



Buckinghamshire & Milton Keynes  
Natural Environment Partnership



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# Green Infrastructure Opportunities Mapping

Buckinghamshire and Milton Keynes  
Natural Environment Partnership

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# Green Infrastructure Opportunities Mapping

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  - 4) Green Infrastructure Opportunities Zones
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# 1 The Journey so far

## 2009 GI Strategy for Buckinghamshire



## 2013 – NEP’s Delivery Plan



## 2016 - NEP’s Vision and Principles



## 2017-18 – NEP’s GI Opportunity Zones

*To illustrate the Vision and Principles at a strategic scale*

*To provide an area-based strategic approach to GI – and reduce the risk of ad-hoc and unplanned negative consequences to the environment as a result of rapid growth and development.*

### Identified

- i. Existing GI assets (identified in part by overlaying where 3 or more GI assets coincide)
- ii. Three “Priority Action Areas” for GI investment  
In each PAA:
  - Countryside access gateways
  - GI opportunity zones (strategic opportunities, needs or demands)
  - Access links (between main settlements)

*Projects identified in each Action Area to meet objectives – to assist Local Authorities to translate Strategy to delivery*

*To update 2009 strategy - new proposed growth levels and locations- housing, infrastructure*

*Set out a Vision for 2030...*

*...and Principles by which the Vision can be achieved*

*Includes Milton Keynes*

*Methodology differs to 2009 – e.g. all GI “counts” – not just where 3 layers overlap.*

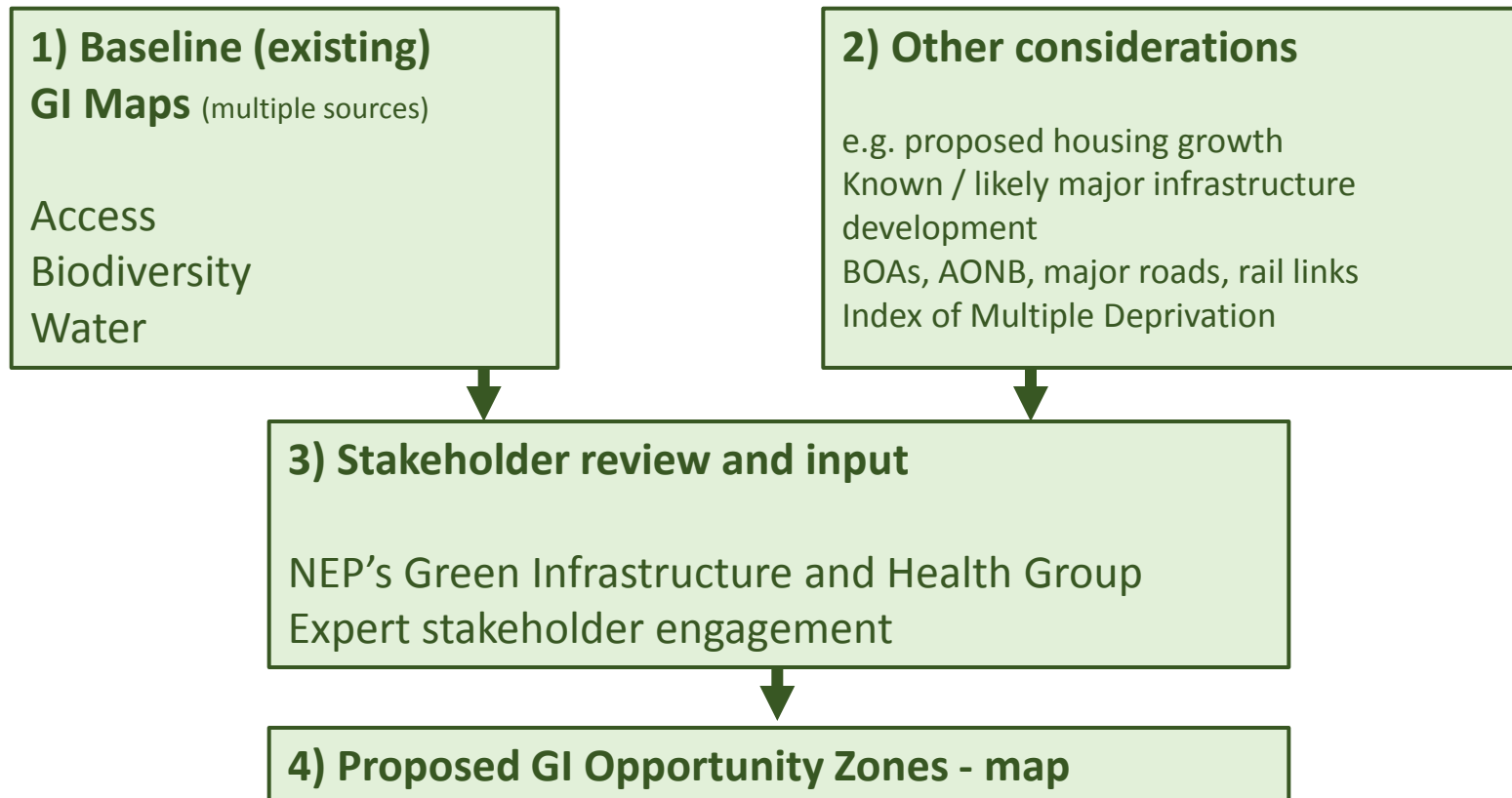
*Enabling document. To open up discussions on the value of natural assets for decision-making.*

*Iterative process – future maps to incorporate updated info, more detail.*

# 2 GI Opportunity Zones: Methodology

The NEP formed a **mapping working group** to take forward the mapping work on behalf of the NEP's GI and Health Task Group. The Task Group approved the methodology and was consulted in detail at each stage of the work.

The final map will be approved through the NEP's Delivery Group and Board.





# 3 Baseline maps - ACCESS

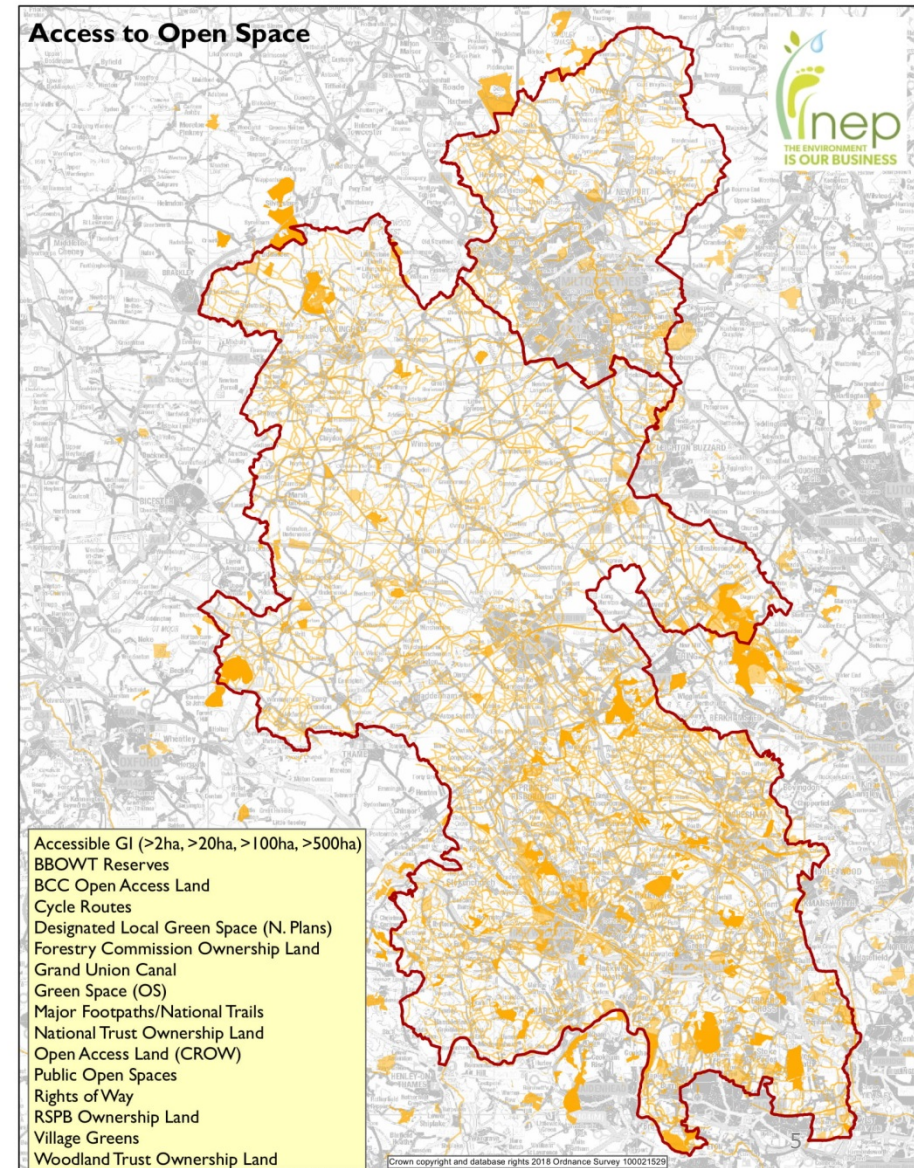
## ACCESS

This map combines data available on existing strategic-scale access information in Buckinghamshire and Milton Keynes

The data layers selected and combined in the map are listed in the lower left hand corner.

The map is effectively a “heat” map of major access routes across the area – i.e. darker orange layers highlight where two or more data layers overlap.

At a strategic scale, the map shows a high density of access routes across the entire area – but does not include information on their condition, use or potential.





# 3 Baseline maps - BIODIVERSITY

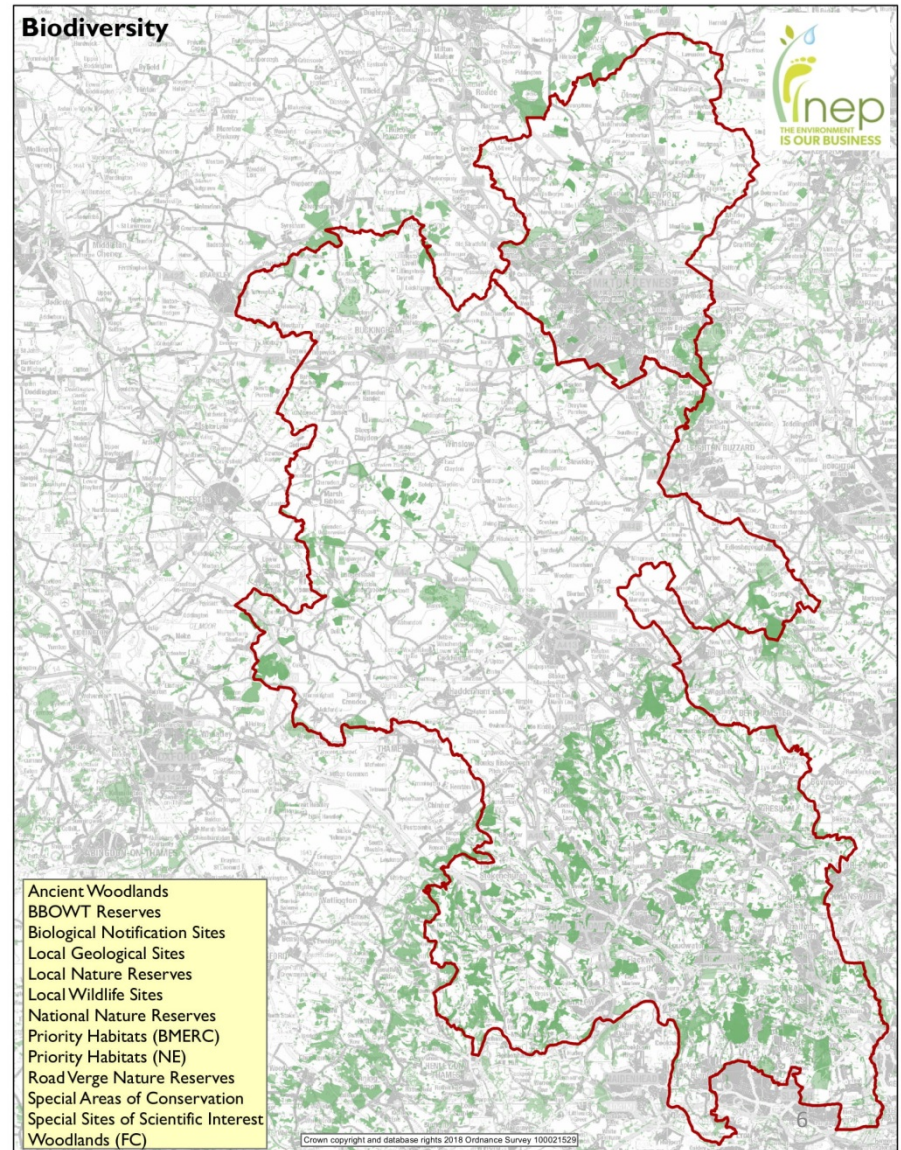
## BIODIVERSITY

This map combines data available on existing biodiversity assets in Buckinghamshire and Milton Keynes

The data layers selected and combined in the map are listed in the lower left hand corner.

The map is effectively a “heat” map of biodiversity assets across the area – i.e. darker green layers highlight where two or more data layers overlap, showing where the “strategic” biodiversity assets are located. The map does not show the condition of those assets.

At a strategic scale, the map shows a higher density of biodiversity features to the south of the Chilterns escarpment and far less in the north half of the area.





# 3 Baseline maps - WATER

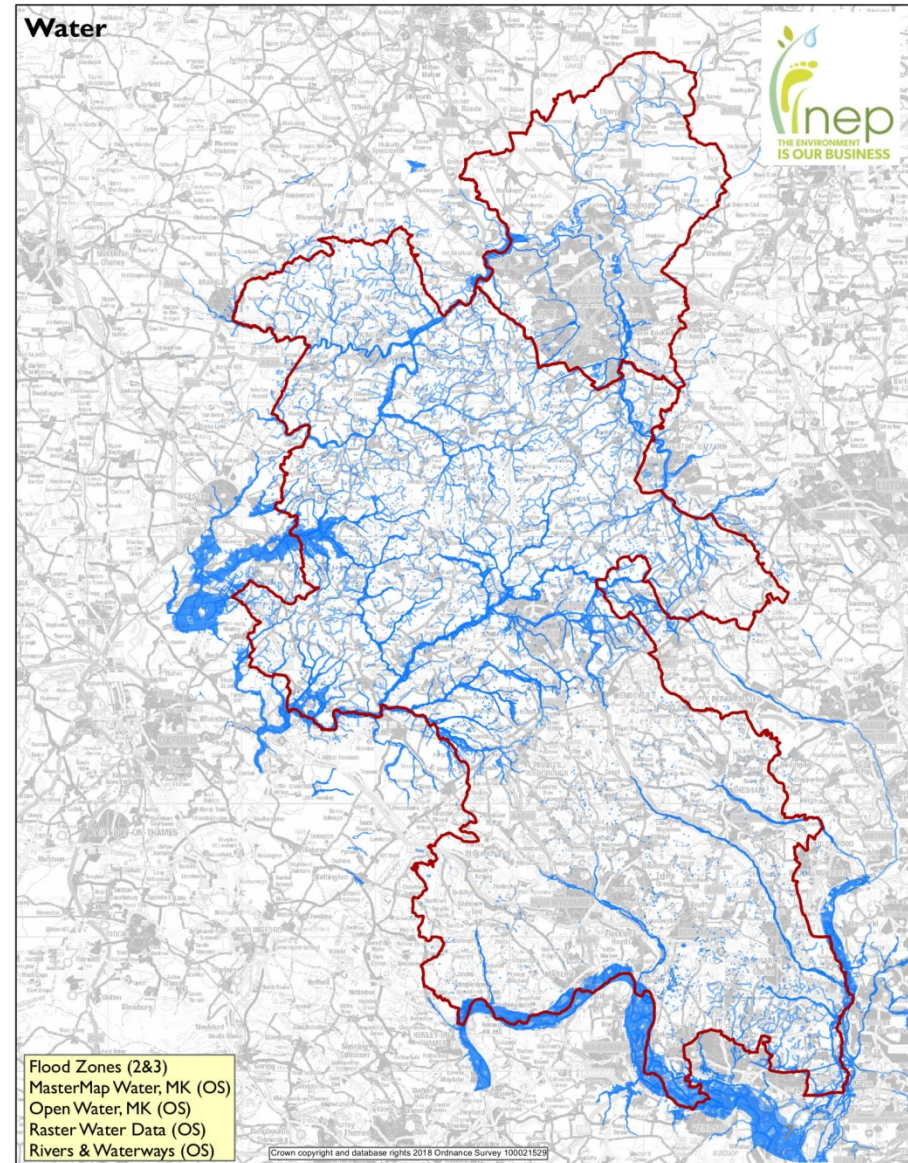
## WATER

This map combines data available on existing strategic-scale water courses and water bodies in Buckinghamshire and Milton Keynes

The data layers selected and combined in the map are listed in the lower left hand corner. The map is effectively a “heat” map of water assets across the area – i.e. darker blue layers highlight where two or more data layers overlap.

At a strategic scale, the map shows a higher density of water features to the northern half of the area, with headwaters and water bodies emerging from the Chilterns escarpment and to the south of the area.

The northern part of the area, rich in water courses, can present opportunities for access-related and biodiversity GI opportunities.





# 3 Other considerations

## Proposed growth and other considerations

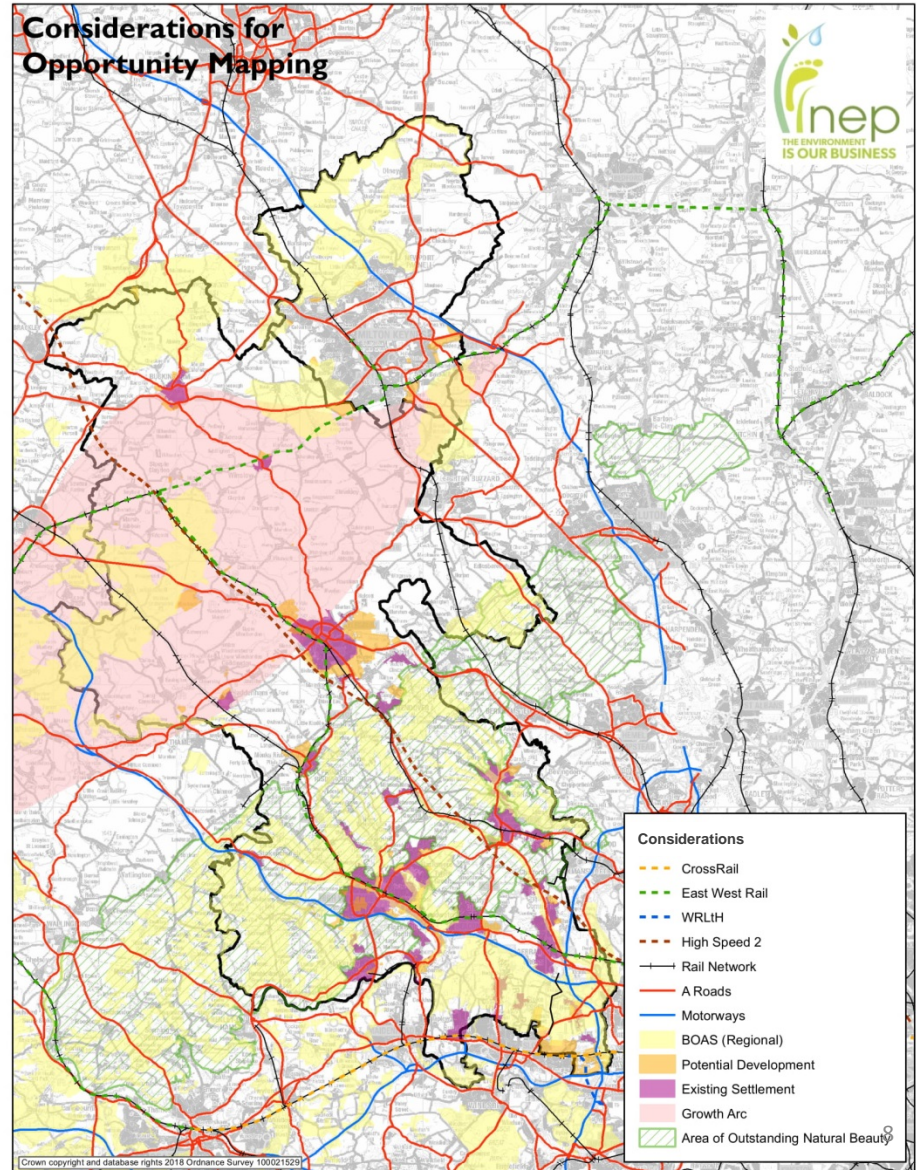
Pressure from growth and associated increased population and visitor pressure is likely to affect all types of GI – hence the need to plan early and strategically the large-scale network of GI for Buckinghamshire and Milton Keynes.

This map shows the known or likely areas of housing growth, infrastructure development and other major factors to take into account when determining the location of GI Opportunity Areas across the area – including major roads and motorways and Biodiversity Opportunity Areas (BOAs).

Aside from the features on this map, experts were also provided with data on the following, to assist with identifying the zones:

- Flooding risk and impact data
- Index of multiple deprivation
- Water quality data

**The considerations mapping includes types and areas of growth that are proposed rather than definite** - for example, Slough growth, Heathrow airport expansion and the rough area of the Oxford to Cambridge Growth Corridor. Future iterations of the mapping work will assess updated data.





# 4 Proposed GI Opportunity Zones for Bucks and MK

## How were the zones identified?

The GI Opportunity mapping process is based on expert assessment of:

Current GI location and value (biodiversity, water, access) – the NEP’s three “baseline” maps (“heat” maps of types of GI).

Known characteristics of GI across Bucks and MK, issues, needs and threats facing GI - so that broad “zones” could be identified

Expert stakeholder views of the specific GI opportunities posed in each zone.

The map has been constructed based on:

Available GIS layers of existing GI – grouped as “biodiversity”, “water” and “access” – multiple sources, not been collated before.

Analysis of the values of existing GI – e.g. benefits to society and the environment (functions / services provided).

Understanding of cross-border GI – what and where, in surrounding counties

Knowledge of “Biodiversity Opportunity Areas” in Bucks and MK (all BOAs are included within the large-scale opportunity zones)

Understanding of additional mapped information on water quality, areas of multiple deprivation, as well as areas of growth (latest from Local Plans), planned and proposed major infrastructure development, etc (to help assess GI “need” / demands and threats).

Expert input to identify GI opportunity zones based on the available information and expert knowledge - to protect, link, create, enhance GI based on the NEP’s [Vision and Principles for the Improvement of Green Infrastructure in Buckinghamshire and Milton Keynes](#).

**Who has been involved?** Stakeholders from many organisations have assisted in determining the zones (See Acknowledgements). Links across boundaries to neighbouring areas have been informed by discussions and reference to existing GI maps

## BUCKS AND MK NEP LARGE SCALE GREEN INFRASTRUCTURE OPPORTUNITIES MAP - MAY 18

This GI Opportunity Zone Map has been informed by a detailed exploration of the mapped networks of access, biodiversity, and water as well as an understanding of other considerations including development pressures and existing designations of relevance.

Furthermore its creation has been guided by the expertise of those on the NEP’s Green Infrastructure and Health Task Group.

GI Opportunities exist across all of Bucks and MK and that is why there is a light green wash covering the whole area. On top of that, the ‘opportunity zones’ have: specific large-scale, broad areas of needs for GI, and/ or provide specific large-scale opportunities for GI in the future to provide benefits to landscape, wildlife, water and people.

The map is a discussion starting point and must be read alongside its supporting document and the ‘Vision and Principles for the Improvement of Green Infrastructure in Bucks and MK’.

This suite of documents provide an area-based high level strategic approach to protecting and enhancing GI and reduce the risk of ad-hoc and unplanned negative consequences to the environment as a result of rapid growth and development.

- 1 - South Bucks Heath & Parkland
- 2 - Chiltern Escarpment & Hinterland
- 3 - River Thames - Flood Plain & Meadow Habitat
- 4 - Chilterns Area
- 5 - Bernwood Ray & Hinterland
- 6 - Woodland Between Bicester & Buckingham
- 7 - The Forest Ridge
- 8 - The Ouse Valley
- 9 - Whaddon Chase & Surrounding Links
- 10 - Greensand Ridge (Nature Improvement Area)
- 11 - Bedford & MK Waterways Park
- 12 - Linkage Area
- 13 - Ouzel Corridor
- 14 - Colne Valley area
- 15 - River Thames Corridor

### Legend

-  Bucks & MK Vision and Principles
-  Identified GI Opportunity 'Zones'

# 4 Proposed GI Opportunity Zones

## What do the GI Opportunity Zones show?

All of Bucks and MK provide opportunities for GI. This is why all of the opportunities map for our area is shaded green.

However, the GI “opportunity zones” (darker green) are “strategic scale” areas that have been identified by our expert stakeholders as the major large-scale zones (i.e. at the kilometres scale) of GI opportunity within the County of Buckinghamshire and Unitary Borough of Milton Keynes **because they may have one of more of the following:**

Similar characteristics considered to be of value from a Green Infrastructure perspective – and the potential to enhance similar certain benefits

Contain established networks of GI / a concentration of existing GI and potential for increasing its effectiveness

Face specific common threats or challenges

Are areas for focus when considering creating and /or maintaining larger resilient networks and hubs of GI

So - each zone either has **specific large-scale, broad areas of needs** for GI, **and/ or provides specific large-scale opportunities** for GI in the future to provide benefits to landscape, wildlife, water and people.

We have classified the main GI need or opportunity within each zone into specific types

**Creating** new GI

**Protecting**, buffering existing GI

**Enhancing** existing GI – e.g. where large-scale coordination can bring positive GI results (e.g. upper water catchment works and woodland planting to “slow the flow” – e.g. area 7

**Providing connectivity** / linkage between GI assets (e.g. woodland)

**Improving access** to GI

These types of opportunity can help to improve access, recreation opportunities, health and wellbeing, benefit habitats and wildlife movement and increase wildlife resilience to pressures and threats.

The zones therefore represent the NEP’s interpretation of where there are large-scale opportunities or needs for GI linkage, improvement or creation.

We do not attempt to map opportunities at the more detailed scale. This should be an exercise carried out at the local scale.



# GI Opportunity Zones

## Caveats – interpreting the mapping

**There are certain caveats to be aware of and things to remember** when using / interpreting the GI Opportunity Zones

- NEP’s Vision and Principles – apply at ALL scales and across the entire area (it is NOT, therefore a map of where to / where not to develop). No area lacks opportunities for GI . This is why the entire county is coloured light green. GI exists and that there are opportunities for its improvement in all places.
- The map has no legal status but will be endorsed by the entire NEP Partnership. It will stand alongside, and illustrate, the NEP’s GI Vision and Principles document for Buckinghamshire and Milton Keynes.
- The map is a discussion / enabling document. It is intended to be used to open up discussion on the full value of natural assets and the consequences of decision-making - as a guide and starting point for discussions with LAs, developers, infrastructure providers; and for LAs to plan their area’s GI opportunities early and strategically – using a similar process at a more detailed scale.
- Boundary lines of the opportunity zones are indicative, and are not intended to be precise at this scale.
- The map shows broad, strategic-scale opportunities for GI and does not purport to be authoritative regarding all opportunities for GI. More detailed opportunities can be worked on at a local (e.g. parish) scale basis – for example, identifying and creating GI opportunities for new local rights of way; and for linear and small-scale features such as watercourses, ponds and small groups of trees. [*Mention – not include potential creation of areas of GI opportunities alongside new roads and railways, or corridors of GI within urbanised land*].
- The mapping of Green Infrastructure can be carried out at different scales. The mapping undertaken here is not a replacement for a detailed understanding of specific local needs and opportunities. It represents the high level structure of GI across the NEP area which could be refined locally to a higher level of detail as need and resource dictates.

# GI Opportunity Zones

## Descriptions to accompany the zones

**Each zone on the map is numbered**

**Please see the corresponding information in the numbered Appendices below for explanation and interpretation of each zone: values, threats and opportunities.**



# 5) Acknowledgements

The Buckinghamshire and Milton Keynes Natural Environment Partnership **would like to thank** all members of the GI and Health Task Group, the mapping working group and all organisations which have provided input to the production of the GI opportunity zones mapping.

Our sincere thanks go to the representatives involved from:

*Aylesbury Vale District Council  
Buckinghamshire County Council  
Buckinghamshire, Berkshire and  
Oxfordshire Wildlife Trust  
Buckinghamshire and Milton Keynes  
Environmental Records Centre  
Chiltern Rangers  
Chilterns Conservation Board  
Chiltern District Council  
Colne Valley Regional Park  
CPRE Buckinghamshire  
Environment Agency*

*Greensands Trust  
Milton Keynes Council  
Natural England  
NHS Buckinghamshire - Chiltern Clinical  
Commissioning Group  
Revive the Wye Partnership  
South Bucks District Council  
The Parks Trust  
Wycombe District Council*

*All other members of the NEP's Green  
Infrastructure and Health Task Group*

# This work is never complete!

- **GI Opportunities mapping is not a perfect science. Our map is based on current best available information and input of knowledge from a broad network of experts.**
- **We aim to show that, although ALL of Buckinghamshire and Milton Keynes present opportunities for Green Infrastructure, the mapping work shows the large-scale opportunity areas, the nature of those opportunities and encourages early and strategic planning of GI (prior to development) to help achieve them – in line with our Vision and Principles for the Improvement of Green Infrastructure in Buckinghamshire and Milton Keynes.**
- **The GI opportunity zones mapping will be under regular review and future iterations will be launched as a result of, for example:**

*New sources of information and data; policy changes. e.g. – New GI standards; new GI typology (as mentioned in the Government’s 2018 25 Year Environment Plan); developments in natural capital mapping; updated baseline maps; stakeholder input. Future iterations with increasing detail will lead to stronger links with e.g. biodiversity accounting offset sites; identification of possible priority GI project opportunities.*



# You can help!

*If you have any comments on the mapping, please send them to us:*

*Nicola Thomas Partnership Manager, NEP – [nthomas@buckscc.gov.uk](mailto:nthomas@buckscc.gov.uk)*

*Phil Simpkin, Chair, Green Infrastructure and Health Task Group – [Philip.Simpkin@Wycombe.gov.uk](mailto:Philip.Simpkin@Wycombe.gov.uk)*

*Buckinghamshire & Milton Keynes NEP mailbox - [nep@buckscc.gov.uk](mailto:nep@buckscc.gov.uk)*

# Appendices

- i) The GI Opportunity Zones – details
- ii) Data – Data List  
Data selection



## i) The GI Opportunity Zones

Details and maps for each GI opportunity zone

# The GI Opportunity Zones – some things apply to ALL areas

## Generic Value of existing Green Infrastructure across the entire area:

- **Certain ecosystem services** – e.g. CO<sub>2</sub> sequestration, Oxygen production, dust interception (improved air quality), buffering of precipitation runoff – **are provided in all areas** currently – and with potential for greater and more services in the future.

## Threats across the entire area:

- **Threats to the specific zones are listed in the appendices below.**
- **In addition, certain issues pose threats to the nature, extent, connectivity, current and potential future status of the GI right across Buckinghamshire and Milton Keynes** – including:
  - Potential development / infrastructure development – and associated visitor and management pressure on GI resources
  - Increased traffic and growth pressures risk affecting enjoyment of existing GI – e.g. noise, congestion, pollution, increased emissions).
  - Lack of policy / other requirement to ensure GI is managed into the long term.
  - High land values - for example in locations of potential development, which can lead to:
    - Decline of farming (e.g. through higher insurance costs)
    - Fragmentation of land ownership – and accompanying lack of consistent management – e.g. areas of woodland
    - Piecemeal and speculative land acquisition - across the whole area to a greater or lesser extent. Land may be held for a long period for prospective development – can make things harder for management for conservation; deteriorating quality in that time can lend itself to decisions favouring development.

## Opportunities across the entire area:

- **The NEP's Principles for achieving its 2030 vision of improved GI across Bucks and MK – APPLY TO ALL OF BUCKINGHAMSHIRE AND MILTON KEYNES.** This is why the GI opportunities map is all a shade of green – none is left blank. Areas shaded in lighter green will have locally important GI assets and opportunities some of which will also be important at a higher level, they are however not mapped in their own right at this scale.
- **All Development and Growth areas – provide opportunities for the incorporation of best practice GI and biodiversity** – including sustainable drainage opportunities. The GI opportunities relating directly to development are most closely linked to accessible natural green space. Biodiversity and green space can be incorporated into developments. Elsewhere other areas of biodiversity and habitats should be protected from development and conservation management funded by it. Water/flood management is in many ways a specific issue to be dealt with on a site by site basis. Access and Biodiversity need a strategic approach.
- **Early and strategically-planned creation / expansion of GI in areas of need and opportunity** can lead to biodiversity gains, improve health, wellbeing and the economy and reduce recreational pressures elsewhere (e.g. ecological wetlands such as at Kingsbrook in Aylesbury).
- **It is likely that** purpose-built cycle ways and all types of access routes will be sought between all towns along zones of opportunity – esp medium and large conurbations.
- More information on Ecosystem services is available – for example see the wheel diagram at: ([freshwater watch](#)), or the text from Section 2 (pg 7+) of Wycombe District Council's Canopy Cover Study [Wycombe District Council's Canopy Cover Study](#)

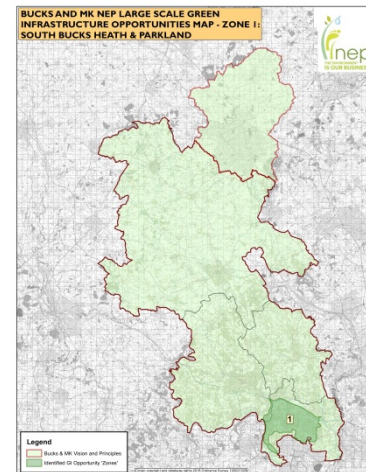
# The GI Opportunity Zones

Zone Number	Name	See Appendix Number
1	South Bucks Heathland and Parkland	1
2	Chilterns Escarpment and foothills	2
3	River Thames – flood plain meadow habitat	3
4	Chilterns area	4
5	Bernwood Ray and hinterland	5
6	Woodland between Bicester and Buckingham	6
7	The Forest Ridge	7
8	Ouse Valley	8
9	Whaddon Chase and surrounding links	9
10	Greensand Ridge (Nature Improvement Area)	10
11	Bedford and MK Waterways Park	11
12	Linkage Area	12
13	Ouzel corridor	13
14	Colne Valley area	14
15	River Thames Corridor	15



# 1 – South Bucks Heathland and Parkland

This opportunity zone that borders the River Thames, includes areas of heath and large blocks of woodland, including the nationally important Burnham Beaches, it links with zone 14 the Colne valley park.

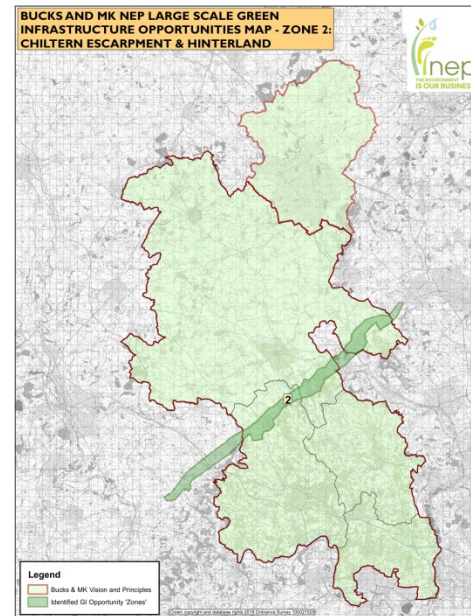


Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><u>Biodiversity</u></b> High biodiversity value with a number of protected areas</p> <p>e.g. acid grasslands and heaths, ancient woodlands</p> <p><b><u>Access</u></b> Good access in places (although some not connected) – for example Country Parks Several sites of open access land Long distance trails (e.g. Shakespeare’s Way and Beeches Way)</p>	<p>Proximity to areas of major growth – e.g.</p> <ul style="list-style-type: none"> <li>• Proposal for Slough extension into South Bucks (see Slough BC area)</li> <li>• Proposed Heathrow development</li> <li>• Potential upgrade of A355 road to major road</li> </ul> <p>Piecemeal development can lead to fragmentation of habitats</p> <p>Threat that habitats become fragmented.</p> <p>Managing visitor pressure at sensitive sites</p> <p>Air quality</p>	<p>Protection – e.g. secure woodland between BB Stoke Common into protected and sympathetic management.</p> <p>Buffering</p> <p>Connectivity – maintain current linkage (fragmentation a threat) and create new links – e.g. improve biodiversity value and connectivity by linking BB SAC and Littleworth Common SSSI and incorporating private estate land. Plus areas north of Stoke Common. Some enhancement</p> <p>Access – new access (and biodiversity) to appropriate areas. Potential to act as a buffer. E.g. extension to existing and new Country Park proposals – new accessible green space.</p> <p>Landscape appearance would be improved.</p>

## 2 – Chilterns escarpment and foothills

The Chilterns scarp is a spectacular chalk ridge with views out across the Vale of Aylesbury. One of the most well-known features of the Chilterns Area of Outstanding Natural Beauty, and with good access along the Ridgeway National Trail, the scarp is a popular area for visitors. It also has significant concentrations of prehistoric monuments and important wildlife habitats, many of which are sensitive to visitor pressure.

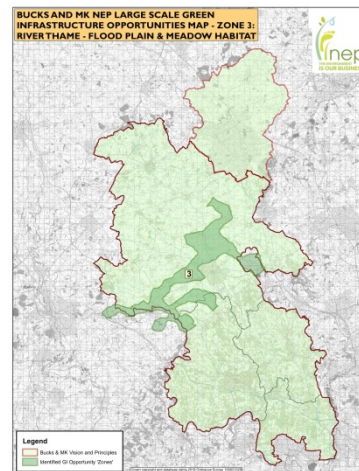
Much of the area between the base of the scarp and the clay vale to the north west (the Scarp foothills) is in intensive arable use but there are some important wildlife habitats here including chalk springs that feed the tributaries of the River Thames. Much of this zone lies outside the AONB but forms a part of the setting for the AONB.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions)
<p><b><u>Biodiversity and water</u></b>  <b>Exceptional – includes mosaic of chalk grassland, beech hangers, box woodland, ancient woodland, chalk streams headwaters, former chalk quarries and species rich hedgerows. Chalk streams, headwaters and ponds are an important feature of an otherwise dry landscape.</b></p> <p><b><u>Access</u></b>  <b>Nationally-important recreation corridor along the escarpment top. Includes the Ridgeway National Trail and many shorter, circular promoted walking and cycling routes. Key honeypot visitor sites include Wendover Woods, Coombe Hill, Whiteleaf, College Lake.</b></p>	<p><b>Housing, and transport infrastructure growth and land use change – leading to:</b></p> <p><b>Habitat fragmentation and severance</b></p> <p><b>Changing panoramic views with development below the escarpment – also introducing light pollution, noise and motion. (Compounded by cumulative effect of many development sites visible along a ridgetop linear walk).</b></p> <p><b>Decline in quality of habitats and populations of characteristic species</b></p> <p><b>Impacts of visitors and dogs on sensitive habitats, including erosion of thin chalk soils, trampling of rare flora, disturbance of ground nesting birds, and off-trail mountain biking in woodland</b></p> <p><b>Pests, diseases and invasive non-native species</b></p> <p><b>Over-abstraction of the Chilterns aquifer</b></p>	<p><b>Protection and buffering</b></p> <p><b>Connectivity</b></p> <p><b>Restore, Enhancement, expansion</b></p> <p><b>For example - restore, enhance and expand key habitats e.g. linking up small fragmented chalk grassland sites; link chains of sites in conservation land management; habitat enhancement in the scarp foothills to help buffer and protect core ecological areas; reinstate chalk grazing on chalk grassland where habitats not in favourable management.</b></p> <p><b>Access – to appropriate areas; also investment in visitor management – increase capacity and facilities, redistribution away from most sensitive sites; better walking and cycle access to the scarp from Aylesbury to reduce reliance on cars; enhancing GI where people live.</b></p>

### 3 – River Thame – flood plain meadow habitat

This opportunity zone includes the river itself, along with a large number to tributaries especially to the north and east of Aylesbury, this zone is influential regarding water flow ultimately into the River Thames. There are linkages to the Chilterns escarpment (zone two) in three places. This zone has the largest population of the native [Black Poplar](#) in the UK and has in places a unique landscape character. This zone also crosses over the border into Oxfordshire.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><u>Biodiversity and water</u></b></p> <p>Good habitat for wading birds</p> <p>Black poplar landscape</p> <p><b><u>Access</u></b> along the River Thame</p>	<p>Possible infrastructure and housing development and growth e.g. Expressway option via Thame Valley; HS2; Ox2Cam Growth corridor</p> <p>Inadequate management – e.g. of black poplars</p> <p>Eutrophication – run-off from the land (e.g. fertilisers) into water courses causing dense plant growth such as algae – which reduces oxygen needed by fish and reduces water quality.</p> <p>Land management issues in upper catchment threaten river with pollution impacts including phosphates and nitrates and also affect flooding events in the Aylesbury area.</p>	<p>Linkage along river corridors and surrounding habitats alongside river</p> <p>Enhancement</p> <p>Whole of upper Thame catchment is an opportunity zone – for improved land management in the upper catchment and natural flood management.</p> <p>Ecosystem services provision, e.g. flood alleviation and water provision in droughts. If could slow flow in catchment – would be of huge benefit downstream including Aylesbury and new development around Aylesbury.</p> <p>Access - Aylesbury Vale – deficient in large-scale accessible green space – key opportunities to improve this.</p>



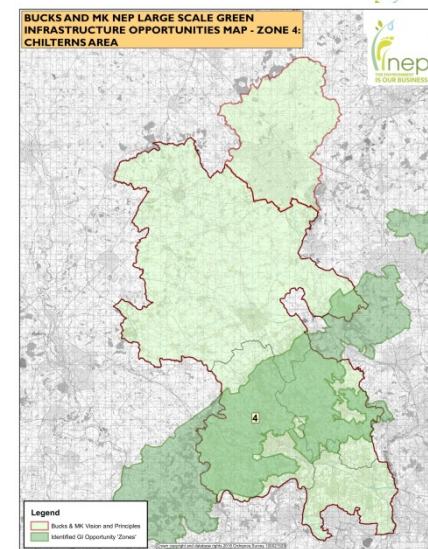
## 4 – The Chilterns area

This opportunity zone includes all of the Chilterns AONB and extends beyond in places, and there are significant opportunities to link areas of woodland and chalk grassland habitats and provide recreation opportunities.

The AONB is nationally-designated as one of the finest landscapes in the country. Over 50% lies within Buckinghamshire and the area as a whole is recognised as a significant and high value GI resource. The Chilterns is rich in wildlife habitats, prehistoric monuments and spectacular views.

With over 1.6 million people living within 5km of the AONB, over 55 million leisure visits every year and the only protected landscape with a stop on the London Underground, the Chilterns is one of the most accessible AONBs in the country.

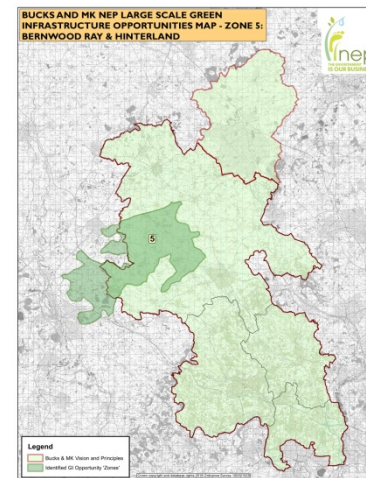
This zone is a major strategic greenspace resource for Buckinghamshire, London and South-East England.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions)
<p><b><u>Biodiversity</u></b> High value – biodiversity and landscape – including a mosaic of chalk grassland, chalk streams, farmland habitats, ancient woodlands, cathedral-like beech woodlands, rare box and juniper woodlands.</p> <p><b><u>Access</u></b> – valuable recreational resource – wide range of access routes and recreational opportunities; dense network of open access.</p> <p><b><u>Ecosystem services provided</u></b> – include water quality and flow; flood alleviation; air quality; carbon capture; recreational value and associated health / wellbeing benefits.</p>	<p>Impacts of visitors and dogs on sensitive wildlife and sites.</p> <p>Habitat fragmentation for example due to changes in land use/ land management, and housing and infrastructure development</p> <p>Declines in quality of wildlife habitats and associated declines in characteristic species</p> <p>Impacts of invasive non-native pests and diseases (and climate change).</p> <p>Over abstraction of chalk streams and from the chalk aquifer</p>	<p><b>Protection</b></p> <p><b>Buffering</b></p> <p>Restore, enhance and expand key habitats at the landscape scale.</p> <p>Investment to encourage greater use by communities within large urban centres of the adjoining areas e.g. High Wycombe.</p> <p>Investment in walking and cycling access from where people live and from rail stations to encourage alternatives to car access e.g. access hubs around rail stations.; also investment to promote health benefits – recreation and volunteering.</p> <p>Schemes to promote sustainable visitor management.</p>

# 5 – Bernwood Ray and hinterland

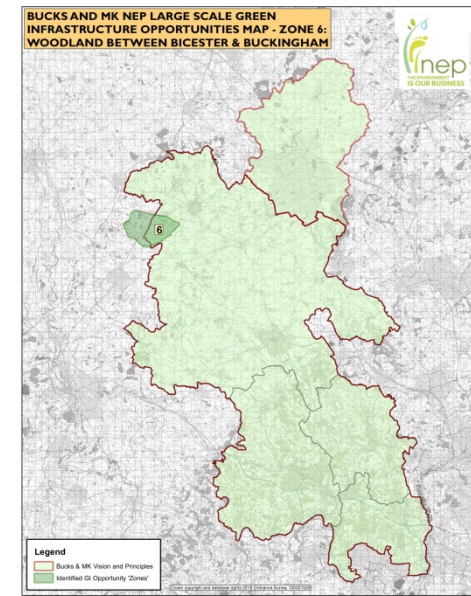
This opportunity zone is characterised by a number of large woodland blocks running in a NE/SW direction along with the large area low lying river Ray meadows. The zone also incorporates the parkland areas of Claydon House and Waddesdon Manor and also many hills and limestone ridges including Quainton Hill and the Upper Winchendon ridge. This zone cross over the border into Oxfordshire to include more woodlands and the Otmoor wetlands.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><u>Biodiversity and water</u></b>  <b>Exceptional biodiversity value</b>  <b>One of the most biodiverse zones of biodiversity in Bucks and MK</b></p> <p><b>River Ray Meadows– species rich lowland meadow and floodplain meadow with wading birds.</b></p> <p><b>Wildflower rich – provides pollination services.</b></p> <p><b>Bernwood – ancient woodland some meadows and ancient landscape with particularly rare bat and other interests.</b></p> <p><b>Two combined are of exceptional value.</b></p>	<p><b>NIC growth corridor – possible new sizeable garden town</b></p> <p><b>HS2 and East-West Rail</b></p> <p><b>Major infrastructure development:</b></p> <p><b>1 of 3 Ox-Cam expressway route options</b></p> <p><b>Eutrophication</b></p>	<p><b>Protection</b></p> <p><b>Buffering</b></p> <p><b>Enhancement</b></p> <ul style="list-style-type: none"> <li><b>Flood protection / alleviation.</b></li> <li><b>Pollination services</b></li> </ul> <p><b>Scope for more wildlife access (e.g. reserves)</b></p> <p><b>Possible GI investment sink area....</b>  <b>e.g. Obvious area for compensation for growth corridor, expressway etc – to achieving net gain.</b></p> <p><b>Habitat creation (current land values allow this)</b></p> <p><b>Access - Aylesbury Vale – deficient in large-scale accessible green space – key opportunities to improve this.</b></p>

## 6 – Woodland between Bicester and Buckingham

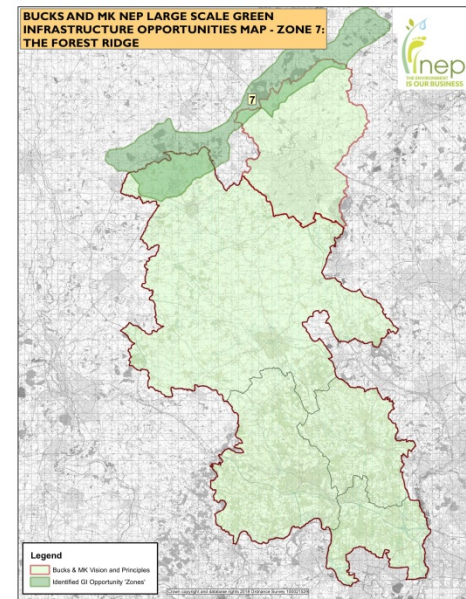
This opportunity zone is characterised by a relatively high density of woodlands that cross over the border into Oxfordshire.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><i>Biodiversity</i></b>  <b>Woodlands</b> – and associated benefits to air quality, CO2 sequestration, oxygen production, dust interception, buffering of precipitation runoff etc (see slide 19)</p>	<p><b>Major infrastructure development:</b>  <b>HS2</b></p> <p><b>1 of 3 Ox-Cam expressway route options (tbc)</b></p> <p><b>NIC growth corridor – possible new sizeable garden town</b></p> <p><b>Risk - fragmented habitats</b></p>	<p><b>Create new habitats – to dissipate visitor pressure</b></p> <p><b>Cross-border connectivity – wildlife resilience</b></p>

# 7 – The Forest Ridge

This opportunity zone is characterised by a number of large woodland blocks set along a ridge, there are good opportunities to link many of the woodland blocks together, with other modifications to land use that as well as enhancing recreation and wildlife potential would have substantial water catchment benefits regarding more desirable year-round River Ouse water flow patterns. This zone links to several others including to the northeast into Northamptonshire.

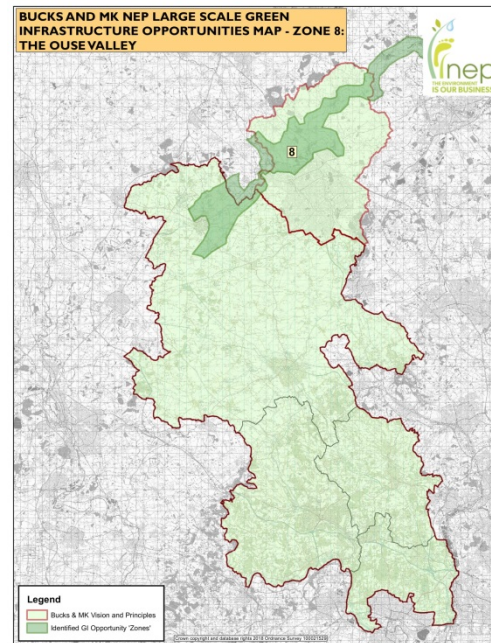


Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><u>Biodiversity</u></b>  <b>Large blocks of woodland including ancient woodland located close together</b></p> <p><b>Ridge-line: defines Bucks from Northants</b></p> <p><b><u>Water</u></b>  <b>Woodland reduces flooding events (slows the flow).</b></p> <p><b><u>Access</u></b>  <b>Recreation value to MK and Northants.</b></p>	<p><b>Strategic opportunity</b></p>	<p><b>Protection</b></p> <p><b>Connectivity - GI Creation and linkage</b></p> <p><b>Flood protection / alleviation.</b></p> <p><b>Potential recreation in new woodlands. Ecosystem services provision, e.g. flood alleviation and water provision in droughts.</b></p> <p><b>New woodlands and better linkages, grassland</b></p>



# 8 – Ouse Valley

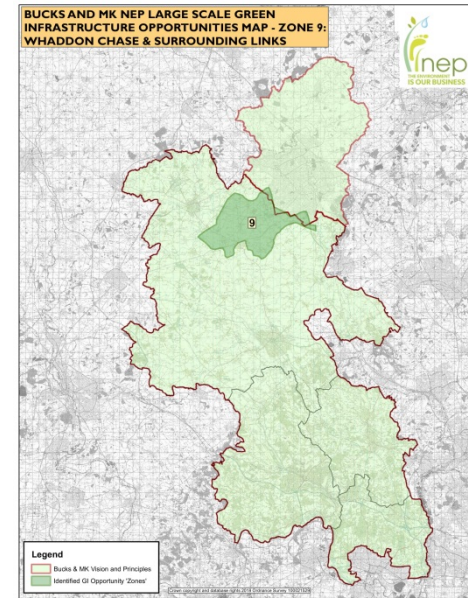
This opportunity zone largely includes the Ouse Valley Biodiversity Opportunity Area, where there are opportunities to create linkages between existing GI assets along the river corridor. There is potential, perhaps working with the mineral extraction industry to create a large scale regional important biodiversity asset, similar in scale to the [Great Fen Project](#) so to raise often piecemeal and fragmented habitat creation projects to another level.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><u>Biodiversity</u></b> Wildlife habitats – e.g. lakes, scrub, lakeside habitats – one of the equal best places in Bucks and MK for water birds alongside College Lake.</p> <p><b><u>Access</u></b> Recreation (sailing, water activities) health and wellbeing.</p>	<p><b>Development (housing)</b></p> <p><b>Gravel extraction</b></p> <p><b>Eutrophication</b></p> <p><b>Lack of appropriate habitat management</b></p>	<p><b>Enhancement and restoration – to provide GI benefits of flood alleviation / flood risk reduction further downstream.</b></p> <p><b>Habitat creation and linkage.</b></p>

# 9 – Whaddon Chase and surrounding links

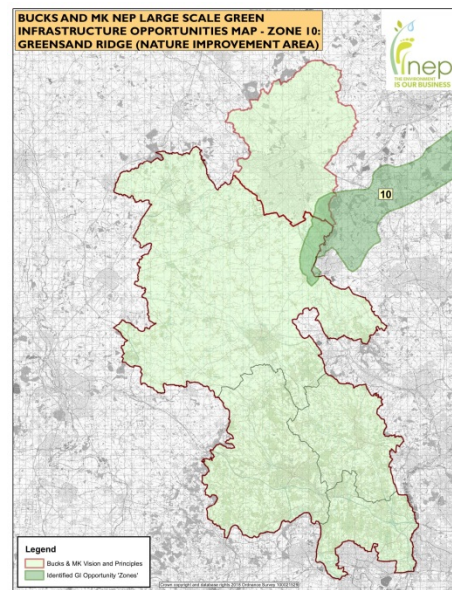
This opportunity zone incorporates a number of woodlands in the Whaddon Chase area where there is very good potential to create linkages especially relating to recreation within the context of probable large scale local development. The 'core' Whaddon Chase area has been extended to include other local concentrations of woodlands including those in the Addington and Swanbourne areas.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><u>Biodiversity</u></b>  <b>Woodlands, hedgerows</b></p> <p><b>Fen areas and grassland</b></p>	<p><b>Development pressure – including urban extensions to Milton Keynes, Ox2Cam growth arc.</b></p> <p><b>Possible Expressway route and East-West rail</b></p>	<p><b>Linkage / connection with area 5 and areas 8 and 7</b></p> <p><b>Conserving and creating habitat links between woodlands</b></p> <p><b>GI creation and great potential for recreation - possible free-to-roam area (like Richmond Park).</b></p>

# 10 – Greensand Ridge (Nature Improvement Area)

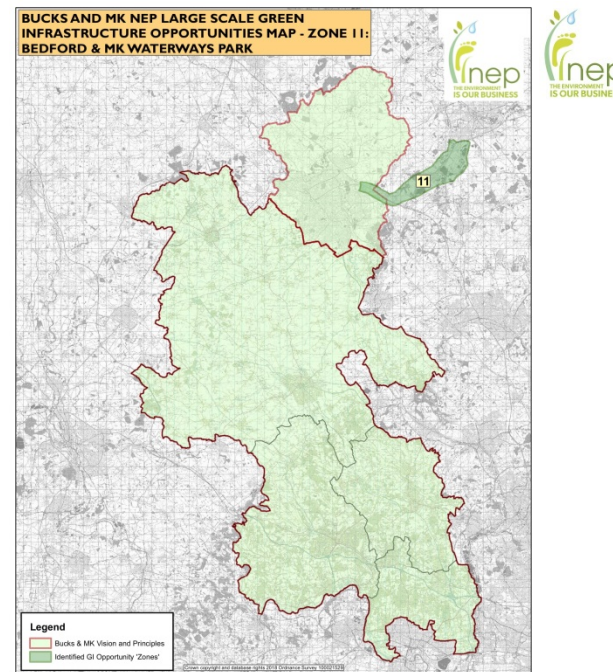
This opportunity zone is largely defined by its underlying geology. It has large areas of woodland, acidic grassland and heath. Stockgrove country park straddles the county boundary with Bedfordshire which has the largest part of the Greensand Ridge. The ridge is a [Nature Improvement Area](#) *The boundary to the Greensand ridge need to be moved east*



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><u>Biodiversity</u></b>  <b>Acid Heathland and grassland</b>  <b>Woodland</b></p> <p><b><u>Access</u></b>  <b>Highly valued recreational area (MK, as well as Beds etc.) e.g. Greensand Ridge Walk and Cycleway.</b></p>	<p><b>Development</b></p> <p><b>Possible expressway route</b></p> <p><b>Visitor pressure – on habitats and facilities</b></p> <p><b>Lack of appropriate habitat management</b></p>	<p><b>Connectivity of internal habitats</b></p> <p><b>Create new habitats – to dissipate visitor pressure</b></p> <p><b>Cross-border connectivity – wildlife resilience</b></p>

# 11 – Bedford and Milton Keynes Waterways Park

This opportunity zone is the wider corridor of the proposed new [waterways park](#) (linking the Great Ouse in Bedford to the Grand Union Canal in Milton Keynes) and has the potential to be the spine of GI along which new developments between Bedford and Milton Keynes are located. These include lakes and woodland plantations. This corridor zone links with zone 13, the Ouzel corridor.

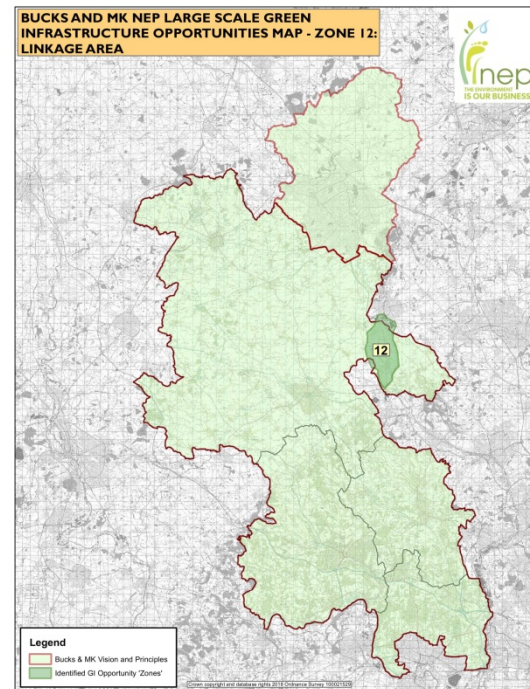


Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<u>Access</u> - for recreation	<p><b>Increased urban development in the zone along the proposed route.</b></p> <p><b>Area represents a strategic opportunity</b></p>	<p><b>Linkage – between existing GI assets in both Milton Keynes and Bedfordshire</b></p> <p><b>Creation for access and recreation</b></p> <p><b>Canalside-related habitats</b></p> <p><b>Economic benefits</b></p>



# 12 – Linkage area

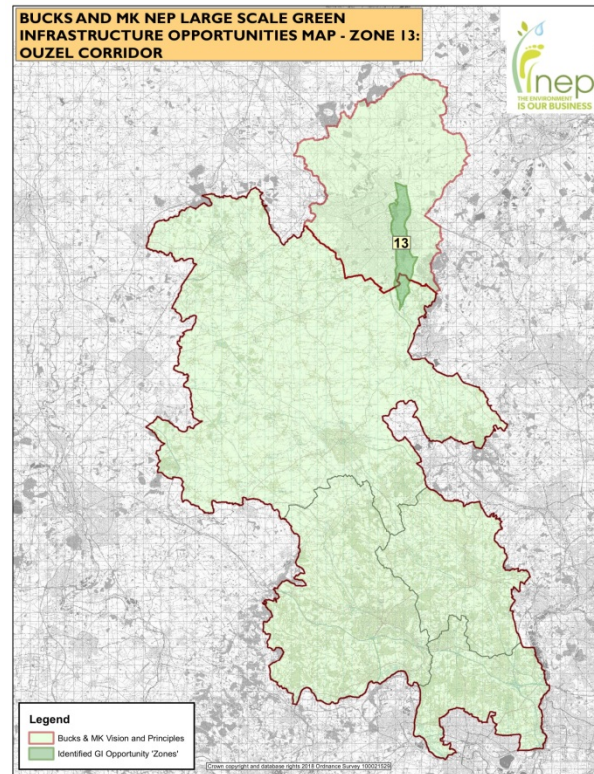
This opportunity zone provides a link between the River Ousel (zone 13) and the upper reaches of the River Thame (zone 3). In addition, a link to zone 2 the Chilterns escarpment and it's hinterland. This relatively small zone includes a number of GI assets including Parkland associated with Ascott house and Mentmore Towers.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><i>Biodiversity and water</i></b></p> <p><b>Farmland, streams and parkland including woodland and the Mentmore mature tree avenue.</b></p>	<p><b>Strategic opportunity</b></p>	<p><b>Linking the Greensand Ridge (zone 10) via the River Ousel (zone 13) to the Chilterns via the Ascott house and Mentmore Towers parkland habitats.</b></p> <p><b>Linkage / connectivity.</b></p> <p><b>Biodiversity and access (e.g. along the Grand Union Canal) – may help alleviate recreational pressures elsewhere</b></p>

# 13 – Ouzel corridor

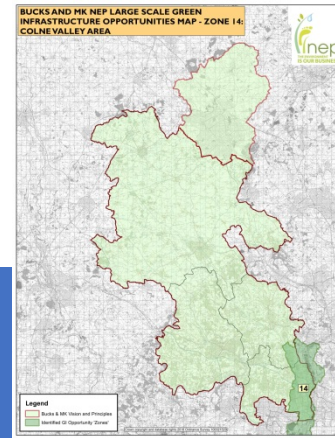
This opportunity zone follows the River Ouzel and adjacent areas, upstream from the Ouse valley (zone 8) southwards through Milton Keynes where much of the land area has already been developed for housing and parkland. In this developed area there is scope for the creation of a more diverse suite of GI assets including many suggested in the [Milton Keynes Parks Trust Biodiversity Action Plan](#). In addition, the incorporation of imaginative and innovative GI assets into areas zoned for development including the area north of the M1 to Newport Pagnell and to the south of Milton Keynes must be encouraged. The Grand Union Canal runs along much of this zone and provides a major GI asset for public recreation.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
<p><b><i>Biodiversity and water</i></b>  River, lake, pond, canal, woodland plantation, parkland and urban habitats</p>	<p><b>Built Development, with the likelihood of more in the future.</b></p> <p><b>Threat of fragmentation by e.g. expressway</b></p> <p><b>Eutrophication</b></p>	<p><b>Creation - Potential to create zones for recreation, access, wildlife habitats.</b></p> <p><b>Flood buffering. The incorporation of GI assets into built developments and the river and canal corridors.</b></p> <p><b>Linkage - with Bedfordshire - to ensure a whole-valley approach is taken.</b></p>

# 14 – Colne Valley area

This opportunity zone covers the Colne Valley Regional Park and extends beyond this in areas. The zone has a complex mosaic of habitats providing numerous recreation opportunities.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
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**Biodiversity**  
 Connections and wetlands – e.g. 70 lakes, 100s of kms of water courses. Park includes 13 SSSIs, mostly wetland, and some ancient woodland. Important area for birds travelling between Colne and Lee Valley.

**Access**  
 Hundreds of kms of public rights of way – including those added by the Park often to link gaps between paths in neighbouring LAs. National Cycle Route and Colne Valley Trail share a route between Rickmansworth and Langley (with plans to extend to Colnebrook to Staines and the Thames Path). The South Bucks Way and the London Loop also go through the CVRP. 20 circular walks in the valley.

**Water**  
 The Colne is a very braided channel. Many lakes.

**Development**  
 – e.g. Slough, LHR, HS2, Western and Southern link to Heathrow.

**Air quality / air pollution**

**High land values**  
 – speculative acquisition and then holding onto land...makes things harder for conservation. Deliberate lack of management can mean development more likely in the future.

**Decline of farming**  
 – due to high land values (e.g. insurance costs)

**Visitor awareness**  
 - of the park and its connections in the area has improved but remains a challenge

**Visitor pressure**  
 – least of the key problems. Colne Valley Regional Park looks to encourage visitors, and manage them while in the area appropriately.

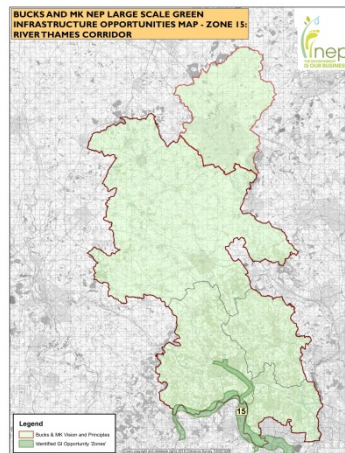
**Connectivity (e.g. opportunities to connect ancient woodlands), maintaining and enhancing biodiversity.**

**Public access and recreation – opportunity to improve awareness. Around 3 million people live within 10 miles of the park.**

**Buffering also helpful – e.g. around SSSIs.**

# 15 – River Thames Corridor

This opportunity zone covers the Buckinghamshire stretch of the River Thames Corridor from just downstream of Henley through the southern part of Wycombe District Council and into South Bucks District. The river corridor includes a wide range of wetlands and riverside meadows as well as the Jubilee River, the Buckinghamshire part of Dorney Wetlands, the Little Marlow Lakes Country Park and the joining of chalk stream tributaries with the Thames. The opportunities in this zone cannot be considered in isolation from those in adjacent areas south of the river.



Current value / GI functions provided	Issues / threats	Main GI opportunity / needs (functions) [protection / buffering / connectivity and linkage / enhancement / creation / access / other]
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**Biodiversity and water**  
 Important habitats for wetland bird species, including migratory species.  
 The River Wye / Hughenden and Hambleden Stream chalk streams join the Thames in this zone.  
 Areas of scarce wet woodland.  
 Riverside meadows, woodlands and parkland.  
 Woodland escarpments rise from the Thames at Cliveden

**Access**  
 Three long distance trails (Thames Path, Shakespeare's Way and London Green Belt Way), with short links to the Chiltern Way as well as other walking routes. National Cycle Route 61 follows Jubilee River.

**Development pressure**  
 Visitor pressure – heavy use of Thames Path; increased tourism at Marlow; Little Marlow Lakes County Park  
 Need to improve habitat and river management – e.g. ecological status of River Thames and river traffic and mooring impacts on river-edge habitats.

**Creation – for wildlife and access**

- New mosaic of wetland at Little Marlow Lakes Country Park.
- Open water and river edge reedbed-habitat.
- New wetland to west of Marlow
- Potential for surface and ground water flood retention areas.
- Fish refuges for when Thames floods.

**Creation – for access / recreation**  
 (to relieve higher visitor pressure from new housing on designated sites - e.g. at Burnham Beeches)

- Development of more walking routes- from stations, riverside heritage trail
- Foot / cycle link from High Wycombe to Bourne End along the old railway line
- Public open space and walking routes at Little Marlow Lakes Country Park.



# ii) Data List

The following table details the data used in baseline mapping to inform the opportunity mapping work.

Layer	Category	Source	Date
Ancient woodlands	Biodiversity	Natural England	Jul-12
BBOWT reserves	Biodiversity	BBOWT	May-17
Biological Notificaiton Sites	Biodiversity	BMERC	Jan-17
Local geological sites (RIGS)	Biodiversity	BMERC	Jan-17
Local nature reserves	Biodiversity	Natural England	Dec-16
Local wildlife sites	Biodiversity	BMERC	Jan-17
National nature reserves	Biodiversity	Natural England	Dec-16
Priority habitats	Biodiversity	Natural England	2017
Priority habitats	Biodiversity	BMERC	Jan-17
Road verge nature reserves	Biodiversity	BMERC	Jan-17
Special areas of conservation	Biodiversity	Natural England	Dec-16
SSSI's	Biodiversity	Natural England	Dec-16
Woodlands	Biodiversity	Forestry Commission	2015
Accessible GI (2ha, 20ha, 100ha, 500ha)	Access to open space	ANGSt	2009
BBOWT reserves	Access to open space	BBOWT	May-17
BCC Open Access Land	Access to open space	Buckinghamshire Green Infrastructure Strategy	2009
Cycle routes	Access to open space	BCC	2009
Designated Local Green Space (Neighbourhood Plans)	Access to open space	BCC	Aug-17
Forestry Commission Ownership	Access to open space	Forestry Commission	2016
Grand Union Canal	Access to open space	BCC	2017
Greenspace (inc Country Parks)	Access to open space	Ordnance Survey	Jul-17
Major Footpaths/National Trails	Access to open space	Natural England/Ordnance Survey	Sep-16
National Trust Ownership	Access to open space	National Trust	Sep-14
Open Access Land - CROW (Open Country, Reg. Common Land)	Access to open space	Natural England	Jul-15
Public open space	Access to open space	District councils (local plans, core strategies)	1996-2011
Regional Parks (Colne Valley)	Access to open space		
Rights of way	Access to open space	Bucks County Council	Dec-16 (Bucks)
Rivers & Waterways (Grand union canal, all rivers, lakes, ponds & reservoirs)	Access to open space	Ordnance Survey	2017
RSPB Ownership	Access to open space	Bucks County Council	Aug-17
Village greens	Access to open space	Natural England	Aug-11
Woodland Trust Ownership	Access to open space	Woodland Trust	May-13
Flood Zones (2&3)	Water	Environment Agency	Feb-13
Mastermap Water (MK)	Water	Ordnance Survey	Aug-17
Open Water (MK)	Water	Ordnance Survey	Jul-17
Raster water data (MK)	Water	Ordnance Survey	Jul-17
Rivers & Waterways (Grand union canal, all rivers, lakes, ponds & reservoirs)	Water	Ordnance Survey	2017
BOAS (Regional)	Constraints	BMERC	Feb-09
Existing settlement (urban areas over 3000 population)	Constraints	Buckinghamshire Green Infrastructure Strategy	2009
Planned development (Local plan sites, green belt releases, Heathrow opportunity sites, Slough extension)	Constraints	Ringway Jacobs	2017
A-Roads	Constraints	Ringway Jacobs	Feb-15
CrossRail	Constraints	Ringway Jacobs	2017
East West Rail	Constraints	Ringway Jacobs	2017
HS2	Constraints	Ringway Jacobs	2012
Motorways	Constraints	Ringway Jacobs	Mar-15
Growth Arc	Constraints	BCC	2017
Rail Network	Constraints	Ringway Jacobs	Nov-12
WRLTH	Constraints	Ringway Jacobs	2012
Identified GI Opportunity Zones	Constraints	BCC	Mar-18

## ii) Data selection

The selection of which data to include to inform the opportunity zones took account of

- *Availability*
- *Reliability*
- *How recent*
- *Scale of map being produced (very large scale) v scale of data being considered*
- *Purpose of output – indicative, enabling, illustrative – at the strategic scale*
- *Time, resources, other constraints*

*There is more information available than we could include.*

*The initial mapping works at an agreed strategic level.*

*The mapping can be revisited at a more detailed scale or as information sources develop.*