Mapping a Nature Recovery Network in Sussex at the District Level

Sussex Nature Partnership and Sussex Biodiversity Record Centre
April 2021

Final Report - to accompany Executive Summary

Methodologies, findings and mapped outputs

Phase 1 Methodologies, findings and outputs

1. Mapping 'core areas' of a nature recovery network

Problem Statement
What constitutes the 'core areas' of a nature recovery network, what data is needed to map this at a district level, what scale is 'useful' and what process should be used to identify the areas to be included?

Components
The project team interpreted this as a map of 'what we already have' - in terms of existing recognised wildlife/nature-rich habitat present within these districts.

Following guidance (NE 2020) and discussion within the project team, 'core areas' were interpreted as the sites and habitat types which have been formally recognised (through some sort of process) for their value for wildlife/nature at a national and/or local level.

Following discussion and feedback from the LNP NRN Working Group, the components of core areas that made most sense (both in terms of local data sets and eventual use of the map) were identified as follows:

- Designated Sites (SSSIs and Local Wildlife Sites. SSSIs cover other EU designations)
- Priority Habitats i.e. those listed as Species of Principal Importance under Section 41 of the Natural Environment and Rural Communities Act 2006)- categorised as follows
    - Ancient Woodland (included specifically within NPPF - so pulling it out separately will be helpful to planners)

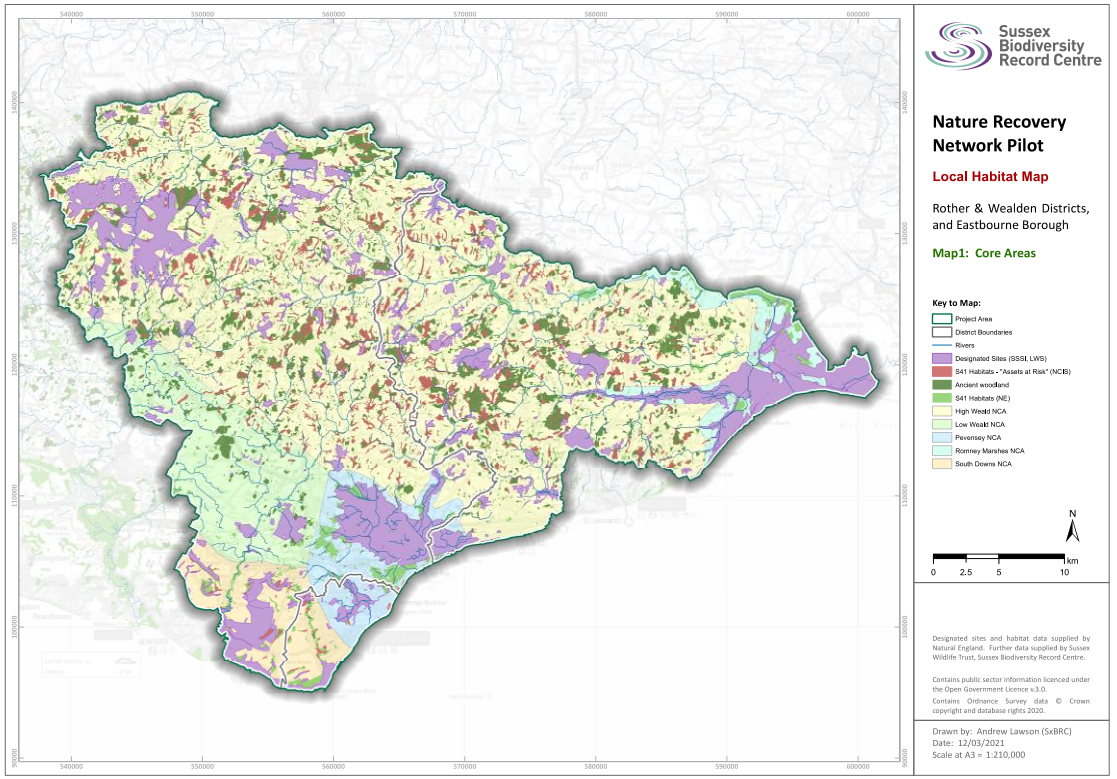


Figure 1: Proposed 'core areas' for the project area

- Natural Capital 'at risk' - these are the priority habitats identified in Sussex as being particularly fragile/vulnerable and /or already highly fragmented[1]. (See Sussex LNP 2019). Much more needs to be done to protect these from further loss or degradation.
- Other priority habitats (i.e. those not included in the above categories)

The five National Character Areas (NCAs) were then added to the map as these reflect the distinct landscape types within which these core areas sit (in terms of underlying geology, landform etc). Many of the core habitat types are closely linked to these factors. The use of NCAs also reflects the approach being taken to development of NRN mapping within the SDNPA (by landscape character area) and thus inclusion here provides a common framework that can help to link maps across administrative boundaries in Sussex.

The proposed core areas map is shown in Figure 1.

Data sets used: NE Priority Habitat Inventory, Ancient Woodland data and SSSIs. Local Wildlife Trust Boundaries were supplied by SxBRC on behalf of the Sussex LWS Initiative.

Gaps and limitations of data available: hedgerows are a vital habitat type across the area but no complete dataset of this habitat type exists locally. Other datasets held for the High Weald AONB but not replicated across the rest of Sussex (e.g. species rich meadows) are also absent from this map. There are other datasets available for Sussex that haven't been included, but could play a role at a more detailed mapping scale such as ponds (point data) and open water (OS Mastermap). In terms of quality of data, local data sets for priority habitats are available but those for key habitats such as chalk grassland and heathland are now 15-20 years old are would benefit from updating.

Condition data has not been included in this map but has been used in the Lawton Recovery Map (see below

Observations on the use of this map
Presentation of a map of core sites comes directly from Lawton principles and starts to identify where sites are located in relation to each other, which can then form the basis for further expansion and connection through the creation of new habitat.

Some guidance (e.g. TWT handbook[2]) suggests that the emphasis in core zones should be on 'protection and enhancement/ improvement'. This makes logical sense from a Lawton perspective but achieving this must go beyond simply identifying 'core areas' on a map.

In terms of **protection** - not all core areas are 'equal'. For example, some of these areas have statutory protections (SACs, SPAs, SSSIs) while others are merely recognised nationally as important (Priority Habitats) but carry only weak protections. Others are locally important (Local Wildlife Sites) but this may also carry very little protection in reality, particularly from loss due to development or declining condition from lack of management. So great care must be taken in interpreting this map in terms of protection. Recognition of core sites within an LNRS will not confer any additional statutory protection on them, unless they are specifically recognised within local plans and specific policies attached to them which specifically protect them from development. However, this map can be used to advocate their importance as a means of achieving this policy recognition within local planning processes and decisions.

This map does not contain any information about the **condition** of existing habitats or sites. There is very little data available to inform this, but what does exist is shown on the 'Lawton Recovery Map' shown below.

Further thoughts on how to represent habitat condition are set out in section 2 below.

[1] Natural Capital at Risk in Sussex comprises those natural capital assets (habitats) that are not adequately protected under existing mechanisms; are fragile or vulnerable ad/or already highly fragmented; may be of particular significance in a Sussex context; are irreplaceable or not easily re-created. The habitat types that fall into this category in Sussex are: lowland heath, mudflats and saltmarsh, vegetated shingle, reedbed/fen/grazing marsh, floodplain woodlands, species rich grassland. Sussex Nature Partnership (2019). Natural Capital Investment Strategy for Sussex
[2] https://www.wildlifetrusts.org/sites/default/files/2020-10/Nature_Recovery_Network_Handbook_LO_SINGLES.pdf

2. Emerging thinking on how to create a 'recovery map' for a LNRS

Problem Statement
What should be mapped on a 'recovery area' map, what data is needed, what scale is 'useful' and what process should be used to identify the areas to be included?

Inherent tensions and 'steps' to the thought process
Guidance from Natural England proposes that each Local Nature Recovery Strategy should include mapping of 'specific proposals for creating or improving habitat for nature and wider environmental goals'[3]. It should include areas which could become of particular importance for biodiversity, or where the recovery or enhancement of biodiversity could make a particular contribution to other environmental benefits".

Each LNRS is intended to be "practical - not theoretical" and should consider "deliverability as well as desirability". It is also intended to identify and channel investment into "local priorities for protection and enhancement"[4]. So there is inherent tension in the process of identifying so-called 'recovery areas' which requires pragmatism to resolve - moving from theory to practice and weaving together a strategic 'prioritisation' approach with a realism about what is actually deliverable in practice.

After much consideration, we conceived the process of identifying these areas to be informed by several 'layers' of spatial information (which must be confirmed/shaped by stakeholder engagement):

i. The 'theoretical', Lawton-led understanding of where habitats should be 'expanded, linked and created' to create the ecological networks known to be vital for 'nature's recovery'. *This is the narrative that outlines 'what nature needs - and where - in order to recover*". After discussion within the project group it was agreed that this theoretical underpinning was a vital part of the process which should be understood and inform the final map. However, it is very important that this is not seen as the final map (as may be the tendency in processes which were previously driven by ecological network mapping criteria only).
ii. A 'natural capital' analysis - which identifies where habitat creation (nature-based solutions) can contribute to delivering wider environmental objectives such as water supply, water quality, flood risk management, provision of access to nature, pollination, carbon storage and so on. Understanding where nature can help to deliver multiple benefits and harness different possible funding streams will enable targeting of effort where it will fulfil the twin objectives of benefit for people and nature. *This is the narrative that outlines where we will get 'more bang for our buck'!*
iii. A spatial analysis of the factors which will facilitate delivery such as information on existing engagement by landowners (such as existing involvement in HLS which could be used as a proxy for 'interest' in habitat creation on their land), publicly owned land (which could use used for habitat creation of Nature-based Solutions (NbS)), presence of a protected landscape (and associated management plan and/or land ownership), presence of farm clusters. *This is the narrative that identifies where there is existing interest, land, statutory management plans and other factors that can be used as a foundation for further engagement and generation of practical ideas and proposals*
iv. Finally - a spatial understanding of where delivery bodies (organisations, partnerships, initiatives, projects) are already in place that can help to lead delivery in a particular area. This includes location of existing habitat creation projects which could thus be expanded or used to encourage landowners in the area to become involved. *This is the narrative that tells us where operational effort is already being deployed to engage with stakeholders and deliver projects - and these are areas which provide an obvious existing focus for expanding activity in an efficient and coherent way.*

These should all be considered vital elements of the 'baseline' information needed to then embark on stakeholder engagement in order to identify the proposals and areas for action that meet the challenge of being "deliverable and desirable" and "practical not theoretical". It is important to note that this project did not attempt to create a final 'delivery map' as it was not based on

[3] NE unpublished guidance for piloting of Local Nature Recovery Strategies (insert link).
[4] *ibid*

extensive stakeholder engagement of the type that will be required during a formal LNRS process. However, this project did attempt to better understand how to map the above layers of information that will be needed to inform any final LNRS 'delivery' map. The findings for each are set out below.

i. Mapping areas where habitats should be expanded, linked and created to create ecological networks ("Lawton recovery map")

This layer of information occupies a more traditional ecological network mapping space - familiar to many of the partner organisations on the LNP.

Components

The challenge in creating this map is to identify which existing data and spatial analysis can be used to identify where habitat creation and enhancement (and of what type) would be beneficial as a means of fulfilling the Lawton principles of **'bigger, better, more, joined'** areas of wildlife-rich habitat across the project area.

The emphasis was on identifying what historic data or analyses would be useful (and could provide a basis for a framework going forward), understanding the limitations of this work for this purpose, and identifying any gaps that would need to be filled ahead of preparation of a LNRS for this area.

Within the project area, several pieces of work are relevant:

- **Biodiversity Opportunity Areas (BOAs)** - identified for Sussex and the wider South East in 2009. BOAs were identified following a NE facilitated methodology and protocol which brought together spatial habitat data sets and local biodiversity forums - to identify the clusters/concentrations of designated sites and priority habitats across the landscape which, if better connected and expanded through habitat creation or restoration, would help to create ecological networks across the South East.
- **B-Lines** - identified by *Buglife* as areas containing opportunity to create habitat for the benefit of pollinators.
- **Condition assessment data for SSSIs and Local Wildlife** Sites in Sussex - which provides a broad insight into the condition of these sites. See below for a discussion of the problems with these data sets.
- **Habitat potential modelling** work. This is available for two habitat types (wetland and chalk grassland) - but only for parts of Sussex (and only partial coverage of the project area).

The project team looked at each of the above in turn - with the following conclusions:

Biodiversity Opportunity Areas

BOAs have not been actively used in Sussex since the abolition of the Regional Plan, although some attempts were made by Sussex Wildlife Trust to encourage planning authorities to recognise them within their local plans. However, elsewhere in the south-east they remain a 'live' approach - particularly in Surrey - and there is consensus across the South East Nature Partnerships that the use of BOAs as part of the framework for mapping nature recovery opportunities should continue.

Therefore, this project looked at BOAs within the context of 'Lawton recovery mapping'. In particular, it investigated whether the BOAs in the project area still adequately capture clusters of priority habitats. The results are shown in Table 1.

This table identifies that **BOAs capture the significant majority of most priority habitats** within the project area- with some exceptions (see habitats highlighted). This suggests that BOAs remain relevant as a means of identifying sub-county areas where clusters of priority habitats could be expanded and better connected in order to create ecological

Explanation of a BOA (Surrey Nature Partnership)

"An individual BOA consists of a spatial concentration of already recognised and protected sites for wildlife conservation (its 'foundation sites'), inside a boundary that also includes further but as yet undesignated 'priority habitat' types (plus some other undeveloped land-uses); all of which have common, contiguous geological, soil, hydrological and topographic characteristics to those of the foundations sites. As such, BOAs represent those areas where improved habitat management, as well as efforts to restore and re-create priority habitats will be most effective in enhancing connectivity to benefit recovery of priority species in a fragmented landscape. They therefore remain the basis for achieving a coherent and resilient ecological network in Surrey".
Surrey Nature Partnership 2019. Biodiversity Opportunity Areas: the basis for realising Surrey's ecological network.

networks. However, there is a need to re-assess the boundaries of BOAs in relation to certain habitat types and/or create 'supplementary' BOAs to specifically capture pockets of priority habitats that are not currently contained within original BOA boundaries.

It also suggests that in principle, BOAs 'work' for most priority habitats as a way of targeting habitat creation efforts to create the 'bigger, better, more, joined' approach - but that they may not be relevant for those habitat types that are less clustered and 'tied' to underlying spatial locations due to soil, geology, landform etc - such as woodland, hedgerows, ponds and so on. A different, additional approach will be needed for these habitat types that can be more easily created within a landscape.

A second question in relation to whether the BOAs are a useful potential component in a recovery map was whether they captured suggested areas for habitat restoration generated by the national NE habitat network modelling dataset. On mapping these (see Figure 2), it can be seen that the BOAs do capture the majority of habitat creation areas suggested by the combined NE dataset. However, there are some notable areas of possible habitat network that lie outside BOAs, so this information could be used in any future review or refinement of the Sussex BOA network particularly in identifying potential adjustments to BOA boundaries or addition of supplementary BOA areas.

Finally, the project team also asked LNP stakeholders why BOAs have not been kept 'live' in Sussex or used as a useful concept for targeting delivery. There was no real answer to this other than resources were needed to achieve consistent adoption of BOAs within local plans and these were not available at a sufficient level to gain real 'traction'. Also, and probably more critical, BOAs are essentially just 'blobs on a map' in Sussex. There is a brief statement of significance that accompanies each BOA, but no detailed work was done in Sussex to develop detailed mapping or delivery opportunity planning within each BOA. Thus, they remained too broad a concept to have any useful application in practice. The converse is true in Surrey, where detailed objectives, targets and delivery opportunities have been identified for most of their BOAs and this facilitates targeting of resources and development of habitat delivery projects.

However, from the above analysis, the project team recommend that BOAs remain an important element of any 'Lawton recovery map' for Sussex. They were created via a stakeholder engagement process in 2009 and still have merit, both as a unifying concept across the South East, and as a sub-county unit which succeeds in capturing the vast majority of priority habitats.

The extent of overlap with the NE habitat network also led the team to omit its use for broad mapping purposes, although it is recommended it is used for any future review of BOAs.

Other proposed additions to a 'Lawton recovery map' are described below.

Table 1: % area of Priority Habitats captured within BOAs in Wealden, Rother and Eastbourne areas

S41 Habitat	Extent (ha) in study area	Extent (ha) in BOAs	% S41 habitat within BOAs
Coastal and floodplain grazing marsh	8146.1510	7821.5221	96.01
Coastal saltmarsh	43.7695	43.7558	99.97
Coastal sand dunes	11.2027	11.1571	99.59
Coastal vegetated shingle	384.2767	377.0556	98.12
Deciduous woodland	21586.9936	11519.6958	53.36
Lowland calcareous grassland	1365.2120	1357.5984	99.44
Lowland dry acid grassland	156.6532	121.4427	77.52
Lowland fens	35.6026	24.5368	68.92
Lowland heathland	1752.9479	1711.4165	97.63
Lowland meadows	456.2024	319.0928	69.95
Maritime cliff and slope	177.4679	168.1292	94.74
Mudflats	28.0571	26.9734	96.14
Purple moor grass and rush pastures	55.4637	54.1483	97.63
Reedbeds	38.1337	35.7448	93.74
Saline lagoons	12.7970	12.7970	100.00
Traditional orchard	131.1507	28.0981	21.42
TOTALS	34382.0816	23633.1647	68.74

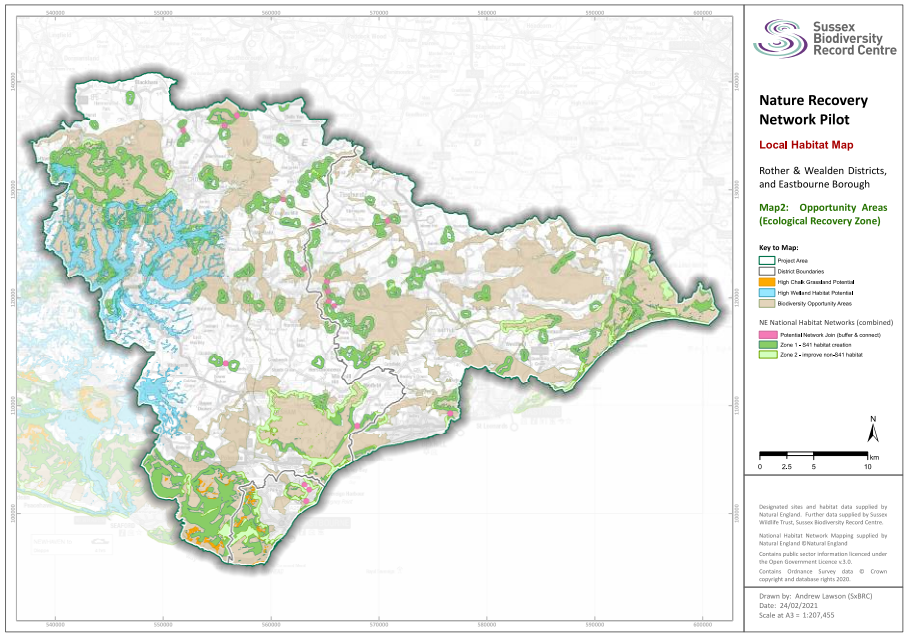


Figure 2: Testing the overlap between BOAs, local habitat potential models and NE national habitat network data

B-lines

B-Lines are a concept developed by Buglife, to create a series of wildflower-rich stepping stones for insects across the landscape. The B-line areas do overlap significantly with BOAs in some areas while in others, they provide linkages between BOA areas. They may therefore have a useful spatial application in terms of understanding where/how best to create more ecological connectivity across the project area which will not only benefit insects, but will provide additional connectivity between priority habitats. B-Lines are also a nationally recognised concept and so inclusion within any LNRS will enable wider connection to neighbouring 'B-Line' implementation across the country.

Together the BOAs and B-lines capture a greater coverage of priority habitats (see Table 2) as the Beelines provide an extension to and connection between BOAs.

Together they also cover **61% of the project area**. Feedback on this would be interesting in the context of what might be need to support nature's recovery - and in terms of what might be 'deliverable'.

Table 2: % area of Priority Habitats captured within BOAs and B-Lines in Wealden, Rother and Eastbourne Districts

Main_Habit	Area (ha) in BOAs and B-Lines	Area (ha) in study area	% in BOAs and B-Lines
Coastal and floodplain grazing marsh	7846.1	8146.2	96.3
Coastal saltmarsh	43.8	43.8	100.0
Coastal sand dunes	11.2	11.2	100.0
Coastal vegetated shingle	379.5	384.3	98.8
Deciduous woodland	14464.2	21587.0	67.0
Lowland calcareous grassland	1363.6	1365.2	99.9
Lowland dry acid grassland	129.4	156.7	82.6
Lowland fens	32.0	35.6	90.0
Lowland heathland	1712.8	1752.9	97.7
Lowland meadows	366.4	456.2	80.3
Maritime cliff and slope	168.2	177.5	94.8
Mudflats	27.8	28.1	99.0
Purple moor grass and rush pastures	54.3	55.5	97.8
Reedbeds	35.7	38.1	93.7
Saline lagoons	12.8	12.8	100.0
Traditional orchard	76.8	131.2	58.5

Condition assessment data for SSSIs and Local Wildlife Sites

Adding 'condition' data for designated sites can help to identify areas to target for habitat enhancement. This could go either onto the 'core areas' map - but has been included in this 'Lawton recovery map' to help to identify areas which are a priority for intervention in terms of improved habitat management.

There is very little condition available for core areas. However, two datasets are available which can provide a partial insight into condition of important habitats:

- Condition of SSSI units
- Single Data List 160 information on condition of Local Wildlife Sites[5]

Both of these datasets have limitations but are the best available information on habitat condition which is generally accepted as being a huge omission in the evidence base for nature conservation activity both nationally and locally. Much more thought needs to be given to how to develop a 'condition' baseline for habitats in Sussex so that a strategy for targeting habitat improvement can be developed.

No connectivity mapping has been carried out for Sussex habitats and so this type of dataset is not available.

Habitat Potential Modelling data

Habitat potential modelling has been carried out for a number of habitats in Sussex in certain geographical areas to identify where habitat creation will be most effective (based on a range of parameters). These are therefore only partial datasets and do not extend across the whole of the Sussex area. Within the project area, small areas are covered by wetland habitat potential modelling (part of the Ouse catchment extending into the western part of Wealden DC) and chalk grassland potential (to the south west area of Wealden and Eastbourne).

[5] Other local data is available for LWS. 35 sites are surveyed per year as part of the LWS Initiative (LWSI). However, there are over 660 sites and so there is unlikely ever to be a complete and current dataset of survey data. The condition data collated for the LWSI thus also includes proxies for condition.

Despite being partial datasets, these have been included in the recovery map as this information may be useful in the areas for which it is available and also demonstrate the 'usefulness' of this type of data which reflects whether it is practical/possible to actually create certain habitats in a particular geographical area.

All of the above have been drawn together to create a final proposal for a 'Lawton Recovery Map' for the project area. This is shown in Figure 3 below.

Observations on limitations and potential use of this map

Many of the limitations of this map have been noted above - but in summary are:

- At this scale, and without any underpinning detail - this is a **theoretical map** which does not provide any indication of where or how habitat creation projects could be delivered in practice. However, it is useful in indicating broad spatial areas within which there may be potential to restore and create habitat in order to improve ecological connectivity and condition as per the Lawton principles.
- The areas on the map, particularly the BOAs, are of most relevance to **priority habitats** and are not as useful/relevant for more widespread and 'flexible' habitat types (such as woodland, hedgerows and ponds, which are not as reliant on underlying factors such as soil, geology and so on). A different approach will be needed to target strategic areas for creation of these habitat types[6].
- These areas are representative only of 'opportunities' - and do not hold information about the constraints to habitat creation across the project area - or 'deliverability'.
- Some data sets shown on this map are incomplete for the spatial area (habitat potential maps). Similarly, the map does not harness some specific local datasets (for example, historic field boundaries and meadow habitats within the AONB) - and further discussions are required to identify additional datasets that could be used to further information this type of mapping.
- Landscape features - such as major rivers- could play an important role in identifying potential ecological corridors in the landscape. These have been included in the core map but could be drawn out as key opportunities for improving habitat connectivity across the landscape.

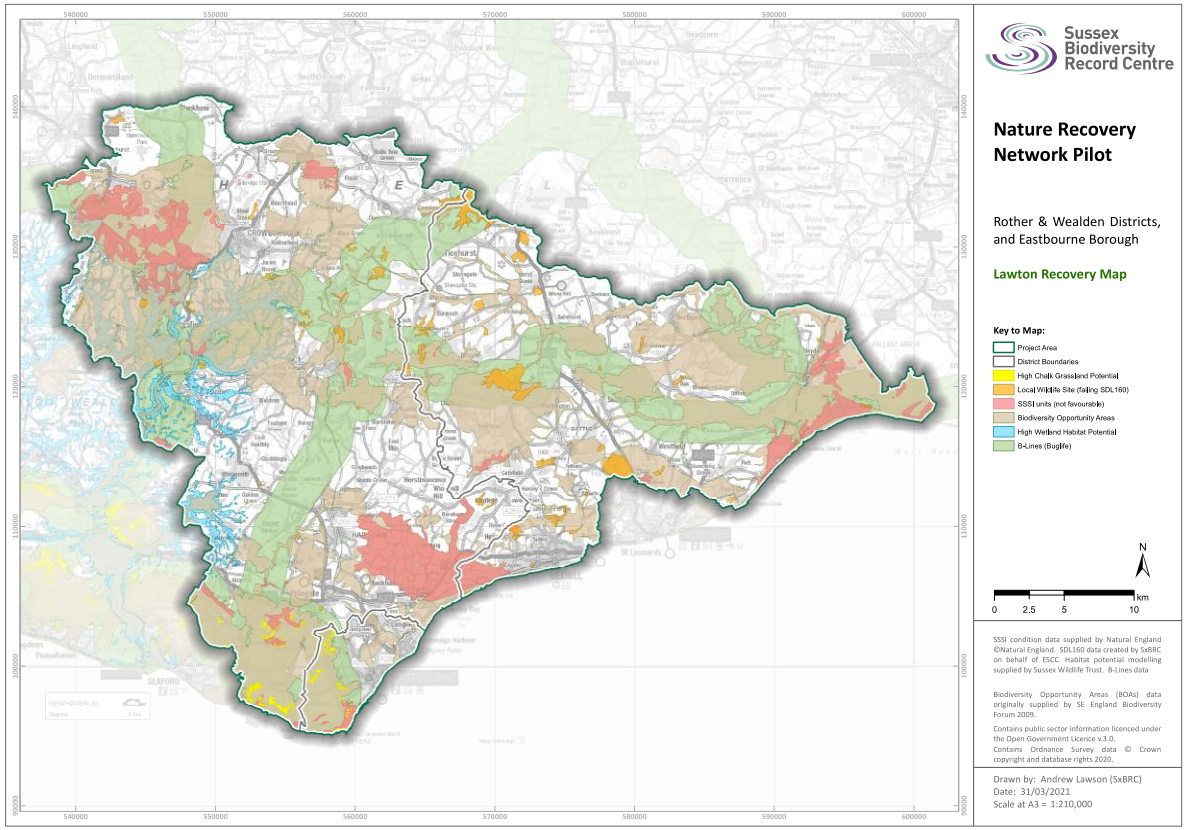


Figure 3: Proposed 'Lawton' recovery areas for the project area

[6] 'Woodland Opportunity Mapping' may be a useful concept in this regard where larger scale woodland creation opportunities can be identified spatially through the use of GIS information to map 'opportunities' and 'constraints' to woodland creation. A Landscape Character approach may also be very helpful for guiding creation of woodland and other habitat types, where broad guidelines are are developed for each landscape character area indicating the types of habitats (and locations for these) that will be beneficial in enhancing the landscape of the area. The South Downs National Park is developing this type of approach. See https://storymaps.arcgis.com/collections/b6120985f1184c3bb3d1c5df317478b2

- Condition data is only available for some designated sites - and is not available for priority habitats in general. Habitat enhancement opportunities are therefore grossly under-represented.
- The scale of this map is large and so, as has already been mentioned, its 'usefulness' is largely as an indicative tool which can be used to identify spatial areas of interest for which more detailed analysis of delivery options can be developed. However, it could also be useful as an element of stakeholder engagement in terms of helping to developing a broad 'ecological' vision for the project area.
- There are white areas on the map. This is a point that resonated strongly with LNP members. The concern is that parts of the map not covered with a recovery area may appear to hold no opportunities for habitat creation or enhancement. This will send the wrong message to landowners and communities in these areas. Of course, the gaps on this map are due to these areas being less relevant for creating ecological connectivity between priority habitat types - but this does not mean this they are not suitable for other habitat creation or enhancement activity. This point must be dealt with in any final LNRS map, so that all stakeholders within an LNRS can identify suitable habitat creation and enhancement actions for their local area.

ii. Natural capital investment areas

This area of work relates to understanding 'spatially' where **nature-based solutions** can be used to deliver multiple benefits - while supporting biodiversity through the creation and enhancement of habitats.

This area of mapping is less developed than the elements above and will need future refinement in the future. However, several sources of information are available for the project area which enable a 'start' to be made with this sort of spatial analysis. **These are shown separately below as it hasn't been possible to develop a composite map within this project.** This should be done ahead of any LNRS development as a key layer of baseline data, helping to identify areas where nature-based solutions can deliver tangible benefits for people and nature.

Possible Components: Natural Capital Investment Areas.

Several pieces of work have already been done at the Sussex level, which could help to identify 'natural capital investment areas' on this map layer. These include:

- Natural Capital Investment Strategy for Sussex (Sussex Nature Partnership 2019).
- Access to nature - spatial mapping on existing assets, demand and capacity (derived from Ecoserve modelling data (historic)).
- The People and Access to Nature Network Strategy, developed by the South Downs National Park Authority
- Green Infrastructure spatial datasets held by local planning authorities, may also be useful in this area - but have not been included in this project.
- Local Authority climate action plans - similarly, where these identify opportunities for habitat creation as an element of climate change mitigation (carbon sequestration) or adaptation (such as flood risk management), these can be included here. This information is not yet readily available in spatial form.

Natural Capital Investment Strategy

This contains maps and guidelines for the targeting of nature-based solutions for delivery of the following benefits/services: water supply; water quality; flood risk management (for properties at risk of flooding); flood risk management at the coast. These are mapped to the wider East/West Sussex scale (shown in Figures 4 a, b, c and d below) but with some work could be developed at a smaller scale for use at the district level. In relation to the Wealden, Rother and Eastbourne districts, they do help to flag areas where habitat creation could be beneficial for delivering these multiple benefits - but are only of broad indicative use.

Natural Capital Investment Areas: sufficient water supply

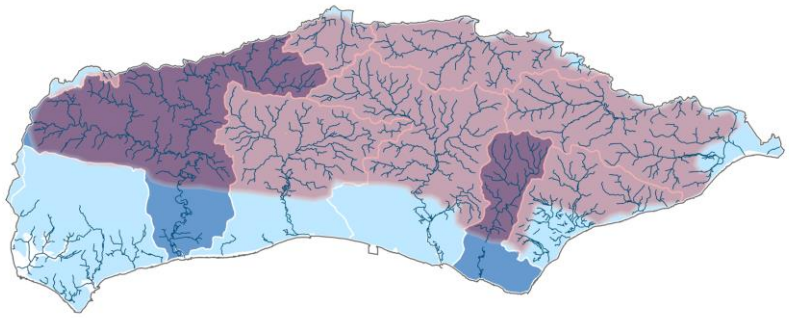


Figure 4a. Natural Capital Investment Areas: Investment in all headwaters (shaded pink) will be beneficial in supporting the resilience of water supply in catchments - but those shaded purple will be considered a priority. This relates to the prevalence of low flows in these catchments and their importance for water extraction.

Natural Capital Investment Areas: a clean water environment

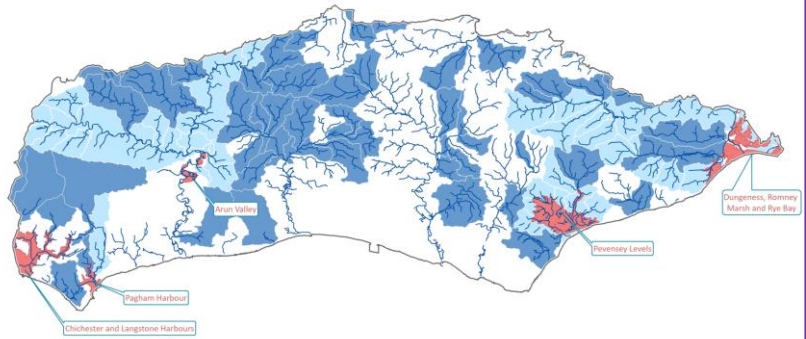


Figure 4b. Natural Capital Investment Areas: Areas shaded in dark blue are water bodies with poor/bad ecological status (failing water bodies). Those shaded light blue have moderate/good status. Habitat creation in all will be beneficial but the urgency for investment is in those failing water bodies **upstream from internationally protected sites (red)** - where the water quality coming into these sites has a significant impact on the biodiversity they support.

Natural Capital Investment Areas: flood risk management

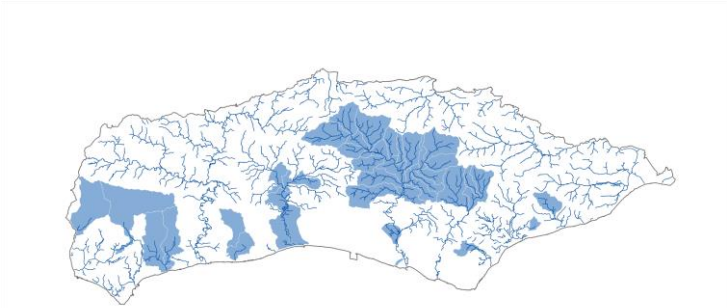


Figure 4c Natural Capital Investment Areas: areas where investment in natural capital may contribute to flood risk mitigation for properties at risk of flooding (from rivers). This map is based on spatial data from Environment Agency on 'properties at risk' from flooding (Solent and South Downs area).

Natural Capital Investment Areas: coastal assets for flood risk management

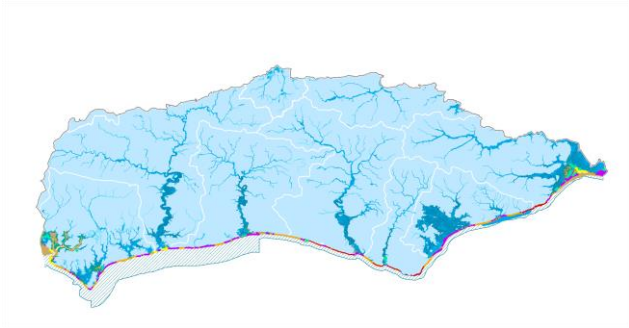


Figure 4d Natural Capital Investment Areas: areas where investment in natural capital may contribute to flood risk mitigation at the coast: tidal reaches of the main rivers; inter-tidal habitats and areas of inshore waters (for restoration of kelp beds and other seabed habitats that can absorb energy).

Access to nature: existing, demand and capacity

Spatial datasets do exist for Sussex for existing areas currently providing opportunities for access to nature. These datasets are based on previous data supplied by local authorities on 'open spaces' and include a variety of types of 'open space, 'green infrastructure' and linear features such as Public Rights of Way - see Figure 5 below. This map illustrates only location and broad type of greenspace and does not provide any information on the habitat types found in these spaces or condition.

In addition, historic modelling data (2015) produced through *Ecoserve*, can be used to understand where demand for access is greatest, and where the capacity exists to provide this. This modelling as based on the Accessible Natural Greenspace Standards. It used 2011 census data to estimate demand but did not reflect landowner willingness for potential access. The outputs for the Wealden, Rother and Eastbourne areas are shown in Figure 7 below.

This information relates to existing concentrations of population/settlements and so does not help to understand the impact of new housing and settlement creation on existing 'access assets' - or on the level of new accessible natural greenspace that might be necessary as part of any new development. However, it does start to broadly identify where the local authorities and others can seek to create new opportunities for people to access nature - either on existing or newly created areas of habitat.

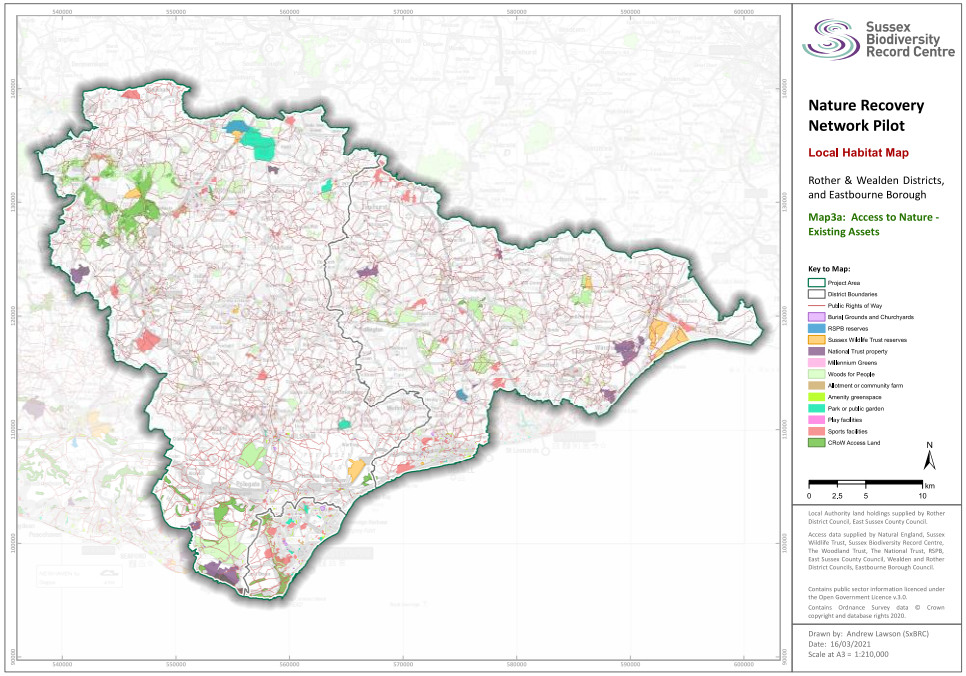


Figure 5. Access to Nature - existing assets

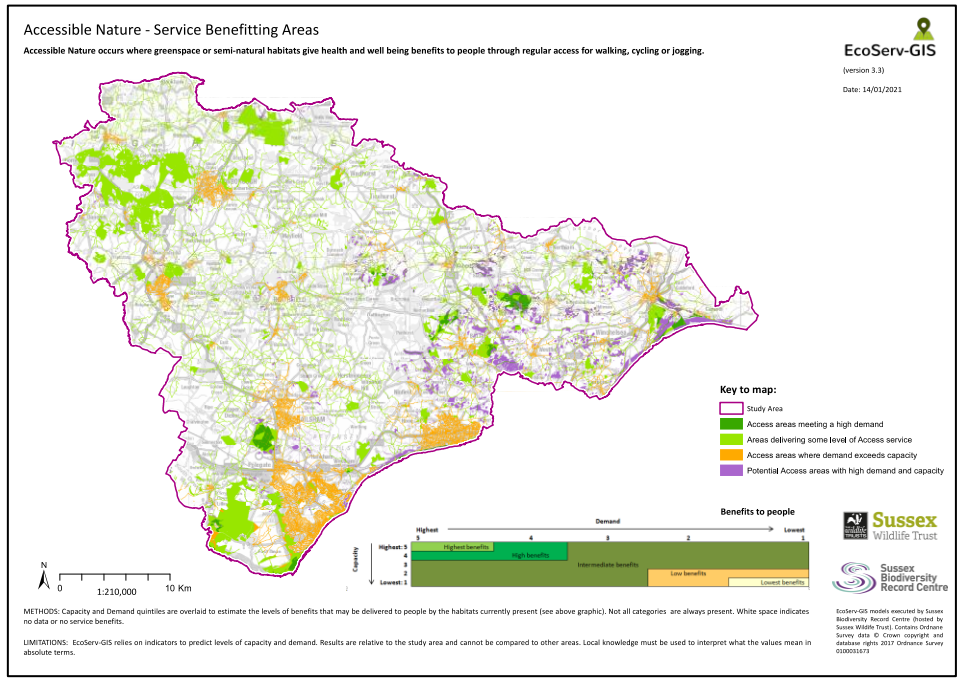


Figure 6. Access to Nature: demand and capacity for greater provision

South Downs National Park Authority: People and Access to Nature Network (PANN)
A study by the South Downs National Park in 2019 identified a number of priority areas for investment in natural capital. These are shown in Figure 7, with two of the areas overlapping with the project area (the 'Lewes Connections' Investment Area and the 'Hailsham to Eastbourne' Investment Area). These areas have been identified to address deficits in greenspace provision, improve connectivity between greenspaces and address urban edge pressures built to do so in a way that supports sustainable and healthy communities, strengthens natural and cultural heritage and builds resilience to the effects of climate change. This analysis also anticipates potential development pressure.

Limitations and gaps of this work: This strategy only covered the districts which overlapped with the National Park and so excludes Rother District. The Natural Capital Investment Areas are also simply broad areas at present and more work is to be carried out by the National Park to develop the detail needed within each to identify opportunities for delivery on the ground.

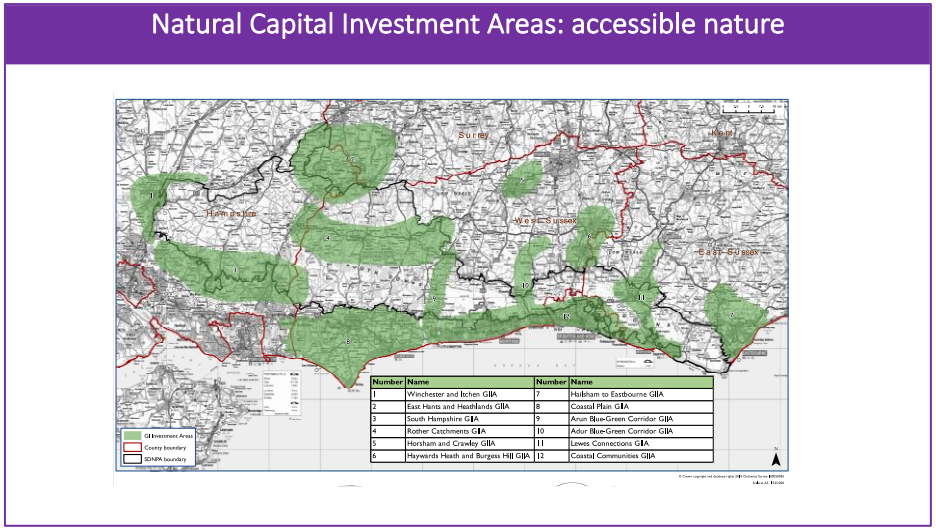


Figure 7 Natural Capital Investment Areas for 'accessible nature' (SDNPA)

iii) Factors facilitating delivery

It became clear throughout this project, that in addition to the theoretical work to identify Lawton recovery zones and opportunities for natural capital investment, any LNRS must respond to the NE challenge to be 'practical and deliverable'.

A logical step in the thought process is to understand where there are certain factors already in place that could help to facilitate the development of habitat creation/enhancement activities and projects on the ground.

Components

This project has made a start in identifying what some of these factors could be, and how they could be mapped using data available in Sussex. The components included to date are:

- The presence of 'interested/engaged' landowners - those who are familiar with and supportive of habitat creation activities and therefore may be open to future conversations about further work. A proposed proxy for this is 'land covered by Higher Level Stewardship scheme' (HLS). This dataset is available for Sussex.
- Farm clusters. These exist across some areas of Sussex and provide a network/forum through which interested landowners can come together to work collaboratively on environmental measures and objectives. This is thus a wider 'proxy' for interest/engagement - but also for a mechanism for wider geographic coordination. There was no sptial dataset available for this project but this information could be gathered in any future work.
- Land owned and managed by conservation organisations. These areas are in active conservation management and may provide a local focus of expertise and coordination and help to stimulate localised activity around these sites. This information is available for Sussex for land held by Wildlife Trusts, RSPB, National Trust and Woodland Trust
- The location of publicly owned land (i.e. land owned by government agencies, local authorities, town and parish councils). These land holdings may provide local authorities and others with opportunities to create habitat for the delivery a range of public policy priorities such as carbon storage, access to nature, flood protection and so on. Spatial data sets do exist for land owned by national government agencies (e.g. Forestry Commission, NE). During the course of this project, local authority landholdings were made available for East Sussex County Council and Rother District Council but not for Wealden District Council or Eastbourne Borough Council. In general, this should not be a difficult data set to obtain. It is not known if there is a consolidated data set within each District council of land owned by town/parish councils. South Downs National Park Authority also owns a small amount of land and this should be available on a spatial dataset.

- The location of protected landscapes which have a specific focus on the protection and enhancement of landscape and biodiversity. These areas are managed in accordance with a management plan, which has a statutory basis and is recognised within local plans. Presence of a protected landscape should also bring with it a strategic approach to delivery, additional coordination and resources for the initiation and delivery of habitat enhancement/creation projects.

These factors are shown on Figure 8 below.

Much more thought and work should be done to develop this map further, through the identification of other factors and suitable proxies that can be mapped.

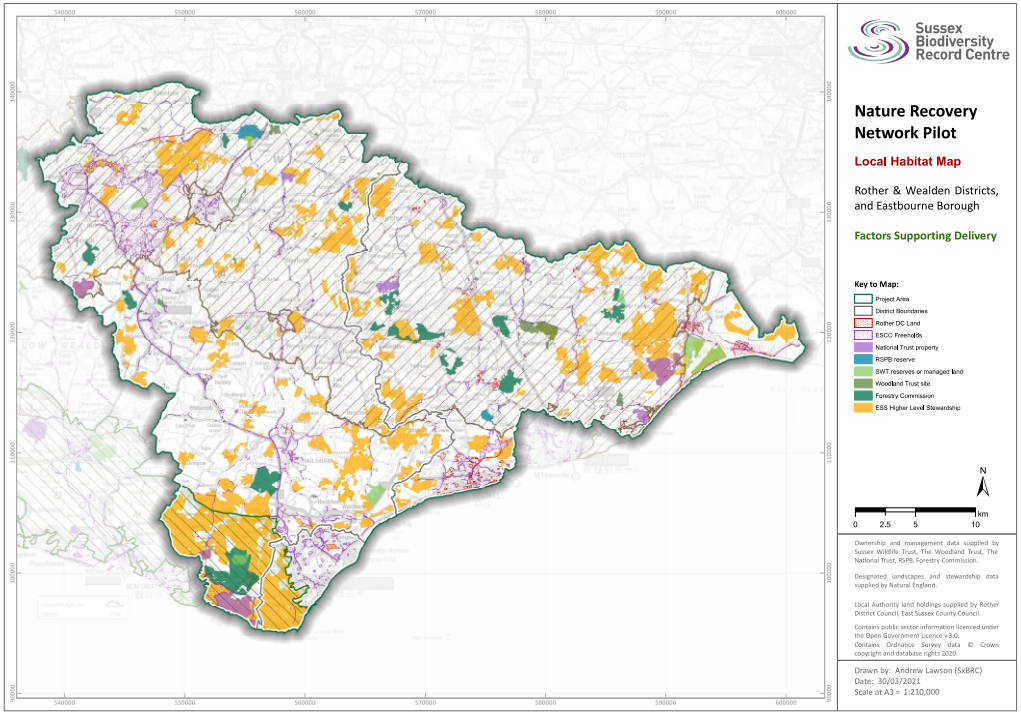


Figure 8: Factors supporting delivery (preliminary)

iv) Nature recovery project and partnership working

Finally, this project identified the value in understanding where organisations, partnerships, initiatives and projects are currently located - as an additional and critical factor that will facilitate delivery on the ground. These will be locations where delivery bodies will have already invested in engaging landowners, deploying resources, advise and expertise - and for which they may

have developed visions and plans through a consultative process with local stakeholders. It makes logical sense to build future delivery upon work already happening and in areas where resources may already be in place.

Several years ago, Sussex Nature Partnership attempted to capture this sort of information spatially across the SxNP area (see Figure 9 below). This is supported by a detailed project spreadsheet. The 'Biodiversity Action Reporting System' (BARS) was used in Sussex in the past but is not closed. Neither of these approaches has remained 'live' and neither is quite what is needed for the purposes of an LNRS - but they do provide the basis upon which future work could be done to develop a spatial understanding of where existing partnership working and project delivery could facilitate the targeting of future effort and resources.

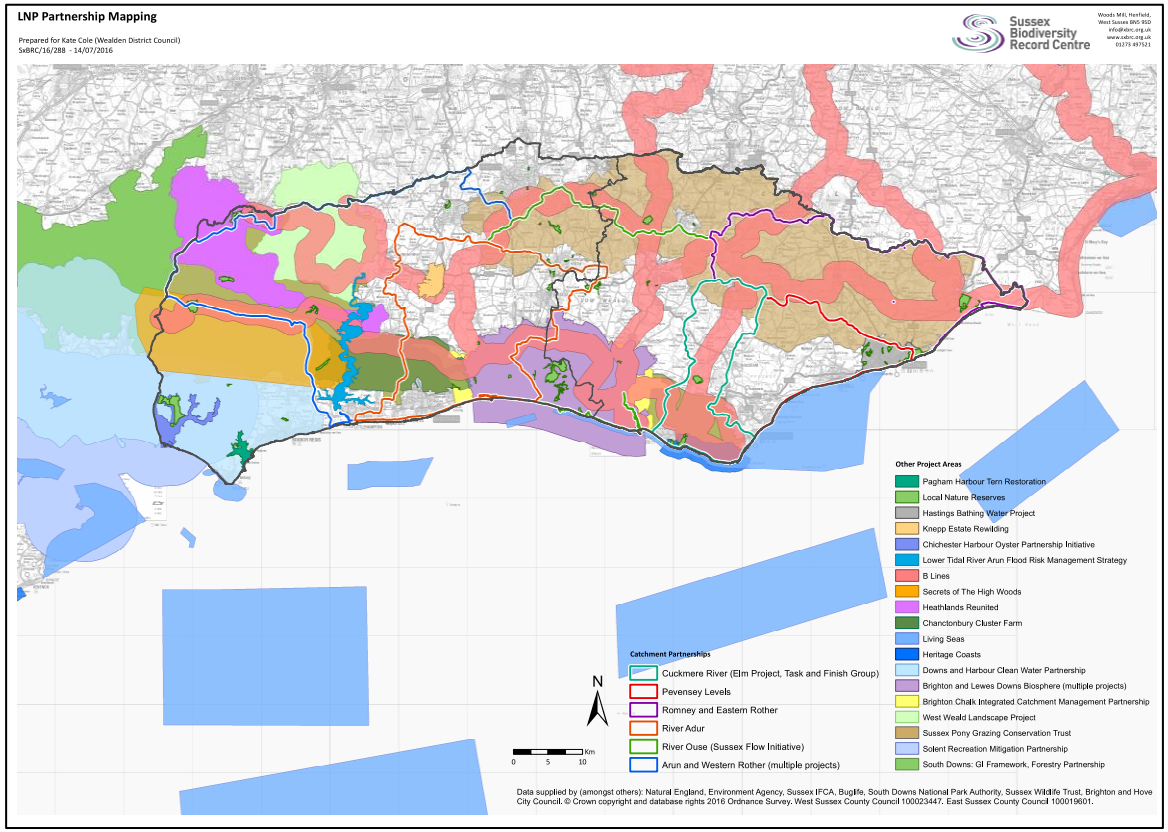


Figure 9. Location of habitat delivery projects in Sussex (2016)

Drawing the above together into a composite strategic/opportunities map

Funding was not available to draw the above maps together into a composite strategic/opportunities map. This could be done as an extension of the project to provide a more integrated picture of where the various layers together start to indicate areas where ecological need and delivery factors start to overlap. This could provide a useful tool for future stakeholder engagement with LNRS production.

3. Recommendations for future work

- Identification of key gaps in habitat data for Sussex and development of a costed plan to ensure these gaps are filled ahead of the formal start of any LNRS process in Sussex. Addition of these to the core/Lawton recovery maps once completed. Examples include: updates to local priority habitat datasets (chalk grassland, heathland), development of habitat connectivity modelling, assessment (or development of useful proxies) for the condition of habitats, and how to use species data within the 'Lawton recovery mapping' approach.
- Formal 'sense checking' of the Sussex BOA network with wider stakeholders (are they still fit for purpose? What other work is needed to make them a useful part of the recovery network? Should there be a formal 're-adoption' of BOAs by LNP as a foundation for nature recovery mapping). This consultation exercise could be led by the SxNP.
- Continued engagement with SDNPA and High Weald AONB to identify and agree a framework for core/Lawton recovery mapping that will ensure coherence across approaches being taken both within protected landscapes and the areas beyond their boundaries.
- Extension of the mapping of core areas and the 'Lawton Recovery Map' across the whole Sussex LNP geography, as an acknowledged part of 'readiness' for future LNRS preparation. (This would be a relatively small and straightforward piece of work (1-2 days work by SxBRC for the core and Lawton Recovery Maps). This should be done now (despite gaps or uncertainties around status of BOAs or alignment with protected landscapes) so that the information can start to inform emerging local plan development. Maps can be labelled as 'preliminary' and amended at a later date as gaps are filled or BOAs amended.
- Mapping of all existing nature-recovery projects and partnerships across Sussex. These areas will act as logical spatial areas where existing deployment of resources can be used as a foundation for future activity. Identifying and mapping this information will involve engagement with all delivery partners to request and collate information, followed by GIS mapping to add them to the map. Work carried out by the SxNP in 2016 to compile this sort of information can be used as a basis for this work.
- Development of a framework for 'monitoring and evaluation' of delivery of a Local Nature Recovery Strategy, including developing a suitable baseline against which to identify progress. This could be led by the LNP and SxBRC and involve discussion with NE and other record centres across the South East (co-ordinated within the umbrella of SENP).

Phase 2: Methodologies, Findings and Outputs

The purpose of this phase of the project was to engage with the strategic planners in the three local authorities to explore some initial questions about the possible relationship between Local Nature Recovery Strategies (and the maps that might underpin these) and spatial planning and development processes at a district level. These conversations were designed to tease out the possible application of the maps by local planning authorities, understand barriers and challenges to their delivery and to develop ideas as to how any final LNRS might be formally connected to and supported by local plans.

The broad questions asked included:

- What is their understanding of Local Nature Recovery Strategies, how they might be prepared and how they will be used?
- Do maps of Core Areas and Lawton Recovery Areas produced by this project make sense - and are they useful at the scale at which they have been developed?
- How might they be used to broadly inform emerging local plans?
- How do the mapped Core Areas and Lawton Recovery Areas relate to new housing allocations or SHELAA[7] sites - and what questions might this raise for future siting and design of housing/development?
- How might they be used to inform the application of 'net gain' or other planning gain?
- As the Environment Bill stands, local authorities will have a "duty to have regard to" Local Nature Recovery Strategies? What might this mean in practice and how might they be incorporated into local plans? In particular, how can they be referenced now in emerging plans which are due to be completed before the Environment Bill is enacted?
- Are there other perceived challenges/barriers to engagement with LNRS processes from local planning authority perspective?

To assist with the discussions, detailed maps were created showing an area of each district. These included: Core Areas, Lawton Recovery Areas and either formal housing allocations or SHELAA sites. These are shown in Figures 10-12 below and were very useful in focusing conversations and thinking about the questions above.

In terms of context, it is important to note that all three councils are in the process of reviewing their local plans. All are under pressure to bring forward sites for a large number of new homes. As such, LNRSs in these three areas will be seen within the context of significant development pressure and all have existing constraints on this delivery (such as the presence of High Weald AONB and South Downs National Park across parts of these districts). However, given that the Environment Bill has not yet been enacted, most of these plans are likely to be completed before a LNRS is formally in place. Hence the focus in the questions above on how emerging plans might relate to a LNRS prepared in the future.

[7] SHELAA Strategic Housing and Economic Land Availability Assessment - a process carried out to find possible land for development

Understanding of LNRSs and how they will be prepared and used

The proposals within the Environment Bill are on the radar of the strategic planners interviewed, but there is little understanding of the emerging detail around how they might be prepared and used. There is more understanding of 'net gain' proposals as this is seen to be more refined as a concept and of direct relevance to development planning. All expressed a need to understand more and in particular, to understand how LNRSs are likely to interface with local planning in practice. This flagged a need for much more engagement and knowledge sharing with local authorities by national government - and an imperative for government to work with local authorities to understand what 'readiness' will mean (in terms of the understanding, capacity and expertise that will be required to engage with the LNRS process and then harness delivery mechanisms within their gift to make a contribution to its delivery).

There was interest in the fact that LNRSs are likely to be prepared at a county scale. This was seen as a useful way to help to coordinate a strategic approach across district boundaries. But it did raise questions about what would be needed to ensure 'ownership' and application of a county-wide LNRS at a district/borough level and about the scale and level detail of information that would be useful at the sub-county level. For those districts where there was also a National Park and AONB, there was concern that they could actually fall across three potential LNRS geographies, depending on how "responsible authority' status was assigned in this area of Sussex.

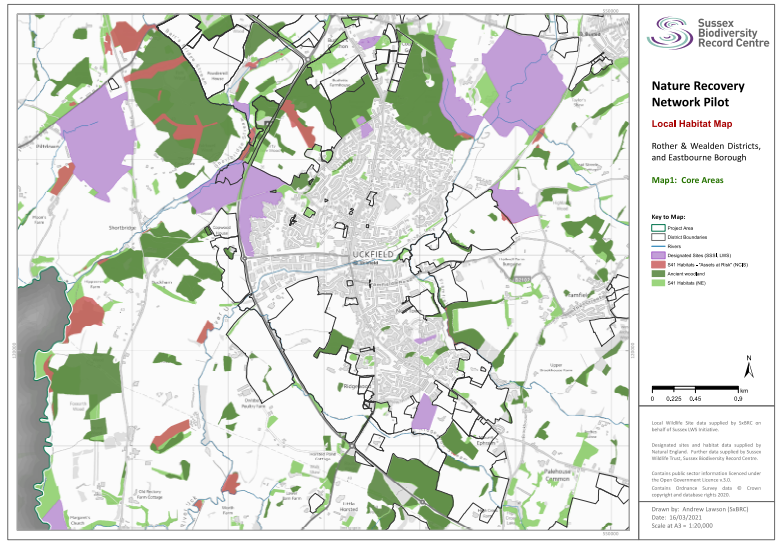
The broad conclusion was that if planning is to play a part in delivering a LNRS, each local plan will need to be influenced by, and where possible embed, key elements of the strategy. For example, if core and recovery areas of a local network are to be protected from development they will have to be specifically protected via policies within each local plan. If local authorities want to see net gain applied 'strategically' for the local environment, this again will have to be dealt with through specific policies in each local plan.

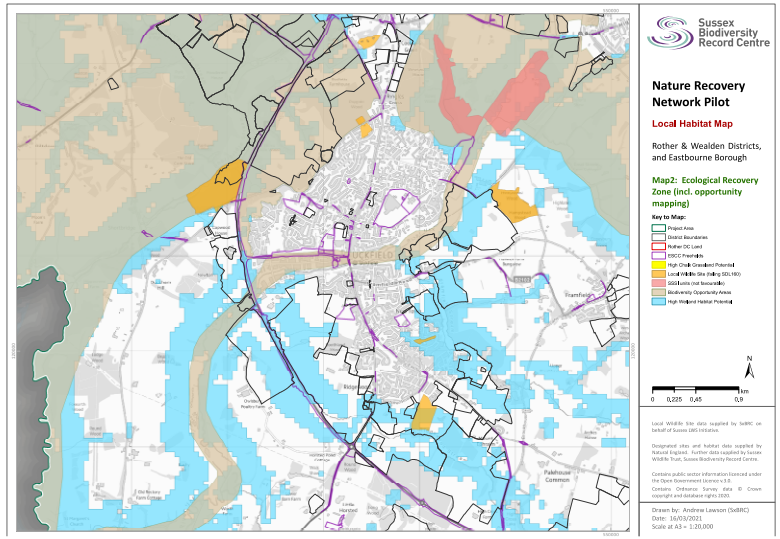
If a LNRS is created at the county scale, its delivery will in part rely on it being effectively embedded in each district/borough local plan. It will be interesting to see how consistently this can be done from district to district within a LNRS area, particularly when the schedule for reviewing local plans may vary significantly from district to district.

Do the maps of Core Areas and Lawton Recovery Areas make sense - and are they useful at the scale at which they have been developed in this project? How might they broadly influence emerging local plans?

Elements of the core area map (designations and priority habitats) are already familiar to strategic planners as they form part of the evidence base of local plans. The concept of ecological network mapping (within the NPPF) also means that strategic planners are familiar with the need to map opportunities to protect and create habitat where possible.

However, the different categories of core and recovery areas presented on these maps (and their origins) provided additional information. The fact that that this was "in one place" was felt to be useful and started to provide an understanding of spatial constraints and opportunities in a particular area.





Figures 10a and 10b. Uckfield area (Wealden DC) showing Core Areas (10a) and Lawton Recovery Areas (10b) with SHELAA sites

In terms of what the various maps mean and how they relate to planning and development decisions, several observations and questions were discussed:

Core areas:
Would a LNRS confer any extra protection to core sites (from loss to development) than they have already? At first glance, inclusion of sites as 'core sites' within a LNRS may not necessarily confer additional protections over and above those they hold already. Thus Local Wildlife Sites and priority habitats are likely to remain more vulnerable than sites with statutory designations such as SSSIs.

For example, the fact that a local authority will only have a "duty to have regard to" a LNRS means there is a risk that core and recovery areas (as set out in a LNRS) could be 'considered' within a local planning process but ultimately still trumped by greater priorities. They could thus be left with nothing more than their existing protections and will still lack the weight of constraints specifically noted in planning policy - such as 'showstopper' constraints (e.g. flood risk) as set out in the NPPF.

In areas of high housing pressure in particular, it was stressed that the mere presence of a LNRS will not necessarily provide weakly protected areas (such as LWS and priority habitats) with any greater protection from development. Their 'value' as part of greater network will be better understood but their fate will still depend on local level trade-offs between priorities, an in particular, the pressure of housing numbers a district is required to provide.

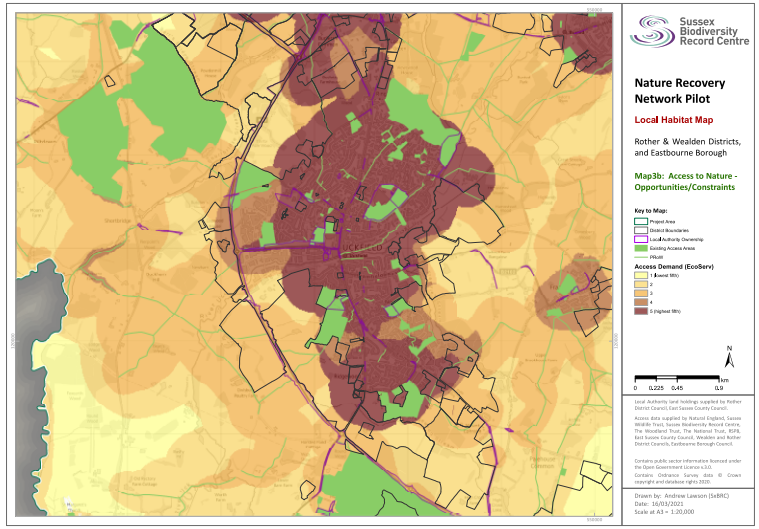


Figure 10c. Access to Nature (Uckfield, Wealden DC)

However, having said that, even at this 'experimental' stage the maps provide useful information when considering sites brought forward under the current SHELAA processes in relation to sites of known value for nature. It was assumed that a final LNRS would provide even more detail and would carry more weight given the stakeholder engagement it would involve.

This discussion raised broader questions about the relationship between the emerging environmental legislation and planning policy. For example, does planning policy need to be amended to reflect LNRSs? What will the current planning policy reform process mean for the whole concept of LNRS being proposed? The current lack of integration between the Environment Bill and the planning policy White Paper was noted as a significant concern and one which added even more uncertainty as to how emerging policy thinking might work in practice.

Recovery Areas
The 'recovery area' maps provide an interesting/useful indication of areas of importance for ecological network creation. However, **they do not provide enough detail to understand which habitats are included**. This will be needed when developing any detail for leveraging net gain from any developments in or adjacent to these areas (either onsite or offset). In the past, BOAs were only ever 'blobs on a map' in Sussex and as a result were of little practical use for planners (hence their abandonment as a concept in recent years). An approach for resolving this is set out in more detail below.

Accessible nature maps provided a very useful visual indicator of existing demand for access and promoted the thought that the impact of new development on existing access need should be understood (i.e. development on top of areas that could provide access needed by existing settlements could exacerbate the problem). It also stimulated discussion about the relationship between a LNRS and provision of green infrastructure within settlements and new developments. It was not clear how the two would work together or interact. More needs to be done in this area.

Need for information now

All three authorities involved in this project are in the process of reviewing their local plans. There is thus a need for more of this type of mapped/strategic information imminently if it is to form part of the evidence base for the emerging plans. It was acknowledged that this mapping information had limitations and was not formally part of the LNRS process for East Sussex (yet) - but it remains useful information that could help to embed 'nature recovery network' thinking in emerging plans. Anything further that the LNP can develop as an extension of this project will be very helpful.

How do the mapped Core Areas and Lawton Recovery Areas relate to new housing allocations or SHELAA[8] sites - and what questions might this raise for future siting and design of housing/development? How might they be used to inform the application of 'net gain' or other planning gain?

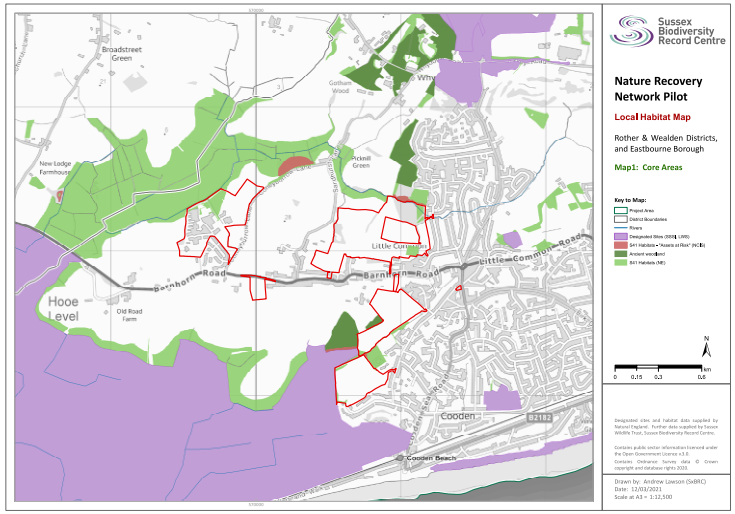
In general, if an area is to be impacted by development or could benefit from habitat creation via the planning system, a much finer scale of habitat mapping and 'opportunity' detail will be required to both understand the habitat types that may be lost, and where in the district these could be offset.

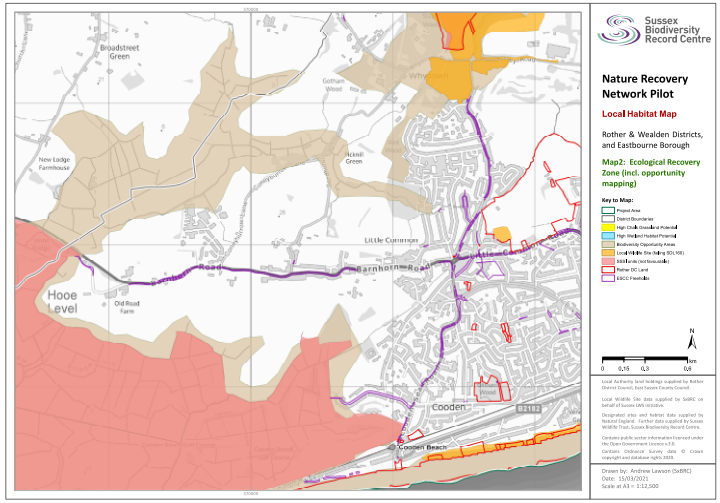
A possible useful principle was proposed during discussions: that **any offsite net gain should be located in the 'nearest relevant recovery area' to a proposed development** (e.g. the nearest BOA or B-Line area where this habitat type is present and could benefit from expansion, connection and so on). This supports a democratic principle that any benefit from a development should be felt as close to the site as possible and certainly within the district/borough (not elsewhere in the county - this would not be locally popular). A LNRS will be created at a county-scale, which therefore means that each will have to be interpreted locally **by each district** with sites for net gain identified by each planning authority for receipt of any locally generated offsite net gain. However, it was acknowledged that a process facilitated at the county level to help identify sites in each of the district areas, would be very helpful

The local authorities saw real merit in having some control over where off-site net gain would be located and that identifying sites for this purpose would help to provide this.

Developing detailed mapping and identification of opportunities within each recovery area/BOA will be very time-consuming. Therefore a 'risk based' approach could be used, with detailed delivery planning carried out for those recovery areas/BOAs located close to proposed development sites. This could map habitats, identify habitat creation needs/opportunities and work with local stakeholders, landowners and developers to identify possible locations for habitat creation (either within developments or as offsets to proposed development). Where new development is being proposed in the form of urban extensions, many of these recovery areas affected will be close to existing settlements and so will provide an opportunity to do some detailed work to create new natural areas and assets which will be of direct benefit to people and nature.

Commissioning of detailed ecological surveys of any proposed sites could also be carried out by local authorities to provide more detailed information at the site level as part of the local plan development.





Figures 11a and 11b. Bexhill area (Rother DC) showing Core Areas with housing allocations(11a) and Lawton Recovery Areas (11b) with county and district landholdings included.

[8] SHELAA Strategic Housing and Economic Land Availability Assessment - a process carried out to find possible land for development

This would assist in understanding the impact of any proposal on the local nature recovery network, but would also provide baseline information for the calculation of net gain, which in turn will assist in thinking strategically about the type of offsite net gain that many be needed offsite. This can then be matched with the detailed analysis of local recovery areas in order to identify possible offsetting sites. If done in advance, this will help to strategically target net gain and enable sites to be found to receive it that can deliver a range of benefits.

The LNRS could also be used to identify the types of habitat to be included within development (as part of on-site net gain) and the % net gain that should be leveraged from a particular site. For example, proposed sites that are close to or within core/recovery areas could be expected to deliver **a higher % net gain** due to their obvious contribution to the nature recovery network. This could be set out in the local plan within a specific policy or SPD for the site.

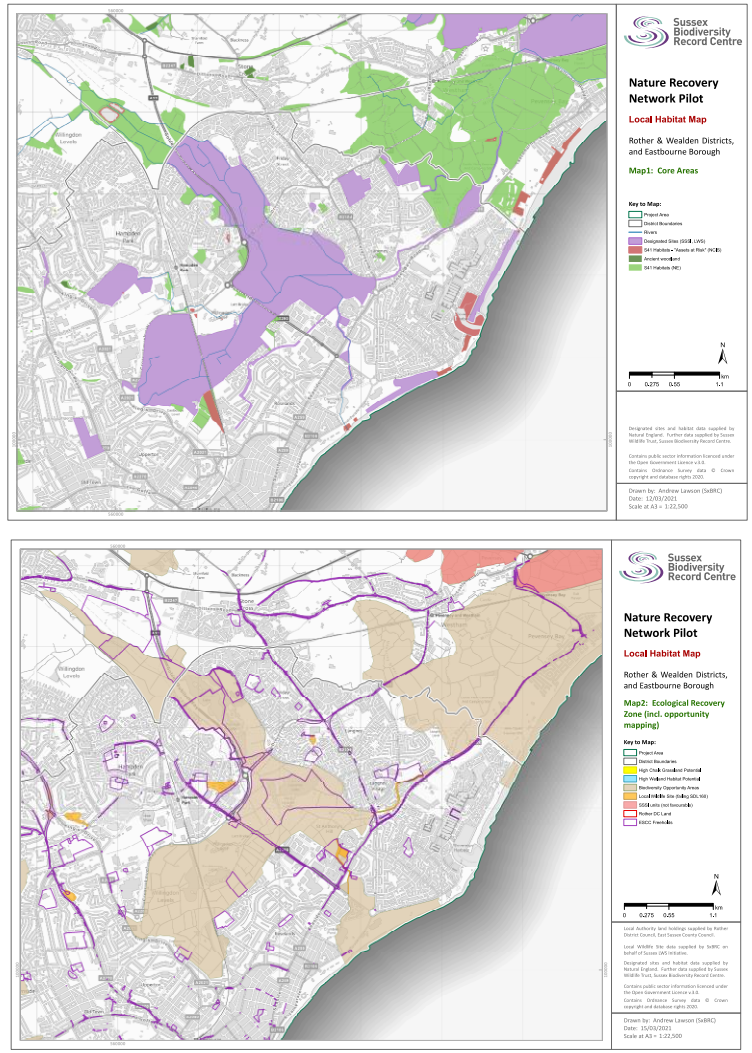
If the strategic deployment of net gain is to work in practice, local authorities will have to understand how to identify and secure sites for off-site net gain. This is not something that many have given any thought to. Various models could be explored (using existing local authority land assets, land acquisition securing an arrangement with landowners to develop habitat up-front (habitat banking) and so on). Local authorities need much more information about how this will work in practice and what they may need to do to ensure sites are ready to receive net gain when needed.

Where development is happening predominantly on brownfield sites within urban areas, it was also proposed that **a high % net gain to be delivered offsite** could be specifically requested and targeted to deliver improvements to key recovery areas and greenspaces within the council area for the benefit of both nature and people.

As the Environment Bill stands, local authorities will have a "duty to have regard to" Local Nature Recovery Strategies? What might this mean in practice and how might they be incorporated into local plans? In particular, how can they be referenced now in emerging plans which are due to be completed before the Environment Bill is enacted?

As noted above, the local authorities noted that any future LNRS will need to be embedded in some way within each local plan to ensure that it can influence planning decisions and is connected to the delivery of net gain. In East Sussex at present, most local authorities are currently reviewing local plans and the timeframes they are working to means that most will be finalised before an official LNRS is prepared. This raises a specific question. How do strategic planners 'future-proof' their emerging plans so that they can help to deliver an LNRS once it is prepared?

All agreed that it would be necessary to include several policy 'hooks' in the emerging plans that will enable the later LNRS to be referred to and enacted. There is an urgent need to identify how to do this now as plans are in active preparation and are not likely to be held up by the Environment Bill or implementation of its requirements. Guidance from government on wording and an approach would be very welcome. In the meantime, the LNP may be able to bring districts together to work on wording, to ensure consistency of approach in emerging plans within a future LNRS area.



Figures 12a and 12b. Central Eastbourne area (Eastbourne BC) showing Core Areas (12a) and Lawton Recovery Areas (12b) with county and district landholdings included.

With suitable hooks in place, the Districts/Boroughs favoured the development of a **Nature Recovery/Biodiversity SPD** by the County Council, which would then be adopted and customised by each local planning authority, effectively linking the LNRS to their new local plans. This would ensure that a consistent approach was taken by each district/borough within a county (LNRS) area.

Other perceived challenges/barriers to engagement with LNRS processes from local planning authority perspective

Several local authorities have very low GIS and data-handling capacity. This will constrain their ability to contribute spatial data to a LNRS mapping exercise, and then to use it within internal decision-making processes. Government should be much more aware of this constraint and how it will affect implementation of both net gain and LNRS delivery.

Monitoring and evaluating contribution to delivery of a LNRS and habitat created via net gain was not something the local authorities had thought about. If local authorities (at the district level) are to be expected to play a part in this, this should form part of a wider 'readiness' exercise for local authorities. Any county-wide monitoring and evaluation system for the LNRS will have to gather information on net gain (either from local authorities or via the national register).

Recommendations for future work

- Identification of suitable wording for inclusion within emerging local plans in order to 'future-proof' these plans and provide the policy hooks for the LNRS once it is drafted. SxNP can work with all local planning authorities across Sussex (including the South Downs National Park) to identify suitable wording and a future county-wide SPD/policy for biodiversity and net gain for customisation/adoption by districts at a later stage.
- Extension of this project to develop detailed core and Lawton recovery maps for one 'recovery area' (e.g. a BOA) adjacent to an area targeted for housing development (existing allocations or concentration of SHELAA sites)) within each of the three districts. This would aim to identify the level of detail required for planning the delivery of habitat creation in relation to development and strategic planning processes, and to widen the engagement of stakeholders to explore how a more detailed delivery planning process might work in practice. All three districts are supportive of this idea and have already suggested possible areas of their districts to focus on. This would be very timely given that all are currently in the process of reviewing local plans and there is therefore still time to influence these (although only just!). This sort of analysis of the interface between LNRS, net gain and housing pressure will be fundamental to understanding how local elements of a nature recovery network can be protected and enhanced in the face of significant development pressure. The outputs of this work can be shared across all planning authorities in Sussex as part of greater discussion about the interface between the Environment Bill and planning.
- Identification of a method and evidence base for Sussex to supporting **increased % net gain** (i.e. beyond mandatory 10%) - whether at a district-wide or site-based scale. Within Sussex, it is clear that when and how > 10% net gain should be required must be based on a robust understanding of 'biodiversity need' and 'feasibility/deliverability'. This sort of approach is being followed elsewhere (e.g. Kent). This is a discussion that the LNP and SxBRC would be well placed to lead. Such a project would involve learning from elsewhere, consulting with all local planning authorities within Sussex and developing the evidence base required to support any proposed increase beyond 10%.
- Continuation of the engagement with all local planning authorities in Sussex on LNRS and net gain and how it may be implemented in practice. This has been initiated by the LNP and can be continued via its 'Local Authority Network' and a planned series of webinars and resources for local authorities. Similar early discussions with all remaining local authorities across East Sussex, West Sussex and Brighton & Hove City Council would help to get all local planning authorities to the same level of engagement and understanding. This could be done by the SxNP once Sussex-wide core and Lawton recovery maps have been prepared.
- Wider engagement with other key stakeholder groups (such as farmers, landowners, farm advisors and community-based organisations) to start similar conversations and pave the way for development of a shared vision for nature and people in Sussex, once the Responsible Authorities are in place. Early conversations with these stakeholders will also start to develop a shared understanding of how other mechanisms available can help to deliver a LNRS.