reduce food miles and associated carbon emissions, whilst also tackling food security issues. The ability to sequester carbon is substantial (regardless of the scale of operation) and namely achieved through careful management of soils, strategic tree and hedgerow planting, effective woodland management and agri-forestry. However, climate change impacts are expected to affect productivity therefore impacts need to be considered, mitigated against and adapted to where possible.

Wellbeing and Social Inclusion

The benefits of agriculture and community food production to health and wellbeing are substantive, offering opportunities for healthy physical recreation, engagement with nature, healthy and affordable food, therapeutic value, tackling loneliness and mental health issues by offering a place for inclusive natural sociability to tackle prevalent issues around social isolation / inclusion. In a predominantly rural area such as Greater Cambridge, the opportunity exists to promote a sense of place by enabling residents to learn about the unique landscape character and agricultural history, supporting connections between urban and rural residents in doing so. This latter point is essential given that rural areas can be marginalised and experience higher rates of poverty and isolation.

Environmental Factors

Agriculture, community orchards and allotments are not only a sustainable use of land, but they can contribute to localised reductions in air pollution, flood risk control and as a means of filtering harmful water pollutants. Also, growing and consuming locally grown produce effectively reduces the need for excessive food packaging including single-use plastics.

Existing and emerging evidence

6.95 The list below summarises the relevant resources, strategy and policy documents that have been reviewed to provide the evidence presented in this section. Full details of each document and their relevance can be found in Appendix 2:

- [Greater Cambridge Sustainability Appraisal Scoping Report \(2019\)](#)
- [Cambridge City Council Open Space and Recreation Strategy \(2011\)](#)
- [South Cambridgeshire Recreation and Open Space Study \(2013\)](#)
- [Cambridgeshire Green Infrastructure Strategy \(2011\)](#)
- [West Cambridgeshire Hundreds](#)

Key assets

Agriculture

6.96 The majority of South Cambridgeshire contains high-grade and versatile agricultural land, some of the best within the UK. While historically the area was grazed by sheep, today large-scale cereal production, mainly wheat, dominates the agricultural landscape.

6.97 The underlying soils give rise to a mix of classified agricultural land, the majority being of Grades 1, 2 and 3 as shown in Figure 6.18. Cambridgeshire's Farms Estate is the largest in England and Wales, comprising 13,200ha of agricultural land. The estate has around 200 tenants, generating near to £5 million in rent each year for the Council. The estate provides opportunities for new rural based enterprises to set up, encourages public access to the countryside on the holdings, and aims to improve the landscape and enhance biodiversity and heritage value e.g. by planting new woodland and new / refurbished hedges.

6.98 Some agricultural land is managed under an agri-environment scheme (Environment Stewardship or Countryside Stewardship), with environmentally sensitive practises taken up as part of these scheme, for example field margins, winter bird seed mixes and hedgerow planting.

6.99 A variety of habitats exist for plant and animal species within the fields and hedgerows, hills and valleys, woodlands and fen.

6.100 When agricultural areas are overlaid with the biodiversity network mapping, it is possible to explore the wider GI potential of agricultural land in Greater Cambridge. This is illustrated on Figure 6.19.

Community Food Growing

6.101 Greater Cambridge has established local and community food growing enterprises and has been recognised nationally for these.

6.102 In South Cambridgeshire, there are several thriving community orchards (e.g. Histon & Impington, Sawston) growing a variety of fruits and maintaining a link with the district's history as an important fruit-growing area.

6.103 Allotments are a popular and well used resource in Greater Cambridge with a waiting list in place at many sites. South Cambridgeshire has a higher standard of provision of 0.4ha per 1000 population than the national standard of 0.2ha per 1000 population which reflects local demand and the need to promote healthy lifestyles. Although South Cambridgeshire as a whole

has allotment provision above the higher standard, the provision is not evenly spread with 50 villages having no access to allotments.

6.104 There are a range of partnership approaches as well as community projects in allotments and orchards within Greater Cambridge. Transition Cambridge is part of the Transitions Towns movement. They run several practical growing projects which welcome volunteers within Greater Cambridge, including:

- Growing Spaces - aims to reclaim unloved and underused public spaces around the city and transform them using edible landscaping.
- Grow Your Own sessions – in Empty Common Community Garden south of the city centre there are community allotments which often host open sessions where volunteers can help with gardening.
- The Cambridge Cyrenians Allotment Project - works with local homeless people and runs on a therapeutic horticulture model across six full-sized allotment plots in the city providing specific horticulture training, supported work experience and a safe social environment.
- Darwin Nurseries - a horticulture project and farm shop offering adults with disabilities supported work experience in horticulture, retail and animal care.
- Community Orchards and allotments – e.g. Trumpington and Midsummer Common which are run by Friends Of groups and always looking for volunteers to help.

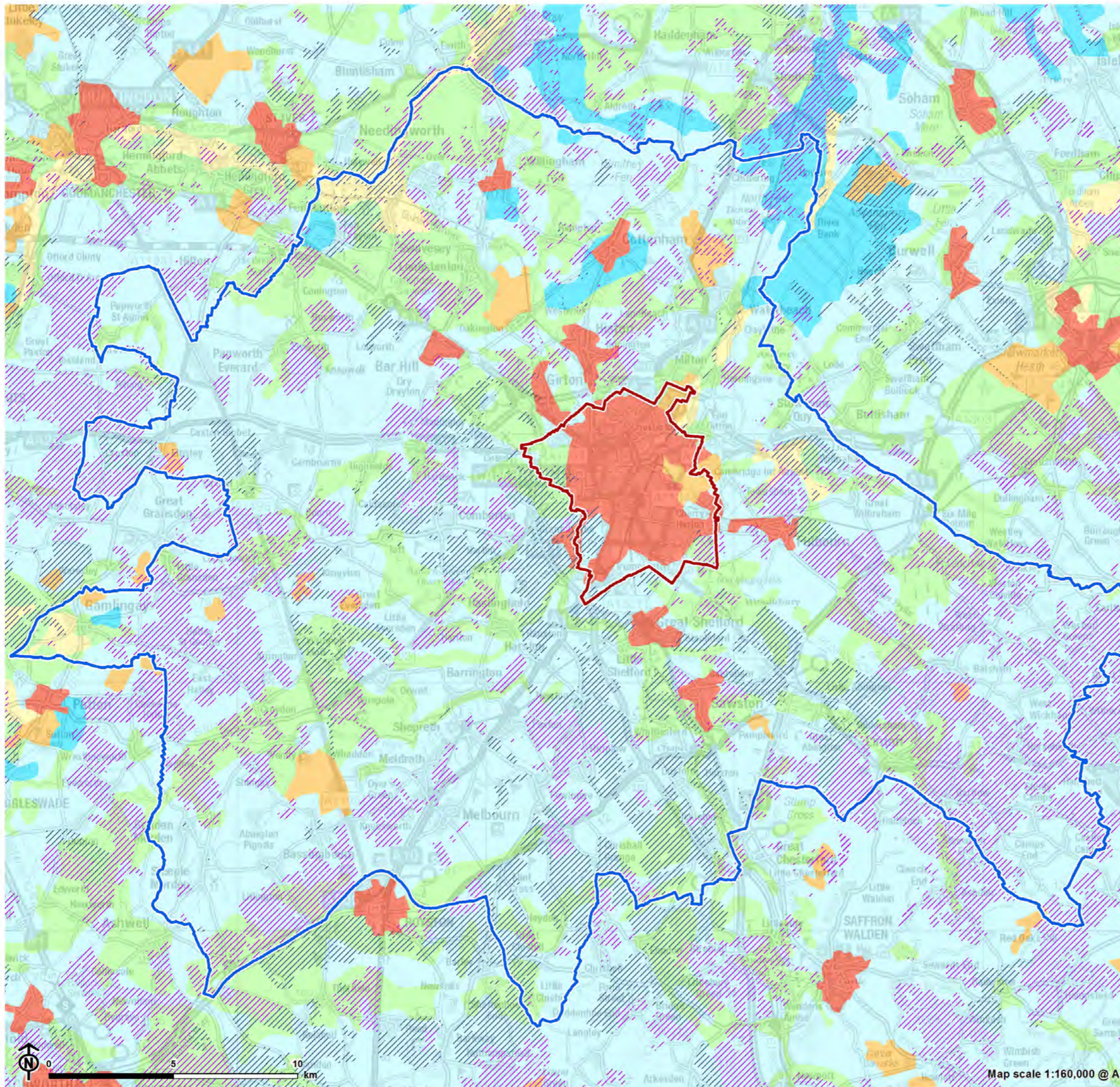
6.105 Cambridge Sustainable Food is an innovative and growing partnership of public, private and community organisations in Cambridge and the surrounding villages. Their work promotes a vibrant local food system all along the supply chain and in the community, with an action plan in place for 2016-2020. The aim is to achieve healthy and sustainable food for everyone alongside improving wellbeing, supporting farmers' livelihoods and building a strong food economy. Recognised nationally in 2016, Cambridge was one of the first cities to hold a Sustainable Food City Bronze Award. Key issues identified include:

- Promoting healthy and sustainable food
- Food poverty, ill health and healthy food access
- Community knowledge, skills and experience
- A vibrant, diverse sustainable food economy
- Transforming catering and food procurement
- Reducing waste and the ecological footprint

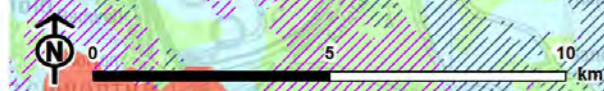
6.106 They have also partnered with The Cambridge Organic Food Company to setup a Cambridge Food Hub. The project is still in the pilot phase, but the idea is for a Food Hub building which would be a significant food storage and distribution centre, small business incubator, shop and cafe that will service Cambridge City and the surrounding area. Northstowe, one NHS England's Healthy New Towns, has been identified as a potential site for the Food Hub.

6.107 Cambridge Organic Food Company source produce from various local growers and farmers to deliver organic vegetable boxes to those in the Cambridge area.

Figure 6.18: Agricultural Land Classification



- Cambridge
 - South Cambridgeshire
 - Countryside Stewardship Management Area
 - Environmental Stewardship Agreement
- Agricultural Land Classification**
- Grade 1
 - Grade 2
 - Grade 3
 - Grade 4
 - Grade 5
 - Non agricultural
 - Urban



Map scale 1:160,000 @ A3

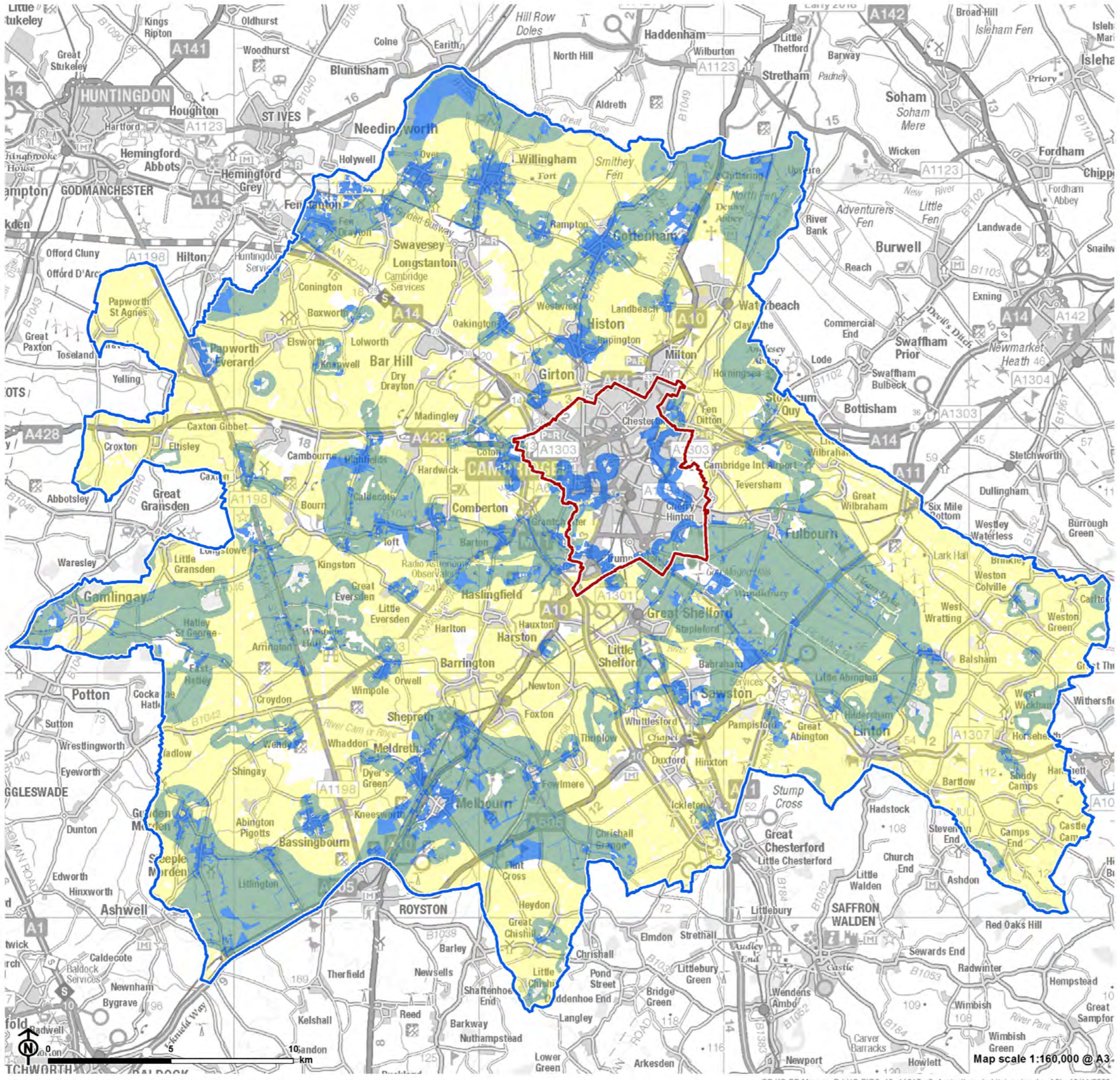


Figure 6.19: Agricultural Land and Habitat Opportunity Mapping

- Cambridge
- South Cambridgeshire
- Agricultural land
- Natural England Habitat Networks not on agricultural land
- Natural England Habitat Networks on agricultural land



Key issues

6.108 Table 6.18 sets out key issues organised by 'forces for change'; noting the sources that have led to their identification. Where an issue was identified through more than one source, the issue has not been duplicated, but the range of sources have been noted in the 'Source' column. Appendices 2 and 3 provide an overview of stakeholder feedback that has informed this assessment.

Table 6.24: Key issues for agriculture and community food growing

Force for change	Issue	Source
Development pressures	Proposed future growth and development is likely to result in increased pressures on high quality agricultural land. The requirement therefore exists to balance development, food production, renewable fuels and biodiversity.	Sustainability Appraisal Scoping Report
Agricultural intensification	<p>Farm amalgamation associated with an increase in agricultural productivity has created an intensively farmed landscape consisting of medium and large arable fields. This has resulted in the loss of corridors in the form of hedgerows and small copses, fragmentation, loss of semi-natural habitats and a landscape sensitive to cultivation due to pesticide, herbicide and fertiliser application. Damage to underground archaeology and historic features is also apparent. Greater demands on agriculture to produce higher yields could also exert pressure on the remaining areas of semi-natural grassland, woodland, wetland and other semi-natural priority habitats.</p> <p>The scale of agricultural production and agricultural productivity needs to reflect what really needs to be grown to meet consumer demands, rather than the traditional approaches to growing commodity crops at the expense of landscape quality.</p>	<p>NCA 88 Bedfordshire and Cambridgeshire Claylands</p> <p>Stakeholder consultation</p>
Peatland management	Whilst the East Anglian Fens are highly valuable for agriculture, the continuing loss of peat means that much of the land is now below sea-level, increasing flood risk and threatening the long-term viability of agriculture. Reducing CO ₂ emissions from these areas by raising water levels could therefore also benefit landowners by extending the productive lifetime of the soil, one of their key assets.	Fens Biosphere Bid Fens for the Future Partnership
Water quality	Agriculture and rural land management is identified as one of the risks in the deterioration in water quality.	Environment Agency Catchment Data Explorer

Force for change	Issue	Source
	<p>Run-off of fertiliser/nutrients, pesticides and sediment affect aquatic ecosystems and contribute to the failure to achieve Water Framework Directive (WFD) 'Good' status in many rivers. There are 8 waterbodies within Greater Cambridge where diffuse pollution from agriculture is thought to be a significant contribution to a WFD failure of the phosphate element. Less water in future as a result of climate change and over abstraction makes this risk more likely and consequential.</p>	<p>Stakeholder consultation</p>
<p>Climate change</p>	<p>Changes in weather patterns, particularly in summer, may exacerbate drought with widespread impacts on agricultural productivity and biodiversity.</p> <p>Low lying peat land to the north of Greater Cambridge has the most productive agricultural soils but is more susceptible to fluvial and surface water flooding. Climate change may exacerbate flood risk within these areas.</p>	<p>Cambridgeshire Green Infrastructure Strategy</p> <p>Sustainability Appraisal Scoping Report</p>
<p>Accessibility</p>	<p>Increased public access within the countryside may result in increased conflicts with visitors and landowners. Potential issues include increased workload and financial burden to landowners, rural crime, uncontrolled dogs and fouling, and conflict with conservation of vulnerable species and habitats.</p>	<p>Cambridgeshire Rights of Way Improvement Plan Update</p>
<p>Habitat loss and fragmentation</p>	<p>Removal of hedgerows and drainage of wetlands to accommodate intensive agriculture has created open landscapes of large fields, often bounded by gappy hedgerows and drainage ditches. This has reduced biodiversity habitats and fragmented links between them.</p>	<p>Cambridgeshire Green Infrastructure Strategy</p>
<p>Allotment provision</p>	<p>Allotments are a popular and well used resource with waiting lists at many sites across Greater Cambridge. The low turnover rate and high level of demand results in a long wait list time to get a plot.</p> <p>In South Cambridgeshire, although total provision is above the national standard, this provision is not evenly spread.</p>	<p>Cambridge City Council Open Space and Recreation Strategy</p> <p>South Cambridgeshire Recreation and Open Space Study</p>

Key opportunities

6.109 Considering the issues noted above, and the range of evidence reviewed, Table 6.25 sets out the key opportunities that have been identified. Opportunities have been categorised as one or both of the following:

- A: Overarching principles/considerations for the emerging Local Plan; and/or
- B: Partnership opportunities.

6.110 At this stage of the study, project or site-specific opportunities have not been identified in these tables. The next stage of this study will provide more detail on potential projects using the information captured in Appendix 3 (consultation outputs).

Table 6.25: Key opportunities for agriculture and community food growing

Code	Opportunity summary	Opportunity description	A	B
7i	Incorporate food growing enterprises into the GI network	Incorporate food growing enterprises of all scales into the GI network to expand involvement, education and production with a view to increasing the numbers of people buying locally grown produce. These approaches would also afford health and wellbeing benefits, aid the rural economy and mitigate against future climate change. CoFarm are currently developing a community food growing scheme across a patchwork of sites extending from Wicken Fen towards their Barnwell site in the city, in partnership with the National Trust. Similar opportunities should be sought e.g. on the County Farms Estate, working in partnership with local NGOs, the council, residents and farmers.	Yes	Yes
7ii	Increase provision of allotments	<p>Increase provision of allotments, particularly in the 50 South Cambridgeshire villages which have no provision.</p> <ul style="list-style-type: none"> – New developments provide an opportunity to increase the provision of allotments for community growing and to connect with existing sites, as shown within the Cambourne development. – The design of open spaces and buildings in new developments (particularly those too small to provide their own allotments) should promote areas for small scale food growing including fruiting trees in open spaces and productive roofscapes on buildings. <u>Greater Cambridge Sustainable Design and Construction SPD</u> (adopted 2020) provides further information. 	Yes	Yes
7iii	Purchase farmland to convert to	Where privately owned farmland is offered for sale, there may be opportunities to purchase land with the aim to convert it into natural green space, biodiversity		Yes

Code	Opportunity summary	Opportunity description	A	B
	natural green space, biodiversity sites or community food growing enterprises/allotments	sites or community food growing enterprises/allotments, thus increasing the quantity of much needed publicly accessible green space.		
7iv	Work with landowners and community food growing enterprises to identify land for community-based farming and education.	Work together with landowners of commercial agricultural holdings and community food growing enterprises to identify small parcels of agricultural land that could be better utilised as sites for community-based farming and education. This less industrial method of food growing would serve to promote local food growing and consumption whilst enhancing social relationships.		Yes
7v	Safeguard the best and most versatile agricultural land	Safeguard the best and most versatile agricultural land with highest grade soils to ensure agricultural productivity is maintained to meet demand. As such, development should avoid the loss of higher grades of agricultural land and brownfield sites / lower quality agricultural land should be prioritised land for development.	Yes	Yes
7vi	Maximise GI opportunities in agricultural areas	Connect urban and rural areas through expanding the GI network to encompass the GI assets within agricultural landscapes. Increase connectivity of GI assets and access to the countryside by expanding the PRoW network within agricultural areas as well as improving wayfinding opportunities.	Yes	Yes
7vii	Enhance arable landscapes	Enhance the arable landscape, considering the diverse range of agricultural land including fields and hedgerows, hills and valleys, woodlands, fen and other semi-natural habitats. Manage the land sustainably to maximise benefits for a range of plants and animal species, improve soil and water quality, and ameliorate climate change by promoting good agricultural practice. Link to the West Cambridgeshire Hundreds project which involves landowners, NGOs and Natural England and aims to link up habitats, particularly ancient woodlands and hedgerows.	Yes	Yes
7viii	Expand and connect chalkland	Maintain sustainable but productive agricultural land use, while expanding and connecting the chalkland assemblage of semi-natural grasslands. The potential	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
	assemblage of semi-natural grasslands.	exists to sensitively manage road verges, extend buffer strips along field margins to benefit soil and water quality, reduce soil erosion, strengthen landscape character and enhance biodiversity and pollinator networks.		
7ix	Promote uptake of agri-environment schemes and sustainable land management:	<p>Promote uptake of agri-environment schemes and innovative ways of sustainable land management:</p> <ul style="list-style-type: none"> – Agri-environment schemes and woodland grant schemes can effectively enhance the agricultural environment and its natural capital value, thus providing a wider range of public goods. These schemes can help to reduce flood risk, connect habitats and provide for biodiversity through the adoption of innovative landscape management projects. – The new Environmental Land Management Scheme currently being developed has a strong biodiversity and carbon sequestration focus offering great opportunity for improving the existing agricultural landscape and industrial production systems into a multi-purpose land management approach. The role nature-based options will play in helping to achieve Net Zero within ELMS are yet to be confirmed. However, it is essential to invite the farming community into the conversations to ensure inclusion, education and ultimately, receptivity to change in the future. – Diversification of land uses can improve biodiversity and provide alternative or additional income streams for farmers and land managers. 		Yes
7x	Identify agricultural areas that would benefit from natural regeneration.	Identify agricultural areas that would benefit from natural regeneration. Natural regeneration seeks to reinstate natural processes but is not a replacement for farming. It provides opportunities for communities to diversify and create nature-based economies, for living systems to provide the ecological functions on which we all depend; and for people to re-connect with wild nature. To be effective, these projects need to be delivered at scale and therefore require collaborative partnerships.	Yes	Yes
7xi	Plan and manage tree planting in suitable	Carefully plan and manage tree planting and agroforestry to sequester carbon, enhance landscape character, provide value for biodiversity, reduce water quality issues and mitigate some on-farm climate	Yes	Yes

Code	Opportunity summary	Opportunity description	A	B
	agricultural landscapes	change impacts e.g. by providing shade. The main opportunities in Greater Cambridge's largely mono-agricultural landscape falls with river route tree and copse link ups.		

Identifying broad opportunity zones

6.111 Drawing together all of the evidence presented in this section, Table 6.26 sets out the broad opportunity zones identified under this theme. This is supported by Figure 6.20.

Table 6.26: Broad opportunity zones for carbon sequestration

Opportunity map reference	Description	Code
7a – Grade 1 agricultural soil conservation	Safeguard the best and most versatile agricultural land, directing development away from these areas.	7v, 7ix, 7x
7b – Network of community farming sites	Introduce a range of community food growing schemes stretching across a patchwork of sites extending across South Cambridgeshire villages to sites at the settlement edge of Cambridge. Implementation of these schemes to be facilitated through partnership working with the council, farmers, residents and NGOs.	7i, 7iii, 7iv
7c – Chalk stream pollution mitigation	Agri-environment targeting on agricultural land in the sensitive chalk catchment to minimise water quality issues from diffuse rural pollution. (See Theme 3: Water Environment for further detail).	7vii, 7ix, 7xi
7d – Chalkland semi-natural grasslands (not spatially specific)	Expand and connect the chalkland assemblage of semi-natural grasslands. Manage road verges and extend buffer strips along field margins.	7viii, 7ix
7e – Ancient woodlands and hedgerows (not spatially specific)	Maintain and manage a sustainable and productive arable landscape, including woodlands, hedgerows and other semi-natural habitats. Replicate / partner with the West Cambridgeshire Hundreds project which aims to link up ancient woodlands and hedgerows.	7vii
7f – Sustainable land management including agri-environment schemes (not spatially specific)	Increase the proportion of productive farmland benefiting the environment, promoting the uptake of agri-environment schemes and innovative ways of sustainable land management	7ix
7g – Public access to the countryside (not spatially specific)	Increase connectivity of GI assets and access to the countryside by expanding the PRoW network through agricultural land. Improving public access could be more reasonably targeted on the County Farms	7iii, 7vi

Opportunity map reference	Description	Code
	Estate, or delivered through agri-environment targeting.	
7h – Allotment provision (not spatially specific)	Increase allotment provision particularly in South Cambridgeshire's villages (x50) where there is no provision, through new developments, purchase of private land offered for sale, conversion of existing land use or identification of small parcels of agricultural land that could be better utilised.	7ii, 7iii, 7iv
7i – Natural regeneration (not spatially specific)	Determine agricultural areas that would benefit from 'natural regeneration'. Natural regeneration seeks to reinstate natural processes but is not a replacement for farming. Needs to be delivered at scale and therefore requires collaborative partnerships.	7vii, 7viii, 7ix, 7x
7j – Tree planting and agroforestry (not spatially specific)	Enhance carbon sequestration on agricultural land through carefully planned and managed tree planting and agroforestry. The main opportunity comes through river route tree and copse link ups.	7vii, 7xi

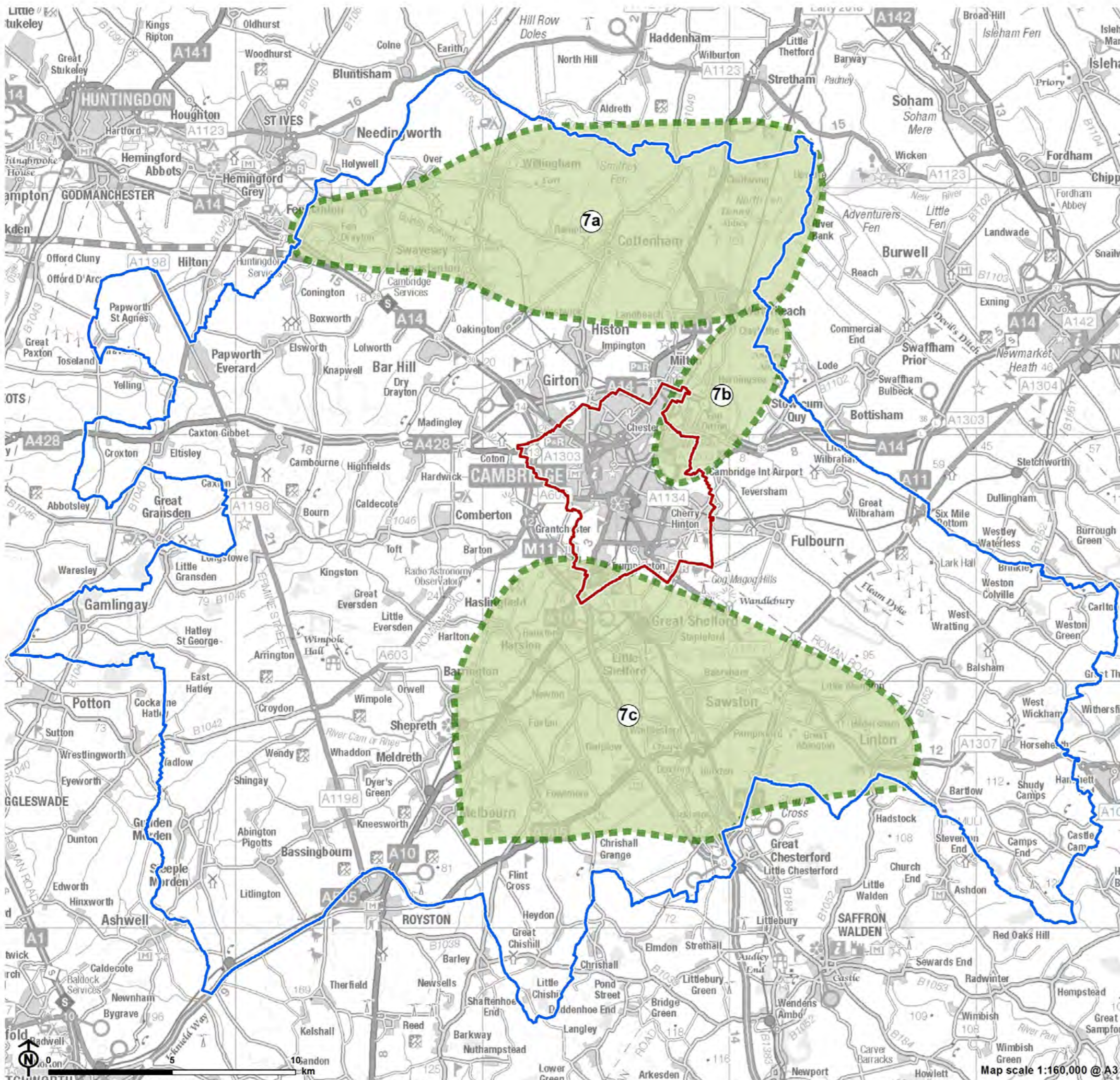


Figure 6.20: Agriculture and Community Food Growing Broad Opportunity Zones

- Cambridge
- South Cambridgeshire
- Agriculture and community food growing broad opportunity zones
 - 7a: Grade 1 agricultural soil conservation
 - 7b: Network of community farming sites
 - 7c: Chalk stream pollution mitigation
 - 7d: Chalkland semi-natural grasslands (not spatially specific)
 - 7e: Ancient woodlands and hedgerows (not spatially specific)
 - 7f: Sustainable land management incl. agri-environment schemes (not spatially specific)
 - 7g: Public access to the countryside (not spatially specific)
 - 7h: Allotment provision (not spatially specific)
 - 7i: Natural regeneration (not spatially specific)
 - 7j: Tree planting and agroforestry (not spatially specific)

Chapter 7 - Priority areas for enhancement

7.1 Whilst the previous chapters have considered issues and opportunities thematically, this chapter draws all of the broad opportunity zones together to start to identify where the greatest opportunities for achieving multiple benefits exist. Figure 7.1 provides a cumulative view of all of the broad opportunity zones.

7.2 The figure shows the areas where GI interventions might deliver a number of ecosystem services and related benefits. These broad enhancement zones will be refined in the next stage of this study (with reference to the preferred spatial option). Whilst there are locations where enhancement or creation of GI assets to support a single function will be important (for example biodiversity), it is anticipated that the areas where multiple opportunity zones overlap will inform the priority areas of search for more specific, deliverable GI project opportunities.

7.3 Referring back to the broad opportunity maps presented at the end of each GI theme section, it is possible to identify the range of GI themes that underpin the areas showing high levels of opportunity.

7.4 Figure 7.1 highlights river corridors as key areas where GI interventions could result in multiple benefits. There are large areas of multi-theme opportunity to the south east and south of Cambridge. North east of Cambridge presents multiple opportunities as do areas west of Cambridge around Bourn and Kingston. Opportunities associated with the northern fens, washes and wetlands feature in multiple themes.

7.5 Later stages of this Study will:

- Refine the priority areas: providing an evaluation of the priority areas for enhancement against the preferred development strategy within the Local Plan to identify potential conflicts or synergies; culminating in the development of a 'long list' of potential opportunities to expand and enhance the GI network.
- Identify specific opportunities to expand and enhance the GI network: looking in detail at the deliverability of these opportunities; drawing on stakeholder knowledge to explore site ownership, existing uses and current or planned adjacent land uses. This culminates in the prioritisation and presentation of specific opportunities, setting out the benefits and potential mechanisms to deliver these.
- Make recommendations and provide policy development advice: bringing together all of the findings to make recommendations on policy direction and wording to ensure that the Local Plan provides a supportive and positive framework for delivering on the ambitions for GI in Greater Cambridge.

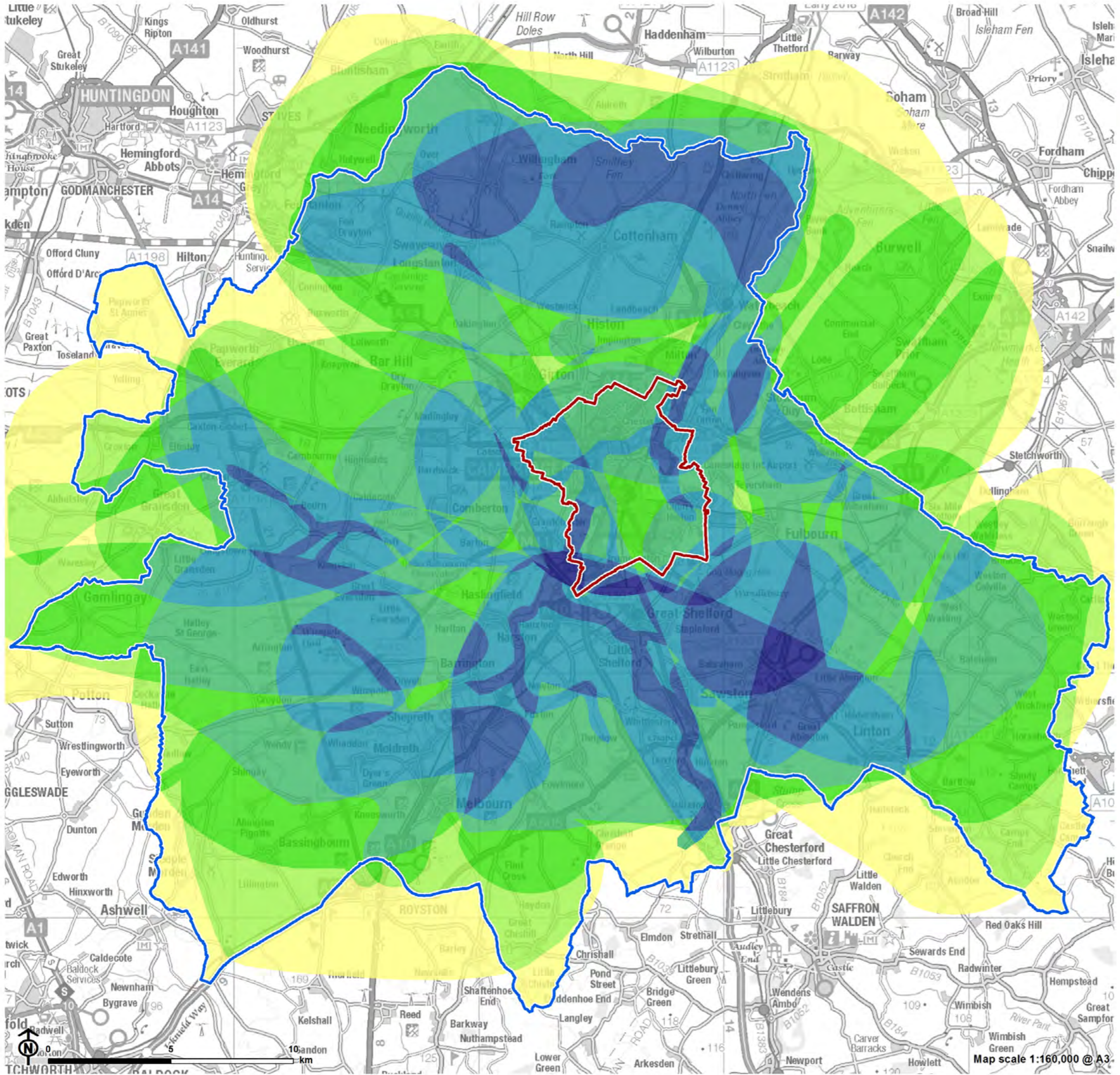


Figure 7.1: Combined Broad Opportunities Map

Cambridge
 South Cambridgeshire

Number of GI themes

	1
	2
	3
	4
	5
	6
	7



Appendix 1: Glossary and acronyms

Glossary

Term	Description
Adaptive management	“ <i>Modification of activities in light of experience form rigorous monitoring</i> ” (CIEEM, 2018 ¹⁷).
Agri-environment schemes	<p>Voluntary agreements that provide annual payments to farmers and land managers to ensure they manage their land in an environmentally sensitive way that goes beyond the minimum required of them by regulation.</p> <p>Under the Agricultural Bill, ELMS (see below) is proposed to provide a results-based payment scheme, anticipated to be in place in 2024.</p>
ANGSt (Accessible Natural Green Space Standards)	<p>Published by Natural England in 2010, ANGSt recognises the value of greenspaces, principally in relation to the ‘cultural’ ecosystem services of health, wellbeing, etc. ANGSt recommends that everyone, wherever they live, should have access to natural greenspace as follows:</p> <ul style="list-style-type: none"> • Of at least 2ha in size, no more than 300m (5min walk) from home; • At least one accessible 20ha site within 2km of home; • One accessible 100ha site within 5km of home; • One accessible 500ha site within 10km of home; plus • A minimum of 1ha of statutory Local Nature Reserve (LNR) per 1,000 population.
Biodiversity	The variability among all living organisms - terrestrial and aquatic - and the ecosystems that they are part of. Biodiversity includes the diversity within species, between species and of ecosystems.
Biodiversity metric	<p>A proxy measure or index of biodiversity to allow comparison over time or space. Metrics are used in recognition that it is not possible to finitely inventory the state of all biodiversity present.</p> <p>In relation to development, the metric is used as a measure of predicted impact(s) on habitats and how much new or restored habitat, and of what type, is required to deliver sufficient net gain. Use of metrics does not replace the need for a detailed biodiversity assessment (as would accompany any individual planning application) or monitoring.</p>
Biodiversity Net Gain (BNG)	Increase in the quality and/or quantity of habitats in comparison to the original condition or baseline i.e. enhancement over and above the level required to mitigate or compensate for detrimental impact, or which is otherwise prescribed or committed to happen (e.g. as part of pre-existing planning consent).

¹⁷ CIEEM (2018) Guidelines for Ecological Impact Assessments in the UK & Northern Ireland, 3rd Ed. CIEEM Winchester, UK

Term	Description
Biodiversity off-set	Compensation for the unavoidable and immitigable loss, fragmentation or other detrimental effect on an ecological receptor. Off-setting seeks to ensure that no net loss in ecological value is achieved.
Biodiversity Opportunity Areas (BOA)	BOA were originally identified at county or regional scale. Some LPA have now progressed a more refined Ecological Network (see below) which identifies 'Opportunity Areas' therein. Both have a common aim though scale and age of data is different. BOA remain relevant particularly when considering cross-boundary and wider strategic connectivity.
Biodiversity unit	A unit as measured by the biodiversity metric which represents a combined measure of habitat distinctiveness, area and condition. The production of a biodiversity unit in the habitat market refers to an increase in the biodiversity value of land by one unit.
Carbon sequestration	The process by which carbon (as carbon dioxide) is removed from the atmosphere and held in solid (in vegetation or soils) or liquid (in the oceans) form.
Compensation	The protection of biodiversity assets should be achieved through avoidance and mitigation wherever possible. Compensation, the next step in the hierarchy, should only be used in exceptional circumstances and as a last resort, after all options for avoidance and mitigation have been fully considered. Compensatory measures should, therefore, only be used to address any residual impact that cannot be avoided or mitigated.
Conservation covenants	Voluntary but legally binding agreements under the Environment Bill between a landowner and a designated “responsible body” such as a conservation charity, public body or for-profit body to conserve the natural or heritage features of the land.
Ecological network	<p><i>“An ecological network can be understood as a number of core, well connected, high quality areas of well-functioning ecosystems, together with those parts of the intervening landscape that are ‘wildlife-friendly’ and which, collectively, allow wildlife to thrive” (NERR082, 2020¹⁸).</i></p> <p>NB: Contrast the term ‘nature network’ which serves both nature and people as interdependent functions.</p>
Ecosystem	A dynamic complex of plant, animal and micro-organism communities, and their non-living environment interacting as a functional unit (CIEEM, 2018).
Ecosystem services	<p>Benefits provided to people by natural capital (ecosystems and the biodiversity they contain). Services broadly comprise:</p> <ul style="list-style-type: none"> • Provisioning services e.g. food, fibre, fuel and clean water;

¹⁸ NE (2020) Natural England Research Report NERR082: Nature Networks: A Summary for Practitioners <http://publications.naturalengland.org.uk/publication/5144804831002624>

Term	Description
	<ul style="list-style-type: none"> • Regulating services e.g. climate control, flood regulation, carbon storage, pest control and pollination; • Cultural services e.g. recreation, spiritual, educational, intrinsic and aesthetic value. <p>Supporting services (e.g. soil formation, photosynthesis, biodiversity) originally distinguished are now typically seen as functions or processes associated with natural capital 'stocks'. Ecosystem services may be described as 'flow'.</p>
Effect	The effect (e.g. population decline) of a given impact (e.g. habitat loss) on an ecological receptor. Effects may be beneficial or detrimental.
Environmental Land Management Scheme (ELMS)	The emerging new land management policy to replace the existing Common Agricultural Policy (CAP). The scheme is aligned with the 25-year environment plan goals and is underpinned by natural capital principles and the delivery of public goods, alongside market products. Farmers will be paid for work that enhances the environment, such as tree or hedge planting, river management to mitigate flooding, or creating or restoring habitats for wildlife.
Favourable conservation status (of a species)	<i>When "Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; and the natural range of the species is neither being reduced nor is likely to be reduced in the foreseeable future; and there is, and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis"</i> (Habitats Directive, Article 1(i)).
Fragility	One of the Ratcliffe criteria (Ratcliffe, 1977 ¹⁹) used to describe nature conservation value. <i>"Some habitats and geological features are more sensitive to change and are at greater risk of being lost or damaged due to the direct or indirect impacts of climate change, human activities or other influences"</i> (MHCLG, 2019 ²⁰).
Geodiversity	The variability of rocks, minerals, fossils, landforms, geomorphological processes and soils which collectively underpin the habitats and species which develop thereon. Protection of geodiversity and biodiversity typically sit together, for example, protection of SSSI under the Wildlife & Countryside Act 1981 or protection of non-designated assets in the NPPF.

¹⁹ Ratcliffe, D.A. (1977) A Nature Conservation Review. Cambridge University Press

²⁰ MHCLG (2019) Planning Practice Guidance: Natural Environment – Standard Criteria for LWS <https://www.gov.uk/guidance/natural-environment>

Term	Description
Green infrastructure	<p>“A network of multifunctional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities” (NPPF, 2019²¹).</p> <p>“A strategically planned and delivered network comprising the broadest range of high quality green spaces and other environmental features. Designed and managed as a multi-functional resource capable of delivering those ecological services and quality-of-life benefits required by the communities it serves and needed to underpin sustainability. Its design and management should also respect and enhance the character and distinctiveness of an area with regard to habitats and landscape types” (NE, 2010²²).</p> <p>“Green infrastructure is the ecological framework for environmental, social, and economic health – in short, our natural life support system” (Benedict & McMahon, 2006²³).</p> <p>Different types of GI will contrast in the functions they serve, such as the distinction between urban green space and wider GI. Some types will score very poorly or not at all, for select functions and this can be entirely acceptable. It is the range of functions that is important to capture in any analysis.</p> <p>Note that green infrastructure may include artificial features such as green roofs, green bridges, wildlife under/overpasses or fish ladders.</p> <p>Green infrastructure is the tool by which ecosystem services can be planned and delivered through policy.</p>
Habitat potential map	Identifies “ <i>the potential for an area to support specific habitat creation. Shows areas of lost habitat that need to be restored</i> ” (NERR082, 2020).
Impact	The impact (e.g. habitat loss) which causes an effect (e.g. population decline) on an ecological receptor. Impacts may be beneficial or detrimental.
Integrity	In relation to a designated site, ‘integrity’ refers to the “... <i>coherence of ecological structure and function...that enables it to sustain the habitat, complex of habitats and/or levels of populations of species for which it was classified</i> ” (ODPM Circular 06/2005: Biodiversity and Geological Conservation ²⁴). In

²¹ MHCLG (2019) National Planning Policy Framework. Ministry of Housing, Communities & Local Government, London, UK <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

²² NE (2010) Nature Nearby: Accessible Natural Greenspace Guidance

²³ Benedict, M.A. & McMahon, E. (2006) Green Infrastructure: Linking landscapes & communities. Island Press, Washington DC

²⁴ ODPM (2005) Government Circular: Biodiversity & Geological Conservation – Statutory Obligations & Their Impact within the Planning System. Office of the Deputy Prime Minister,

Term	Description
	relation to species or habitats, 'integrity' refers to the maintenance of the conservation status of a habitat or species population at a specific location or geographical scale.
Landscape character area	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse ²⁵ . Identified through a Landscape Character Assessment - the process of identifying and describing variation in the character of the landscape. It seeks to identify and explain the unique combination of elements and features (characteristics) that make landscapes distinctive.
Local Nature Partnerships (LNP)	LNP bring together local organisations, businesses and people who want to improve their local natural environment. Established in the vision of the Government's 2011 'Natural Environment White Paper', there are 47 LNP across England. The LNP in Great Cambridge is 'Natural Cambridge'.
Local Nature Recovery Strategies (LNRS)	LNRS are a new system of spatial strategies for nature under the Environment Bill, covering the whole of England. Locally led by an appropriate "responsible authority", these will identify the opportunities and priorities for enhancing biodiversity and supporting wider objectives such as mitigating or adapting to climate change in an area.
Mitigation	Adverse effects that cannot be avoided should be adequately mitigated. Mitigation measures negate the adverse impact of a plan or project, during or after its completion. In respect to development, mitigation should form part of the development proposal, but additional measures can be imposed by the decision-maker. All mitigation measures should be secured through the use of planning conditions or planning obligations ²⁶ .
Mitigation hierarchy	The mitigation hierarchy underpins planning policy and decision making. It requires that potential adverse impacts be avoided or, where this is not possible, mitigated and, as a final resort, compensated (off-set).
Natural capital	<i>"The elements [assets or 'stocks'] of nature that directly and indirectly produce value or benefit to people [i.e. ecosystem services. Natural capital may include] ...ecosystems, species, freshwater, land, minerals, the air and oceans, as well as natural processes and fluctuations"</i> (NCC, 2016 ²⁷).

London, UK www.gov.uk/government/publications/biodiversity-and-geological-conservation-circular-06-2005

²⁵ Natural England (2014) An approach to Landscape Character Assessment. Defra

²⁶ BS 42020:2013: Biodiversity. Code of practice for planning and development

²⁷ NCC (2016) Natural Capital Protocol. Natural Capital Coalition, London, UK www.naturalcapitalcoalition.org/protocol

Term	Description
Naturalness	<p>One of the Ratcliffe criteria (Ratcliffe, 1977) used to describe nature conservation value.</p> <p><i>“The degree to which a site supports natural features, including rock exposures revealing underlying geology, or demonstrates active or past natural processes”</i> (MHCLG, 2019²⁸).</p>
Nature network	<p>A nature network may be distinguished from an ‘ecological network’ as, in addition to the primary role to support thriving wildlife, <i>“a nature network should also enhance natural beauty and conserve geodiversity and opportunities should be taken to deliver benefits for people, such as flood alleviation, recreational opportunities and climate change adaptation and mitigation. These joint aims... are at the heart of nature networks and they are inter-dependent: networks for wildlife that also deliver benefits to people also tend to be more valued by people”</i> (NERR082, 2020).</p>
Nature Recovery Network (NRN)	<p>The NRN, as identified in the 25 Year Plan (2018), is an expanded, enhanced and increasingly connected network of places that are richer in wildlife and more resilient to climate change, that is key to delivering the Government’s Nature Strategy outside of designated sites. <i>“It comprises a core network of designated sites of importance for biodiversity and adjoining areas that function as stepping stones or wildlife corridors, areas identified for new habitat creation and up to 25 nature recovery areas [at landscape or catchment scale] for targeted action”</i> (MHCLG, 2019²⁹). Benefitting wildlife and people, the NRN will provide an integrated approach to nature recovery.</p> <p>The NRN national delivery partnership will be led by NE (launch late 2020), supported by local partnerships. Local Nature Recovery Strategies (LNRS) will be piloted in 2020/21.</p>
Nature Strategy	<p>Introduced under the 25 Year Plan (2018), the Nature Strategy sets out the Government’s approach to deliver our commitments under the Convention on Biological Diversity. The strategy will set the overall ambition and specific goals for habitat and species recovery over ten years:</p> <ul style="list-style-type: none"> • restoration of 75% protected sites to favourable condition by 2042, • create or restore 500,000ha of wildlife-rich habitat outside of protected sites as part of a Nature Recovery Network,

²⁸ MHCLG (2019) Planning Practice Guidance: Natural Environment – Standard Criteria for LWS <https://www.gov.uk/guidance/natural-environment>

²⁹ MHCLG (2019) Planning Practice Guidance: Natural Environment – How do local ecological networks relate to the Nature Recovery Network? www.gov.uk/government/collections/planning-practice-guidance

Term	Description
	<ul style="list-style-type: none"> • take action to recover threatened, iconic or ecologically important species, • increase woodland cover, • improve soil health and restore peatlands.
Offsetting	Biodiversity offsets are distinguished from other forms of ecological compensation by the formal requirements for measurable outcomes: the losses due to impact, and gains achievable through the offset, are measured in the same way, even if the habitats concerned are different ³⁰ .
Planning conditions	The Town and Country Planning Act enables the local planning authority to grant planning permission to impose “ <i>such conditions as they think fit</i> ” to ensure delivery as agreed. This power should be interpreted in light of material considerations such as the National Planning Policy Framework.
Planning obligations	Planning obligations are legal obligations under Section 106 of the Town and Country Planning Act entered into to mitigate the impacts of a development proposal by a person with an interest in the land and the local planning authority.
Position in the ecological mosaic	<p>One of the Ratcliffe criteria (Ratcliffe, 1977) used to describe nature conservation value.</p> <p>The relationship or connectivity of a site or habitat parcel to adjacent areas of nature conservation value. This reflects not only contribution to a functional ecological resource but recognises the ecological character of the locality, county or region.</p>
Potential value	Sites or habitat parcels which could, through appropriate management or natural progression, develop greater nature conservation value.
Priority habitats &/or species	<p>These are of Principal Importance in England and are listed in the Natural Environment and Rural Communities (NERC) Act 2006 Section 41. The list includes UK BAP habitats and species (identified in response to the 1992 Rio Convention during the interim period until legislation came into place).</p> <p>Of the s41 species, many are also protected under UK legislation.</p>
Rarity	<p>One of the Ratcliffe criteria (Ratcliffe, 1977) used to describe nature conservation value.</p> <p>Rarity relates to the frequency of occurrence, or abundance, of a habitat, species or community. Rarity may be considered at a range of scales – local, county or national, for example.</p>

³⁰ DEFRA (2012) Biodiversity Offsetting Pilots. Technical Paper: the metric for the biodiversity offsetting pilot in England

Term	Description
Recombinant ecology	Flora and fauna not directly representative of an 'original' assemblage at a given locale but are nevertheless locally-appropriate in the current context, or indeed as future target for management objectives.
Replacement	Creation of an acceptable substitute habitat for that which has or would be lost, fragmented or otherwise detrimentally affected.
Restoration	The process of assisting the recovery of an area or ecosystem that has been degraded, damaged or destroyed. The aim of ecological restoration is to re-establish the composition, structure and function to a close approximation of its pre-degraded state.
Typicalness	One of the Ratcliffe criteria (Ratcliffe, 1977) used to describe nature conservation value. <i>"Areas that exemplify a type of habitat, geological feature, or a population of a species, that is characteristic of the natural components of the landscape in which they are found"</i> (MHCLG 2019 ³¹).
Wetspot	Area at risk of surface water flooding.
Zone of influence	Area over which ecological features may be impacted by a given project or project activity.

Acronyms

AES – Agri-Environment Scheme

GI – Green Infrastructure

BNG – Biodiversity Net Gain

NPPF – National Planning Policy Framework

NPPG – National Planning Practice Guidance

NERC – Natural Environment & Rural Communities

LWS – Local Wildlife Sites

SSSI – Site of Special Scientific Interest

LNRS – Local Nature Recovery Strategies

CRoW – Countryside & Rights of Way

PRoW – Public Rights of Way

DNIP – Doubling Nature Investment Plan

GIS – Geographic Information System

IMD – Index of Multiple Deprivation

³¹ MHCLG (2019) Planning Practice Guidance: Natural Environment – Standard Criteria for LWS

NO₂ – Nitrogen Dioxide
NAQO – National Air Quality Objectives
BCN – Bedfordshire, Cambridgeshire, Northamptonshire
SSSI – Sites of Special Scientific Interest
HRA – Habitat Regulations Assessment
NCA – National Character Area
LCA – Landscape Character Assessment
AONB – Areas of Outstanding Natural Beauty
TPO – Tree Preservation Order
MSA – Minerals Safeguarding Area
MCA – Mineral Consultation Area
SAC – Special Areas of Conservation
SPA – Special Protection Area
AAP – Area Action Plan
CCC – Committee on Climate Change
PRV – Protected Roadside Verges
CPPF – Cambridge Past, Present and Future
ELMS – Environmental Land Management Scheme
WWNP – Working With Natural Processes
CSZ – Core Sustenance Zone
LNRs – Local Nature Reserves
GCP – Greater Cambridge Partnership
SuDS – Sustainable Drainage Systems
SFRA – Strategic Flood Risk Assessment
SWMP – Surface Water Management Plan
NVZ – Nitrate Vulnerable Zone
SPZ – Source Protection Zone
RNAGs – Reasons for Not Achieving Good status
CAM – Cambridgeshire Autonomous Metro
SM – Scheduled Monument
ANG – Accessible Natural Greenspace
Ha – Hectares
SPD – Supplementary Planning Document
NE – Natural England

Appendix 2: Existing and emerging policy and evidence review

Full reference list

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Evidence informing each GI theme

Theme 1: Landscape, cultural heritage and sense of place

Document	Status	What does it cover?
<u>National Character Area (NCA) profiles: NCAs 46, 86, 87, 88 and 90</u>	Published by Natural England (2013-2015)	NCAs divide England into 159 distinct natural areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity, history, cultural and economic activity. The documents provide 'key characteristics' of each landscape area, Statements of Environmental Opportunity and a summary of key drivers for landscape change. Each profile also offers a broad analysis of each area's characteristics and ecosystem services in order to provide a decision-making framework for the natural environment.
<u>Sustainability Appraisal Scoping Report</u>	Published by South Cambridgeshire District Council and Cambridge City Council in 2019	The document assesses the potential impacts of the joint Local Plan on social, economic and environmental issues through the process of Sustainability Appraisal (SA) (incorporating Strategic Environmental Assessment (SEA), Health Impact Assessment and (HIA) and Equalities Impact Assessment (EqIA)). The existing Local Plans, which will be replaced by the Greater Cambridge Local Plan, were both adopted in 2018 and set out development needs for each area up to 2031.
Greater Cambridge Landscape Character Assessment	Emerging	Provides information on landscape context within which GI proposals will be framed as well as an understanding of where landscapes require enhancement to aid the GI network function.
Greater Cambridge Green Belt study	Emerging	The document considers both 'national' Green Belt purposes, as defined in the NPPF, and the 'local' Green Belt purposes as defined in the current Local Plans. The report provides clarity on the strategic GI context where enhancements to the Green Belt will be required.
<u>Greater Cambridge Local Plan - Habitats Regulations Assessment (HRA) Scoping Report</u>	Published by South Cambridgeshire District Council in 2019	This Scoping document has been produced to provide guidance on the development of the Greater Cambridge Local Plan in the context of European sites; providing a reference point for stakeholders wishing to comment on the proposals. The report identifies which European sites have the potential to be affected by the Greater Cambridge Local Plan, evidence key information on these sites and outline the pathways by which they could be affected.

Document	Status	What does it cover?
<u>Cambridgeshire Green Infrastructure Strategy</u>	Published by the Cambridgeshire Green Infrastructure Forum in 2011	Highlights opportunities for improving landscapes, enhancing biodiversity, enjoying heritage and getting out into the countryside. Considers broader types of open space than open space studies including land supporting biodiversity and access to the countryside.

Theme 2: Biodiversity and geodiversity

Document / Project	Status	What does it cover?
<u>A Green Future: Our 25 Year Plan to Improve the Environment</u>	Published by Her Majesty's Government in 2018	<p>The Plan introduces the Nature Strategy – the Government's approach to deliver our commitments under the Convention on Biological Diversity. These include restoration of 75% protected sites to favourable condition by 2042, create or restore 500,000ha of wildlife-rich habitat outside of protected sites, increase woodland cover, improve soil health, and restore peatlands.</p> <p>The Strategy will be delivered through the Nature Recovery Network (NRN) - an expanded, enhanced and increasingly connected network of places to provide a resilient network rich in plants and wildlife. The NRN national delivery partnership will be led by NE (launch late 2020), supported by local partnerships. LNRS will be piloted in 2020/21</p> <p>This will be achieved through the restoration of terrestrial and freshwater protected sites and the recovery of threatened species of animals, plants and fungi. Increased woodland coverage will also be delivered.</p>
<u>Planning Practice Guidance: Natural Environment – How Do Local Ecological Networks Relate to the Nature Recovery Network?</u>	Published by the Ministry of Housing, Communities & Local Government in 2019	As set out in the 25 Year Environment Plan, the NRN comprises a core network of designated sites of importance for biodiversity and adjoining areas that function as wildlife corridors, areas identified for new habitat creation and up to 25 nature recovery areas (at catchment or landscape scale) for targeted action. Local ecological networks are recognised as significant contributors to the NRN and the opportunity exists to create, restore or enhance habitats to improve connectivity.

Document / Project	Status	What does it cover?
<u>Natural England National Habitat Network Mapping</u>	Ongoing project delivered by Natural England	Spatial dataset that describes the geographic extent and location of Habitat Networks for 18 priority habitats, primarily using the priority habitat inventory with additional data added in relation to habitat restoration-creation, restorable habitat, fragmentation action, network enhancement and expansion zones. The maps are created following a standardised process that incorporates a range of data layers and identifies specific locations for a range of actions to help improve the ecological resilience for each of the habitats/habitat networks. Habitats included are lowland fen (e.g. the Cam Washes, Fen Ditton, L-Moor, Fowlmere Watercress Beds, and Fen Drayton), lowland meadows (Barton Bridge), lowland calcareous grassland (Stow-cum-Quay Fen, Gog Magog Golf Course, Roman Road to Kingston Woods, and Therfield Heath), traditional orchard (Cottenham and Willingham), and wood pasture & parkland (Christ's Pieces).
<u>Mapping Natural Capital and Opportunities for Habitat Creation in Cambridgeshire</u>	Published by Cambridgeshire Biodiversity Partnership in 2019	Provides detailed habitat base maps for Cambridgeshire with the aim of examining habitat change over 80 years and to identify opportunities to enhance biodiversity. A GIS based approach was used to identify potential areas for the expansion of key habitats, with consideration given to the siting of new habitats given the proposed connectivity to existing habitat types.
<u>Developing with Nature Toolkit</u>	Ongoing project delivered by Natural Cambridgeshire Local Nature Partnership (LNP)	Development of a Toolkit to help developers and infrastructure providers support integration of biodiversity best practice into development design and achieve Biodiversity Net Gain (BNG). The toolkit includes an 'assessment template' and an 'example scoring matrix'. These can be used alongside the <u>Guidelines for Ecological Impact Assessment in the UK and Ireland</u> , the emerging <u>Natural England Biodiversity Metric 2.0</u> and the draft BS 8683 Process for Designing and Implementing Biodiversity Net Gain – Specification.
<u>Great Crested Newt (GCN) District Licensing</u>	Ongoing project delivered by Natural England	Modelling by Natural England underpins this strategic risk-based approach to authorising development affecting GCN. District level licensing schemes operate in certain parts of England to better protect great crested newt populations, operated by either Natural England, a Local Planning Authority (LPA) or a third party on behalf of the LPA. Red zones contain key populations, Amber Zones show main population centres. Green zones (where GCN are sparsely distributed) encompass the remainder of the study area.

Document / Project	Status	What does it cover?
<u>Gog Magogs Countryside Project</u>	Ongoing – recognised within the <u>Cambridgeshire Green Infrastructure Strategy</u>	Project to create over 600ha of publicly accessible greenspace on the chalk south east of Cambridge from Great Shelford and Stapleford to Cherry Hinton and Fulbourn. The scheme connects and safeguards five SSSIs, three CWS and three PRVs all designated for chalk grassland habitats and species. Serving the south and eastern half of the city as well as adjacent villages, this is one of two major ecological networks recognised in the Cambridgeshire Green Infrastructure Strategy 2011.
<u>West Cambridgeshire Hundreds</u>	Landowner-led project partnership between the Wildlife Trust, the Farming and Wildlife Advisory Group East, the National Trust, Natural England, the Forestry Commission, and the Woodland Trust.	Landscape scale scheme to create a viable ecological network to connect the ancient woodlands (and hedgerow network), Wimpole Park and other historic parks, and species-rich grasslands in south-west Cambridgeshire. A landowner-led project partnership, and second of the two major ecological networks recognised in the Cambridgeshire Green Infrastructure Strategy 2011.
East Anglia Fens Peat Pilot	Emerging project delivered by Natural England	One of five national pilot projects to deliver the IUCN UK Peatland Strategy 2018-2040 ³² . The study area extends north from Cambridge, encompassing the Cam Washes within the East Anglian fens. The project will work with internal drainage boards to address water flows on and around the fens, providing long-term sustainability of peat management opportunities.
Cambridge Landscapes – Potential Nature Recovery Network	Preliminary work shared within CPPF written response to Greater Cambridge Local Plan Issues & Options February 2020	Partnership project including the Wildlife Trusts, CPPF and others, the landscape scale network includes five priority areas within a 10km radius of Cambridge as part of the network: <ul style="list-style-type: none"> • Gog Magog Hills • Cambridge Fens

³² International Union for the Conservation of Nature (IUCN) (2018) UK Peatland Strategy 2018-2040

Document / Project	Status	What does it cover?
		<ul style="list-style-type: none"> • Wicken Fen Vision South • River Cam Corridor • Boulder Clay & Woodlands (extending out toward the West Cambridge Hundreds). <p>In addition, the Fen-edge Orchards & Drovers opportunity area (15km² north west of Cambridge) is under consideration.</p>
<u>Environmental Stewardship (ES)</u> and <u>Countryside Stewardship (CS)</u>	ES Handbooks published by DEFRA in 2013 and the CS Manuals in 2020	<p>ES options HQ3 to HQ7 and CS option WT7 relate to the management and creation of fen and reedbed habitats. These were used to augment the dataset on peatland and wetland habitats.</p> <p>It is anticipated that Stewardship options will transition to the results-based payments system of ELMS in 2024.</p>

Theme 3: The water environment

Document / project	Status	What does it cover?
Water Cycle Study and Strategic Flood Risk Assessment (SFRA)	Emerging	Provides an evidence base detailing the interaction between the GI network and river catchments. The document also delivers information relating to surface water flooding issues with the aim of maximising opportunities for natural flood risk management, improving water quality, protecting water resources and enhancing biodiversity.
<u>Anglian River Basin District River Basin Management Plan</u>	Published by the Environment Agency in 2015	Delivered with the purpose of providing a framework for protecting and enhancing the benefits provided by the water environment, the document details a programme of measures to achieve statutory objectives. The river basin management plan also includes detail on water quality, with the aim of informing future decisions related with land-use planning.
<u>West Cambridgeshire Hundreds</u>	Landowner-led project partnership between the Wildlife Trust, the	Landscape scale scheme to create a viable ecological network to connect the ancient woodlands (and hedgerow network), Wimpole Park and other historic

Document / project	Status	What does it cover?
	Farming and Wildlife Advisory Group East, the National Trust, Natural England, the Forestry Commission, and the Woodland Trust.	parks, and species-rich grasslands in south-west Cambridgeshire. Scheme also includes restoration of the Bourn Brook.
Water Ambition Project: Cam & Ely Ouse (CamEO) and Broadlands catchments (East Anglia)	Project established in 2012 by the Norfolk Rivers Trust, in collaboration with Coca-Cola and Tesco.	A project which aims to reduce agricultural pollution and improve water quality through the adoption of sustainable water sensitive agricultural practices by local farmers. The scheme covers Coca-Cola's key sourcing locations and supply chains in terms of sugar beet, resulting in the replenishment of over 280 million litres of water.
<u>Cambridgeshire Green Infrastructure Strategy</u>	Published by the Cambridgeshire Green Infrastructure Forum in 2011	Highlights opportunities for improving landscapes, enhancing biodiversity, enjoying heritage and getting out into the countryside. Considers broader types of open space than the open space study, including land supporting biodiversity, and access to the countryside.

Theme 4: Access and connectivity

Document / Project	Status	What does it cover?
<u>Cambridgeshire and Peterborough Local Transport Plan</u>	Adopted in 2020 by all contributing Councils including Cambridge City Council and South Cambridgeshire District Council	Describes how transport interventions can be used to address current and future challenges and opportunities. Includes policies and strategies to secure growth and ensure planned large-scale development take place sustainably.
<u>The Transport Strategy for Cambridge and</u>	Published by Cambridgeshire County Council in 2014	Provides a detailed policy framework and programme of schemes for the area, addressing current problems consistent with the policies of the Cambridgeshire Local Transport Plan. The document supports the existing Local Plans and takes

Document / Project	Status	What does it cover?
<u>South Cambridgeshire: Transport Strategy and High Level Programme</u>		account of committed and predicted levels of growth, detailing the transport infrastructure and services necessary to deliver this development within the county.
<u>Greater Cambridge Local Plan - Habitats Regulations Assessment (HRA) Scoping Report</u>	Published by South Cambridgeshire District Council in 2019	This Scoping document has been produced to provide guidance on the development of the Greater Cambridge Local Plan in the context of European sites, providing a reference point for stakeholders wishing to comment on the proposals. The report identifies which European sites have the potential to be affected by the Greater Cambridge Local Plan, evidence key information on these sites and outline the pathways by which they could be affected.
<u>Making Space for People Supplementary Planning Document - (SPD) Baseline Report</u>	Funded by the Greater Cambridge Partnership, the document was prepared on behalf of Cambridge City Council in 2019	Provides contextual information on the current transport system and outlines a series of guiding principles to inform the development of the city's spaces and movement patterns. The report identifies best practice and supports the establishment of a comprehensive strategy for movement through the protection and enhancement of the existing environment.
<u>Cambridgeshire Rights of Way Improvement Plan Update</u>	Published by Cambridgeshire County Council in 2016	The document aims to promote the PRoW network as an integral component of the wider transport system and details how active transport networks are functioning. The report also provides a Statement of Action, which sets out how the local PRoW network will be managed and improved as part of an ongoing strategy.
<u>Partnering for Prosperity: A New Deal for the Cambridge-Milton Keynes-Oxford Arc</u>	Published by the National Infrastructure Commission in 2017	Outlines options for maximising the potential of the Cambridge-Milton Keynes-Oxford arc as a connected cluster whilst protecting the area's high quality environment and securing the homes for the future. The document articulates a clear spatial vision for the arc over the next 50 years, informed by physical, economic and social development.
<u>Greater Cambridge Partnership – transport schemes</u>		Forming a partnership between Cambridge City Council, Cambridgeshire County Council, South Cambridgeshire District Council and the University of Cambridge; the scheme provides a delivery body for a City Deal with central Government. The

Document / Project	Status	What does it cover?
		overarching aim of the partnership is to support the continued growth and of Greater Cambridge and improve the quality of life of people, now and in the future.

Theme 5: Recreation and play

Document	Status	What does it cover?
<u>Analysis of Accessible Natural Greenspace Provision for Cambridgeshire and Peterborough</u>	Published by Natural England in 2011	A document providing analysis of accessible natural greenspace provision and deficiencies in Cambridgeshire and Peterborough. The report supports the evidence base for green infrastructure planning and aims to inform the identification of future GI opportunities.
<u>Cambridge City Council Open Space and Recreation Strategy</u>	Published by Cambridge City Council in 2011	The strategy outlines a vision for the provision, improvement and maintenance of a framework of diverse and high value open spaces which are accessible to all and enhance the special character of Cambridge. Forming a material consideration in decision-making, the document informs the planning process on the loss of any open space and offers guiding principles for future provision.
<u>South Cambridgeshire Recreation and Open Space Study</u>	Published by South Cambridgeshire District Council in 2013	The report evaluates the current quantity and quality of green space provision and assesses how effectively this is meeting local need. The evidence collected also identifies the settlements within South Cambridgeshire which are deficient in open space, informing future decision-making relating to proposed improvements by both the District Council and Parish Councils.
<u>Cambridgeshire Green Infrastructure Strategy</u>	Published by the Cambridgeshire Green Infrastructure Forum in 2011	Highlights opportunities for improving landscapes, enhancing biodiversity, enjoying heritage and getting out into the countryside. Considers broader types of open space than the open space study, including land supporting biodiversity, and access to the countryside.
<u>Making Space for People</u>	Funded by the Greater Cambridge Partnership,	Provides contextual information on the current transport system and outlines a series of guiding principles to inform the development of the city's spaces and

Document	Status	What does it cover?
<u>Supplementary Planning Document - (SPD) Baseline Report</u>	the document was prepared on behalf of Cambridge City Council in 2019	movement patterns. The report identifies best practice and supports the establishment of a comprehensive strategy for movement through the protection and enhancement of the existing environment.
<u>Cambridgeshire Future Parks Accelerator (FPA)</u>	Ongoing project (funding awarded 2019)	National project set to receive £700,000 funding to secure the future of the county's parks and green spaces. Data on publicly accessible open space; mapping and valuing existing and potential green space; stakeholder consultation and engagement; funding opportunities and models; governance arrangements and partnerships.
<u>Greater Cambridge Local Plan - Habitats Regulations Assessment (HRA) Scoping Report</u>	Published by South Cambridgeshire District Council in 2019	This Scoping document has been produced to provide guidance on the development of the Greater Cambridge Local Plan in the context of European sites, providing a reference point for stakeholders wishing to comment on the proposals. The report outlines information on recreational pressures and identifies which European sites have the potential to be affected by the Greater Cambridge Local Plan and the pathways by which they could be affected.

Theme 6: Carbon sequestration

Document	Status	What does it cover?
The Cambridgeshire & Peterborough Independent Climate Change Commission	Emerging	Highlights the need for the GI strategy to support any nature-based solutions to achieving net zero and, in particular the role of rewetting peat and tree planting to marry up with the net zero strategy.
Regional Report for East of England / Cambridge	Published by Tyndall Centre (2020)	Local carbon budget calculated in 5yr increments to identify the 'fair' contribution of Cambridge to delivering the global target of 'well below 2°C and pursuing 1.5°C' (UN Paris Agreement, 2016).

Document	Status	What does it cover?
		The Tyndall budget concludes that Cambridge will need to achieve average mitigation rates of CO ₂ from energy of around -12.6% per year, from 2020 onward, to stay within the recommended carbon budget.
<u>UK Peatland Strategy 2018-2040</u>	Published by IUCN Peatland Programme in 2018	Identifies the trajectory to reinstate functional peatlands across the UK. To this end, the East Anglia Fens Peat Pilot Project will work with internal drainage boards to address water flows on and around the fens, and long-term sustainability of peat management opportunities. In support, the Lowland Agricultural Peat Taskforce was established in 2019.
<u>England's Peatlands: Carbon storage and greenhouse gases</u>	Published by Natural England Report NE257 (2010)	Describes the extent and current condition of England's peatlands. Estimates the amount of carbon stored therein, lost from, and assesses the potential carbon savings that widespread restoration could deliver. Incentives, beyond the current policy framework, for sensitive management of peat in East Anglia focus on good agricultural practices as well as the Wetland Vision (2008).
<u>Fens for the Future Strategy: A Proposal for an Enhanced Ecological Network</u>	Published by Fens for the Future Partnership, Final Report (2012)	A partnership of central and local Government bodies, university research, nature conservation charities, landowners and land managers focussed through East Anglia, with the vision " <i>to see the fens become sustainable and resilient to climate changes for the benefit of people, our natural and historic heritage and the rural economy</i> ". The landscape-scale project includes a number of restoration and reconnection successes. Those closest to the study site include Chippenham and Wicken Fens.
<u>The Great Fen Masterplan 2012</u>	In progress Bedfordshire, Cambridgeshire, Northamptonshire Wildlife Trust	The Great Fen project has seen an increase in the area of wet grassland and washland. Recent concerted efforts to re-wet areas have been successful with areas of wet grassland and washland increasing and new reedbed and fen areas being created. The other major wetland restoration schemes, some of which are as extensive as the Great Fen, are: Wicken Vision, Lakenheath Fen, Wissey Wetlands, South Lincolnshire Fens (Baston & Thurlby) and Kingfishers Bridge. The RSPB Nene and Ouse Washes are major areas of grazing flood plain.
<u>Water Works Wet Farming Project</u>	In progress April 2019 - April 2021	Water Works is a 2 year partnership project innovating and testing sustainable management of fenland resources. Wet farming trials are underway to test innovative crops, such as sphagnum moss and bulrush (for food, healthcare and

Document	Status	What does it cover?
	Bedfordshire, Cambridgeshire, Northamptonshire Wildlife Trust	industry), and to store carbon. As part of a biosphere (see below), farming practices will be refined, tested and shared with local farmers, food producers and landowners.
<u>Proposed UNESCO Fens Biosphere</u>	Emerging	In parallel with the Water Works Project (see above) the Biosphere will give global recognition to a unique and valuable area. Central to the vision is the concept that Biospheres, much like GI, connect people, economies and nature to create a secure future. Opportunities should respect the local character and international importance of the fens and serve to extend the habitat network into the wider landscape. Opportunities should connect to parallel ambitious reconnection projects, such as at the Nene Washes. The site forms a flood storage reservoir on the River Nene, managed by the RSPB.
<u>Environmental Stewardship (ES) and Countryside Stewardship (CS)</u>	ES Handbooks published by DEFRA in 2013 and the CS Manuals in 2020	ES options HQ3 to HQ7 and CS option WT7 relate to the management and creation of fen and reedbed habitats. These were used to augment the dataset on peatland and wetland habitats. It is anticipated that Stewardship options will transition to the results-based payments system of ELMS in 2024.
<u>Cambridge City Council Citywide Tree Strategy (2016-2026).</u>	Part 1: Tree protection and enhancement policies. Draft report published by Cambridge City Council	Information on tree protection, enhancement, policies and action plan. May reference GI within it. "The Council will work to ensure a resilient tree population that respects Cambridge's unique character, responds to climate change and urban expansion and underpins the health, liveability and well-being of the City and its inhabitants by taking an integrated approach to the management of the City's trees, regardless of ownership."
Cambridge Tree Canopy Project	Emerging	Provide spatial information on where tree canopy gaps are. GI work can identify where increasing canopy will deliver most benefits or people, carbon sequestration and nature.

Theme 7: Agriculture and community food growing

Document / Project	Status	What does it cover?
<u>Sustainability Appraisal Scoping Report</u>	Published by South Cambridgeshire District Council and Cambridge City Council in 2019	The document assesses the potential impacts of the joint Local Plan on social, economic and environmental issues through the process of Sustainability Appraisal (SA) (incorporating Strategic Environmental Assessment (SEA), Health Impact Assessment and (HIA) and Equalities Impact Assessment (EqIA). The existing Local Plans, which will be replaced by the Greater Cambridge Local Plan, were both adopted in 2018 and set out development needs for each area up to 2031.
<u>Cambridge City Council Open Space and Recreation Strategy</u>	Published by Cambridge City Council in 2011	The strategy outlines a vision for the provision, improvement and maintenance of a framework of diverse and high value open spaces which are accessible to all and enhance the special character of Cambridge. Forming a material consideration in decision-making, the document informs the planning process on the loss of any open space and offers guiding principles for future provision.
<u>South Cambridgeshire Recreation and Open Space Study</u>	Published by South Cambridgeshire District Council in 2013	The report evaluates the current quantity and quality of green space provision and assesses how effectively this is meeting local need. The evidence collected also identifies the settlements within South Cambridgeshire which are deficient in open space, informing future decision-making relating to proposed improvements by both the District Council and Parish Councils.
<u>Cambridgeshire Green Infrastructure Strategy</u>	Published by the Cambridgeshire Green Infrastructure Forum in 2011	Highlights opportunities for improving landscapes, enhancing biodiversity, enjoying heritage and getting out into the countryside. Considers broader types of open space than the open space study, including land supporting biodiversity, and access to the countryside.
West Cambridgeshire Hundreds	Landowner-led project partnership between the Wildlife Trust, the Farming and Wildlife Advisory Group East, the National Trust, Natural England, the	Landscape scale scheme to create a viable ecological network to connect the ancient woodlands (and hedgerow network), Wimpole Park and other historic parks, and species-rich grasslands in south-west Cambridgeshire. Scheme also includes restoration of the Bourn Brook.

Document / Project	Status	What does it cover?
	Forestry Commission, and the Woodland Trust.	

Appendix 3: Consultation

GI online survey

Responses were received from:

- Sport England
- The Wildlife Trust BCN
- Campaign to Protect Rural England (CPRE) Cambridgeshire and Peterborough
- Woodland Trust
- Environment Agency
- British Horse Society
- Anglian Water
- Forestry Commission
- Historic England
- Natural England
- RSPB
- Botanical Society of Britain & Ireland (BSBI)
- Parish councils: Foxton, Gamlingay, Longstowe, Cottenham, Bassingbourn-cum-Kneesworth, West Wickham, Waterbeach, Arrington, Elsworth, Bartlow, Duxford, Barton, Horseheath, Little Abington, Oakington & Westwick, and Parishes Committee.
- Neighbouring authorities/councils: Central Bedfordshire Council, Cambridgeshire County Council, Hertfordshire County Council, Transport Assessment Team Cambridgeshire County Council, Cambridge City Council.
- Cambridgeshire ACRE
- Hobson's Conduit Trust
- Cam Valley Forum
- Cambridge Sport Lakes Trust
- The Federation of Cambridge Residents Associations (FeCRA)
- Member of Millington Road Residents' Association
- Windsor Road Residents' Association
- Christ's Pieces Residents' Association
- ACRA, Accordia Community Residents' Association
- Trumpington Residents' Association
- North Newnham Residents' Association
- Windsor Road Residents' Association
- Hills Road Area Residents Association
- QEW Residents' Association
- Friends of Midsummer Common
- Friends of Queens Green.
- Friends of the Histon Road Cemetery
- Friends of Cherry Hinton Brook
- Nightingale Gardeners
- Cambridgeshire Local Access Forum
- Magog Trust
- 2G3S (Green Groups in the Shelfords, Stapleford & Sawston)
- Fulbourn Forum for community action
- Abbey People Community
- Kingswood Community Group
- Greener Sawston

- Barton and District Bridleways Group
- Swavesey and District Bridleways Association
- Members of the public

The table below organises the online survey feedback into issues and opportunities within each theme for the purposes of informing the identification of key issues and key opportunities. Feedback has been lifted directly from the survey. Feedback not specific to a theme has been included at the end.

Theme 1: Landscape, cultural heritage and sense of place

Issues

- Cambridge's medieval urban spaces: The Backs, Sheeps Green, Lammas Land, Coe Fen, Grantchester Meadows, and ancient Ditton Meadows and style of rural footpaths and small bridges are equivalent to the best art that is in the Fitzwilliam Museum.
- Development is eroding the areas of best landscape, from the south-east to south side of the city and in particular the views and chalk downland round the Gogs and the green space between the Biomedical Campus and Nine Wells Nature Reserve.
- Development is eroding the landscape and views on the west – Coton Corridor.
- Drought and groundwater issues impact on green space assets: the leafiness of trees, hedges, verges. Mature trees are dying and newly planted trees not thriving.
- Safeguard rural style of paths by local allotments e.g. Glebe Road by the allotments and path by Rock Road Allotments and by Vicar's Brook allotments as attractive assets for pedestrian use.
- Mill Road Cemetery (3.9ha) key asset – grade II listed – access been improved to the site but major problem with desire paths, and the lack of a formal path at the Gwydir Street gate. Also enhance wildflower species on site.
- Historic environment: Conservation and enhancement of the natural environment is an important facet of sustainable development. There is an important synergy between the historic and natural environment. Countryside, landscape parks and the open spaces in our cities, towns and villages often have heritage interest, and it would be helpful to highlight this. Make reference in the text to the role GI can have to play in enhancing and conserving the historic environment. It can be used to improve the condition and setting of heritage assets and to improve access to them. Likewise the historic environment can help contribute to the quality, character and distinctiveness of green spaces by helping to create a sense of place and a tangible link with local history. Opportunities can be taken to link new GI networks into already existing green spaces in town or existing historic spaces such as church yards to improve setting of historic buildings/townscape.
- Recreational pressures on heritage assets e.g. Wimpole and Anglesey Abbey, often compounded by not only population growth but also areas with deficit of accessible green space in the surrounding landscape.
- There is need for a LCA and Historic Landscape Characterisation for the county to inform the decisions regarding development in the area. GI study to then draw synergies with these outputs.

Opportunities

- Adopt a public realm strategy that is tailored to Cambridge “rural style”- of natural open spaces. This needs to be incorporated into management plans for green stewardship that make it clear that green space areas have been left wild by design – dandelions along the Backs, cow parsley on Fen Causeway
- Historic Environment Strategy as required in the National Planning Policy Framework to ensure the city retains the essential character of our streets, public spaces and green infrastructure. List views, green streetscapes, paths and walks.
- Protection (or TPOs) of currently unprotected tree-lined ways e.g. in Barnwell that offer valued grand trees, benefits for people, micro-climate, habitat for wildlife and corridors between green spaces. Plus replace any lost trees, in collaboration with communities.
- Maintain and enhance the historic / landscape assets (the Commons, gardens, cemeteries, green corridors, wedges and fingers as well as the Green Belt provide an important component of the landscape setting of the historic city. College gardens as well as Histon Road and Mill Road cemeteries, are designated as heritage assets in their own rights. Cows grazing in the meadows close to the city centre, the iconic views of The Backs, the Commons and meadows all play a crucial role and form part of the character of this historic city.)

Theme 2: Biodiversity and geodiversity:

Issues

- Retention of Nine Wells Nature Reserve
- Only 1 Ecology officer in South Cambridgeshire – involved heavily with planning enquiries
- Nine Wells nature reserve is, arguably, the most valuable and interesting nature reserve near Cambridge, not just for its geology and history, but also for the invertebrates that live, precariously, in its clear, cool waters. It is a lovely bosky enclave in an area that offers few such delights. It deserves to be celebrated, treasured and protected. – development, housing, jobs and Cambridge South station will put pressure on this small site so it needs to be buffered.
- City verges and open spaces. Pesticide use on and the mowing impact on city verges and open spaces needs addressing. Verges full of cow parsley were blitzed this summer by Cambridge City council contractors working for Cambridge County Council. There needs to be a policy to protect these valuable green assets.
- Many of the more natural sites including nature reserves and SSSIs are being over-run by people using them as greenspaces to the detriment of the habitats and species. Results from lack of strategic greenspace locally and the decades of under-investment as Cambridge has grown rapidly.
- SSSIs being used for daily dog walking with increased trampling, nutrient enrichment and disturbance to wildlife with reduced breeding populations.
- Fenland Basin. Large areas of cultivated land with little or no natural habitat.
- Cumulative and in-combination visitor impacts on sites such as the Cam Washes SSSI need proper consideration. Examples of where this has not obviously happened is the Waterbeach New Town SPD/SEA and planning applications.

- Invasive species may out-compete indigenous ones, especially in a changing climate.
- Areas drained by IDBs don't offer much wildlife or amenity value, and can be 'cut off' from access. Drains often don't form logical biodiversity connections or transport/navigation links.
- Wetland sites may be at risk from inadequate surface water flows, from the impacts of climate change on rainfall levels, but also the potential for increased groundwater abstraction for public water supply (from increased housing). RSPB Fowlmere is already suffering from, and at further future risk from low surface water flows, which threaten its nature and visitor values. Fen Drayton Lakes is prone to winter flooding, which may increase in severity/duration in future – although this can be mitigated through improved and appropriate visitor infrastructure.
- Stourbridge Common and the meadows adjacent to Fen Ditton need to be protected.
- Cambridge North Station/Chesterton Sidings. This is a very important brownfield site, but is being developed without thought about the impact on biodiversity. Substantial areas need to be retained and maintained at a variety of successional levels to provide habitats for different species.
- Funding for the provision and maintenance of adequate visitor infrastructure is a constraint, for example at Fen Drayton Lakes. We have struggled so far to secure developer contributions from new large-scale developments (such as Northstowe) to improve accessibility. Access to initial capital outlay funds is the most difficult element to secure.

Opportunities

- Greenways: if wide enough can act as a wildlife corridor; hedging and careful planting would be beneficial for wildlife.
- Cambridge Science Park. There is a range of different habitats on the site and in particular, there are some important Breckland like areas. In general, the site is currently managed to be neat and tidy with frequent grass cutting of most areas. There is a quick win to be had for biodiversity by varying the frequency of cutting to allow a range of different sward heights. In many areas a longer sward height would also look better as it wouldn't become so parched and desiccated during droughts.
- Ensure that the City's Local Nature Reserves (LNRs) are managed to high standards to protect and enhance their biodiversity and landscape. The LNRs are: Barnwell East, Barnwell West, Bramblefields, Byron's Pool, Coldham's Common, Logan's Meadow, Nine Wells, Paradise, Sheep's Green and Coe Fen, Stourbridge Common, and West Pit.
- Establish green roofs on all new buildings to increase biodiversity, absorb carbon dioxide and attenuate rainfall.
- Build Sustainable Urban Drainage Systems (SUDS) into future developments wherever possible to attenuate run-off. New retention ponds should be as natural as possible to provide opportunities for wildlife. SUDS should be retrofitted to recent major developments that lack them, wherever possible (e.g. the St Andrews Park Estate, Chesterton, built in 2003).
- Build rainwater harvesting systems and greywater recycling systems into future developments wherever possible (e.g. as done at the Eddington development).
- Include nest bricks for Swifts, House sparrows and Starlings in new buildings. Swift nest bricks were included in a new development at Fulbourn but not at Trumpington, a missed opportunity.

- Ensure a higher ratio of greenspace to built development in new developments. Sealing of surfaces should be minimised wherever possible.
- Ensure a higher proportion of houses with gardens in new developments. The Covid-19 crisis has highlighted the value of private gardens (even if only small) to the mental and physical health of people. They are important for local biodiversity, absorb rainfall (rather than sending it into surface water drains) and cool the atmosphere by absorbing heat from hard surfaces. Shrubs and trees absorb carbon dioxide, filter out pollutants, reduce noise levels, and provide shade.
- Encourage hedgehogs by requiring new developments to enable their free movement between gardens and encourage homeowners to create gaps in the bottom of their fences to help them.
- Use native flowers and shrubs in roadside planting (e.g. along Green End Road in Chesterton, in place of failed exotics).
- Assess the scope to improve biodiversity around sports grounds and buildings. While sports turf itself needs to be managed to meet the demands of the players the surrounding grounds could be managed much less intensively (without herbicides, with reduced cutting regimes), saving money and reducing the carbon footprint and providing opportunities to create more diverse grassland habitats for wildlife (e.g. by reintroducing meadow species from local seed sources if any).
- Actively seek out the remaining colonies of scarce plants in Cambridge and propagate them for reintroduction to suitable habitats.
- Diversify the farmed landscape by recreating lowland meadows and pastures lost through land drainage, built development close to the river in urban settings, and the specialisation and intensification of agriculture. Some far-thinking land managers have redressed the balance through imaginative projects, and these should be encouraged through Environmental Land Management schemes. For example, the Trumpington Farm Company have transformed arable land adjoining part of the upper river north of Grantchester into a wetland nature reserve.
- Restore the ecological health of farmland. Intensive arable farming, involving a switch to winter rather than spring crops, the loss of fallows, reduced use of organic manures, and herbicides and insecticides, has depleted soil organic matter, soil carbon, and populations of microorganisms, and invertebrates, with knock on effects on farmland birds (e.g. rooks, lapwings, skylarks, cuckoos) and insects (e.g. butterflies and pollinators). This will require significant changes in farming practice, with a stronger emphasis on protecting and enhancing natural capital. This should also be encouraged through Environmental Land Management projects.
- Strategic Gogs Green Belt farmland with views of the city - if not to be developed this area could be part of a longer term plan to create a beautiful green wildflower meadows corridor, all the way from the heart of Cambridge up to Magog Down. Such a strategy would preserve the views and green spaces of this beautiful Cambridge city approach, one of the few places where Cambridge children can toboggan, as a breath of fresh. It would also enhance people's experience of nature next to Addenbrookes Hospital and would correlate with the Hobsons Conduit Trust's plans for an enlarged Nine Wells Nature Reserve.
- Need a policy to recognise the value of Cambridge city gardens to people and wildlife.

- Proposal for Nine Wells enlarged Nature Reserve Area and Gog Magog Hills chalk downland Wildflower Meadows.
- Protection and enhancement, with possible extension, of the Nine Wells Local Nature Reserve. Opportunities for achieving some of this through mitigation measures may arise from currently proposed transport infrastructure projects close to Nine Wells: Cambridge South station (Network Rail), Cambridge SE Transport Project (GCP) and East West Rail link. Also from the approved extension of the Cambridge Biomedical Campus into South Cambridgeshire, which comes very close to Nine Wells.
- The network of ditches, drains and watercourses, including the river Cam, support important populations of water vole and otter, both protected species. Water vole populations have declined nationally in recent years, with the fenland area providing a potential stronghold for the species. Joining-up existing areas of habitat, creating large areas of continuous suitable habitat, will help to support resilient water vole populations.
- Lack of funding – BNG offers potential to fill gaps in public and private investment. It also makes collective responsibility and partnership more likely to mobilise action.
- Connectivity of habitats for wildlife resilience and continuous access is vital for both people and wildlife. Rivers provide the best opportunity for this, as they are naturally there, are rich with wildlife and link to other habitats. Rivers have missed out on national and local ecological designations for purely historical and arguably regrettable reasons. Further designations, if only local, would be a start, along with linking up with Huntingdonshire DC (and Cambridgeshire CC as Minerals Planning Authority) to designate the Great Ouse Valley as being of regional or national significance.
- RSPB Fen Drayton Lakes and Ouse Fen Reserves need intervention. The Great Ouse Valley holds great potential for the provision of further and improved green infrastructure, providing local recreation and educational opportunities to communities in Greater Cambridge. We calculate that with suitable investment, our Reserves at Fen Drayton and Ouse Fen could accommodate in excess of 80,000 visitors a year. They will provide opportunities for families, walkers, cyclists and nature lovers with easy access from Cambridge and its hinterland.
- Woodlands need protection zones around them to prevent urban encroachment and control levels of impact from residents and visitors – e.g. around Gamlingay Parish to conform with Parish tree strategy.
- Opportunity for designation of protected road verges if appropriate species found.
- Creating a sequence of new woodlands and grasslands linked to the new growth areas. Need to safeguard Cambs high quality farmland, but new GI to integrate development can deliver a connected landscape through to the River Ouse to the west.
- Create more B lines linked to new transport corridors.
- Cherry Hinton Brook – several city wildlife sites (sites 11, 48, 17, 40, 18) and protected open spaces in this area. Proposed for development of new urban country park in Policy 16 of 2018 Local Plan.

Theme 3: The water environment

Issues

- Hobson's Brook between Nine Wells and Cambridge city centre needs intervention.

- Water abstraction and reduced flows (Cam Valley Forum want substantial change, look at [Let it Flow report](#)) - Reduced flows put water habitats and fisheries under stress and at times lead to local extinctions and long-term habitat damage. Reduced flows also reduce the dilution of treated sewage discharges and of nutrients in urban and rural run-off.
- Cam and chalk stream abstraction and sewage pollution
- Flooding of cycle ways and roads – from pressure on old sewers and loss of green spaces and verges.
- Prolonged dry weather/drought events result in lower water levels, rivers can run dry, or if flowing at reduced volumes will result in more concentrated level of fertiliser/nutrients/pesticides etc. that have greater deleterious effects than would otherwise be seen if they were able to be more diluted by a greater volume of water.
- Development pressures - Increased pressure and increased risk of deterioration in the quality of river water and river ecosystems.
- Problems need to be tackled at source by changing the ways in which water is taken from the Chalk aquifer, and bringing in supplies from elsewhere. While water abstraction is largely a matter under the control of central Government, the water industry and its regulators, how it is managed is highly relevant to the future health of our local environment. The Cam is an iconic river and, with its tributaries, merits greater protection and enhancement.

Opportunities

- Improvements needed on green corridor which extends from the Lime Kiln nature reserve, through Cherry Hinton Hall, along Cherry Hinton Brook (which needs considerable restoration work and improved water flow) and the adjacent lakes (major effort needed to determine how best to use these long-term) through to Coldhams Common and then across Newmarket Rd (new opportunity with installation of Chisholm Trail) and out to Ditton Meadows and the Cam.
- Cam Valley Forum: recommendation to establish a clear focus on river corridors. We'd like opportunities for environmental improvement to be sought within the area 50 metres each side of the rivers, streams and brooks within Greater Cambridge. These corridors should be formally defined and recognised as opportunity areas within the Local Plan, in the Cambridge Biodiversity Action Plan, and in the estate management strategies of the Colleges and other businesses that own land within them.
- River Cam Landscape strategy needed recognising the value of the river and its chalk streams to people and wildlife; the importance in that of river group and community stewardship, plus a regulatory framework that is enforced.
- Cherry Hinton Brook (chalk stream) vital green corridor, rare status as a chalk stream and has important wildlife such as the Water Vole.
- Hobson's Brook corridor can be improved by various actions as outlined in the document "Hobson's and Vicar's Brook Corridor 10-year Vision" approved by the City Council in 2017. These include:
- Nine Wells to railway culvert. Maintain flag iris stands and meandering watercourse. Manage hedge to prevent over shading of Brook.
- Railway culvert to Addenbrookes Road. Introduce a two stage channel, reducing width to 700mm in base for dry weather flow and allow for overall width and flow conveyance for

flood risk management. Raise section of bed level to increase flow. Increase buffer between farming and Brook. Introduce off line reed stands on wet ledge. Potential to introduce opportunities for nesting Kingfisher.

- Addenbrookes Road to Guided Bus Crossing. Introduce scalloped bank profile and reduce dry flow channel width. Manage a channel through the Phragmites stands. Install strategic natural log flow deflectors to create and maintain a two stage meandering channel.
- Guided Bus to Long Road. Introduce a scalloped woodland edge. Possible two stage channel in places. Remove sections of woodland on eastern bank and open up. Reduce and maintain height of brook side hedge to 1.5m.
- Long Road to Porson Road. Remove the majority of the scrub on the eastern bank, reduce tree cover and crown lift to introduce more light into Brook. Create and maintain willow pollards. Introduce gravels to enhance existing fast flowing sections over submerged root plates.
- Porson Road bridge area. Formalise bank and ramp down into Brook. Add gravels and make more of a formal area and to promote opportunities for spawning minnow and aquatic invertebrates. Coppice edge of Clare Wood to increase light to the channel.
- Brick bridge to Memorial Bridge. Reduce tree cover and pollard willows, scrub removal to increase light to watercourse. Narrow channel in places through Introduction of large site won woody debris into brook.
- Memorial Bridge to Brooklands Avenue. Remove silt and lower bed level. Narrow channel by reinforcing and repairing bank that is leaking into allotments. Continue soft engineering with chestnut stakes and pre-planted coir roll.
- Whole brook. Annual monitoring and control of invasive species, including Azola, Crassula and Himalayan Balsam and Nuttells Pond weed. Scalloping vegetation and underlying silt to create meanders. Complete rotational pollarding of existing willows and plant new pollards from appropriately sourced cuttings or native stock. Rotational cutting of bankside vegetation.
- Proposals for Riverscape Opportunity Areas. need to enhance GI in 'river corridors', opps should be sought within corridors that extend at least 50 metres each side of the main rivers, streams and brooks. These corridors should be formally defined and recognised as 'Riverscape Opportunity Areas' (or 'River Corridor' instead of 'Riverscape' if you prefer) in the Local Plan, in local BAPs, and in the estate management strategies of the Colleges and other businesses that own land within them. These should be priority areas in targeting the new ELMS too.
- Reconnect Cam Valley floodplain / riverside commons more fully with the river, e.g. by creating new inlets, ponds and ditches. The network of ditches, drains and watercourses, including the river Cam, support important populations of water vole and otter, both protected species. Water vole populations have declined nationally in recent years, with the fenland area providing a potential stronghold for the species. Joining-up existing areas of habitat, creating large areas of continuous suitable habitat, will help to support resilient water vole populations.
- West- West Fields and Bin Brook waterway routes.
- Development of strategic water storage reservoirs as a means to reduce abstraction from the chalk aquifer, surface water courses and sustain agriculture.

- Opportunities for influencing the development of wetlands downstream of sewage treatment works in order to help reduce phosphate levels in watercourses.
- Further mandating of infiltration SuDS such that water is retained in the ground rather than lost to the sea via systems that, due to sea level rise, are likely to be mostly pumped out rather than drainage to sea by gravity in circa 30 years' time. These Suds can provide 'micro-green infrastructure' and pathways/corridors to wider GI through swales etc. However, swales are only commonly used along 'major arteries' in development sites, whereas these could become features in all streets.
- Streams, lakes and watercourses - particularly floodplain should be made accessible to residents for walking and cycling, and for amenity space, subject to balancing nature conservation and enhancement initiatives.
- Anglian Water - wish to continue to be involved in this project as we are keen to work with other bodies in relation to biodiversity enhancement. For example in relation to requirement to demonstrate BNG as part of development proposals. We would be keen to explore how this would be managed both on and off site and the role of businesses as well as environmental bodies in its delivery.

Theme 4: Access and connectivity

Issues

- Cambridge Autonomous Metro is threat to landscape in which villages sit; the route is an axe between villages and the natural ridgeline and may pave the way to further building. If it goes ahead, there must be green infrastructure compensation in the form of green spaces and wildlife corridors; because agricultural land isn't public access, there is the opportunity for the quality of green infrastructure to go down but the quantity to go up.
- Issues with development and busway plans on Green Belt setting, especially Gogs Hills.
- PROW network is thriving but vastly underfunded in terms of maintenance. The sites which provide the most value to people are those open to the most users. It is no use having individual sites which people cannot safely access. No longer in a position to provide different categories of access on the same routes; we need to provide one route suitable for as many different users as possible.
- Cherry Hinton Brook (chalk stream) is a green corridor provides green space and a vital access route for a large part of the population in this densely populated and less wealthy part of Cambridge. It is a green corridor that links the Wandlebury/Gog Magogs area with the centre of the city. Essentially a blue-green corridor due to the presence of the three large lakes, Cherry Hinton Brook, fields, hedges, road verges and some small areas of woodland. Lots of wildlife value and species dependent on habitats here.
- CAM route problematic for Gog Magog Down.
- Stapleford to Gog Magog Down path is poor: well-surfaced 3m wide path south of hedge would be better. Formal access to Drift Road (as above) could usefully incorporate alternative walking route to Magog Down and/or paths to Sawston via black shed.
- Wandlebury and Roman Road access to Stapleford is poor: above path with A1307 crossing would solve this.

- Dernford Quarry Reservoir: new permissive access road is now main access point and must be brought up to required standard. Old access road must be closed for safety of path users.
- DNA path far too narrow and poorly lit, given extraordinary number of users. East-West Rail will place further pressures on this area.
- A1307 path/Linton Greenway needs hedging, increased separation from noisy motor vehicles, and improved crossings at Abington and Hildersham.
- Sawston Greenway would be greatly improved by running from Shelford station alongside existing railway, then along old railway route to Sawston; including links to River View, Stapleford and Dernford Quarry Reservoir. Would solve many existing poor areas of route.
- Sawston/Whittlesford: local lobbying to Huawei to open up former Spicer's site.
- Stapleford to Whittlesford: no easy access by cycle. Link between Dernford and Spicer's level crossing sorely needed.
- Very little or poor access between necklace villages east to west, e.g., Sawston to Fulbourn although a future route could go along proposed high power route.
- Access between Stapleford and Whittlesford by foot is poor, by cycle non-existent. There is good potential for access around Huawei/Spicers site.
- Great Shelford has only 4 miles' worth of Rights of Way.
- There is a lack of Bridleways in the ROW network (only 15-20%) so ideally all ROW should be available to all non motorised users i.e. horse riders, cyclists and walkers. Lack of bridleway all over county but especially north of the A14 corridor.
- New transport proposals by East West rail and the Greater Cambridge Partnership (GCP) (proposed new busways and car parks). This is a real concern as several being proposed cut through important local landscapes and will cut the few ecological corridors around the city.
- Western area poorly served by public transport and have limited opportunities to cycle in safety, as roads are narrow and there is a lot of commuting traffic which makes the road environment unsafe and dangerous, for cycling to be a serious option for commuting.
- St Neots to Cambourne poorly served by GI.
- Would be good to have measures to make green infrastructure available to those who do not have cars.
- More cyclepaths and footpaths between villages, for example Over and Willingham has no cycle path, and the only footpath is not direct and not suitable for pushchairs.
- St Ives and Huntingdon areas have poor bridleway access.
- Poor bridleway access to Milton Country Park.
- 4 villages of Earith, Colne, Bluntisham & Somersham. There is no footpaths or cycle paths that offer safe access between the villages. During the lockdown many people were walking on the B105.

Opportunities

- Access to Shelford Clay Pit along White Hill Lane.
- Cambridge Autonomous Metro route problematic for Gog Magog Down.

- Stapleford to Gog Magog Down path is poor: well-surfaced 3m wide path south of hedge would be better. Formal access to Drift Road (as above) could usefully incorporate alternative walking route to Magog Down and/or paths to Sawston via black shed.
- Wandlebury and Roman Road access from Stapleford is poor: above path with A1307 crossing would solve this.
- Sawston Greenway would be greatly improved by running from Shelford station alongside existing railway, then along old railway route to Sawston; including links to River View, Stapleford and Dernford Quarry Reservoir. This would solve many existing poor areas of route.
- Sawston Greenway: must use existing and old railway route. Also, fill in missing cycle paths from Dernford to Huawei/Spicers and within Sawston.
- A1307 path/Linton Greenway needs hedging, increased separation from noisy motor vehicles, and improved crossings at Abington and Hildersham.
- Need preservation and democratisation of access particularly to college playing fields
- The Cambridgeshire Rights of Way Improvement Plan states that the bridleway network is inadequate, fragmented and in need of improvement. Every development project is an opportunity to enhance the RoW network and the available green sites and these opportunities should be grasped. Focus/priority needs to be in RoW network, not just new cycle/pedestrian routes. Cycle ways could also be bridleways, tackle issue of equestrians using busy main roads.
- DNA path needs doubling in width to match existing users.
- Cambridge Southern Fringe Area Action Plan CSF5 Countryside enhancement strategy focused on the area south of Addenbrooke's; contact County Council.
- Active travel commitments and provision must also include horse riding.
- For safety reasons more linked, safe off-road routes should be provided for multi-use purposes e.g. cycling, walking *and equestrian* alike. Especially along River Ouse public footpath which should be a public bridleway instead.
- Maintain the RoW network as well as the need to create any new access to be available to all in any new developments.
- New rights of way and continuous, enhanced access (e.g. cycleways) along watercourses would enhance the cycling (commuting and leisure) offer more than on-road cycleways. The Rivers Rhee and Bourn Brook are examples of this variable access, especially when contrasted to the River Cam.
- Opportunities need to be further developed in the outlying villages to allow residents access to green infrastructure, of a similar level to those living in proximity to Cambridge city, with careful management to ensure nature conservation is not severely impacted.
- Opps for access through woodland edge environments to link villages should be considered. Opps for circular walking and cycling routes within parishes, and between parishes to allow people the opportunity to walk and cycle more.
- Improve access to Fen Reeves Woodland.
- Areas outside the city, especially to the south and west, are largely unspoilt and relatively "green" and require very careful management to maintain their habitats as unspoilt landscape for wildlife, and as areas that visitors can enjoy and benefit from. More footpaths

and cycle tracks needed, with conservation of green areas along them, plus better access to public transport and carefully managed parking areas for visitors.

- In South Cambridgeshire improved cycle connections between villages, to the business and research parks and to the city are needed some of which are set out in the draft Local Cycling and Walking Infrastructure plan.
- Creation of green corridors providing for cyclists and pedestrians alongside any new road building or enhancement - for example work to the A10.
- Provision of high-quality cycle routes through and to new developments such as Marshall's airport.
- Separate bike and pedestrian paths: Existing cycle / pedestrian paths (1m wide) especially near the city and between green spaces needs to be separated into walkers/cyclists. Made wider, poss grass between and bollards to ensure safety of all.

Theme 5: Recreation and play

Issues

- Poor grassland management in playing fields (College playing fields - over zealous with spray - Emmanuel, Trinity Old playing field).
- Arbury, Petersfield and Romsey (North Cambridge) are the poorest areas in housing provision and in the provision of open space.
- King's hedges has limited green space.
- Flats round CB1 Station Area - no private space and residents on Great Northern Road say open space provided does not give any access to nature and strictly controlled
- Milton Country Park is frequently at capacity and has had to close the gates to restrict numbers at times. Visitor numbers have grown to a level which is unsustainable and the site needs to either grow to accommodate numbers or change its access model.
- College playing fields that used to be made available to outside bodies are being used less. These are facilities that could and should be shared more.
- Most open space sites are too crowded (except Eddington), especially Cambridge City central sites.
- Cambridge City key spaces: Coldham's Common, Stourbridge Common & Ditton Meadows. These alongside the River Cam are vital assets for people to maintain a healthy work-life balance. They have a 'wild-like feel' that is not manicured like a Park and needs to be respectfully maintained.
- Development pressures on sites e.g. Darwin Green and Castle Ward.
- Two Country Parks with car parks at Wandlebury and Milton are often full with traffic backing back.
- Thriving sites providing the most value include those managed by partners such as the Wildlife Trust. Cambridge PPF and National Trust. These provide a necklace of larger sites around the city but with poor connectivity between. The ANGSt survey done by Natural England in 2010 identified significant shortfall in natural green spaces of all sizes around the city, and especially in Foxton.

- South Cambs DC passed responsibility for green spaces to parishes years ago, and parish sites are often well managed for formal recreation and sport, but with fewer managed natural green spaces and many non-connecting public rights of way.

Opportunities

- Cambridge Sport Lakes Trust are promoting a site of 220 acres for green/blue development. This site is strategically important given the development pressures on the Northern side of Cambridge. Our proposition will provide for a 3Km+ corridor linking the North East Cambridge Development in the south to Waterbeach new town in the North. This development will double biodiversity in an area of low habitat value agricultural land and create a space for wildlife and people as well as taking the impact pressures off Milton Country Park.
- Two college playing fields (Trinity Hall and Fitzwilliam) provide green lung but there is no general public access except for limited activities (e.g. cricket in the summer). These sites should be protected from development.
- Sawston: future recreation facilities possible as part of Cambridge City Football Stadium
- Cottenham Recreation Ground facilities could be expanded to meet future demands.
- Cherry Hinton lakes could become a public park, reducing pressure/safety issues on the pits.
- Intervention needed at Wandlebury Country Park, Milton Country Park, Cambridge Commons, Cherry Hinton Hall Park.

Theme 6: Carbon sequestration

Opportunities

- Selective conversion of small underused areas of short mown grass to woodland can enhance their value in terms of biodiversity and amenity but also significantly reduce ongoing management costs: see the Woodland Trust's report "Trees or Turf" for evidence of this.
- Woodland Trust can also support tree planting by parishes and schools through our community tree packs.
- Woodland Trust is arguing that all new housing development should have at least 30% tree canopy cover, which we think is an ambitious but deliverable target.
- Parts of Cambridge City have shortages of street trees and greenspace and some parts of South Cambs are mainly agricultural land, which could benefit from inclusion of some more trees and small areas of woodland to benefit both people and wildlife but also enhance the profitability of agriculture.
- Watercourses of all sizes need trees alongside for shading the water in view of hotter, drier summers in shallower water. Trees also provide connected habitat and more inviting, legible landscapes.
- The Fen Biosphere project has enormous potential for carbon sequestration, water resource and water quality management as well as flood risk management. Natural England are best placed to advise on the progress and potential.

- With regard to planning woodland creation, whenever the Forestry Commission receives a grant application to support new woodland our team of Woodland Officers undertakes detailed checks to ensure the proposed planting area does not impact upon other priority habitats such as deep peat or features of archaeological interest. Priority is given to new woodland that extends and or links ancient woodlands such as those in Huntingdon, West Cambridgeshire Hundreds, south of the Great Fen and Grafham Water.
- The benefits derived from new woodlands need not be at the expense of taking up large areas of land; even quite narrow woodland shelter belts beside rivers has two very important functions. Firstly, they act as filters to agricultural run-off and spray drift, improving water quality, and secondly, the casting of shade keeps rivers cool, which is essential for fish populations during the increase summer temperatures associated with climate change. In addition, working in partnership with the EA, new woodlands can hold back storm water surges when targeted in the right position within a drainage network.
- Creating new woodlands on the County Farms estate will also provide additional income not only from wood fuel but also from the capture of atmospheric carbon, which can be traded as 'Carbon credits'.
- Woodland in the construction industry. Home grown timber used in construction stores atmospheric carbon literally into the fabric of the building, which is a huge advantage over the use of steel, blocks, bricks and mortar, each of which consumes large amounts of energy in their manufacture and therefore the emission of carbon dioxide. Prioritising the use of home grown timber over imported timber will be vital for sustainable development and new housing.

Theme 7: Agriculture and community food growing

Issues

- Fulbourn parish is dominated by large mono-agricultural fields, managed by intensive farming methods.
- Agricultural impact on water quality - diffuse pollution of watercourses. Run-off of fertiliser/nutrients, pesticides and sediment affecting aquatic ecosystems and contributing to failure to achieve WFD 'Good' status in many rivers. There are 8 waterbodies within Greater Cambridge where diffuse pollution from agriculture is thought to be a significant contribution to a WFD failure of the Phosphate element. Less water in future makes this risk more likely and consequential.
- Agriculture accounts for low publicly accessible GI coverage.
- Being a largely agricultural landscape, many corridors in form of hedgerows and small copses have been lost.
- Community orchards (see Abbey People pdf.) – Barnwell area has 2 community orchards (Margaret Wright and Abbey community orchards). Margaret Wright is a successful Council regeneration project rescued from being derelict land into a thriving community green and wildlife oasis, that Abbey People has enjoyed managing and developing with Council support.

Opportunities

- Farmland and river routes (Wicken matrix) in the north would benefit from tree link ups (linking existing woodland and copses).
- Farmland in the east would benefit from woodland copse link ups.
- Farmland and river routes in the south would benefit from tree planting (preferably as copses).
- There is scope for converting some arable land into green space, but to provide real benefit it needs to be on a landscape scale.
- Convert some agricultural land into biodiversity sites.

Not theme-specific

Issues

- Community/friends groups are supportive but lack influence in management and this needs to change.
- Significant new housing in the Greater Cambridge area will lead to increased demands on green infrastructure in terms of visitor pressure which in the case of nature sites will need to be managed so as to maintain their nature value, whilst providing great recreational/educational experiences.
- Cambridge North East sub region lacking in GI.
- Modern housing developments around the city are not providing private gardens.
- Within or adjacent to Fulbourn parish, none of the green infrastructure sites are fully thriving, and require considerable intervention for them to achieve their potential. Sites requiring intervention include Fulbourn Fen Nature Reserve, Little Wilbraham and Great Wilbraham Fens, the Wilbraham River, Fleam Dyke, the Roman Road, Wandlebury, Gog Magog Downs, and the hedgerows and footpaths that link the sites. Within Fulbourn village, between Teversham Road and Cow Lane, the two green fields of semi-improved natural grassland bisected by a chalk stream fed from the spring at Poor Well, is under threat from large housing development. The lowering of the water table from over extraction by Cambridge Water is a serious threat to the flora and fauna, and biodiversity. The natural springs at Fulbourn Fen Nature Reserve and The Temple at Gt Wilbraham run infrequently and with little pressure.
- North Cambridge and rural villages should be a focus for greenspace.
- Funding for the provision and maintenance of adequate visitor infrastructure is a constraint, for example at Fen Drayton Lakes. We have struggled so far to secure developer contributions from new large-scale developments (such as Northstowe) to improve accessibility. Access to initial capital outlay funds is the most difficult element to secure.
- Milton (proposed development on sewer works) needs more GI.
- Area lacking GI - The areas beyond the A14 eg Earith, Bluntisham, clone, pidley, somersham, woodhurst, oldhurst.
- Threat of development and expansion of the city North and East, into three huge green swathes: Coldhams Common, Stourbridge Common, and Ditton Meadows.

Opportunities

- Imaginative renovation of the Market Square in city centre. Currently lack of trees and biodiversity.
- Cambridge Southern Fringe Area Action Plan CSF5 Countryside enhancement strategy focused on the area south of Addenbrooke's; contact County Council.
- Within or adjacent to Fulbourn parish, enhancement is possible if some agricultural land is taken out of production and used for woodland and meadows.
- Both strategic provision (100 Ha + and 500 Ha + sites) and local provision (in and around villages, and associated with major new developments) is required.
- Foxton PC- major new GI asset between the southern edge of Foxton village and the woods. Key opportunity to convert an agricultural field into a biodiversity and landscape enhancement area, with informal public access, to better link the village to the woods.
- Opportunities around minor, rural south-west villages of Bassingbourn and Melbourn with their green spaces needing to be included in the strategy (as not yet). Possibility of wider access to military land here. Importance of green corridors (e.g. Ashwell Street - Clear Farm Wood - Clunch Pit Wood - Well Head Springs - Ford Wood - Rouses - Recreation Ground ... and the chalk streams).
- The cycle path along the busway between the station and Trumpington would benefit from trees along parts of the open fields.

Key assets highlighted by stakeholders

- Country parks such as Milton, Coton and Trumpington Meadows all provide great value to the area.
- Fowlmere RSPB Reserve provides recreational and nature experiences for c20-25k visitors every year. It is a treasured asset for local residents of nearby villages like Fowlmere, Shepreth and Melbourn, but also attracts visitors from much further afield. RSPB Fen Drayton Lakes and Ouse Fen have great potential, and have links to St Ives, Cambridge and villages between through the guided busway.
- Great Ouse Valley corridor including RSPB Fen Drayton, Cambridgeshire Guided Busway, Paxton Pits, Ouse Fen, Needingworth quarries.
- Our wetlands, whether rivers, lakes or fens – these define our sense of place, our relationship with wildlife and our vulnerability to climate change. They are the biggest magnet in Cambridgeshire, from punting along the backs in Cambridge to Fen Drayton lakes or Fowlmere.
- Community gardens and orchards.
- Grantchester Meadows.
- Coton Reserve.
- West Fields.
- The River Cam and corridor.
- Corridor of Common Land and open spaces along the river.
- Christs Pieces, Parker's Piece, Midsummer Common, Jesus Green, Stourbridge Common.
- Cambridge Botanic Garden. Cambridge riverside and the Cam itself including along The Backs and to Grantchester. Wimpole Hall. Anglesey Abbey. Wicken Fen. The guided busway. Parker's Piece, Midsummer Common. Grantchester Meadows. Gog Magogs/CPPF. Rights of Way network. The surrounding farmland. Allotments e.g. Histon.
- Histon Road recreation ground, Histon Road Cemetery, Ascension Cemetery off Huntingdon Rd, playing fields of Fitzwilliam College, Mayfield School and Trinity Hall (College), Eddington open areas.
- Elsewhere In Cambridge City and nearby: Jesus Green, Midsummer Common, Parkers Piece, Christ's Pieces, Coe Fen, including Newnham children's recreation area, Lammas Land, Grantchester Meadows, Jesus Green, college "backs" on Queens Road, Trumpington Meadows, Gog Magog.
- For wildlife in the City of Cambridge: paradise in Newnham area.
- Cherry Hinton Chalk Pits, Fulbourn Fen, Gog Magogs and Wandlebury Country Park.
- Gog Magog Down.
- Wandlebury Country Park.
- Wimpole Hall parkland and designated areas of wildlife interest such as ancient woodlands (Eversden Woods, Hayley Wood etc).
- Beechwoods near Wandlebury.
- Dernford Quarry Reservoir in Sawston, known informally as The Oasis: has agreement for public access.

- Access to river at Ash Grove between Babraham and Stapleford.
- Babraham Pocket Park and access to river.
- The Roman Road and SSSI from Wandlebury to Worsted Lodge, and on to Balsham.
- Dernford Fen SSSI: thriving but no public access. Full public access may be inappropriate.
- John Huntingdon Charity Community Orchard, Mill Lane Sawston.
- Millennium Copse, Tannery Road, Sawston.
- Butler's Green, off Mill Lane, Sawston.
- In Sawston – small spaces within housing estates: Princess Drive, Teversham Way, Wakelin Avenue, Church Lane, Churchfield Avenue, Town Close, etc: Land known as The Spike or Towgood's Charity Land, at the end of South Terrace, Sawston; Huckeridge Hill, Cambridge Road, Sawston (owned by Sawston Parish Council – used for bonfire night).
- Necklace of ancient woodlands in the Western hundreds area offer significant value to wildlife and residents in the west of the County.
- Rural footpath network e.g. the Roman Road from Mark's Grave to Hare Wood is particularly important.
- Central riverbank parks, Fenners Meadow, Botanic Gardens, natural parkland near Addenbrookes and the Biomedical area.
- River corridor to Trumpington.
- South Cambs area- ancient woodlands and meadows.
- Nineteen-Acre Field and spaces well sowed with wildflowers around Eddington.
- Cherry Hinton Brook - green corridor that links the Wandlebury/Gog Magogs area with the centre of the city.

Good examples of green infrastructure

- Trumpington Meadows Country Park. This demonstrated how the interests of wildlife, flood management, and people's enjoyment can all be met by taking an integrated approach to opportunities presented by significant new developments.
- The Thames Landscape strategy still growing strong after nearly thirty years is a model of how to develop plans in a way that fully engages and works with the local community.
- Beacon Forest; site under discussion.
- Cambridge Great Park in Shelford, Stapleford, Sawston area south of Cambridge.
- Example of Green Stewardship via Friends Groups and a River Cam Landscape Strategy is a means of delivering green infrastructure. It works because local people have a sense of ownership.
- The Gog Magog Downs.
- Isolated success stories such as Trumpington Meadows, Cambourne, Hobson's Park, Magog Down to name a few.

- John Clare Countryside Parish Nature Recovery Plans, carried out by Parish Councils and linking habitats together to create green corridors between the River Nene and the River Welland, west of Peterborough.
- In terms of funding management, in Peterborough, the Nene Park Trust manages the Ferry Meadows country park, which is a large area of natural green space radiating out from the city centre into the countryside.
- Furthering the natural bypass channel installed at Byron's Pool Local Nature Reserve (LNR) in 2011, the EA has been working with partners (Cambridge City Council, Cam Conservators, Cam Valley Forum, Wild Trout Trust et al.) to deliver free movement for fish and eels in the Cam Catchment. This includes the installation of eel passes at Bottisham, Baits Bite lock and Jesus Green lock as well as installing a natural bypass, 'The Rush', at Sheep's Green LNR in 2017.
- Further enhancements have been made with the installation of pre-barrage at Burnt Mills Gauging station, Haslingfield, which enables fish/eel passage without impacting upon gauging for the purposes of water abstraction monitoring and flood risk control. The obsolete weir at Harston, on the River Rhee, was removed in 2019 allowing natural functioning of the river. Alongside the fish/eel passage focussed projects our fisheries team has been working with angling clubs to enhance access for fishing with the installation of accessible fishing platforms alongside in-channel enhancements with the installation of pre-planted coir rolls to provide habitat diversity. Future work will continue to seek free movement of fish and eels on navigational structures and structures which are associated with the historic legacy of milling. Our vision is to deliver river restoration beyond the channel and to seek opportunities to reconnect lost floodplains which provide flood risk and biodiversity benefits. Our maintenance regimes will be reviewed so that they provide proportional maintenance to provide flood benefits whilst enabling biodiversity sustainability. Aspirations to help deliver the Government's 2020 Biodiversity Strategy and EA 2025 targets include Natural Flood Management (NFM), River resetting (reinstating natural river form), supporting ELM options which promote enhancement of our wetlands and river and supporting the reintroduction of fauna such as Beavers which influence river processes. We will continue to seek to control invasive non-native species (INNS).
- Natural Flood Management - Potential Bin Brook project – still in development. EP team leading for EA. Potential wetland(s) and other measures within Bin Brook catchment to reduce diffuse and sewage pollution and provide natural flood management to protect domestic properties. Partners are Cambridge Past, Present & Future, Anglian Water. See related projects form "Bin Brook Improvement Project". This project will also provide habitat for Water Voles and will improve recreational opportunities for the public by creating 100 metres of new footpath adjacent to the new wetland, which will connect two existing footpaths. The new wetland will be adjacent to a popular surfaced walking/cycling route and a viewing area will be created to enable the public to view the new wetland.
- Biodiversity Net Gain pilot in Warwickshire.

Technical Workshops

Organisations represented at the four workshops included:

- Environment Agency
- Natural England
- Forestry Commission
- Woodland Trust
- RSPB
- National Trust
- Wildlife Trust BCN
- Future Parks
- Cambridge Past, Present, Future (PPF)
- CoFarm Cambridge
- Cambridge Sustainable Food
- Water Resources East
- South Staffordshire Water
- BCR Infinity Architects / Cambridge Great Park
- Chris Blandford Associates
- Stantec
- Mott Macdonald
- Greater Cambridge Shared Planning
- Councillors from Cambridgeshire County Council, Cambridge City Council and South Cambridgeshire District Council

The whiteboard extracts on the following pages provide an overview of the discussions.

Help us guide the Greater Cambridge's Green Infrastructure Network...

Workshop 1: Landscape, cultural heritage and sense of place & Agriculture and community food growing

Local Plan process focuses on development, but need to extend thinking beyond this into the vast areas of open space in Greater Cambridge. Develop a viable framework to allow landscape to evolve over time considering all aspects e.g. accessibility, ecological connectivity, climate change.

Largely happened, but space is finite especially to East. New villages / net zero villages may happen where space is appropriate. Can be forefront of development nationally.

Reflect findings from updated LCA, particularly historic environment and how it has evolved over time, the value of assets and setting.

Equal need focus on low human-level views e.g. wetlands, history of agriculture, paths and byways, and linking them together.

Ensure LVIA /LS/LCA is embedded into planning system to influence sensitive development e.g. as in London which is a great example of preserving protected views in the city.

Requires carefully planned design.

3 chalk pits (in area by Cherry Hinton, Coleridge). Privately owned but possibility to develop into a publicly accessible landscape scheme? It would enable inclusivity of water features which are limited across Greater Cambridge at present.

Wicken Fen Nature Reserve - 100 year vision to re-establish open spaces for both nature and public by rewetting the fens. Buffer the SSSI within the nature reserve and enhance setting / value of this natural heritage asset.

Consider: Wicken Fen itself is beyond Greater Cambs boundary although vision covers study area.

Good example of habitat restoration. Future site where the existing buffer area here could be extended and strengthened into the study area.

Determine locations to complement existing sites e.g. buffers or new sites to alleviate recreational pressures.

How can GI improve the condition and setting of heritage assets?

Are there opportunities to implement traditional Cambridgeshire 'rural style' landscape features into urban spaces / public realm to create and enhance sense of place?

Retention of highest grade agricultural land for production?

Scale question and productivity. Think about what needs to be grown and where to support people rather than 'commodity crops' e.g. sugar.

Modeling done for Cambridge City only to date (could extend beyond into 5 Cambs).

Potential to convert agricultural land into green space / biodiversity assets? How and where?

Multi-purpose land management. Not necessarily 'conversion' rather multiple objectives within a land holding.

Nature based options to achieve Net Zero. How this will be linked to ELMS. Inviting farming community into the conversation to ensure there is a feeling of inclusion.

ELMS: biodiversity focus. Carbon sequestration etc. into farming. Relates back to industrial nature of farming and the landscape in Greater Cambs and how things can change for the better e.g. agro-ecological methods (see FFC).

Heavy water use - Opportunities to retain water in landscape but these tend to be high cost e.g. capturing rainwater.

Retire first those areas that are served purely by irrigation as opposed to natural water sources.

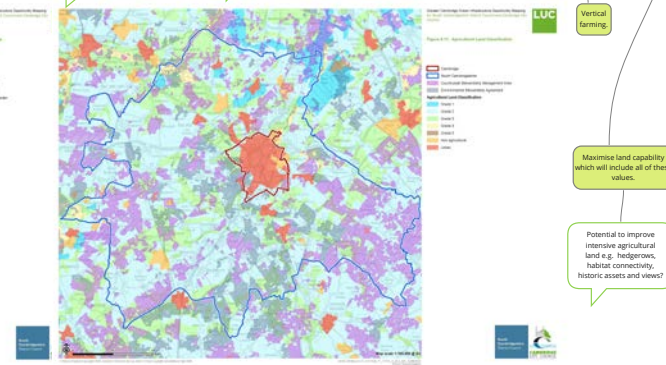
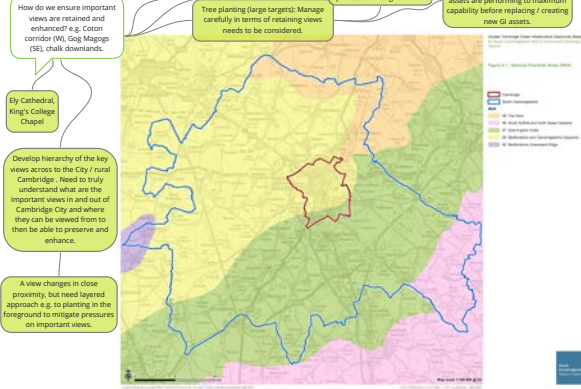
Convert parts of holding into community-based farming (less industrialised and supports communities).

NFU - document due to be published.

Case studies of successful integration of ELMS and planning policy?

Local authorities are game changers in this - provided they embed sustainability into land management practices.

Greater Cambridge is largely agricultural, which provides huge opportunity for sustainable change at scale.



Managing shared but sometimes competing demands on space e.g. informal recreation (biking) vs biodiversity.

How can we mitigate against recreational pressures on landscape and heritage assets? e.g. enhance/ expand existing sites, possible new sites, divert pressures to underused sites.

How and where to improve interpretation and educational opportunities of assets?

Rework the way agriculture functions to serve community and biodiversity too.

Food growing enterprises e.g. community orchards. Community led, educational benefits. Where are there opportunities to expand?

First community farm in Abbey Ward.

Reasons for gaps in agri-environment scheme take up? What are the opportunities in these areas?

Catchment management - water company working with land managers to fund improvement to water quality. Align with CSP areas for high water quality improvements.

Tend to be where there is vested interest (from water company side) to improve drinking waters but not necessarily across the board.

Sustainable diets and nutrition.

Importance of local food growing and local sharing of food.

Need to truly understand where our food comes from. Opportunity to help everyone understand this - politicians need to push for this within local planning to cover food issues linked to social, culture, community and health.

Post Covid short window of opportunity. People more aware of fragility of complex global supply chains and where food comes from. Opportunity to systematically address health inequalities, biodiversity loss, health + wellbeing - a moment in time to enhance the role of community food growing.

Cambridge Sustainable Food / CoFarm have discussions underway with National Trust for a community food growing scheme from Wicken Fen area across a patchwork of sites that extend down towards the City. They are also in discussions with RSPB too about opportunities.

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Final comments:

Roads are severance features in the landscape. The southeast is therefore valuable in part of overall larger view of Greater Cambridge.

Importance of a macro-scale vision to then enable more micro-scale projects/opportunities to be developed, aligned to the overarching vision for Greater Cambridge.

Case study: Wild Kenhill Estate (North Norfolk Coast) - review document (16.5.2020). 4 climates here where they are looking to change entire agricultural process.

Ensure habitat / ecological connectivity is considered alongside the opportunities for agricultural land change and enhancement.

Maximise land capability which will include all of these values.

Potential to improve intensive agricultural land e.g. hedgerows, habitat connectivity, historic assets and views?

Vertical farming.

LUC

Help us guide the Greater Cambridge's Green Infrastructure Network...

Workshop 2: Access and connectivity & Recreation and play

Ecological capacity exceeded (habitats damaged) as not intended for recreational use. Not solely increased recreational pressure as a result of Covid.

Plus population growth = pressure on remaining wildlife habitats. Sites not designed to serve recreational function.

Countryside not serving needs of the people. Need new larger publicly accessible open spaces.

Wildlife Trust - Nature Network which touches on accessible green space. Analysis shows GC lacks open access for public (instead intensive arable).

Disconnected villages include Over and Willingham, Earth, Colne, Blunstonham & Somersham, Sawston to Fulbourn

Needs to be a focus on local council support roles. Better approach to working together.

GI evidence base highlights how different strands e.g. health and wellbeing, carbon, air pollution are all integral to GI and how GI can influence each.

Open spaces contribution to health.

IDP - other infrastructure requirements 'competing' with GI. How can green space be packaged to seem more of a priority to developers?

Softer approaches? Online guidance, workshops? Partnership with existing org's in Greater Cambridge.

Policy should embed national standards e.g. GI and nature.

Not a requirement like other infrastructure. Needs strength of policy in Local Plans. It is the smaller developments that are not providing. Larger developers are seeing the value of providing green space e.g. Trumpington.

How to tackle quantity / accessibility issues in the North? Arbury, Petersfield and Romsley are the poorest areas in housing provision and in the provision of open space. Foxton shortfall in green space.

Endowments as a method of funding parks management e.g. Trumpington. But issues of this being tied to new developments only. Must consider areas where new developments unlikely to provide new green space e.g. Gog Magogs.

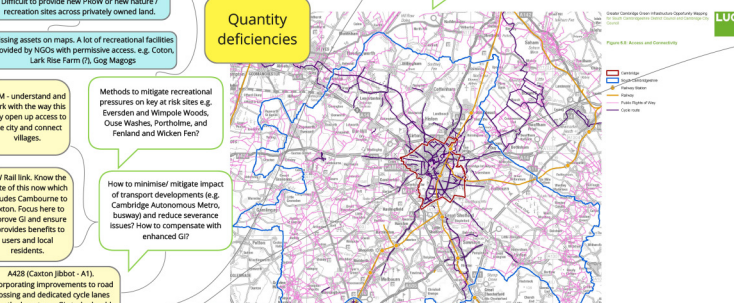
How to improve access to key GI assets such as the Country Park and parklands networks, and existing cycle/footpaths?

Link planning and ELMS to ensure there is a focus to land managers on including 'access' options within their agreement.

Land owners aren't keen in GC to take up access options. They are more inclined to take up biodiversity / nature options on their land holdings.

Partnership working required with Natural England advisers to enable this.

Widen scope of agriculture: work with land managers to change how the land can be managed more sustainably with improved accessibility a post-Brexit world



Quantity deficiencies

Trumpington, NW Cambs development. Waterbeach - good provision of open space but smaller developments not providing sufficient open space.

Make existing sites bigger, or make the countryside around villages more amenable and enjoyable. Difficult to provide new PRoW or new nature / recreation sites across privately owned land.

Missing assets on maps. A lot of recreational facilities provided by NGOs with permissive access. e.g. Cotton, Lark Rise Farm (?), Gog Magogs

CAM - understand and work with the way this may open up access to the city and connect villages.

E-W Rail link. Know the route of this now which includes Cambridge to Foxton. Focus here to improve GI and ensure it provides benefits to users and local residents.

A428 (Caxton Jbbot - A1). Incorporating improvements to road crossing and dedicated cycle lanes over the long-term. GI study should pick up on these projects and work with these to widen benefits.

8 village design guides. But reluctance of developers to engage with this. A challenge that needs addressing.

How to minimise/mitigate impact of transport developments (e.g. Cambridge Autonomous Metro, busway) and reduce severance issues? How to compensate with enhanced GI?

Mitigating pressures on the network

Parish Councils vital for funding / managing these spaces.

Not just large open spaces. Think about role of pocket parks/village greens in delivering access to open spaces in both rural and urban areas.

Recreation and play - thinking about wider variety of open spaces e.g. allotments, pocket parks, cemeteries. How can these be used to enhance deficiencies?

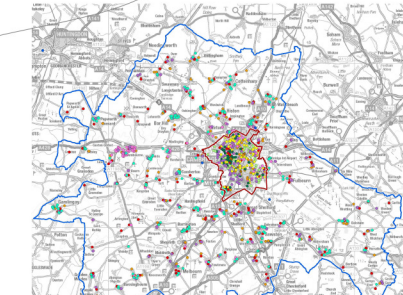
Difficult to plan for this as dependent when opportunities arise (e.g. when new land comes up for sale). Opportunity for local communities and voluntary groups to purchase voluntarily for providing locally accessible green spaces.

Neighbourhood Plans must also focus on these local green spaces.

Opp limited currently because only 10 of approx. 105 have NHOod plans at present. Therefore, only real opportunity at present is from development.

Not all developments are providing green space or play especially smaller developments.

Need to develop an organisational structure or alternative for developers to contribute to. Likewise for biodiversity.



Accessibility to assets

Procurement issues.

Possible to link planning and agriculture: Planning provides benefits for farming community e.g. supplying food to local schools, with return benefits to planning e.g. by providing access to agri land.

Countrywide Stewardship (CS) payments for access currently only in Pillar 2. How will CS take up at present translate into uptake of ELMS permissive access options?

Have to plan carefully as many key assets e.g. Milton CP are at full capacity already without adding more people.

Local authority funding is an issue for managing green spaces. Creating and expanding green spaces needs to consider funding issues.

NE Cambridge AAP - proposing significant improvements to connectivity in the whole area (in draft currently).

Could consider paid access to green spaces e.g. Botanic Gardens. There is a demand for this in Greater Cambs so could be explored.

Endowments as a method of funding parks management e.g. Trumpington. But issues of this being tied to new developments only. Must consider areas where new developments unlikely to provide new green space e.g. Gog Magogs.

How to improve access to key GI assets such as the Country Park and parklands networks, and existing cycle/footpaths?

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Improving PRoW network and shared use

Where to create new PRoW and enhance linkages to fill gaps in the network, maximising connection to key GI assets and between rural outer villages (gaps in S and W)?

Barriers to delivery?

Non-localised uses - equestrian / cyclists - possible source of information for improving the mapping and joining up the network.

Thinking about the macro-scale top - ensure micro-scale projects are sensitive to / reflective of a wider holistic framework and vision.

GI online survey feedback to be evaluated for specific opportunities drawing upon local knowledge.

How and where to provide mixed use PRoW e.g. equestrian, cyclist and walkers?

How to improve existing PRoW that are not associated with development?

Circular walking routes around villages to allow safe access to countryside?

If PRoW are seen as part of the transport infrastructure this could open up additional funding.

Local Access Forum - stakeholders to engage in this process

Lack of resources to fund e.g. by Highways / Local Council, so issue to resolve this in terms of talking on new paths.

Longevity issues of agri environment access options. Permissive access often reversed once out of scheme.

Features which provide changing experience dependent upon type of user.

Linear opportunities are likely to be the most feasible.

Focus on water features (rivers) to enhance GI and accessibility throughout the countryside.

Potential to enhance green corridors and connectivity between assets e.g. Cherry Hinton Brook, Sawton Greenway, Linton greenway?

Where to expand continuous, variable access along watercourses e.g. Rivers Rhee and Bourn Brook. Opportunities on River Cam?

A lot of permissive access for residents in rural villages to farmland.

Need to link rural villages to one another, key assets and places of work.

Final / other comments:

Have clear understanding on the purpose of a green space e.g. recreation, community, biodiversity to effectively determine the opportunities for enhancements or connecting.

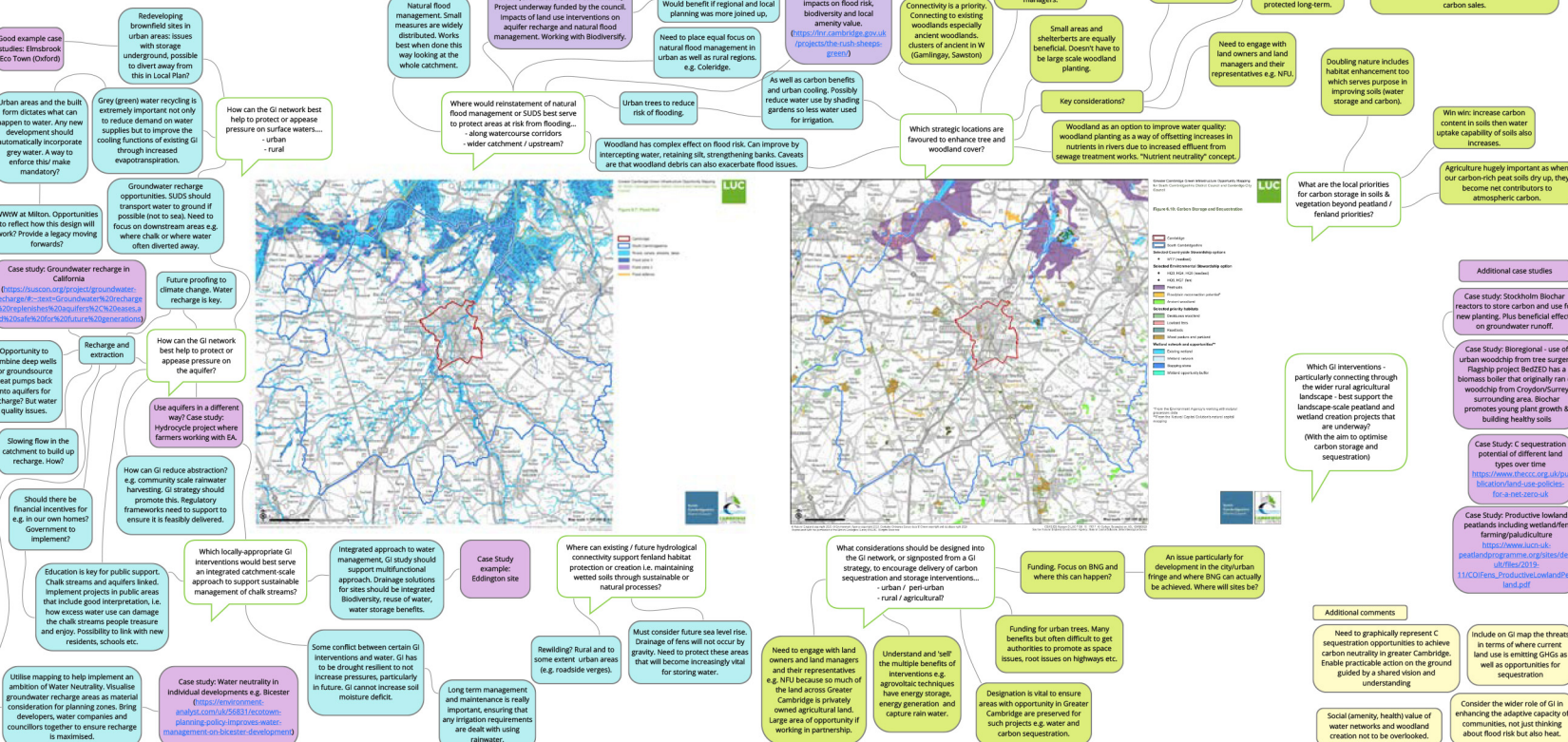
Health and Wellbeing Strategy is a golden thread in terms of policy formation.

Post-covid: need to use lessons learnt to ensure resilience in future and ensure health and wellbeing of residents is maintained through accessibility to green space.

Think about scale of projects emerging from this study and potential sources of funding: projects which have a greater effect/wider scope that integrate communities may be easier to deliver in terms of accessing more funding resources.

Help us guide the Greater Cambridge's Green Infrastructure Network...

Workshop 4: Carbon sequestration and storage & The water environment



Appendix 4: List of data used to compile the master green infrastructure data set

Data name	Data provider	Date of extract	Data reliability	Access information	Quality/condition data	Comments
RSPB reserves	RSPB	06/08/2019	3	Included in data		
Ancient Woodland Inventory	Natural England	22/01/2020	3			
Sites of Special Scientific Interest: units	Natural England	22/01/2020	3		Included in data	
Special Protection Area	Natural England	22/01/2020	3	Added manually		
Special Area of Conservation	Natural England	22/01/2020	3	Added manually		
Ramsar	Natural England	24/06/2019	3	Added manually		
National Nature Reserve	Natural England	22/01/2020	3	Added manually		
Local Nature Reserve	Natural England	22/01/2020	3	Added manually		
Country Park	Natural England	22/01/2020	3	Added manually		
County Wildlife Sites	BCN Wildlife Trust	2020	4			
Priority Habitat Inventory	Natural England	26/07/2019	3			
Priority Habitat Inventory: wood pasture and parkland	Natural England	03/10/2018	3			

Data name	Data provider	Date of extract	Data reliability	Access information	Quality/condition data	Comments
Open space	South Cambridge District Council and Cambridge City Council	Unknown	3			
Green space	Ordnance Survey	04/12/2019	3	Most sites assumed accessible, the following were assumed not accessible: Bowling Green, Camping Or Caravan Park, Golf Course, Institutional Grounds, Private Garden, School Grounds, Tennis Courts, Other Sports Facilities		OS mastermap green space only covers urban areas, OS open green space data used to cover rural areas
National Forest Inventory	Forestry Commission	14/11/2019	3			
Protected verges	South Cambridge District Council	Unknown	4		Included in data	
Mastermap: water	Ordnance Survey	13/06/2019	5			
Mastermap: agricultural land	Ordnance Survey	13/06/2019	5			
Registered Parks and Gardens	Historic England	22/01/2020	4	Added manually		

Data name	Data provider	Date of extract	Data reliability	Access information	Quality/condition data	Comments
CRoW: access all areas (open country and registered common land)	Natural England	27/06/2019	3	Assumed fully accessible		
Woodland Trust sites	Woodland Trust	01/04/2019	4	Included in data		
Wildlife Trust sites	BCN Wildlife Trust	Unknown	4	Included in data		
National Trust land: open access	National Trust	21/09/2019	4	Included in data		
National Trust land: limited access	National Trust	21/09/2019	4	Included in data		
Mastermap green space	Ordnance Survey	21/04/2020	3	Most sites assumed accessible, the following assumed not accessible: Bowling Green, Camping Or Caravan Park, Golf Course, Institutional Grounds, Private Garden, School Grounds, Tennis Courts, Other Sports Facilities		OS mastermap green space only covers urban areas, OS open green space data used to cover rural areas
Consultation comments/ manual checks	Consultees/LUC	17/06/2020	5			Comments were individually checked for accuracy

Data name	Data provider	Date of extract	Data reliability	Access information	Quality/condition data	Comments
Accessible natural green space	BCN Wildlife Trust	Unknown	4		Included in data	Was not included in the master green infrastructure data set, however access information was used to inform the master data set
City Wildlife Sites	BCN Wildlife Trust	2020	4			
Scheduled Monuments	Historic England	07/06/2020	4			
Mastermap: hard standing	Ordnance Survey	13/06/2019	5			Not included in data set, but used to cut out roads, built up areas, etc.