East Cullompton and Culm Garden Village Masterplan:
Natural Capital and Ecosystem Service Evaluation

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Cartography by Environment Systems Ltd, June 2022

Map scale 1:30,000

Table of Contents

1 Introduction

Our environment is our life support system sustaining and providing our food, fuel, building materials, fresh air, clean water, carbon storage, and economic worth. Climate change, significant declines in biodiversity, and population growth are putting pressure on our environment, together with a growing scientific understanding of how our environmental system functions have shown that the Earth's resources are finite and need to be carefully managed and considered as an integral part of decision making.

The Dasgupta Review, recently commissioned by the UK Treasury, contains the central message that our economies, livelihoods, and well-being all depend on nature, and the accelerating collapse of the natural world is fuelling extreme risk and uncertainty for a sustainable and prosperous future. The 25-year plan to improve the environment (DEFRA, 2018) acknowledges the natural environment as our most precious Inheritance and considers that the maintenance of its natural processes needs a long-term solution. Recently (March 2022), the Government has set an ambitious new target to raise at least £500 million in private finance to support nature's recovery every year by 2027 in England, rising to more than £1 billion by 2030. All these policy drivers are aimed to help replace damage done to our environmental function. As part of this, the UK Government wants to fundamentally change the way designated sites assessments, under Habitats Regulations, work. Thus, creating clearer expectations of the required evidence base at an early stage, for example, building on the concept of a site improvement plan. This approach should focus on the threats and pressures both on and off the site that, when addressed, will make the greatest difference to the site, and help drive nature recovery whilst enabling truly sustainable development.

The changes to society and industry caused by the ongoing Covid-19 pandemic have further highlighted the importance of our environmental Infrastructure (often referred to as green and blue Infrastructure) for health and wellbeing and the generation of important goods and services, such as clean water provision, carbon sequestration and regulation of atmospheric pollutants. These services are often referred to as ecosystem services. These are the 'goods and services' provided by the environment, that benefit human beings. These ecosystem services include the well-recognised features such as clean fresh water and crops for food as well as many 'hidden' services. These hidden services include regulating features such as climate mitigation as well as supporting services, for example pollination and nutrient cycles. The quantity and availability of these services is referred to as natural capital.

Environment Systems' SENCE (Spatial Evidence for Ecosystem Services) natural capital mapping tool helps show where the environment is working well, for example providing an ample pollinator resource, helping filter water to provide fresh potable water, and reducing flood risk. By considering risk areas, it can help site nature-based solutions where they will best establish and help mitigate risks.

1.1 Why we should consider ES for the Masterplan

DEFRA has set ambitious new targets to ensure we can meet our commitments to maintain and enhance biodiversity and meet the challenges of a changing climate. This is helped by ensuring a net zero approach to development. This applies to the land, its carbon stock, and sequestration potential, as well as to the buildings being established.

When Masterplanning, the areas that provide high levels of ecosystem services should ideally be retained. Alternatively, giving additional care whilst working on these areas help mitigate damage, or allow the valuable resources to be utilised elsewhere on site (such as for seed bank purposes).

The SENCE process also helps highlight opportunity areas; not every habitat has the same chance of success of establishment everywhere, and SENCE shows you the best place to site new land use to help maximise ecosystem service benefits. SENCE also shows you where to avoid issues. For example, in this site there are some hollows which might well trap polluted air and cause frost pockets, it would be good to avoid these when sighting new roads.

1.2 Why is it important to map ecosystem services spatially?

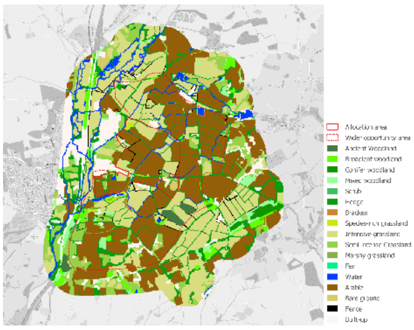
Why does it matter where the different parts of a landscape are? Woodlands are fantastic at providing ecosystem services, they help form soil and vegetation carbon, help form soil and vegetation carbon, intercept rainfall, slow water infiltration, provide water filtration, are key for biodiversity, and provide a recreation resource.

However, not all woodlands are equal. Woodland at A, which is establishing the meander plays a huge role in stopping sediment entering the water reducing its quality, whilst the big woodland at B has much less impact on that point. So, it is not only what the habitat is but where it is, the soil, geology, landform, hydrology, and the management.

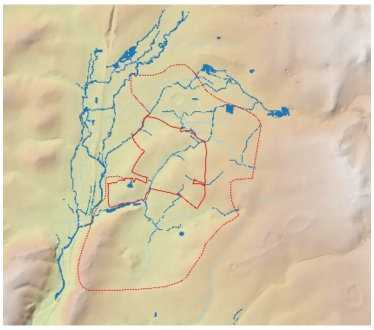
1.3 What drives Ecosystem service and Natural Capital?

Key factors of the land drive ecosystem service, the habitats, their naturalness, and the amount of biodiversity they support (Often called ecological conditions) the soil and geology, and the land form and hydrology.

Habitat



Landform & hydrology



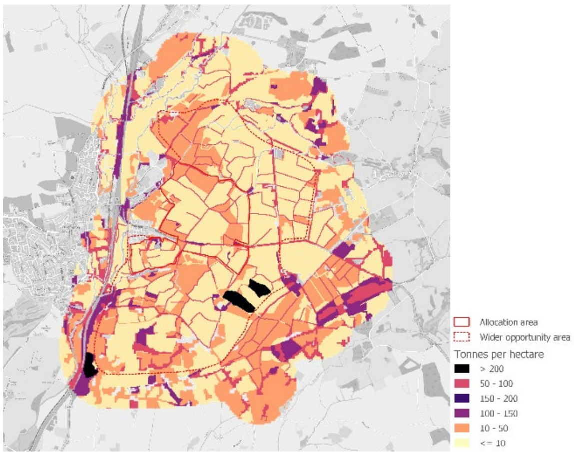
Soil types

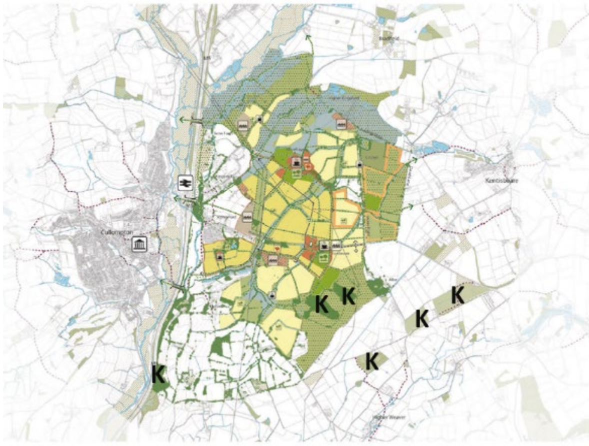
Looking at these key factors for the Masterplan area, the habitats have several significant ancient woodland sites, these have been woodland for so long that the carbon stored in the soil is extremely large and they are very important for biodiversity and a range of other services. However, there are also some more interesting grasslands, marshy grassland and streams that can be used to create more habitat and to put back some of the ecosystem services that will be lost under development, to maximise the benefit of the development. Some interesting things to note are that some of the soil is very prone to erosion, this will need careful handling on working, the wetter terrain will be excellent to establish wetland and grassland to maximise carbon and biodiversity stores. Neath, Brockhurst and Whimple are wetter soil types.

2 Carbon Storage

Considering ecosystem goods and services, and the natural capital they provide, allows us to understand how the land is currently storing carbon and supporting carbon sequestration. These considerations play a significant role in helping us to reach carbon targets towards net zero. The data modelled here allows us to create a carbon budget showing how much each area of land in the Masterplan area is storing carbon, in tons per hectare. From this, we can understand what needs to be re-created, or restored, to reach that net zero target and help offsite carbon elsewhere.

Below is a map that illustrates the current estimated Carbon storage, in tonnes per hectare. On the left is the estimated carbon storage, and on the right is the Masterplan, with the highest carbon storage areas marked with K. You will notice that the areas of woodland are the best at storing carbon, and that the hedgerows are also prominent.





Currently, the total carbon stored on the site is estimated to be:

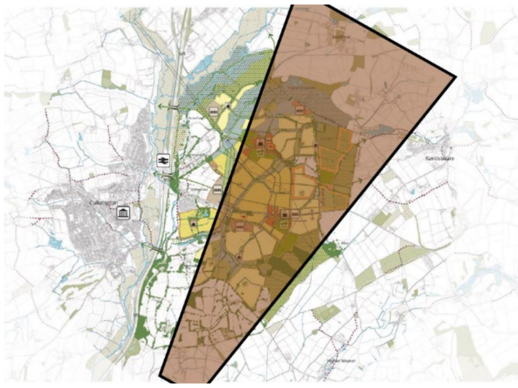
RLB area	2,430 tonnes
Green area	13,870 tonnes
Total Carbon stored	**16,300 tonnes**

A high selling point for the Masterplan is for the site to be carbon neutral. This can be achieved by keeping in place existing habitats that have a high carbon storage potential (e.g., woodlands and hedgerows), but also by restoring and converting relatively low carbon storage habitats into better opportunities.

For example, hedges that have been in place for centuries have very high carbon stores below ground. Establishing a soil management plan, where this soil from beneath the hedge is stored as carefully as possible, will be important in maintaining carbon neutrality with existing habitats.

Currently, a lot of the area is arable, which, during harvests, removes a lot of the vegetation carbon, and releases the soil carbon. Establishing new areas of broadleaf woodland, wetland, and grassland habitats, preferably with native species, will help increase the carbon sequestration of the area, and keep it locked up in the soil as well.

Below is a map that illustrates the potential opportunity for increasing Carbon storage, from low (yellow-green) to high (dark green). On the left is the opportunity for increasing carbon storage, and on the right is the Masterplan. The Masterplan map shows the general area which is best for establishing new habitats, or enhancing existing ones, to increase the carbon storage of the area, and help the Masterplan achieve a net zero status.



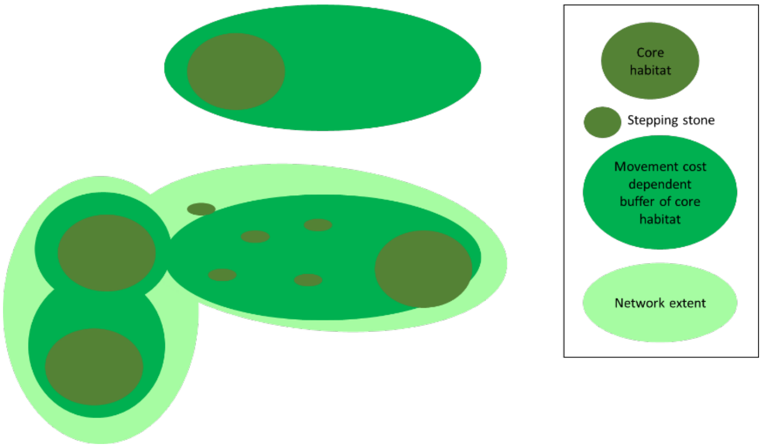
3 Natural Habitats and Their Importance

Natural habitats are key for biodiversity as they tend to have a fully functioning ecosystem. These are made up of multiple parts, and provide the area with a strong resilience against climate change, as well as supporting a wide range of species; even those generally less common.

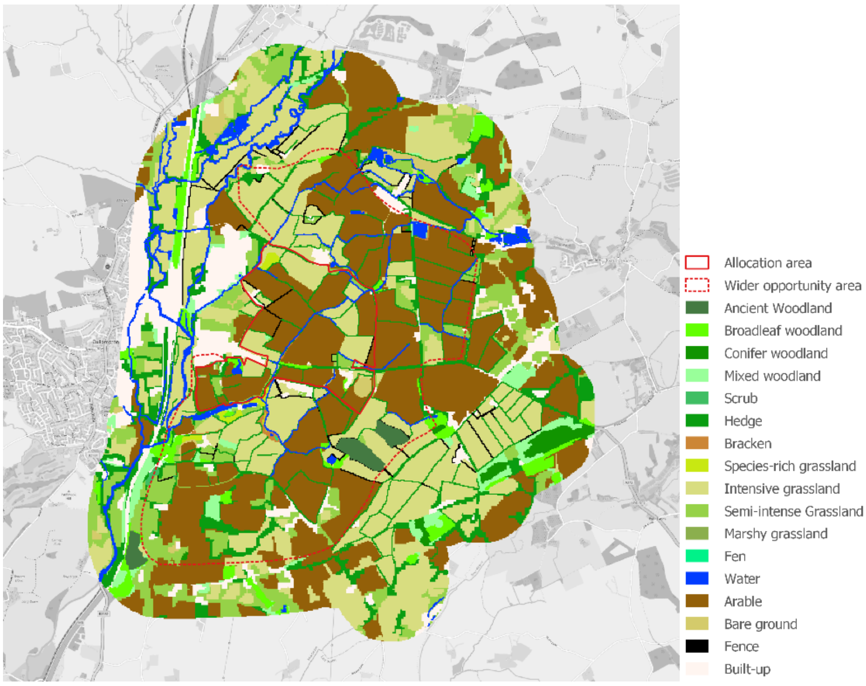
The bigger the block of habitat the more robust it to change, as it has a greater amount of genetic material to share. For example, a small woodland might contain only one nest of dormice, but a larger woodland block might contain a few. The spatial relationship between these blocks of habitats is also important.

The nearer the blocks of habitats are together, the more chance they have of sharing the genetic material. Following on from earlier, even if a small woodland only has one nest of dormice, but is close to another small woodland with only one nest, there is a chance that the two can share their genetic material; particularly if the woodlands are connected by a hedgerow. Where habitats are close enough to share these resources is called an ecological network.

Below is a diagram that illustrates the concept of an ecological network. The dark green is the mark block of habitat, such as a woodland. These can be large (often called a core habitat), or small (termed a 'stepping-stone'). The lighter green areas illustrate the ecological network that facilitates the movement between the core and stepping stone habitats.



This map below shows the habitats within the site, and the way they relate to those on the outside of the site. Some particularly important features for biodiversity are the ancient blocks of woodland, the more species rich grasslands and marshy grasslands, and the hedges and the trees.



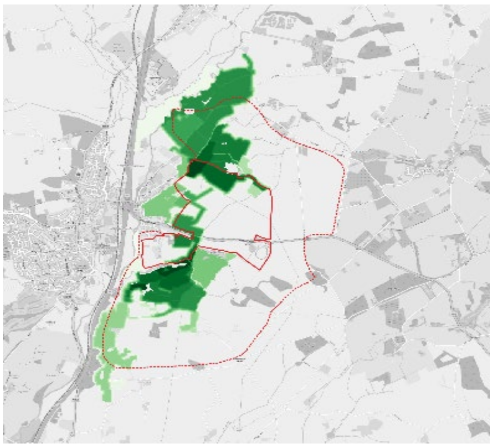
The Masterplan has recognised these significant sites, such as the proposed grassland corridor. This will help maintain and restore native species rich grassland, which is hugely important for biodiversity in general and pollinators. In turn, it will also help local farmers, allotments, and gardens in the new site establish well.

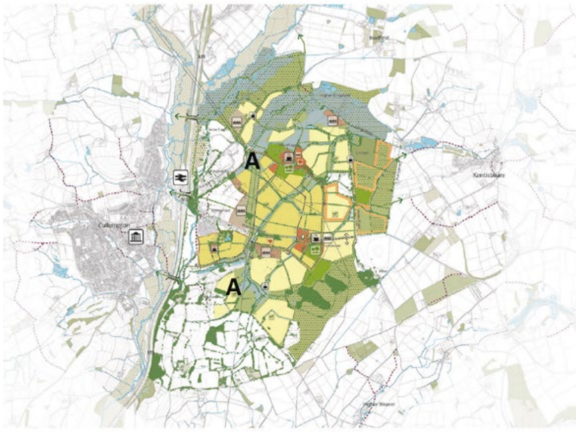
4 Habitat Networks

The following diagrams show how the existing habitats can support biodiversity when retained, and where establishing new habitats on site will significantly enhance the biodiversity. Using this information allows the creation of a mixed landscape with the habitats which would work best in each space, and support cultural needs.

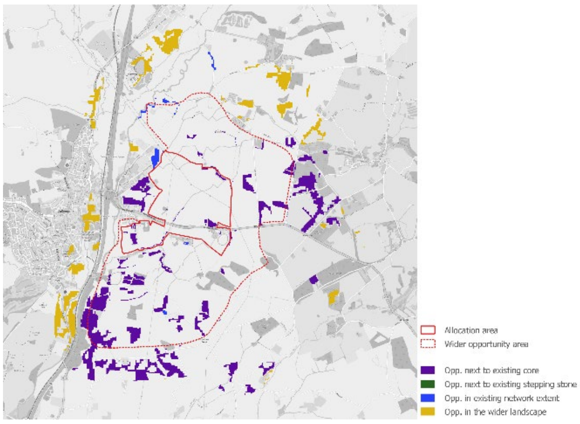
4.1 Grassland features

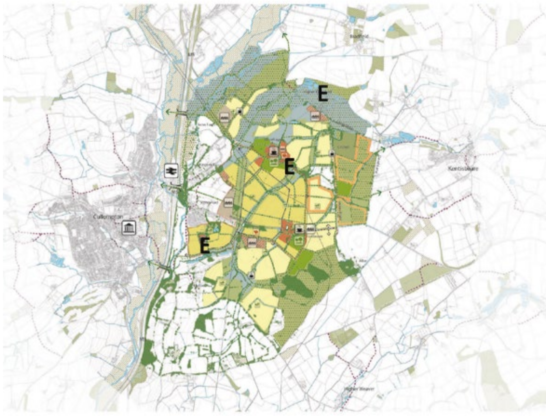
The maps below show the current ecological network of the grassland habitats (left), and the areas in the Masterplan that have the best grassland connectivity (**A**, right). It is recommended that as much of the existing grassland network be left intact as possible.





The maps below show the most opportune locations for expanding the ecological network of the grassland habitats (left), and the areas in the Masterplan that correlate with these areas (**E**, right). Enhancing these areas with additional planting of native grassland species within the high connectivity areas, will assist biodiversity and maximise carbon capture.

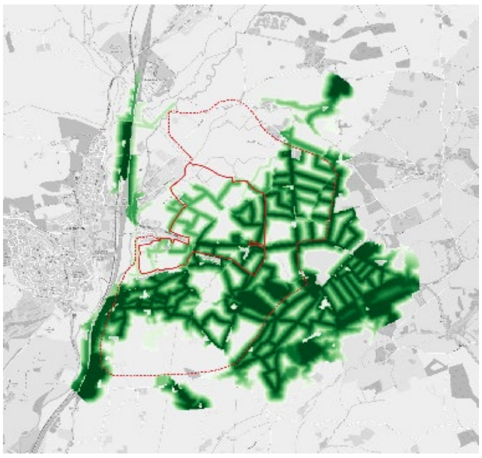


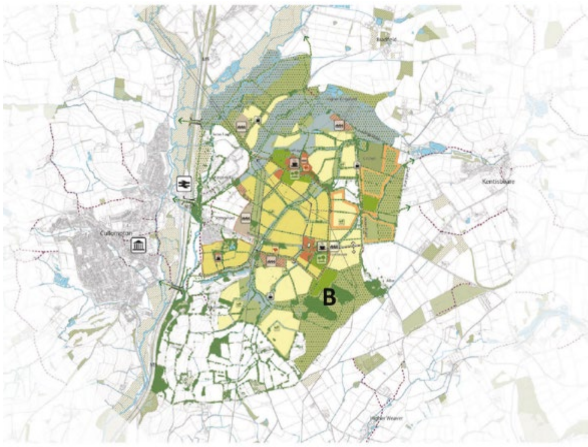


The map below shows the area of the Masterplan that, if established with native grassland species, would provide the greatest impact for the grassland network in the area; making it bigger, better, and more joined up. The Masterplan has recognised this, with the proposal of a Country Park.

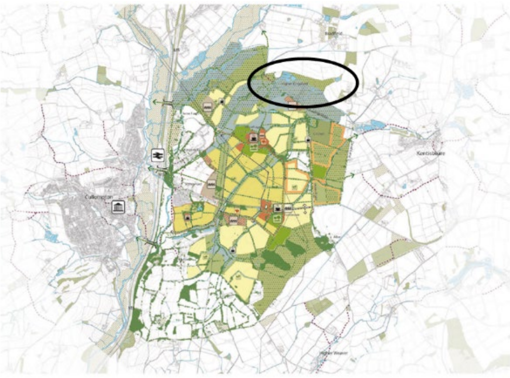
4.2 Woodland features

The maps below show the current ecological network of the woodland habitats (left), and the areas in the Masterplan that have the best woodland connectivity (**B**, right). There is an extensive hedgerow network that connects large stands of woodland across the area. It is recommended that as much of the existing woodland network be left intact as possible, which the Masterplan does recognize.



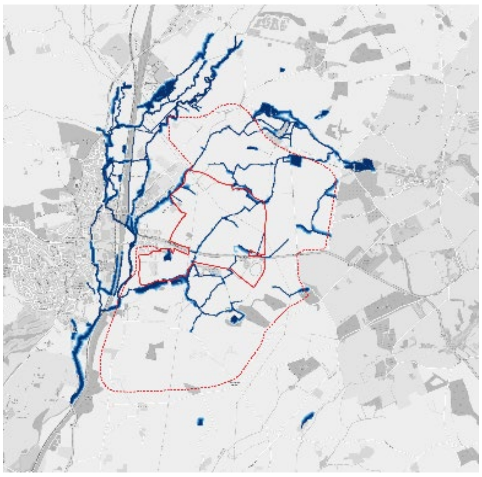


The map below shows the area of the Masterplan that, if established with native woodland species, would provide the greatest impact for the woodland network in the area; making it bigger, better, and more joined up. The Masterplan has recognised this, with the proposal of a Country Park that, if it includes woodland features, would link the woodlands around Kingsmill to those around Bradfield. There is synergy with grassland and wetland networks, so woodland pasture, or marshy grassland would be beneficial.



4.3 Wetland features

The maps below show the current ecological network of the wetland habitats (left), and the areas in the Masterplan that have the best wetland connectivity (**C**, right). There is an extensive river network that connects several large water bodies and ponds throughout the site. This network is maintained in the Masterplan.



The maps below show the most opportune locations for expanding the ecological network of the wetland habitats (left), and the areas in the Masterplan that correlate with these areas (**D**, right).

Most of the area is an opportunity for new wetland features. Establishment / enhancement of wetland features in the northern region would help make the existing network bigger, better, and more joined up, whilst in the south would help in establishing new corridors.

The area around **D** is especially great for establishing wetland adjacent to existing wetland habitats, as part of the proposed Country Park. There is a synergy with a potential for woodland creation, and also grassland creation. This means that wet woodland or wet grassland features would benefit these networks as well.

The wider development area to the NE of Venn Farm is currently located in a region that is great for establishing wetland features, which are also outside of the current network. Wetland features here would mean the network would be larger and more intact. There is an area further to the east within the Indicative Country Park (marked in blue), that is more difficult, or unsuitable, for conversion to wetland, woodland, or grassland features. This area could be more suitable for development.

The map below shows the area of the Masterplan that, if established with native wetland species, would provide the greatest impact for the wetland network in the area; making it bigger, better, and more joined up. The Masterplan has recognised this, with the proposal of a Country Park that, if it includes wetland features, would link the wetlands around Kingsmill to those around Higher Kingsford. There is a synergy here also with a potential for woodland creation, and also grassland creation. This means that wet woodland or wet grassland features would benefit these networks as well.

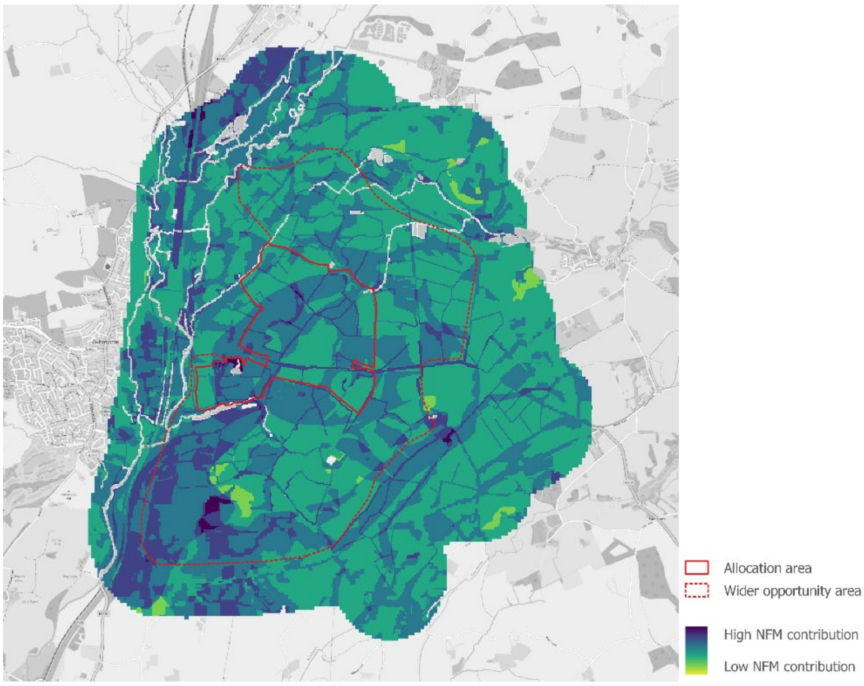
4.4 Development area affected by powerline

The map below shows an area of the Masterplan where the development is affected by a powerline (in red). This means that no buildings can be constructed, or woodland established.

However, the entire area does have a potential for grassland creation, which if established at **M** would have the greatest positive impact on the network for this area. The point marked as **L** has a great opportunity for wetland creation. If this area were established as an area of wet grassland, it would benefit both networks.

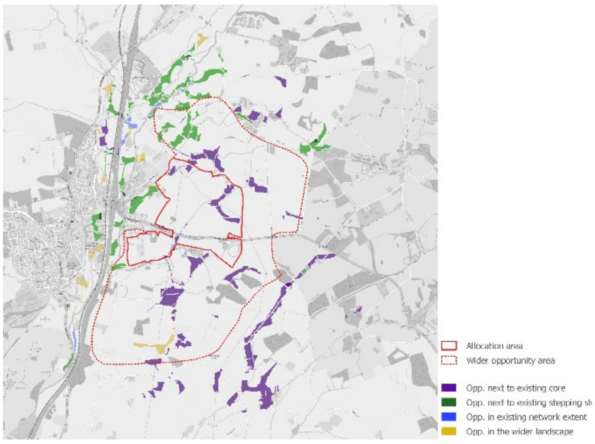
5 Natural Flood Management

This map shows the combinations of soil and vegetation that provide a high degree of water infiltration and storage in the soil. The more water that infiltrates the soil, the slower the flood peaks are in reaching the river, helping to mitigate flooding events. Areas with a higher contribution could be factored into plans for the site.



The establishment of a wetland would allow for storage of water and lengthening time for water to reach the stream, helping reduce the height of the flooding and therefore helping prevent damage etc.

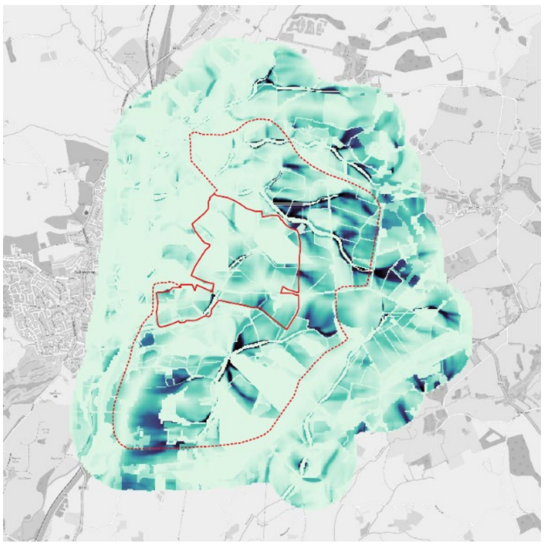
The best way to help slow water down and prevent flooding is to plant native species of deciduous trees. The maps below show areas where tree planting will benefit natural flood management and biodiversity of the Masterplan (left), and the areas in the Masterplan that correlate with these areas (**H**, right). Enhancing these areas with additional planting of native deciduous trees and hedgerows would allow for more storage of water, and lengthening the time for water to reach the stream network; helping to reduce the height of the flooding and prevent damage.



6 Water Quality

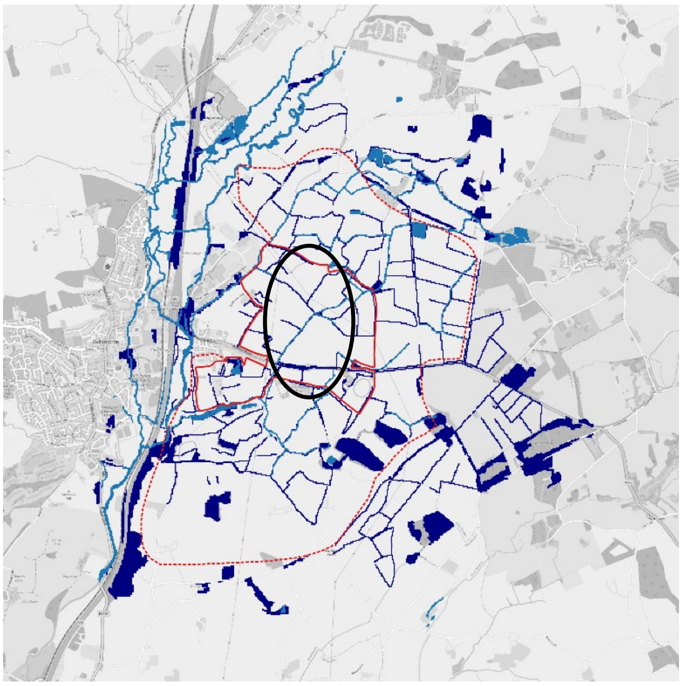
Water quality in the rural environment depends on the land use and pollutants, such as fertilisers and herbicides, blown or running off fields after rain. Another influence is soil particles from nearby fields washing into the streams — these particles tend to carry phosphorus directly into streams.

This map below shows the current erosion potential of the region. This is a useful resource to consider when planning soil management, to identify areas which should be permanently vegetated to prevent further erosion and help prevent pollution.

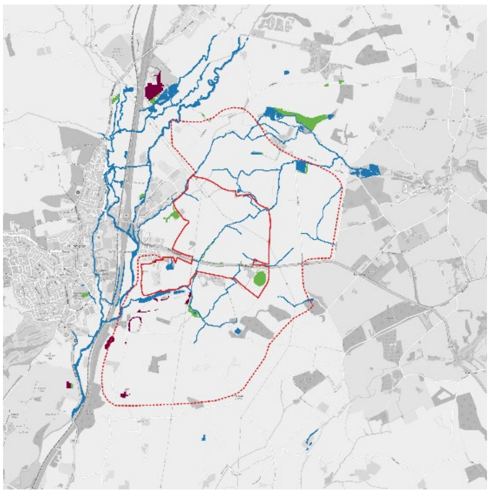


This map below shows the current features that help prevent water pollution by breaking the flow pathways to the river. These are predominantly made up of woodland and hedgerow features. The hedgerow in the circle is a particularly strong link; keeping as much of this feature intact as possible would help mitigate pollution after development.

The Masterplan has considered these data, in that areas of high erodibility are proposed to be permanently covered in vegetation. Where these areas of high erosion risk are within development zones, then they will be worked carefully.

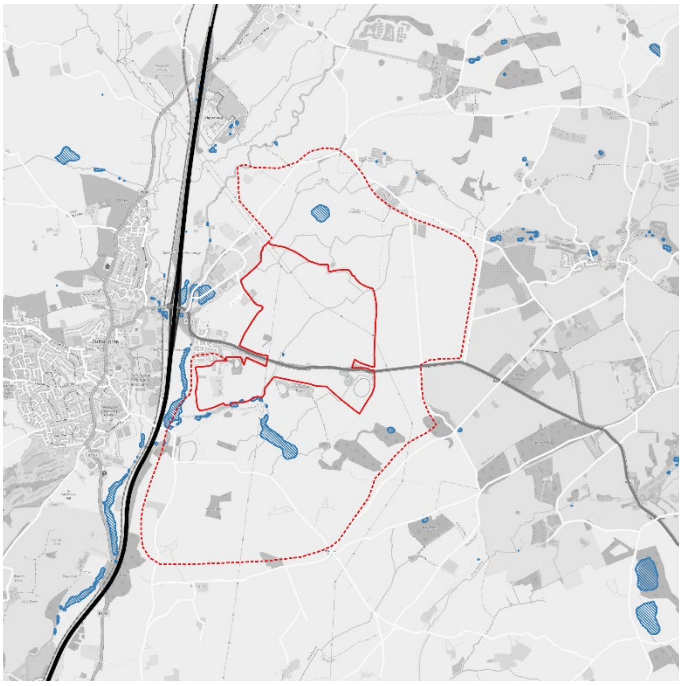


The maps below show the most opportune locations for improving the water quality across the area (left), and the areas in the Masterplan that correlate with these areas (**I**, right). Enhancing these areas with additional planting of native species of hedgerow and woodland would help break the connections between the land and the water courses. The area marked around **J** (right) is also a potential opportunity due to the optimal soil conditions, and would be a good place to establish community areas with native habitats and sustainable drainage systems.



7 Air Quality

Government figures show that air quality is generally good in the region apart from some areas near the M5 which are high in cadmium. However, in developing and siting roads, it is useful to consider where air could pool, as these may develop pollution levels higher than normal. The map below shows these areas in blue; these should be avoided for larger transport routes during development.

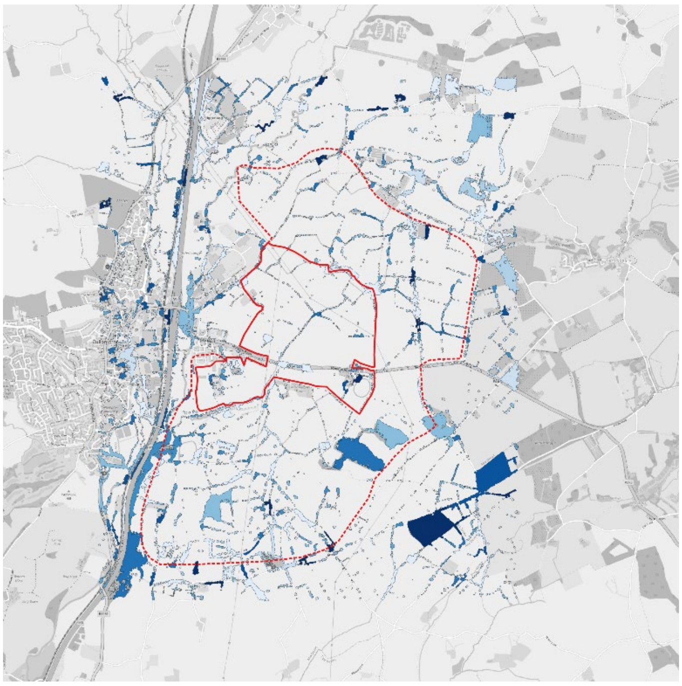


8 Cooling

Large trees cool the air beneath them and the surrounding areas, with the larger the canopy providing a better cooling effect. This is recognised within the development plan, which seeks to retain all large trees, and as many hedgerows as possible. Where works are planned to remove these trees, the top soil from underneath will be used as a separate resource for planting and establishing grassland or woodland features. This is because they are likely to have a well-developed seed bank of native species, which will be able to form a ground flora quickly and help establish their respective ecosystem services in as short a time as possible.

They can also be considered a carbon resource. Therefore, treating the trees and hedges, and the surrounding metre of soil, as a separate resource with its own management plan is a great way of minimising loss, and maximising their restoration potential.

The map below shows the trees with large canopies which, if incorporated into the Masterplan, could provide some urban cooling — as well as retaining biodiversity and carbon storage.



9 Modelling Potential Change in Carbon, Biodiversity and NFM Assets If the Scheme Is Realised to Full Potential.

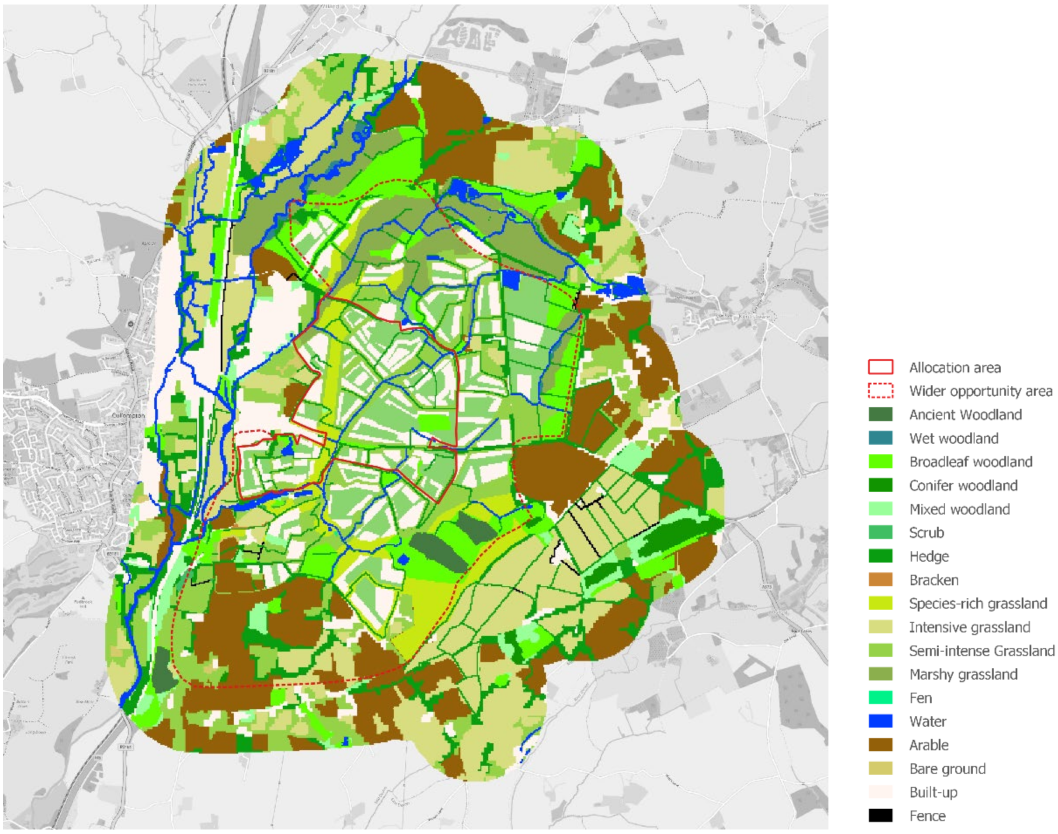
East Cullompton is a large-scale and complex development, with a long duration that will span over more than a decade. With this in mind, we designed a best-case scenario to look at the ecosystem services delivered after the site is developed. This concentrated on the difference in the carbon budgets, biodiversity corridors, and Natural Flood Management (NFM) being delivered by Nature Based Solutions. This is a strategic overview of best-case to indicate the sort of gains that could be made. We strongly advise when the actual plans for works are developed, that the exercise is run again to make sure that the development is optimising results for carbon, NFM and biodiversity networks.

No scientific literature or information from the building life-cycle carbon data was found on the potential loss of carbon due to excavation works, however this is likely to be considerable.

Over time in mineral soils, the carbon in the root system is broken down by soil fauna and flora. Soil organic matter comprises of the soil microbes and the decaying plant. Some soils hold more organic matter than others, as the organic carbon components can bind to the mineral particles in the soil, this is then retained in the soil and not respirated by soil microorganisms. This builds up over time until an equilibrium is reached. The amount of carbon stored within a mineral soil depends upon the soil type, with clay-rich and silt-rich soils storing more carbon than sandy soils. This process can be influenced by several different factors, including rainfall and temperature, habitat, and land management. If the land use remains stable, the soil carbon stored will eventually reach an equilibrium. Positive changes in management to enhance carbon include the use of farmyard manure rather than an inorganic fertiliser.

Negative management practices, such as soil movement undertaken from development, allows an increase in respiration of the plant materials by soil micro-organisms. This decreases the overall carbon content, because of the oxygen entering the system, and leads to carbon being released from the soil into the atmosphere as carbon dioxide. An estimate of how much carbon is lost from this type of aeriation come from estimating carbon lost on ploughing to be between 2.2 t/ha and 4.3 t/ha with a mean figure of approximately three tonnes per hectare being a working excepted value (Haddaway et al 2017).

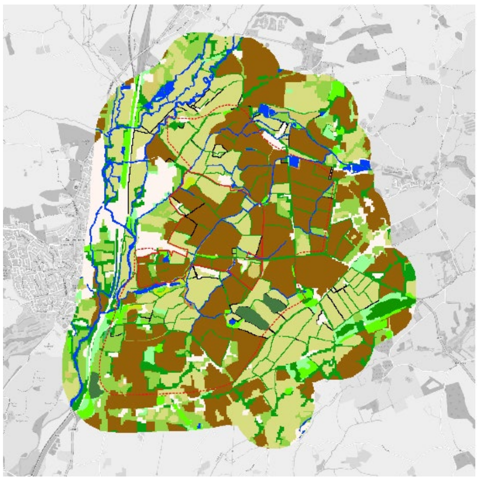
The scenario habitat map is shown below. The following sections illustrate the baseline, and the potential ecosystem services that will come about though the implementation of the scenario habitat changes. It shows the quantitative differences between the baseline and the scenario, and the impact the changes could have within the Allocation area and the Wider opportunity area.


Allocation area
Wider opportunity area
Ancient Woodland
Wet woodland
Broadleaf woodland
Conifer woodland
Mixed woodland
Scrub
Hedge
Bracken
Species-rich grassland
Intensive grassland
Semi-intense Grassland
Marshy grassland
Fen
Water
Arable
Bare ground
Built-up
Fence

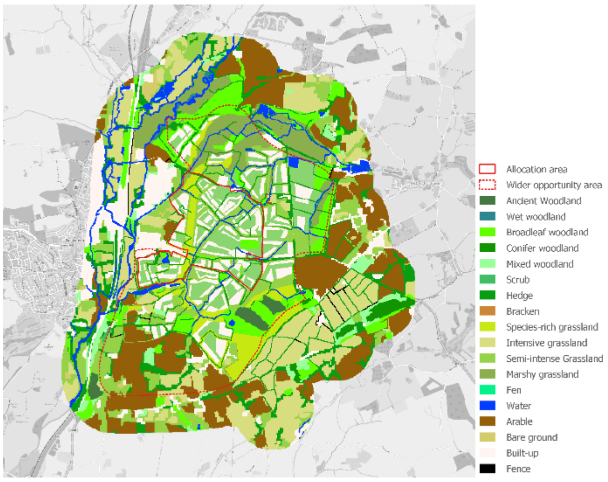
9.1 Biodiversity

For biodiversity, the greatest increase is in Community Greenspace, with 109 ha within the wider opportunity area. The scenario also provides opportunity for a tenfold increase in Species-rich Grasslands. With the scenario increasing woodland connectivity, it has provided an opportunity for a five-fold increase in broadleaf woodlands. The 80% reduction in Arable cover, the scenario predicts, is where most of these gains are realised.

Baseline habitats



Scenario habitats



		Area, Hectares (ha)		
		Baseline	Scenario	Difference
Ancient Woodland	Allocation area	0	0	0
	Wider opportunity	11.26	11.26	0
Arable	Allocation area	88.78	0.17	-88.61
	Wider opportunity	350.56	66.03	-284.53
Bare ground	Allocation area	2.65	0	-2.65
	Wider opportunity	4	1.23	-2.77
Bracken	Allocation area	0.27	0	-0.27
	Wider opportunity	2.32	0.29	-2.03
Broadleaf woodland	Allocation area	1.69	4.71	3.02
	Wider opportunity	9.92	62.55	52.63
Built-up	Allocation area	2.84	44.01	41.17
	Wider opportunity	20.4	127.05	106.65
Community greenspace	Allocation area	0	44.46	44.46
	Wider opportunity	0	108.97	108.97
Conifer woodland	Allocation area	0	0	0
	Wider opportunity	0.67	0.67	0
Fen	Allocation area	0	0	0
	Wider opportunity	0.07	0.07	0
Fence	Allocation area	1.84	0	-1.84

	Wider opportunity	6.81	0.68	-6.14
Hedge	Allocation area	12.84	13.01	0.17
	Wider opportunity	61.59	61.68	0.08
Intensive grassland	Allocation area	34.65	0.04	-34.61
	Wider opportunity	169.26	23.61	-145.65
Marshy grassland	Allocation area	0.07	2.01	1.94
	Wider opportunity	0.07	44.64	44.57
Mixed woodland	Allocation area	0.2	0.22	0.02
	Wider opportunity	5.44	5.44	-0.01
Scrub	Allocation area	0.14	0	-0.14
	Wider opportunity	1.13	0.68	-0.45
Semi-intense Grassland	Allocation area	4.8	30.02	25.22
	Wider opportunity	50	123.21	73.21
Species-rich grassland	Allocation area	1.68	13.88	12.2
	Wider opportunity	5.19	60.08	54.89
Water	Allocation area	4.88	4.81	-0.07
	Wider opportunity	23.45	23.47	0.02
Wet Woodland	Allocation area	0	0	0
	Wider opportunity	0	0.55	0.55

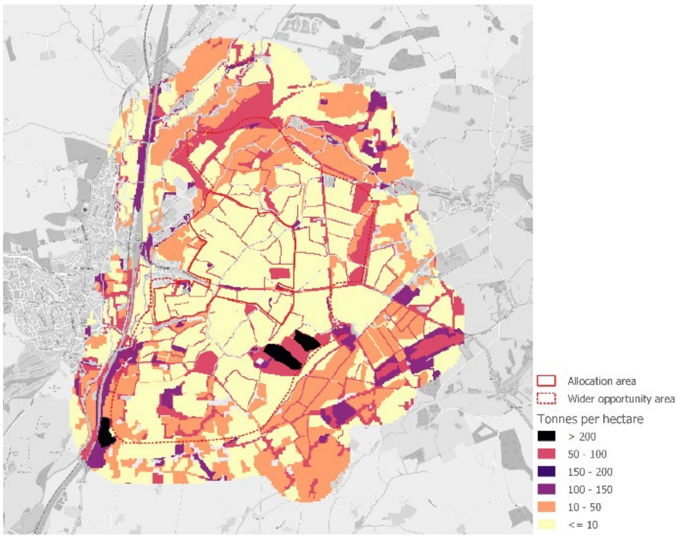
9.2 Carbon storage

The left image shows the carbon storage baseline, right image shows carbon storage scenario. Within the maps, the black and dark purple area have the highest carbon storage (in t/ha); the lighter areas have the lowest carbon storage.

There is an 18% decrease in the total carbon stored across the allocation area in the scenario. This results from the changing intense grassland to community greenspace and in changing arable to urban space, where most of that conversion takes place. There is however, a 13% increase across the wider opportunity area. The largest increases are found in areas of conversion from intensive grassland to broadleaf woodlands. Arable to marshy grassland conversion also created an extra 5 t/ha of storage.

Baseline habitats

Scenario habitats

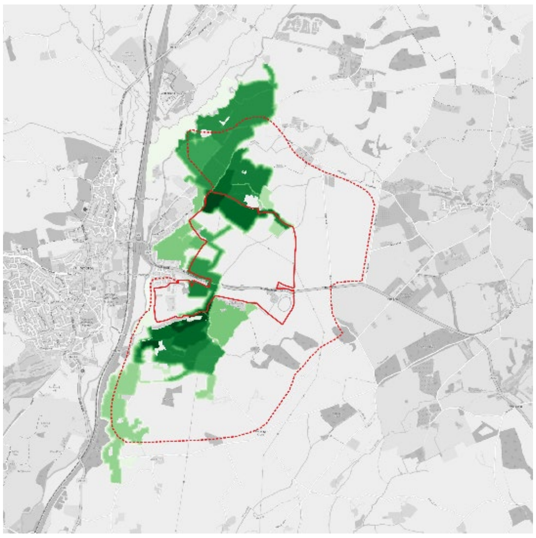


	Total carbon stored, tonnes (t)		
	Baseline	Scenario	Difference
Allocation area	2,434.35	1,995.07	-439.28
Wider opportunity	13,873.21	15,619.21	1,746.00

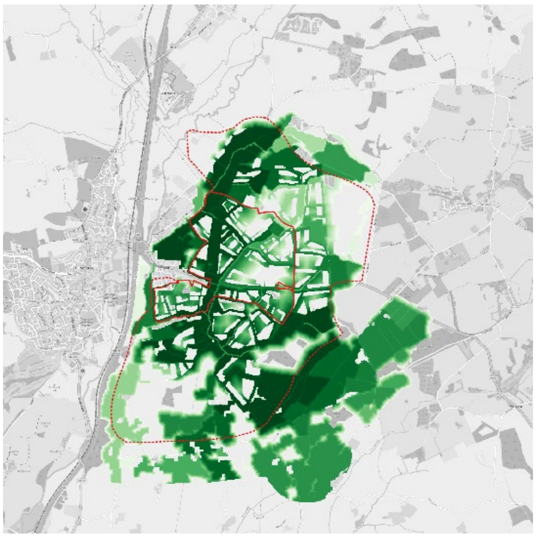
9.3 Enhancement of the grassland network

The left image shows baseline, right image shows scenario, with the darker areas have the highest connectivity, lighter areas have the lowest. There is a 170% increase in the grassland network area for allocation region. There is also a significant increase in community greenspaces, semi-intense grasslands, species rich grasslands in the allocation area too. The proposed changes allow the grassland network to expand across the whole area, rather than concentrated to the west, also allowing connectivity to the intense grasslands in the south-east

Baseline habitats



Scenario habitats

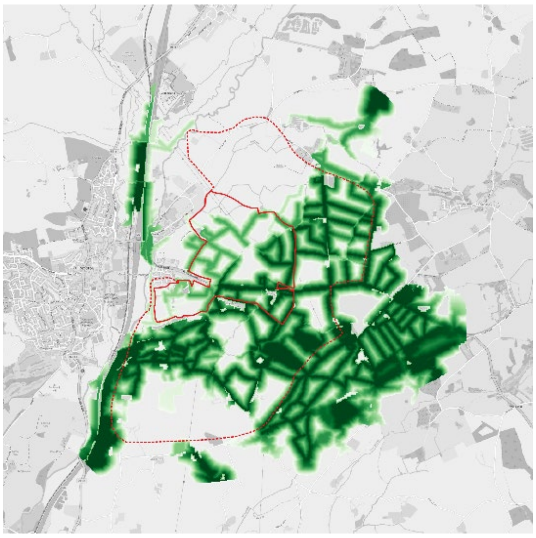


	Area of network, hectares (ha)		
	Baseline	Scenario	Difference
Allocation area	12.54	33.86	21.32
Wider opportunity	52.86	165.99	113.13

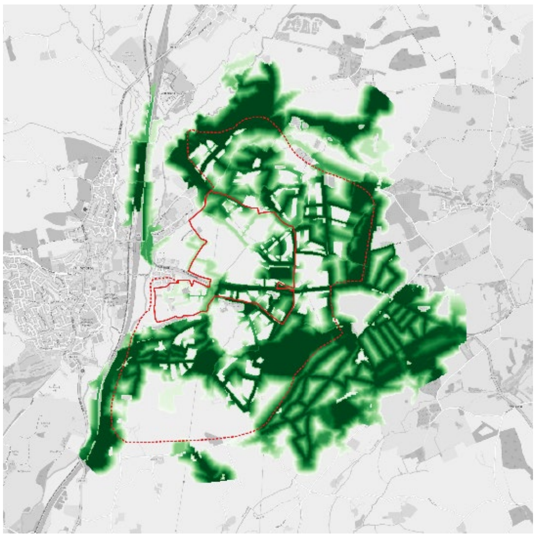
9.4 Enhancement of the woodland network

The left image shows baseline, right image shows scenario, with the darker areas have the highest connectivity, lighter areas have the lowest. There is a 29 ha decrease in woodland network for allocation area, however this have been offset with woodland planting in the wider opportunity area. In wider opportunity area, there is a 6% increase in network area and a five-fold increase in woodland. The scenario provides large areas of broadleaf in the south, surrounding the original ancient woodland. There is also a large conversion of intensive grassland to broadleaf ion the north, and arable to broadleaf in east.

Baseline habitats



Scenario habitats

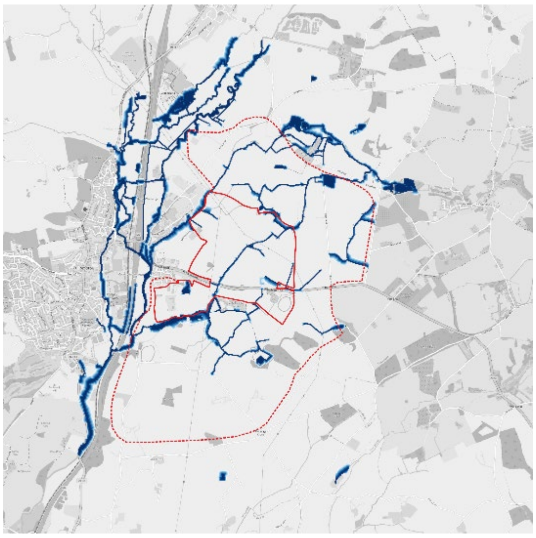


	Area of network, hectares (ha)		
	Baseline	Scenario	Difference
Allocation area	119.50	90.11	-29.39
Wider opportunity	464.39	493.18	28.78

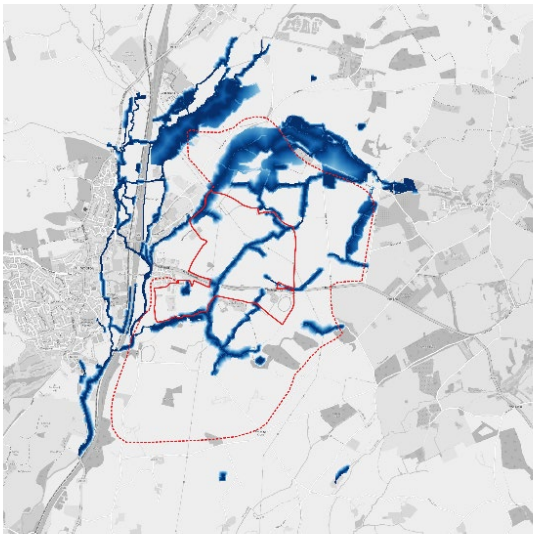
9.5 Enhancement of the wetland network

The left image shows baseline, right image shows scenario, with the darker areas have the highest connectivity, lighter areas have the lowest. Within the allocation area there is a ~120% increase in network area. This is primarily an expansion in width, not length, and sided by conversion of arable to marshy grassland next to exiting water courses. The wider opportunity area has a ~122 % increase in network extent, mostly concentrated to the north, with large areas of arable and intensive grassland converted marshy grassland.

Baseline habitats



Scenario habitats



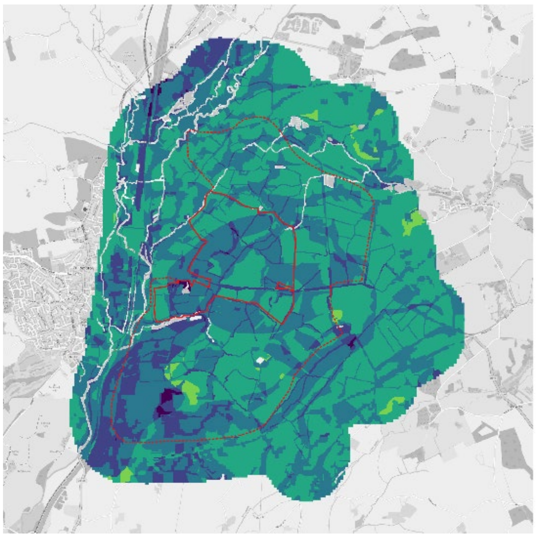
	Area of network, hectares (ha)		
	Baseline	Scenario	Difference
Allocation area	53.89	118.19	64.30
Wider opportunity	232.96	518.32	285.36

9.6 Natural flood management

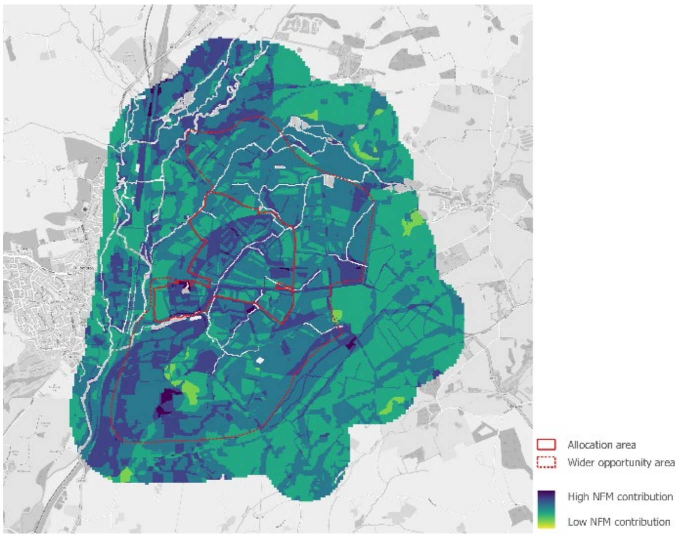
The left image shows baseline, right image shows scenario, with darker areas contribute the most to natural flood management, lighter areas contribute the least. The lower image illustrates the impact of scenario habitats on NFM, with the darker green/blue hues indicate a positive contribute and the darker brown hues indicate a negative contribute.

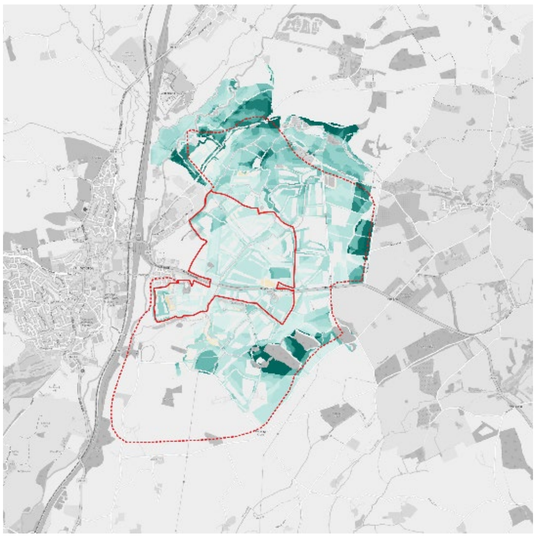
The largest positive impact comes from planting broadleaf woodland from arable and / or intensive grassland. Significant gains (~50%) area made from conversion of arable/intense grassland to marshy grassland, mostly to the north. There is a positive impact (~30%) from arable/intensive grassland to community greenspaces, throughout allocation area. The conversion of species-rich grassland for built-up areas does reduce NFM by 30%, but these areas are very small (<1 ha), and there are only a few areas where this occurs.

Baseline habitats



Scenario habitats





10 Conclusions

SENCE allows for the Masterplan to establish a framework that not only works for the communities, economies, and landscape. SENCE identifies the current ecosystem service provision, allowing for the natural resources to be appropriately managed during development, offering cost savings and environmental benefits, such as carbon and biodiversity loss mitigation, in the shortest timespan. Additionally, budgets for carbon, and other key ecosystem services can be calculated, indicating the level of change when the Masterplan is delivered.

The scenario mapping illustrates the key gains to ecosystem service provision made by carefully considering existing resources, and opportunities, whilst simultaneously minimising service loss. In the wider opportunity area, the scenario shows a potential increase in all ecosystem service provision mapped.

Many areas offer multi-benefit regarding ecosystem services, such as benefit to grassland and wetland networks. These areas provide an opportunity to maximise environmental benefits whilst limiting cost, and should be prioritised within the Masterplan.

Finally, this SENCE-based approach will also help the Masterplan meet the Government's ambitious plans for environmental enhancement, to ensure the capacity to support the new development whilst maintaining biodiversity net gain, delivering essential ecosystem services, and maintaining the natural capital already present in the area.