Landscape Enterprise Networks: Pilot in Oxfordshire

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Acknowledgements

The project team would like to thank all of the organisations that took part in the pilot and who gave time to speak with us. We also thank the OxCam Local Natural Capital Plan team for funding this pilot.

1. Project background

The OxCam Arc Local Natural Capital Plan team became aware of the Landscape Enterprise Network approach (LENs) through the existing LENs project in Northamptonshire. As part of a wider call for small-scale projects to further explore natural capital and natural capital approaches/methods in the Arc, the LNCP team commissioned 3Keel and the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT) to consider where and how the LENs approach could be applied within Oxfordshire, to identify some initial opportunities, and to compare the approach with the Northamptonshire project to understand wider contextual factors that might affect the success of this particular natural capital approach, and in working with demand side interests in general.

Key findings

The project identified several potential initial trades within Oxfordshire among four key players: Thames Water, Blenheim Palace and Estate, East West Rail Alliance, and Oxfordshire County Council. While the opportunities address standalone functions, these functions are underpinned by many common landscape assets, and there are a number of landscape interventions that would address multiple functions at one time. The combination of functions addressed would depend on the demand side players involved in the trade. The key functions identified were:

- Biodiversity
- Water quality and flood management
- Carbon sequestration

In order to proceed with one (or both) of the potential trades above, the following actions would need to be taken:

- One-to-one engagement with the demand organisations, to continue a deeper analysis on specific demand requirements.
- Engagement of potential supply side aggregators.
- Exploration of the role of TOE and TVERC in a biodiversity trade.
- Exploration of the potential for a wider OxCam Arc LENs strategy.
- Identification and engagement of future players.

The comparison of LENs projects in two counties within the OxCam Arc (Oxfordshire and Northamptonshire) also identified that:

- An ‘anchor’ demand side player, committed from the beginning, allows others entering the network to have confidence that a trade would take place and helps give the project credibility at its inception.
- Some organisations, such as agri-food businesses and water companies, have more obvious landscape dependencies. A prevalence of these types of businesses in a region can make an initial LENs network easier to set-up.
- The type of supply aggregators does not seem to affect the initial bringing together of a LENs. network.
- The landscapes of both Oxfordshire and Northamptonshire have many similarities, thus would not drive major structural differences between the LENs networks or the outcomes they achieve (this will be driven by business interests on the demand side).

2. Project approach

The project used the Landscape Enterprise Networks (LENs) approach for identifying business demand in Oxfordshire. Landscape Enterprise Networks (LENs) links the management of land and landscapes to the long-term needs of business and society. It does this by helping businesses to work together to influence the quality and performance of the landscapes in which they operate.

LENs concepts explained

LENs looks at the landscape from the perspective of business need: what are the risks and opportunities that landscapes present to individual businesses, and therefore why should they engage? Rather than starting with a top-down plan for the landscape, LENs breaks down complex landscape systems into 'bite-sized' transactable chunks. It creates a series of discrete value chains, where small consortia of businesses - brought together around a shared landscape need - are helped to procure the landscape outcomes which matter to their business.

The LENs process begins with a systematic analysis of three interacting landscape variables: beneficiaries, functions and assets:

- **Landscape Beneficiaries**. These are the businesses (or other organisations) that have a practical interest in the landscape. These may be in the agri-food sector, but they may also be housing developers, insurance companies, tech businesses or businesses from a wide range of other sectors.
- **Landscape Functions**. These are the practical outcomes of landscape that beneficiaries are interested in. It includes but goes beyond what is often dealt with as 'ecosystem services'. It might be the production of foodstuffs, the supply of raw water, the capacity to receive effluent, mitigation of flood risk, improvement of 'liveability' for attracting and retaining staff.
- **Landscape Assets**. These are the features of the landscape system that underpin its ability to deliver the functions required of beneficiaries. These may include soils, watercourses and aquifers, terrestrial habitats, infrastructure for public access and recreation, rural skills and land enterprises.

The goal of this systematic process is to understand which sectors in a region have most at stake as a result of landscape performance, which landscape assets underpin that performance, and where there are cross-overs in interest for different businesses or sectors in the same landscape assets. Importantly, the objective here isn't about building up a comprehensive picture or plan. It's about using data, intelligence and insight to identify the most promising place to start building a network.

Step 2. The Basic Operating Unit – a collaborative value chain

This step focuses on building a first 'anchor' value chain (see **Figure 1** below). The key tasks are shown in the diagram, above. In essence the process involves working with 'demand side' interests to define a common specification for services; with the 'supply side' to define a service proposition; and then working with both to broker a deal. In our experience the supply side can work best when coordinated through 'supply aggregators' (ie farmer clusters, commodity coops, etc), who help land enterprises to work together as a group and create a joined-up proposition.

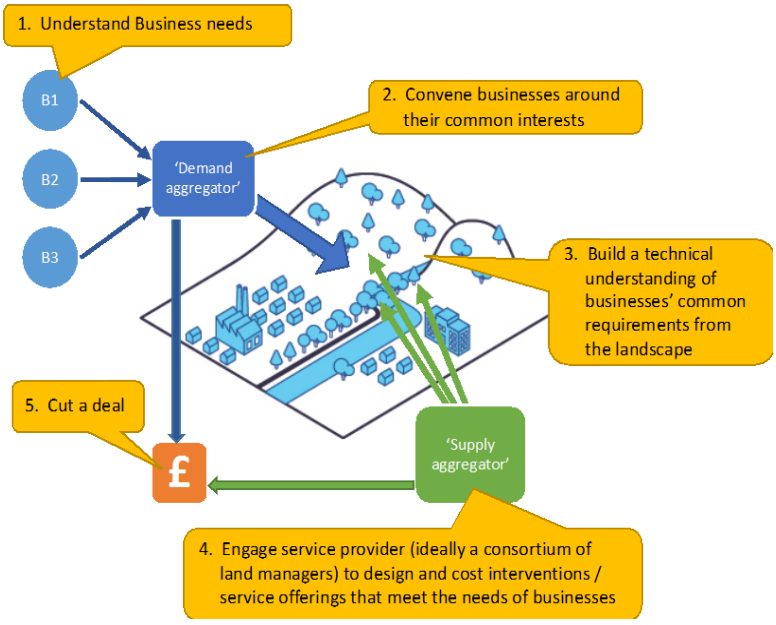

Figure 1 An illustration of the basic operating unit at the heart of a LENs network

Step 3. Growing and formalising the regional network

Building a functioning first anchor value chain creates momentum and interest and leads naturally to both extending the first value chain – by attracting more customers and suppliers – and building the next. It is at this point that some form of organisational infrastructure, and governance, is required to manage and broker trades in an equitable, transparent, and locally accountable manner.

Approach in Oxfordshire

The Oxfordshire pilot described in this report consisted of the first two steps: undertaking the initial demand analysis and bringing together key business interests to explore overlaps and opportunities. The approach was comprised of the following steps:

- Analysis of business demand
- Geospatial analysis of business interests
- Scoping of and engagement with potential demand-side parties
- Scoping of potential supply side aggregators
- Demand-side workshop to ground-truth findings

This project also involved comparing the approach and findings from the Oxfordshire project to an ongoing LENs project in Northamptonshire, in order to identify barriers and facilitators to initiating a LENs approach and to better understand how the regional context informs the development and success of a LENs project. This comparison may also then help inform an OxCam Arc-wide strategy to promote and/or facilitate a more joined-up LENs approach.

3. LENs demand analysis

3.1 Analysis of Oxfordshire business sector landscape

The landscapes around Oxfordshire are economically and culturally dense and vibrant. It encompasses an economy generating GVA of £22billion, high value science, technology, and motorsports businesses, key tourism hotspots in the City of Oxford and the Cotswolds, and over half a million people. While the land sector represents significantly less than 1% of the regional economy, the landscapes themselves underpin a significant proportion of the value created by businesses in Oxfordshire. That underpinning comes, for example, from the landscapes' material impact on placemaking, and businesses' ability to attract and retain talent; on the risks to property and logistics from flooding; on the ability of developers to obtain planning consents; on the health and wellbeing of the population; and on the ability of communities and businesses to both build resilience to climate change and manage their own impacts on climate change.

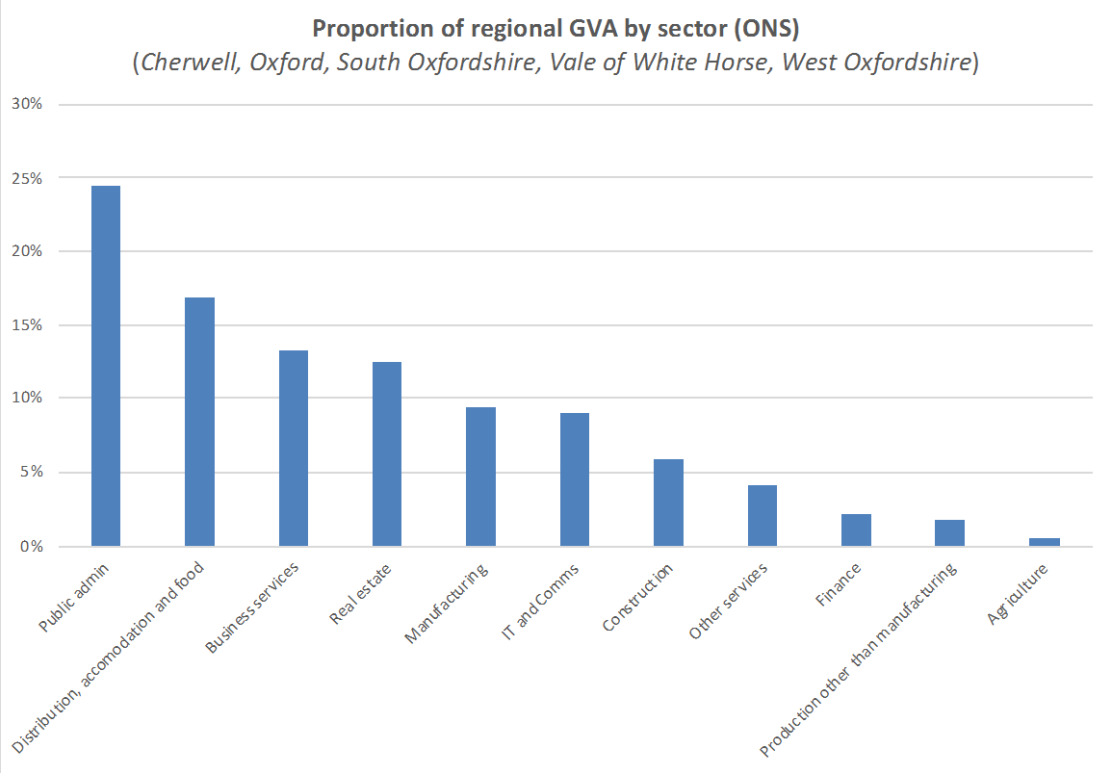

Figure 2 Regional GVA analysis of Oxfordshire

3.2 Key individual businesses

Following an initial analysis of likely private and public sector interest in the management of land and landscapes for the long-term needs of business and society, several organisations were approached to gauge their interest in participating in the Oxfordshire LENs pilot. The following organisations participated in several one-to-one meetings as well as a workshop (see **Section 4**) to understand their interest in the management of Oxfordshire's natural capital assets.

Thames Water

Thames Water is a water utility company serving 15 million people across London and the Thames Valley. They are responsible for both water supply and sewerage across all of Oxfordshire. As with all

water companies in England, they have regulatory requirements around water quality with relation to both supply and sewerage.

A priority area for Thames Water is the Evenlode catchment, where they recently ran a trial with land managers to explore the ability to manage nutrient load through a catchment based approach (CaBA), rather than upgrading or building new treatment works. As it can take 5-7 years before the outcomes of this type of approach are visible in water quality, they are still working through the results of the trial.

In general, Thames Water has been revisiting their engagement and strategy with catchment partnerships such as CaBA groups. They found that historically, their engagement tended to be more reactionary – for example, if an issue arose that needed immediate management. They're now keen adapt their approach to work more proactively with partners in the catchment, and are exploring ways to do this. They'd like to trial the benefits of holistic catchment partnerships, particularly around achieving multiple benefits at once, in three main water bodies, the Evenlode again being one.

Thames Water's key areas of demand interest in Oxfordshire are water quality, flood risk management, carbon, and biodiversity (see **Figure 2** below).

- There is a big phosphate issue in the Evenlode catchment particularly, which has a small plant that is potentially not economically beneficial to upgrade. Other water quality issues include nitrate, pesticide, and metaldehyde – these generally occur in hotspot areas around abstraction points or reservoirs.
- While Thames Water does not have any regulatory requirements around flood risk management in Oxfordshire, it can be an issue for their physical sites, such as treatment works. When there is a large amount of rainfall and groundwater levels rise, there can be an infiltration of groundwater into sewers, which can either cause them to back up and flood upstream in the network, or will overload treatments at end of network, sometimes to the point they are perpetually going to storm even if it hasn't rained that recently. While treatment works have been generally made flood resilient, this is difficult to do for wastewater treatment works, which are designed for everything to drain into so that it can be treated. As the issue here is ground water rather than surface water, it would require exploring whether or not this could be mitigated through land management. See **Figure 3** below for the key locations for this issue.
- Thames Water has a commitment to be carbon neutral by 2030. This is a voluntary, not a binding commitment, but it is likely they may face reputational damage should they fail to meet it. Thames Water also believes it is only a matter of time before there is real governance and regulation around this commitment as well.
- Thames Water has a 5% biodiversity net gain commitment on their sites, some of which are in Oxfordshire, and are looking at a potential wider commitment, extending to with any additional projects they are involved with.

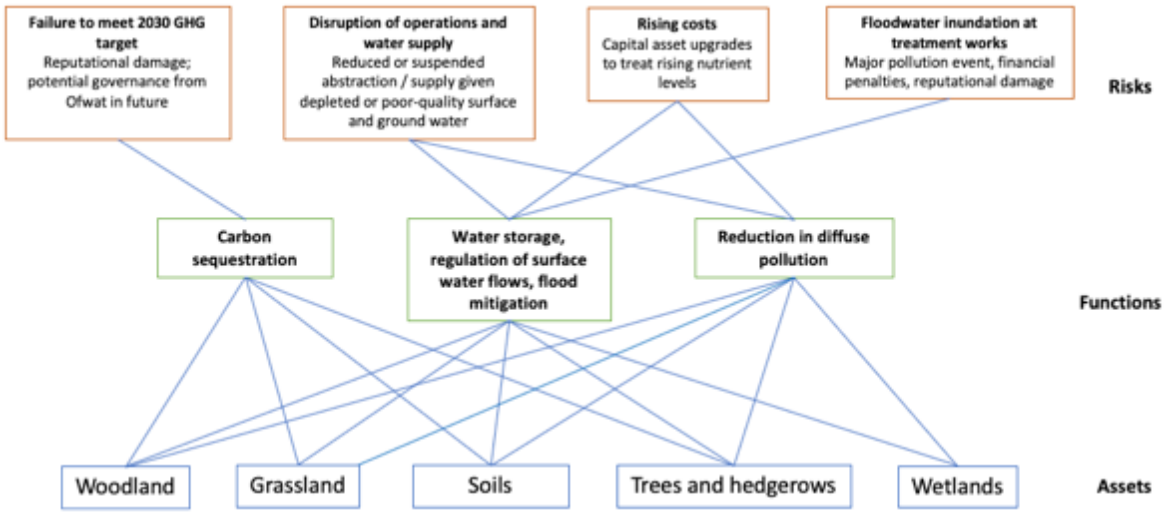

Figure 3 Risk/demand analysis for Thames Water

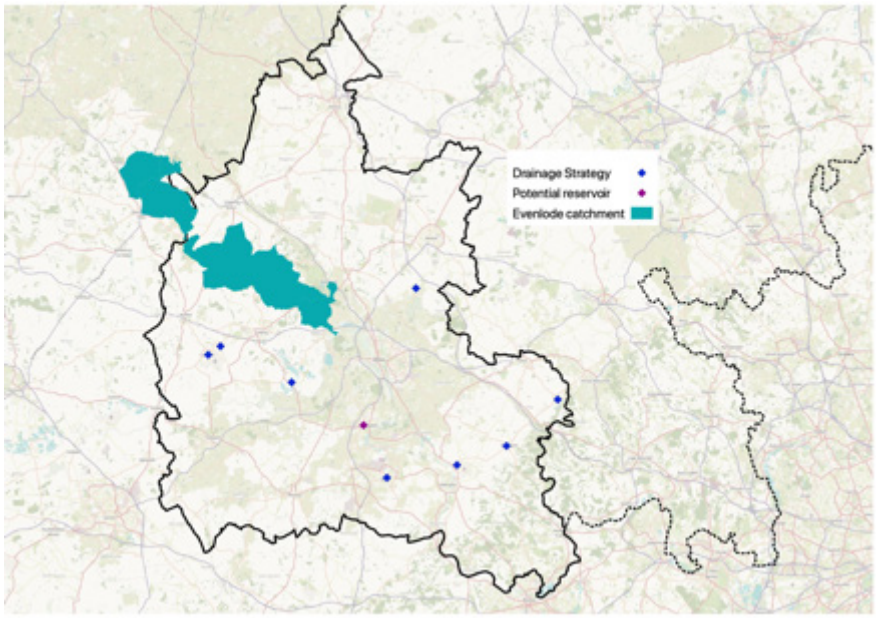

Figure 4 Some example key locational interests for Thames Water

Blenheim Palace and Estate

"Blenheim" is a two-part entity, encompassing both Blenheim Palace, a world heritage site, and Blenheim Estate, which manages and develops the organisation's extensive portfolio, commercial and agricultural properties, as well as dedicated practices of forestry, farming and parkland management.

As both a tourism business and a large landowner, Blenheim is unusual in that it has the potential to sit on either side of a LENs network – demand, or supply. While in a single trade it would be necessary for them to occupy a single role on either the demand or the supply side, as a network grew, it is plausible that Blenheim could play different roles (supply or demand) in different trades.

As a demand interest, Blenheim's key areas of interest are carbon sequestration, flood risk management, and water quality (see **Figure 5**).

- Blenheim has a commitment to be carbon neutral by 2025; they plan to publish a roadmap to meet this goal in autumn 2020. While many of the steps they will seek to take will either

involve directly reducing emissions, or offsetting on their own estate, it is very likely they will need to seek carbon offsets off-site to meet their goal.

- One of the key features of Blenheim Palace and grounds is the lake and Queen Pool, created by Capability Brown in the 18th century. The lake suffers from sedimentation and runoff from the surrounding catchment, putting both the ecological life within the lake as well as the existence of the lake itself in danger – currently the excess siltation means that 75% of the volume of the lake has been lost. Blenheim has plans to dredge the lake in the next year as an immediate solution; in future, a longer-term plan to work with landowners in the surrounding catchment to reduce the silt entering the lake would be both more efficient, cheaper, and more environmentally friendly. While some of this mitigation may be able to take place on their own land, it is likely that some measures may need to take place further up the catchment for greatest effect.
- The village of Cassington, to the southwest of Woodstock, is a high-risk flood area (see **Figure 7** below). Blenheim owns large portions of the village, and would see it as a priority for further housing development if it was not a flood risk. Working with others in the catchment to reduce the flood risk might open up more development possibilities, allowing them to extend their portfolio. As with the water quality issues, while some of this mitigation may be able to take place on their own land, it is very likely that measures will be required in other parts of the catchment as well to effectively reduce the flood risk in Cassington.

As a supply interest, Blenheim's key areas of interest are biodiversity, water quality, and flood risk management.

- As a developer and housebuilder, Blenheim is not unfamiliar with the need for biodiversity net gain. Because of their own extensive land ownership, they are able to meet all of their own biodiversity net gain needs from their development internally. As Blenheim's extensive landownership means they have capacity for achieving biodiversity net gain well above their own requirements, they see providing biodiversity units to others in need of them as a key opportunity.
- As a large landowner, Blenheim has extensive scope to undertake measures on their own land that will help improve water quality and reduce flood risk in the catchment.

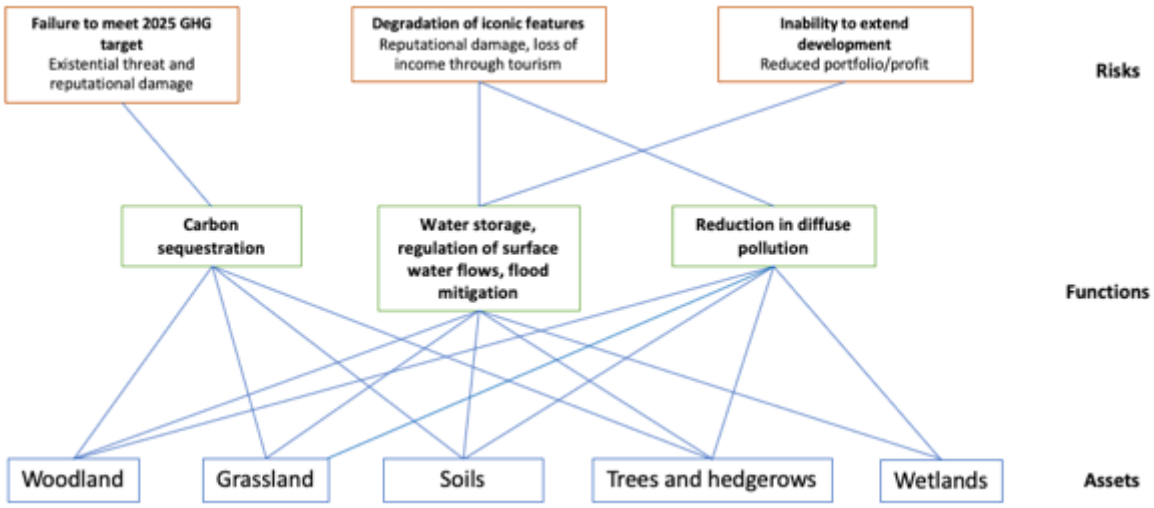

Figure 5 Risk/demand analysis for Blenheim

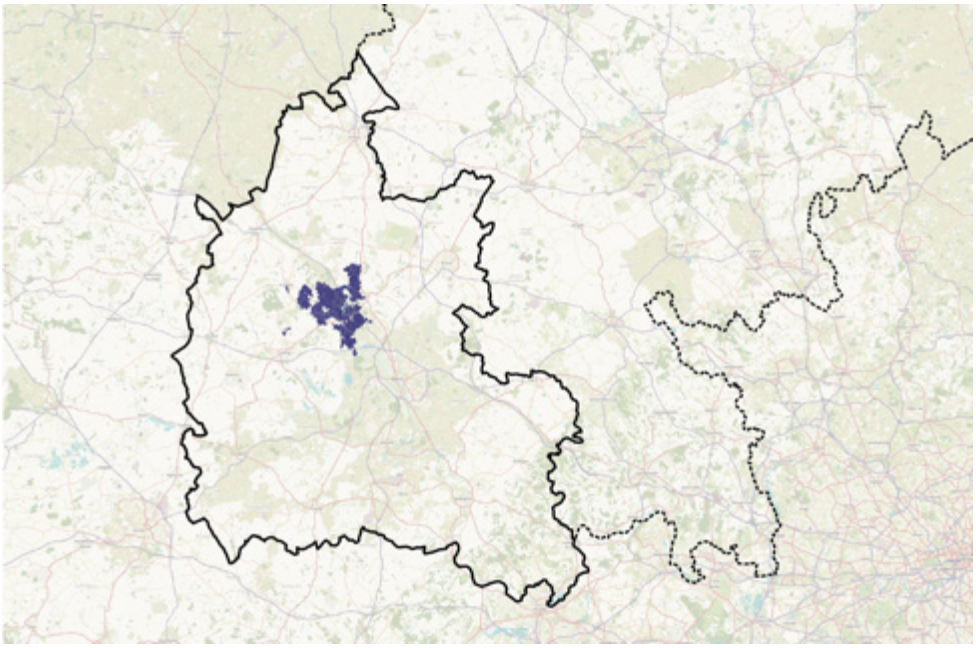

Figure 6 The location and extent of Blenheim's land ownership within Oxfordshire

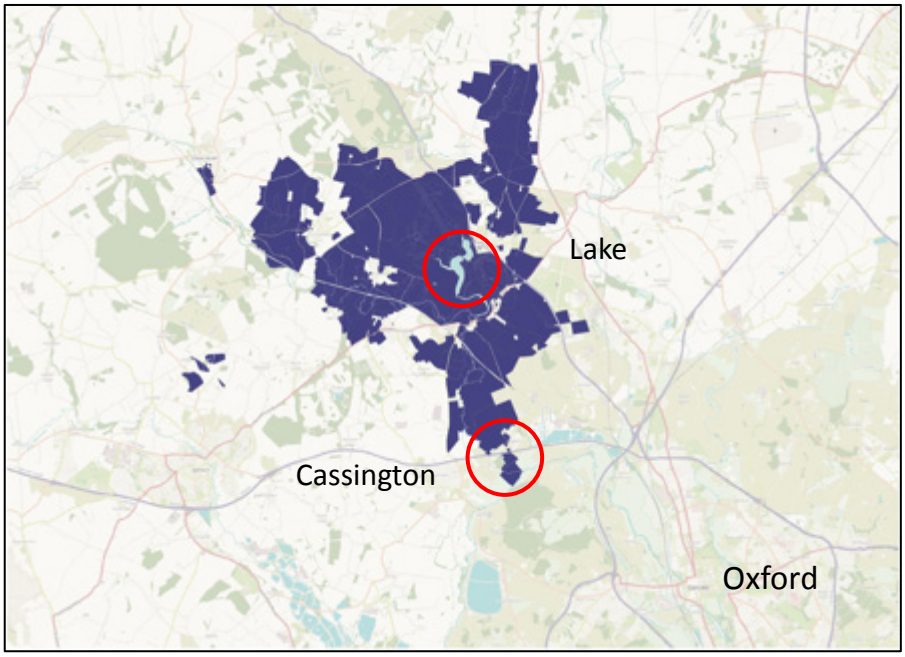

Figure 7 Close-up of Blenheim's key demand locations

Oxfordshire County Councils and Growth Board

The project engaged initially with Oxfordshire's city, district, and county councils through the Oxfordshire Growth Board. The Oxfordshire Growth Board is a collection of local authorities and other strategic partners whose goal is to manage growth within Oxfordshire, including housing. Their remit includes the Oxfordshire Plan 2050.

Both the Growth Board as well as the individual councils have keen interests in a number of natural capital assets and functions.

- In addition to the UK's commitment to be net zero in 2050, some councils in Oxfordshire have various additional GHG targets (e.g. Oxford City Council has committed to being net

zero (as a council) in 2020; South Oxfordshire District Council's Climate Emergency Advisory Committee recently recommended that the council should aim to become carbon neutral by 2025 and the whole district by 2030.

- The County Council and Growth Board are heavily involved in policy development around planning and development in the county. One area they are exploring is policy around net zero homes, and the possibility of prioritising the sourcing of green building materials (such as straw for straw bale homes) from within Oxfordshire. This remit also means they are interested in issues around nutrient management and overload, and biodiversity net gain requirements.
- Oxfordshire County Council has been involved in the development of the draft Nature Recovery Network (NRN) for Oxfordshire (see **Figure 9** below), and have a keen interest in promoting the protection and improvement of biodiversity within the county, particularly within the core and recovery zones outlined in the NRN.
- The management of flood risk and repair of flood damage is an important remit for the County Council. The county may have funds to allocate to areas where flood damage has occurred that would be able to be "unlocked" through match funding from private interests.

The Growth Board and the councils are in a different position than the other demand side interests, in that they will not always have pots of money to invest in their areas of interest.

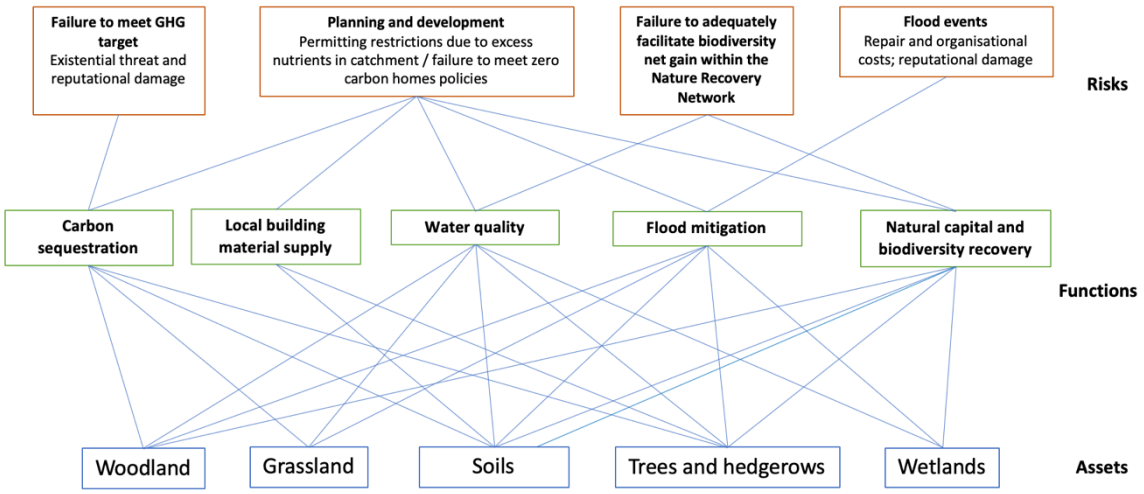

Figure 8 Risk/demand analysis for Oxfordshire Councils and Growth Board

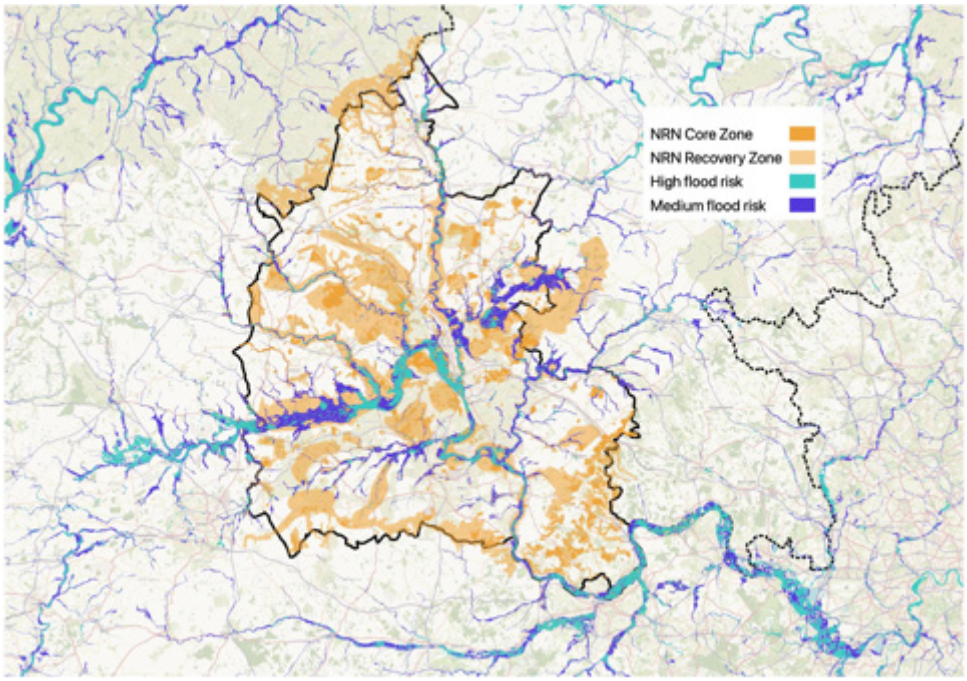

Figure 9 Key priority areas to inform Oxfordshire's planning, development, and biodiversity management

East West Rail Alliance

The East West Rail is a new trainline that will connect Oxford through to Cambridge. It will be developed through a combination of building new rail lines and bringing old ones back into use. East West Rail Alliance is a consortium of Network Rail, Atkins, Laing O'Rourke and Volker Rail. They are responsible for delivering Western Section 2 of the East West Rail line; this is the section between Bicester in Oxfordshire to Bedford in Cambridgeshire.

As part of the planning permission application to build the railway – their Transport and Works Acts order, or TWAO - they committed to 10% biodiversity net gain (BNG) across the project. The TWAO was granted in January 2020 and came into force in February 2020. EWRA is now working with local authorities to discharge the conditions associated with the TWAO around biodiversity net gain; some of these conditions are pre-commencement, some are post-commencement, and some are post-completion.

Under the terms of compulsory purchase for land that is required for their works, they can't purchase land purely for enhancement, so are unable to purchase land to meet their BNG 10% commitment and must necessarily look towards working with other landowners to achieve the target. The terms of fulfilment also specify that any biodiversity offsetting must take place within same county as work being undertaken. This commitment means EWRA's current primary and most pressing landscape need is biodiversity; however, as the rail line is built and becomes functional, flood risk management will also likely emerge as a key priority particularly for consortium member Network Rail.

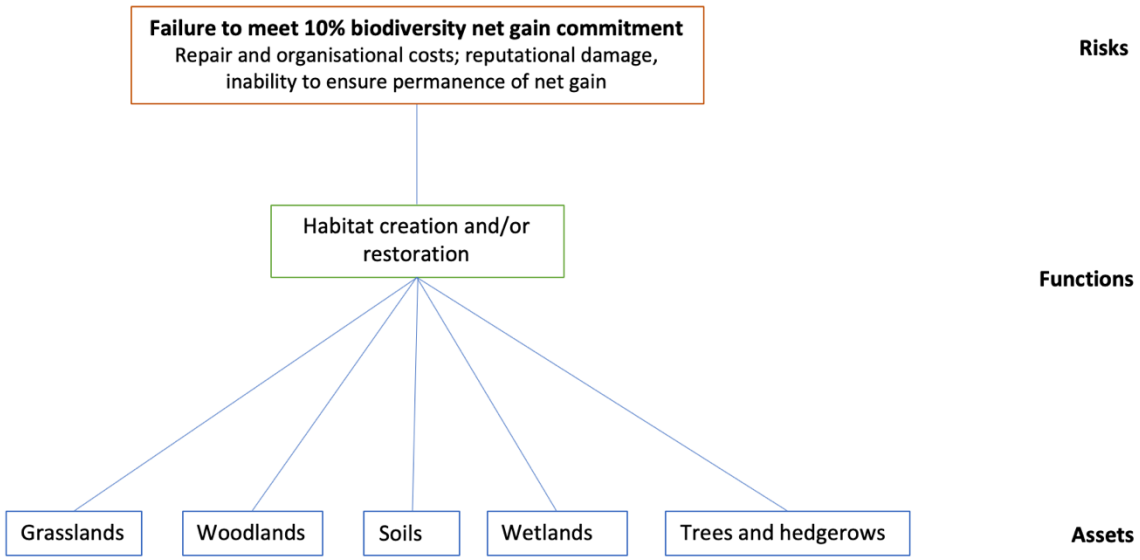

Figure 10 Demand/risk profile for EWRA in Oxfordshire and surrounding areas

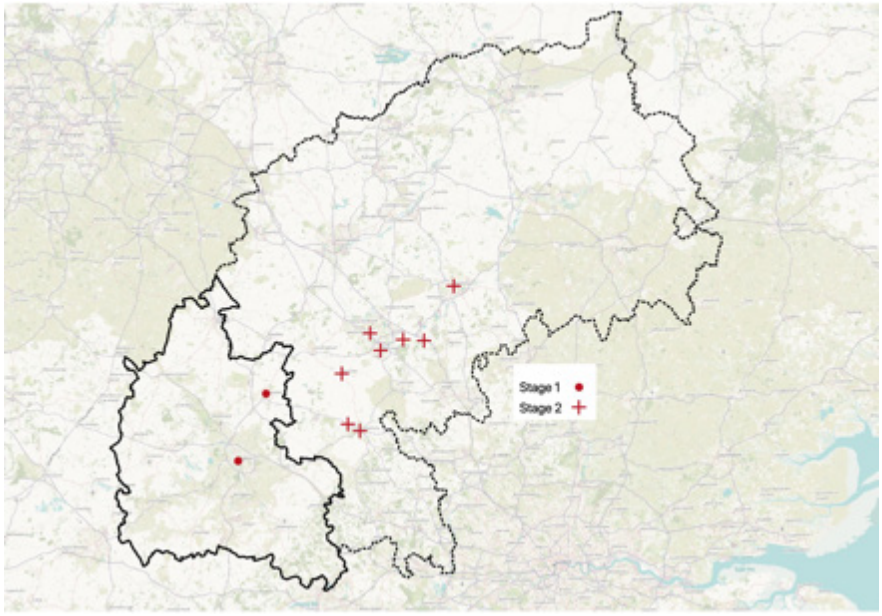

Figure 11. Locations of proposed stations for the East West Rail line; Stage 1 is completed and Stage 2 is in development.

3.3 Natural capital supply and demand in Oxfordshire

Natural capital supply opportunities

Oxfordshire has a diverse and interesting landscape character and geology, which supports a variety of priority habitats and species. Agriculture has a strong influence on the landscape, accounting for 84% of Oxfordshire's land use, shaping the county's countryside as a place to live and visit as well as producing food and supporting local businesses (Table 1; see section 6.2).

Oxfordshire's landscape is defined by its river network, including eight major rivers (Leach, Windrush, Evenlode, Glyme, Cherwell, Oxon Ray, Ock, and Thame) and many smaller tributaries that flow through the county and into the Thames. Rivers and streams are typically associated with complexes of wetland habitats including floodplain wetlands, fens, wet grassland, oxbow lakes,

permanent and temporary ponds and wet woodland (Wild Oxfordshire 2017). Oxfordshire has some of the rarest and finest grasslands in the country, including floodplain grazing marsh, hay meadows, limestone and chalk grasslands and acid grasslands. Woodland accounts for 9% of Oxfordshire's land cover, just under the national average of 10%, and many of these woodlands are small and scattered across the landscape.

A recent assessment of the ecosystem services derived from Oxfordshire's landscape, has shown that at the county level, large areas of woodland, parkland and semi-natural grassland[1], as well as the river network and the string of associated flood plain meadows, deliver a range of cultural and regulating services (Smith, 2019). On the other hand high grade agricultural land scores highly for food provision. Regulating services include for example, flood protection, erosion protection and water quality regulation, carbon storage, and air quality regulation. Cultural services include for example, aesthetic value, education, interaction with nature and sense of place.

By mapping the areas in Oxfordshire that score low for ecosystem services delivery, Smith (2019) has suggested areas that could be suitable for habitat enhancement (Figure 11). By combining this map with the 'potential' zone (now renamed 'recovery' zone) of the Nature Recovery Network for Oxfordshire (Figure 12), it is clear that there are many landscapes across Oxfordshire where investment could support natural capital and biodiversity improvements

[1] e.g., Wychwood, Blenheim Park, Wytham Woods, Port Meadow, Otmoor, Buscot Park and the Chiltern Woodlands

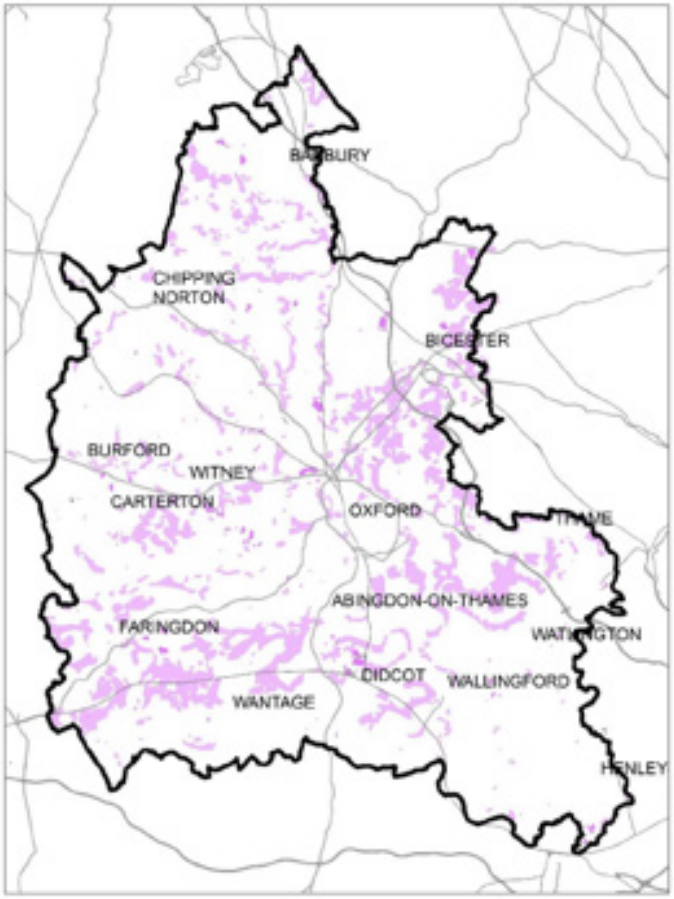

Figure 29: Low scoring areas, suitable for habitat enhancement

Figure 12 Areas in Oxfordshire that score low for ecosystem services delivery and could be suitable for habitat enhancement (source: Smith, 2019)

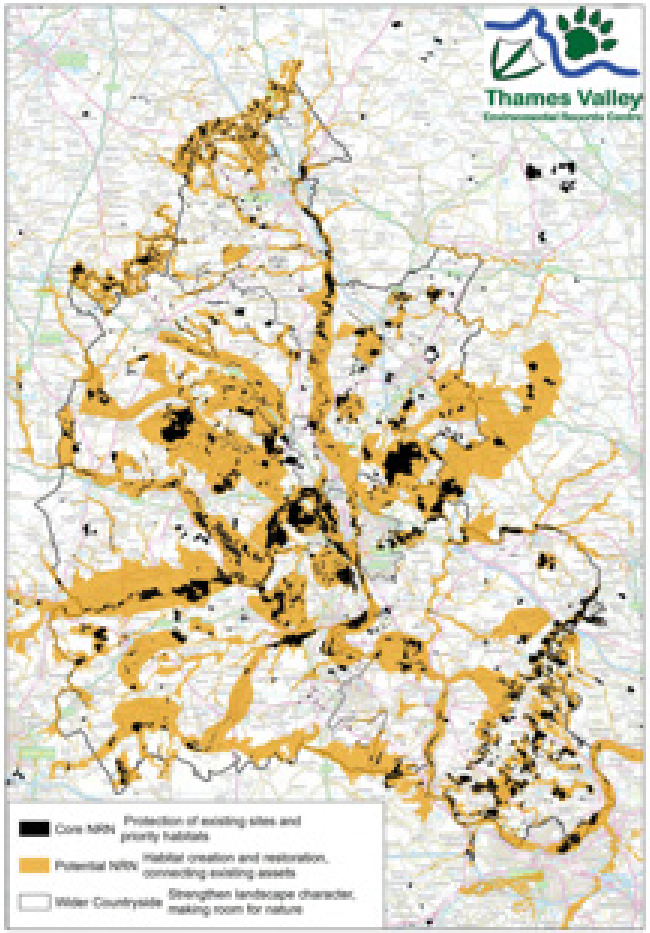

Figure 13 The draft Oxfordshire Nature Recovery Network (source: TVERC, 2019)

Natural capital demand opportunities

The network analysis of landscape demand identified some very strong overlap between the organisations, both in terms of functions and assets (see Figure 13). All of the organisations had an interest in biodiversity, and a majority of them also had interests in carbon sequestration and flood mitigation.

Underpinning that functional overlap are several key assets that address demand needs for all of the organisations: soils, trees and hedgerows, woodland, and grassland. This extensive overlap will make it easier for each organisation to be able to meet their needs in a trade, and means a wide range of interventions and habitats will be feasible for inclusion (which, in turn, makes finding supply easier).

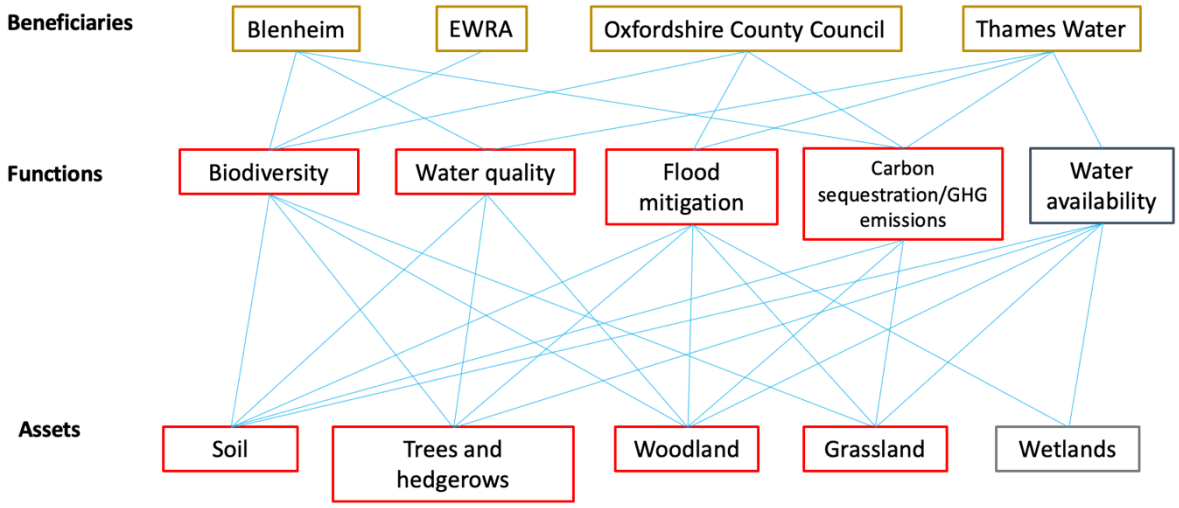

Figure 14 *Network diagram of overlapping demand*

Overlapping natural capital asset interests is only one piece of the puzzle; demand needs must overlap in terms of location, as well. Figure 14 demonstrates the geographical overlap of the key locations for each demand side player, as identified in the initial project analysis. Due to the timeline and scale of the initial analysis, while a decent overview it is not a comprehensive survey of all key locations.

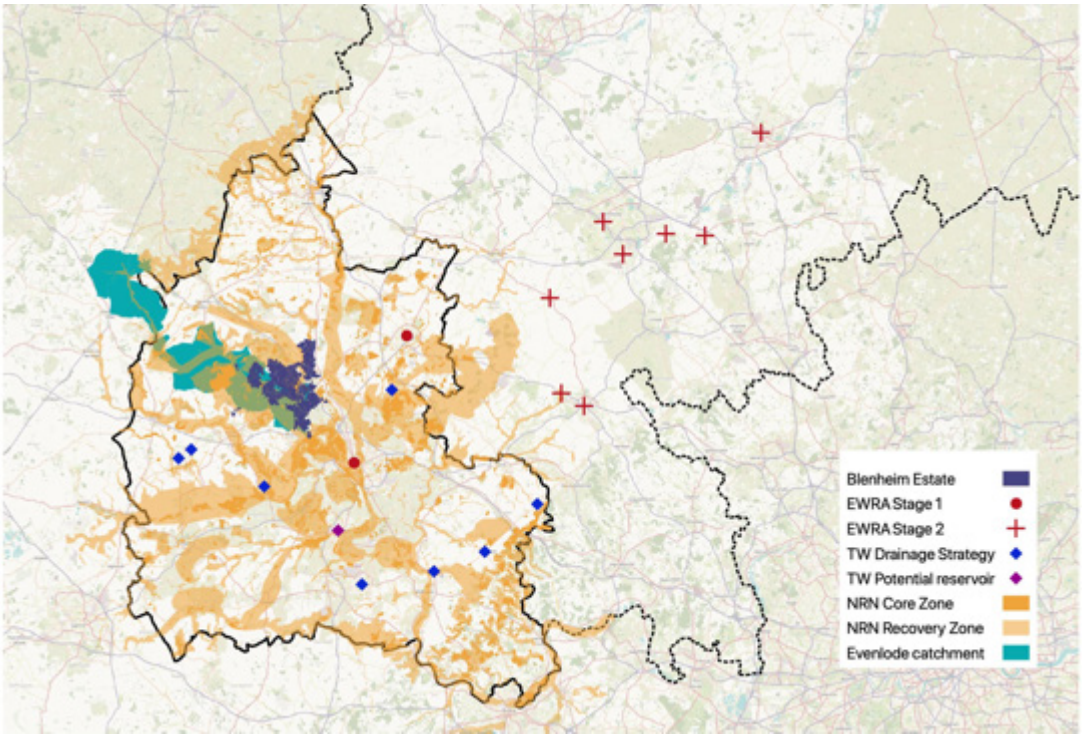

Figure 15 *Map demonstrating relationship between locational needs of different demand players*

The map demonstrates significant overlap in certain parts of Oxfordshire, between some of the demand side players. For example, Thames Water's priority Evenlode catchment and Blenheim's estate, including their flood interests at Cassington; and EWRA's rail line and the proposed Nature Recovery Network.

Potential for co-trade

There is clear potential for a co-trade between two or more of the demand organisations identified. Particularly, measures to improve soil health, increase and/or improve tree cover or grasslands, in the right locations (see **Figure 15** below) could work to increase biodiversity, mitigate flooding, sequester carbon, and improve water quality, hitting all of the biggest demands.

Key functions

- Biodiversity
- Water quality
- Carbon sequestration
- Flood mitigation

Key assets

- Soils
- Trees and hedgerows
- Woodlands
- Grasslands

Likely conditions

- Regulatory approval of measures
- Mix of short- and long- term measures, capital works
- "Right tree, right place"
- Alignment with accredited carbon measuring and biodiversity offsetting metrics

Location

In locations that meet at least two the of following criteria:

- Land is in a catchment draining into a TW sewage plant or in a priority subcatchment
- Land contributes to flood risk in Cassington, and/or sedimentation or phosphate risk to Blenheim's lake
- Land is within EWRA's offset zone
- Land is within the proposed Nature Recovery Network (recovery zone) and/or key to OCC's flood mitigation or development needs

Example interventions

- Woodland creation
- Cover cropping
- Sediment ponds and silt traps
- New cross-slope hedges
- In-field grass and wildflower strips
- Sub-soiling
- Arable reversion

Figure 16 *Key requirements and characteristics of a potential trade*

3.4 Potential supply side players

Oxfordshire has a great diversity of environmental stakeholders, including local authorities, government agencies with a local presence (e.g., Natural England), charities (e.g., the Wildlife Trust (BBOWT), RSPB, Freshwater Habitats Trust, and EarthWatch), local environment groups (see the Wild Oxfordshire Directory), local businesses, landowners and farmers. Thus we anticipate that there will be no shortage in interested supply side players in the county.

Beyond large estates, such as Blenheim Estate, who could act as a sole suppler in an Oxfordshire Landscape Enterprise Network, there are several groups that could act as potential supply aggregators, such as one of the many active Catchment Partnerships, or Countryside Stewardship (CS) facilitation fund farmer groups.

Oxfordshire's active Catchment Partnerships include the Evenlode, Ock, Windrush, Cherwell, and the Thame. These partnerships have dedicated hosts, with strong convening power who can help to bring together a range of sectoral interests and to address land and water management in a strategic manner, at the catchment scale. Oxfordshire's active farmer groups include: the Thames Farmers, a group of 15 farmers (which includes BBOWT's Chimney Reserve) which cover an area of 2,400 hectares in the Upper Thames; the Happy Valley, a group of 9 farmers which cover an area of 2,340 hectares; the Upper Thames Farmer Guardians which occur mainly in the Cotswolds, and include 92 farmers, covering an area of over 25,000 hectares; and the newly established Christmas Common farmer group in the Chilterns AONB which formed in 2020. These farmer groups have dedicated facilitators who help bring farmers, foresters, and other land managers together to improve the local natural environment at a landscape scale - to deliver shared environmental outcomes that go beyond what could be delivered by individual holdings acting in isolation.

Once the demand-side players for an initial Oxfordshire LENs are confirmed, the locations for a first trade will be confirmed. At this stage BBOWT, through their extensive local Oxfordshire network, will be able to help identify the most relevant supply aggregators to help deliver the natural capital outcomes needed from the first trade.

3.5 Other engagement

In addition to the key demand organisations listed above, the project team also spoke with a range of other interested parties within Oxfordshire, including the Local Enterprise Partnership (LEP), Erskine Murray (an insurance business), Trust for Oxfordshire's Environment (TOE), and Thames Valley Environmental Record Centre (TVERC).

All of the organisations were potentially interested in being involved in the longer-term development of a LENs network in Oxfordshire.

- Erskine Murray is an independent insurance broker with a presence in Oxfordshire. Their CEO, Tom Bartleet, has been exploring ways to facilitate natural capital finance and is keen to find real-world projects to get involved in. In a LENs network they would be very interested in exploring their ability to play a key enabling finance role by working with businesses to reduce their premiums where, for example, they've worked within a LENs network to minimise their risk to flood. This is an approach to enabling investment that the LENs programme is exploring more widely across the UK. As businesses do not have access to FloodRe, this method might be particularly valuable.
- The LEP was interested in principle in the approach. The make-up of the LEP membership skews heavily towards SMEs. As such they felt that, considering the difficulties most SMEs are facing in the current COVID-19 climate, it would be prudent to hold off on immediate engagement. They were keen as an organisation to be kept in the loop, with the idea that once the current uncertainties had begun to settle, and there were some more developed

case studies to demonstrate the approach and opportunities within Oxfordshire, it would be a good time to extend the information and opportunity to their membership.

- TOE is an independent environmental funder within Oxfordshire, responsible for both raising funds and allocating grants to support the environment. One of its roles includes receiving biodiversity offsetting money from developers and finding appropriate land managers to provide the offset. In this capacity, they would have the ability to act as an additional funder/demand side player in a LENs network.
- TVERC is a not-for-profit local environmental records centre. They hold over 3 million records of flora and fauna in Berkshire and Oxfordshire, plus information about Local Wildlife and Geological Sites, NERC Act S41 Habitats of Principal Importance (previously known as UK Biodiversity Action Plan (BAP) habitats) and Ecological Networks (Conservation Target Areas and Biodiversity Opportunity Areas). With this data, the have the ability to do calculations of net gain. They also have the internal capability to conduct ecological ground surveys to collect additional information on baseline condition and offset potential. Together, TOE and TVERC could provide the network with a biodiversity matchmaking and accreditation service.

4. Demand-side stakeholder workshop

4.1 Approach

The workshop was designed to bring all of the identified key businesses to review the findings from the initial demand analysis and explore potential trade opportunities arising from demand overlaps. Participants in the workshop included representatives from all of the key businesses identified.

The two-hour workshop began with introductions to all parties attending and a review of the project background and wider context and the objectives of the workshop. A brief refresher review of the LENs approach followed. The bulk of the workshop was then spent reviewing the findings from the analysis (detailed above in **Section 3**) and hosting a facilitated discussion between the businesses to get their feedback on the findings and thoughts on potential opportunities.

4.2 Workshop findings

The primary objectives of the workshop were to review and corroborate the findings, and to get a sense of the opportunities each demand side player saw in the approach.

In general, participants felt that the project findings broadly aligned with their understanding of demand needs and potential opportunities; none felt that any of the findings or conclusions were incorrect, though some organisations believed that there were actually more opportunities than initially identified – particularly Blenheim, with regards to their supply side offerings, and Thames Water, with regards to key locations and hotspots.

There was one key demand opportunity missing from the analysis that was identified in the workshop initially by the Oxfordshire Growth Board: the possibility of adding in social outcomes and benefits from environmental projects, such as increasing access to nature and green space. One implication of this identification of an additional suite of outcomes for these initial organisations is that it opens up the potential for overlap with other and new players in Oxfordshire, such as those interested in access to recreation or public health, or those located in urban and peri-urban areas. Strategic tree and shrub planting, pocket parks, and new or improved access to green infrastructure can provide key ecosystem service outcomes such as air quality and improved mental health which may be of particular interest to organisations in urban areas that may otherwise have fewer landscape interests.

Each organisation believed there was potential opportunity in a LENs network for them, though that opportunity took different forms:

- Blenheim is very enthusiastic about taking part in a LENs network in Oxfordshire, and currently sees itself firmly on the supply side of a trade. It might be more beneficial to the kick-starting of a trade to have them on the demand side, but their unequivocal enthusiasm and well-known name may be enough on its own to act as an 'anchor' player, giving the trade a credibility which can be helpful for bringing other organisations in. In future, the analysis did identify potential demand side needs; it may just be a matter of exploring these further with Blenheim (e.g. more concrete data on what they might gain if they did look outside their holdings to achieve water quality or flood risk management).
- Thames Water sees potential in the approach but would benefit from further investigation of their specific landscapes needs and respective locations. Given its desire to revisit their catchment engagement strategy, and the fact that Evenlode is a test catchment for their exploration of the potential benefits of holistic catchment partnerships, the LENs approach seems like a logical fit.
- While keen to be involved is not immediately clear the role that Oxfordshire Growth Board or the various councils could play in a LENs network – at this point it seems most likely that their ability to engage would take the form of facilitation, perhaps through policy. However it is possible that other avenues for engagement exist, including potentially acting as a funder, similar to the role that Northamptonshire County Council are playing in the Northamptonshire LENs (see Section 5).
- East West Rail Alliance feels the weight of their 10% BNG commitment and the fact that they are the first major development to go ahead (and to make this commitment) in the Arc. They have some clear concerns about how they will meet their commitment – primarily around delivering enough biodiversity units that meet the requirements of additionality and equivalence locally - which would likely be addressed through collaboration via a LENs network. Their need is clear-cut and dovetails nicely with a number of the other organisations.

5. Key initial trade opportunities and next steps

The project identified several potential initial trades within Oxfordshire. While these are opportunities address standalone functions, in reality these functions are underpinned by many common landscape assets, and there are a number of landscape interventions that would address multiple functions at one time. The combination of functions addressed would depend on the demand side players involved in the trade.

Biodiversity

All of the organisations that participated in the Oxfordshire LENs pilot had an interest in biodiversity, whether that be on the demand side, supply side, or in a facilitating role. The requirements for biodiversity net gain generally limit offsets to within the local authority boundary the development is taking place.

EWRA and Thames Water could both work with Blenheim and another supply aggregator (in order to ensure that EWRA's location requirements are met) to obtain the biodiversity units they require; for EWRA, this would be the units for the Oxfordshire piece of their development, from Bicester to the county line (within the bounds of Cherwell District Council). While the role of the councils and Growth Board is less clear, there is interest from them in participation and it's possible a facilitation role could be found for them.

This trade could involve habitat creation and/or restoration on Blenheim land; while the specific types of habitat would be determined by demand side needs (driven by habitats impacted), it could include new woodland, improved grassland, wildflower meadow restoration, or wetland creation. Where possible, the habitat creation/restoration could be aligned with the Nature Recovery Network plan; the plan could also guide identification of additional supply aggregators.

Flood management and water quality

Flood mitigation and water quality emerged as key interests for Thames Water, Blenheim, and Oxfordshire County Council; for these functions, the Evenlode catchment would be a priority area for a trade.

A further assessment of where exactly flood risk mitigation and water quality improvement might be able to take place for both Thames Water (in relation to their drainage strategies, and potentially other sites) and for Blenheim (with regards to their lake and Cassington village) might be effective would be required, but the results could potentially bring Blenheim over to the demand side rather than the supply for this particular trade. Because achieving these water related outcomes will likely require interventions in key flood and water quality hotspots, a trade in this area would be more locationally specific than one around biodiversity or carbon sequestration.

Potential interventions that could be enacted for this trade might include buffer strips and cover cropping, subsoiling in arable fields and grasslands, planting trees and hedgerows in strategic places, and building silt traps and small wetlands. Many of these will also provide stackable co-benefits for biodiversity and carbon.

Carbon sequestration

Carbon sequestration was another key interest for most of the organisations involved in the pilot, including Thames Water, Oxfordshire County Council, and Blenheim as a demand side interest rather that supply side. Carbon sequestration doesn't have locational requirements in the same way that biodiversity offsetting, flood management, or water quality do, so the demand could be met throughout the county or beyond, potentially in other areas of the Arc.

LENs networks are designed to facilitate a multi-functional landscape. Addressing carbon sequestration within a LENs network would help ensure that tree planting did not become a dominant force driving a landscape, and make it more natural to follow the principle of "right tree, right place," particularly as most trees planted within a LENs network would need to provide multiple benefits.

A trade around carbon would be likely to have the fewest locational requirements within Oxfordshire. The most likely interventions would be tree and woodland planting, which can be accredited through the Woodland Carbon Code. Depending on the requirements of the demand side, other possible interventions might be arable reversion, moving to no-till, grassland improvement, and planting hedgerows.

Key next steps

In order to proceed with one (or both) of the potential trades above, the following actions would need to be taken:

- **One-to-one engagement with the demand organisations**, to continue a deeper analysis on specific demand requirements (e.g. number of biodiversity units required, kilos of phosphate to be removed, tonnes of carbon to be sequestered) and locations, to begin to develop more detailed specification that would form the basis of the trade.

- **Potential supply side aggregators would need to be engaged.** This is almost certain to include Blenheim, but should include others as well, such as the farmer clusters identified in Section 3.4.
- **Explore the role of TOE and TVERC in the biodiversity trade.** TOE could provide welcome support in identifying locations for biodiversity offsets and managing the accreditation, or alternatively could end up being a demand player themselves. TVERC will play a critical role in supporting or undertaking a biodiversity baseline assessment of land and biodiversity unit calculation for proposed interventions (a role they already play with TOE and some Oxfordshire local authorities in biodiversity offset delivery).
- **Explore the role of Nature Bid to support the trade.** The Environment Agency's Nature Bid is a platform which could support trading between the demand and supply side, and are keen to trial some new developments with the platform in relation to accounting for a range of environmental benefits (such as carbon and biodiversity).
- **Potential for a wider OxCam Arc LENs strategy.** Several of the demand players in both the Oxfordshire and the Northamptonshire LENs projects have interests that span the Arc, or at least multiple counties within the Arc. This includes EWRA, Anglian Water, and Nestlé. The LNCP team could facilitate a space for existing LENs players in both counties (as well as other interested parties) to communicate, collaborate, and form trades across a larger geographic area within the OxCam Arc. The LNCP team could also help support evidence and information sharing of the LENs approach across the Arc through their new website and their Investment sub-group.
- **Identifying and engaging future players.** This project was intended as a pilot exploration of opportunities to begin to build an initial LENs network in Oxfordshire; as such, the businesses identified and engaged are those with more obviously dependencies on landscapes. While LENs is predicated on the idea that many businesses have land dependencies – e.g. not just agri-food industry and water companies - it is usually easiest to begin a network with the 'usual suspects' – those who understand their dependencies and are already interested in engaging with landscape to meet them - before bringing in businesses to whom this is a new concept and understanding. These businesses are what the project team has focused on in this project; having some work on the ground already underway makes it easier for more 'unusual' businesses to grasp the potential and what it might look like for them to be involved. Once an initial network takes off, it will be time to identify and engage more businesses, using the same LENs network analysis.

6. Comparison of Oxfordshire and Northamptonshire LENs projects

6.1 Northamptonshire LENs project

Background and approach

Nestlé and 3Keel introduced the idea of using LENs to co-procure sustainable landscape interventions to Anglian Water in late 2018. With Nestlé as project partner, Anglian Water and the Environment Agency commissioned 3Keel to explore where and how the Landscape Enterprise Network approach (LENs) could be applied to the organisations' mutual benefit, and specifically, to:

- To identify the specific collaborative value chain that Anglian Water and Nestle can create together for initial co-investment into landscape outcomes
- To scope out the wider opportunity to build on that network and bring in other co-investors.

The project approach was very similar to the current Oxfordshire pilot, involving:

- Analysis of business demand

- Geospatial analysis of business interests
- Scoping of and engagement with potential demand-side parties
- Scoping of potential supply side aggregators
- Demand-side workshop to ground-truth findings

This analysis of business demand identified a third key partner for an initial trade: Northamptonshire County Council. At the end of the demand side workshop, which included the three key partners (Nestlé, Anglian Water, and Northamptonshire County Council), all parties agreed to move forward with a trade.

Key demand interests

Nestlé, comprising Nestlé Cereal Partners UK, and Nestlé Purina – two separate businesses under the Nestlé umbrella. Both businesses have an interest in managing the cost and reliability of supply of suitable specifications of cereal crops into their cereals and Purina factories. A key factor is the ability of soils on producer farms to deal with fluctuations in water availability during the growing season. This is influenced by levels of soil compaction and soil organic matter among other things. Nestlé as a group also has wider landscape resilience interests, as well as an interest in supporting farming techniques that sequester carbon or reduce carbon emissions in order to reach Nestlé's net zero target.

Anglian Water, which has five interest areas: water quality (turbidity, nutrients, coliforms and persistent chemicals), water resources (given the prediction of a net supply and demand deficit in the region by 2025; wastewater permitting (high cost of nutrient removal at treatment plants to meet EA WFD permits); flood risk within wastewater networks; reduction of carbon inventory. Key factors here are soil condition and cultivation methods – affecting infiltration and run-off; crop cover, and the existence of strategically positioned 'interception features' in the landscape, such as woody or wet habitats. Anglian Water also has an interest in planting trees as a means of sequestering carbon.

Northamptonshire County Council, which has an interest in natural flood management, where it might improve the flood resilience of small, difficult-to-protect clusters of dwellings in rural locations (against which they may be able use any match funding to draw down funding for interventions from EA). Key factors here are location-specific soil condition (organic matter and compaction levels), crop cover, and the existence of interception features, such as trees and hedgerows.

Potential for co-trades

1. **Measures to improve soil health** in locations where two or more of the following are the case: (1) fields are in a catchment above an AW abstraction point, (2) fields are on Nestlé producer farms, (3) fields contribute to flooding risk to NCC target communities. Example interventions likely to be part of the trade include: cover cropping, subsoiling, adding buffer strips, and reducing tillage.
2. **Tree and hedgerow establishment** in the same three locations, but also in any location from the perspective of Anglian Water's and Nestlé's interest in carbon sequestration. Example interventions likely to be part of the trade include: planting new cross-slope hedges, planting new woodland, and Earth bank boundary creation for new hedgerows.

The supply-side

To date, two potential 'supply aggregator' organisations have been engaged and expressed an active interest in supplying services in partnership with the farmers from whom they already source arable crops. These are Camgrain and Charles Jackson Food Group, who supply Nestlé Cereal Partners UK. Another four tier 1 suppliers to Nestlé Purina have since been identified, with sourcing locations

currently being collated. Contact has also been made with stakeholders involved in the local Catchment Partnership and NIA, and with local EA teams.

Next steps

All three initial key demand players have decided to move forward and co-invest in a trade in Northamptonshire and surrounding areas. Currently, 3Keel is working with each organisation to develop detailed specifications of the outcomes required and develop the terms under which they will co-invest. Once this stage is complete, the remaining steps are:

1. Delivery of specification of services to supply aggregators, and support as is required to enable costed delivery proposals to be developed by supply aggregators.
2. Develop and agree a list of intervention measures and intervention locations for trade
3. Agree contracting and verification arrangements
4. Set up and run trade using NatureBid platform
5. Collate and share learnings, and build the network

6.2 County comparisons

Demographics and key industry sectors

Oxfordshire and Northamptonshire are both land-locked counties, relatively similar in terms of size with regards to both area and population. Oxfordshire's key economic sectors include high value science, technology, and motorsports businesses, as well as key tourism hotspots in the City of Oxford and the Cotswolds. Northamptonshire's key economic sectors include manufacturing (both food and non-food products), motorsports industry, and business services. Despite the fact that Northamptonshire does not have any tourism draws at the level of Oxford, the largest proportion of its GVA (24%) is accommodation and food services.

Public administration is a key sector in both counties: the largest for Oxfordshire, and second largest for Northamptonshire. The LENs approach can be particularly useful for public sector organisations, which can find it difficult to bring in private sector investment into natural capital. This is reflected in the fact that local authorities are involved in the LENs projects in both counties. Another potential player in this sector is the MoD, which has a presence across the UK and is already engaged in a LENs network in the Hampshire Avon.

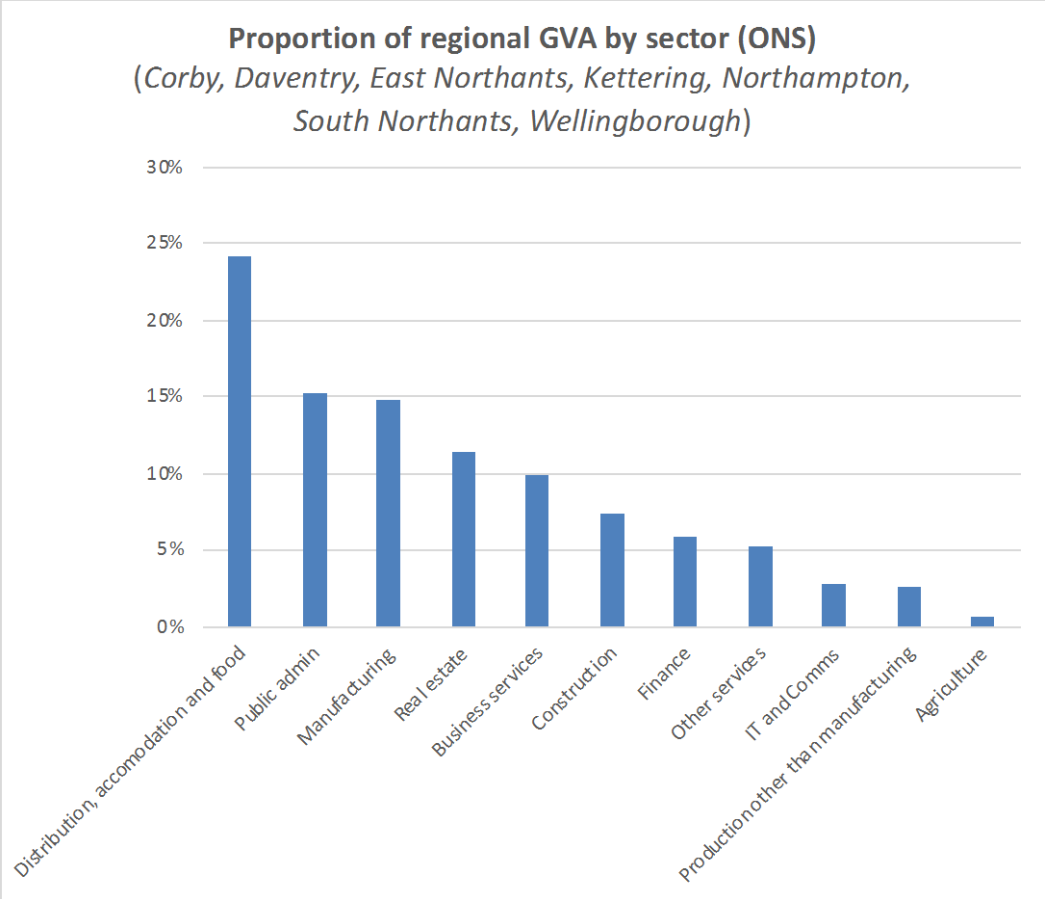

Figure 17 Regional GVA analysis of Northamptonshire

While both counties have a similar areas of land under agricultural cultivation, Northamptonshire has much higher levels of commodity production – such as wheat, oilseed rape, barley, potatoes – and the agricultural supply chain infrastructure reflects that, with many more grain merchants, mills, and food production sites located in the county (such as production factories for Nestlé, Mars, Weetabix, Carlsberg Brewery, and others).

Landscape character and natural capital assets

Oxfordshire and Northamptonshire have many similarities when it comes to landscape character, and natural capital assets. Agriculture dominates the land use of both counties (Table 1). In Oxfordshire, agriculture makes up 83.5% of the county, and farm types include: arable land in the Cotswolds; large fields of mixed arable and pasture typify the Midvale Ridge; and hedged livestock farms dominating the Upper Thames Clay Vales (Wild Oxfordshire 2017). In Northamptonshire, agriculture makes up 83% of the county, and farm types include: arable land, including both cereals and horticulture, with grassland and pasture land increasing in dominance towards the county's western boundary and along the Nene Valley (River Nene Regional Park 2006).

Both counties are defined by their river features - the Thames in Oxfordshire, and the Nene in Northamptonshire. These play a significant role in defining the landscape character and biodiversity of the counties. One of the significant differences from a biodiversity point of view between the two counties is that the south of Oxfordshire lies on the chalk, which provides some of the richest wildlife sites in Oxfordshire (e.g. Lowland Calcareous Grassland and associated species). There's no chalk in Northamptonshire, but the limestone comes to the surface in the northern end of the county, giving rise to similar, but not identical, calcareous grasslands. Priority habitats cover a relatively small fraction of both counties: 6.15% of Northamptonshire and 10.10% of Oxfordshire

(Table 2). Both counties have a similar make up of priority habitats, with the most frequent priority habitat being deciduous woodland, covering 10,457 hectares in Northamptonshire and 15,588 hectares in Oxfordshire. The wooded areas largely correspond with the old hunting forests in both counties, with Rockingham and the Yardley Whittlewood ridge in Northamptonshire, and Bernwood and Wychwood in Oxfordshire.

Natural asset quality is generally similar between both counties as well (Environment Agency, 2019), with the most notable differences being in: Floodplain: higher value of active floodplain in Oxfordshire; Reedbeds: higher value in Northamptonshire; Natural aquifer function: higher quality of asset in Northamptonshire; and, pollinator flood plants: a higher quality of nectar plant species for bees in Oxfordshire.

Key environmental threats in both counties are also similar – in both counties the intensification of agriculture has contributed to significant declines in biodiversity (Northamptonshire Local Nature Partnership, 2016; Wild Oxfordshire, 2017). Also, given their location in the OxCam Growth Arc the continued and increasing pressure from development presents a clear threat to current land use and the condition of natural capital and biodiversity (Northamptonshire Local Nature Partnership, 2016; Wild Oxfordshire, 2017). New development can be viewed as an opportunity, where biodiversity can be integrated and enhanced in planning decisions, through the need to achieve biodiversity net gain.

In both counties there are large areas which have been identified as 'opportunity' areas for investment by local environmental groups (see Figure 18 and Figure 19). Within Oxfordshire, Conservation Target Areas (CTAs), represent some of the most important areas for wildlife conservation, where targeted conservation action will have the greatest benefit. In Northamptonshire, there are range of different environmental opportunities, with two examples highlighted to the OxCam Local Natural Capital Plan as the Rockingham Forest for Life (a project covers more than 200 square miles of once ancient broad-leaved forest), and the Nene Valley Nature Improvement Area (Environment Agency, 2020).

Figure 18 Oxfordshire Opportunity Areas (Environment Agency, 2020)

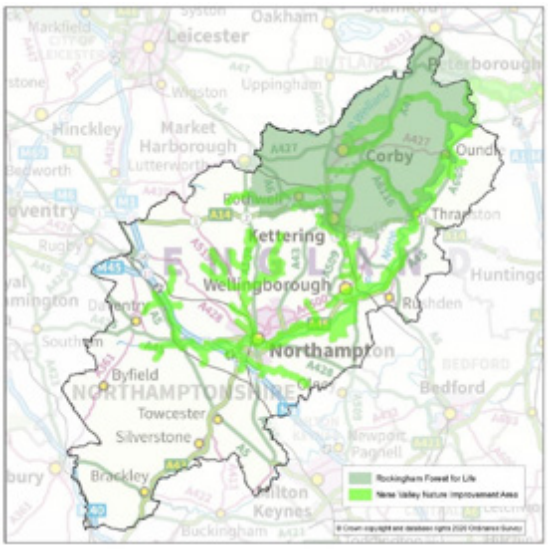

Figure 19 Northamptonshire Opportunity Areas (Environment Agency, 2020).

Table 1 Landcover comparison of Northamptonshire and Oxfordshire (source: Corine 2018 data)

	NORTHAMPTONSHIRE		OXFORDSHIRE	
	Area (ha)	**% of county**	**Area (ha)**	**% of county**
AGRICULTURAL AREAS	196451	83.0	217504	83.5
ARTIFICIAL SURFACES	29178	12.3	29314	11.2
FOREST AND SEMI NATURAL AREAS	9023	3.8	12150	4.7
WATER BODIES	1901	0.8	1435	0.6
WETLANDS	145	0.1	192	0.1
TOTAL	236,699		260,595	

Table 2 Priority habitat comparison of Northamptonshire and Oxfordshire (Natural England Priority Habitat Inventory)

NATURAL ENGLAND PRIORITY HABITAT	**NORTHAMPTONSHIRE**		**OXFORDSHIRE**	
	Area (ha)	**% of county**	**Area (ha)**	**% of county**
COASTAL AND FLOODPLAIN GRAZING MARSH	1084	0.46	4323	1.66
DECIDUOUS WOODLAND	10457	4.42	15588	5.98
LOWLAND CALCAREOUS GRASSLAND	219	0.09	1213	0.47
LOWLAND DRY ACID GRASSLAND	109	0.05	164	0.06
LOWLAND FENS	111	0.05	139	0.05
LOWLAND HEATHLAND	27	0.01	1	0.00
LOWLAND MEADOWS	264	0.11	1299	0.50
PURPLE MOOR GRASS AND RUSH PASTURES	14	0.01	10	0.00
REEDBEDS	10	0.00	4	0.00
TRADITIONAL ORCHARD	118	0.05	192	0.07
GOOD QUALITY SEMI-IMPROVED GRASSLAND	873	0.37	1734	0.67
NO MAIN HABITAT BUT ADDITIONAL HABITATS PRESENT	1265	0.53	1659	0.64
GRAND TOTAL	14550	6.15	26326	10.10

6.3 Key similarities and differences in networks

While the counties on the face of it have a number of similarities, including land use, size, and population, there are a number of key differences that affect the shape that a LENs network might take in each county. In some cases, these differences highlight some facilitators to the development of a LENs network.

How the project started

In Northamptonshire, the LENs project was initiated jointly by two demand side players, Nestlé and Anglian Water. In Oxfordshire, the project was initiated by the OxCam Arc Local Natural Capital Plan team, an organisation with an interest in Oxfordshire's natural capital but no role to play as an entity within a LENs network.

The fact that demand side players initiated the Northamptonshire network is helpful for a few reasons. It means that, even had other players not been identified initially, assuming overlap was found (as it was), those involved knew that a trade would be able to take place from the beginning. Having big demand side names involved and committed from the beginning also helps to bring in other demand side players more easily – they can see there's something likely to happen, and the larger names can help give the project credibility.

In Oxfordshire, the lack of an 'anchor' demand side player, committed from the beginning, has potentially made it more difficult to bring in other players; whilst not unmanageable, it is possible that having one key demand player already 'in' may have made some of the others more willing to commit at this earlier stage.

Types of demand interests

While both counties have similar levels of agricultural land use, the strong food and beverage manufacture interests in Northamptonshire provide a helpful route into demand side players with obvious links to the landscapes. While a key premise of LENs is that most businesses, even outside of the usual suspects, will have operational and/or strategic needs that are met through the landscape, some businesses have more obvious needs than others. This includes water companies, agri-food businesses, developers, and local authorities. For these organisations, the business case can be easier to make, because the causal pathway is clearer and often the data itself is already there.

While both Northamptonshire and Oxfordshire have water company and county council demand interests, Northamptonshire also benefits from a significant presence in the agri-food sector. Similar to the benefits of having a demand side player initiate the LENs project, having a greater population of demand side interests with clearer business cases for investment into the landscape can make the beginning of a LENs project easier.

Types of supply aggregators

The types of supply aggregators initially identified in both counties are somewhat different – in Northamptonshire, it is primarily grain merchants and cooperatives, and in Oxfordshire it looks to be large estates and farmer clusters – because LENs is driven by the demand side, this will be unlikely to affect the initial bringing together of a LENs network, especially as other LENs projects have similar supply aggregators (e.g. a farmer group in the Hampshire Avon LENs, and some large estates in Cumbria). It would be interesting to revisit this analysis after first trades have taken place in both counties, to see if the difference in supply aggregators had any tangible effect on the processes or outcomes of the trade.

Landscape

The landscapes of both Oxfordshire and Northamptonshire have many similarities, and thus have the potential to deliver a range of similar assets and functions that would form the basis of a LENs trade. Thus the landscape features themselves do not appear to be a major driver of difference between an Oxfordshire and Northamptonshire LENs. As explained in Section 2, the LENs approach focuses on the landscape from the perspective of business need, therefore the demand-side interests have a much stronger role in driving the resulting structure and outcomes of a LENs trade.

6.4 Conclusions

Of the similarities and differences identified between the two projects, the only one that appeared to be a real mediating factor in the success of a LENs network was the difference between the initial players involved – the type of organisation that initiated the project and the existing level of private sector interest in landscape intervention – rather than any inherent difference in the demographic characteristics or natural capital landscape of the two counties.

The other difference that likely played a facilitative role in the LENs network was the structure of the agri-food manufacturing sector in Northamptonshire, which yielded more possibilities for initial demand-side players with clear landscape dependencies.

While it is possible that there are some geographic regions where the type and distribution of habitats and natural capital assets might significantly affect the success of a LENs network, or where the type and ratio of economic sectors might become a barrier (such as extremely rural areas dominated by small agriculture producers), it seems more to be the case that key mediating factors will revolve around the type of organisation that instigates a LENs project and the level of existing interest and engagement in initial players.

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