

Evidence to inform selection of Oxfordshire's Biodiversity Net Gain target

Alison Smith, Environmental Change Institute, University of Oxford

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Summary

This document compiles evidence to inform selection of targets for the level of Biodiversity Net Gain (BNG) that should be delivered through new developments in Oxfordshire.

Analysis shows that Oxfordshire is very nature-deprived compared to the average for England as a whole. It contains:

- Only 62% of the area of priority habitats per hectare (ha) compared to England as a whole
- Only 21% of the area of SSSIs per ha compared to England
- Only 18% of the area of nationally protected areas per ha (SACs, SPAs, Ramsar sites, IBAs, LNRs, NNRs and SSSIs) compared to England.

This analysis is based on national datasets. Further analysis is recommended using higher quality local habitat and species data for Oxfordshire from TVERC.

In addition, Oxfordshire's remaining semi-natural habitats face intense pressure from housing and infrastructure development. Over 9,000 ha have been allocated for development in Local Plans, including over 1,200 ha of semi-natural habitats (grassland, woodland, scrub and parkland with scattered trees). This does not include the land lost to windfall developments. Analysis of Ordnance Survey Mastermap shows that over 2,700 ha of natural or agricultural land was converted to sealed surfaces and buildings in just the six years between 2014 and 2020.

Recent analysis has shown that most biodiversity units are delivered on site, with only around 7% currently being delivered off-site. While this conforms to the mitigation hierarchy, it is also very challenging to monitor and enforce delivery of many of these on-site units. It has been suggested that a target of 36% would be required to guarantee delivery of a net gain of 10%, given these enforcement problems.

Preliminary analysis indicates that a target of 10% BNG would only generate enough off-site biodiversity units to fund a maximum of 11% of the estimated costs of reaching the 30x30 nature recovery target (30% of land protected and managed for nature by 2030). This is an optimistic estimate because it includes only the costs of creating habitats and maintaining them for 30 years, not the additional costs of purchasing land or compensating landowners for opportunity costs. It also assumes that no semi-natural habitats that could contribute to the 30x30 target would be lost to development (otherwise the target would need to be even higher).

Therefore we conclude that the national minimum target of 10% BNG will not be sufficient to reverse the historic losses caused by development in Oxfordshire during the current local plan periods, and play a significant role in delivering the national and local biodiversity targets for 2030. Other councils in similar

positions have chosen higher targets (e.g. 20% in Surrey) in order to increase confidence that genuine gains for biodiversity can be delivered.

Introduction

This document compiles evidence to inform selection of targets for the level of Biodiversity Net Gain (BNG) that should be delivered through new developments in Oxfordshire. It is based partly on analysis of the Natural Capital map of Oxfordshire developed at the University of Oxford (Smith, 2019) together with other sources.

The aim is to inform deliberations on whether the national minimum target of 10% BNG will be sufficient to achieve the aim of halting and reversing biodiversity loss caused by past development, and playing a significant role in delivering Oxfordshire's contribution to the national commitment to protect and restore 30% of land for nature by 2030.

This document contains several strands of analysis.

1. A comparison of Oxfordshire to the national average proportions of land occupied by:
 - a. Priority Habitats
 - b. Sites of Special Scientific Interest (SSSIs)
 - c. Nationally listed areas protected for nature (National and Local Nature Reserves, Special Areas of Conservation, Special Protection Areas, Ramsar sites and SSSIs).
2. Pressure on habitats from development:
 - a. Analysis of the areas of different habitats within sites allocated for development in Local Plans.
 - b. Analysis of land use change between 2014 and 2020.
3. Effectiveness of BNG offsets.
 - a. How enforceable is BNG?
 - b. To what extent can BNG offsets fund nature recovery and the 30x30 target?

We also make recommendations for further analysis using more detailed local habitat and species datasets from the Thames Valley Environmental Records Centre (TVERC).

How does Oxfordshire compare to the rest of England?

Using nationally available datasets, we looked at the proportion of land occupied by priority habitats, SSSIs and other protected areas in Oxfordshire compared to the average for England (Table 1).

Table 1. Comparison of Oxfordshire's natural assets with the average for England

	hectares	Hectares of PH, SSSI or PA per hectare	Ratio of PH, SSSI or PA per ha in Oxfordshire compared to in England
Area of England	13,292,879		
Area of Oxfordshire	260,595		
Priority habitats in England	2,254,186	0.17	
Priority habitats in Oxfordshire	27,279	0.10	
Ratio of priority habitats per ha in Oxfordshire compared to in England			61.7%
SSSIs in England	1,100,057	0.08	
SSSIs in Oxfordshire	4,476	0.02	
Ratio of SSSIs per ha in Oxfordshire compared to in England			20.8%
Protected areas in England	1,329,089	0.10	

Protected areas in Oxfordshire	4,573	0.02	
Ratio of protected areas per ha in Oxfordshire compared to in England			17.6%

Data on Priority Habitats was taken from Natural England's Priority Habitat Inventory, downloaded on 31 March 2023. Protected areas include National Nature Reserves, Local Nature Reserves, Special Areas of Conservation, Special Protection Areas, Ramsar sites and SSSIs. These datasets were all downloaded from data.gov.uk in late 2022.

The analysis shows that Oxfordshire is very nature-deprived compared to the average for England as a whole.

- Only 10% of Oxfordshire is composed of Priority habitats, compared to an average of 17% for England. This means that the density of priority habitats is only 62% of the average for England.
- SSSIs cover only 2% of Oxfordshire, compared to 8% of England, meaning that Oxfordshire has just 21% of the average density of SSSIs per ha compared to England.
- For all nationally protected areas (SACs, SPAs, Ramsar sites, IBAs, LNRs, NNRs and SSSIs), Oxfordshire has only 18% of the average for England.

As Oxfordshire is starting from a more nature-deprived state, this implies that higher BNG targets are required to deliver nature recovery.

Pressure on habitats from development

Oxfordshire's remaining semi-natural habitats face intense pressure from housing and infrastructure development. This has been analysed using two methods:

1. Analysis of semi-natural habitats and priority habitats within sites allocated for development.
2. Analysis of changes over time according to OS Mastermap.

Habitats within sites allocated for development

Over 9,000 ha of land has been allocated for housing and employment development in Local Plans. This includes all sites allocated over the current local plan periods of the five local planning authority councils, which cover slightly different periods: 2011-2031 (Cherwell, Vale of White Horse, West Oxfordshire), 2011-2035 (South Oxfordshire) and 2016-2036 (Oxford City). It does not include further land that will be lost for infrastructure developments (roads, energy infrastructure, reservoirs,) minerals extraction, and for major and minor windfall housing developments.

Sites allocated for housing and employment development in Local Plans include over 1,200 ha of semi-natural habitats (Table 2). These sites include a mix of completed sites, sites where development is in progress, and sites for future development. It is possible that some of these habitats could be safeguarded within development site boundaries. However, many are likely to be destroyed or degraded during development, or damaged after development (e.g. by air, water, noise and light pollution, human activity, or inappropriate management).

Table 2. Semi-natural habitats within allocated development sites

Semi-natural habitat	ha
Acid grassland: unimproved	1
Calcareous grassland	41
Neutral grassland	538
Semi-natural grassland	167
Scrub	110
Parkland and scattered trees	49
Woodland (broadleaved or mixed)	291
Traditional orchards	10

Open mosaic habitats	3
Total semi-natural habitats in development sites	1,211

There are also 194 ha of Priority habitats within allocated sites, according to Natural England's most recent Priority Habitat Inventory (March 2023) (Table 3). This includes some areas of Priority Habitat that we assume will be safeguarded, e.g. Graven Hill woods in Bicester, but also some areas scheduled for development, e.g. large areas of lowland calcareous grassland on old airfield sites.

Note that the majority of data in the Priority Habitat Inventory dates from around 2011. Therefore this is a fairly good source for understanding the state of habitats prior to the start of development under the current round of Local Plans. However, it is considerably less accurate than the local Habitat and Land Use (HLU) map held by TVERC, especially for grasslands. It would therefore be valuable to commission TVERC to provide estimates of changes over time drawn from the HLU data.

Table 3. Area of priority habitats (from Natural England's March 2023 dataset) within sites allocated for development in Local Plans and Neighbourhood Plans up to February 2021

Priority habitat (Natural England, March 2023)	ha
Deciduous woodland	144.3
Good quality semi improved grassland	6.5
Lowland calcareous grassland	33.1
No main habitat but additional habitats present	4.4
Traditional orchard	5.3
Total priority habitats in development zones	193.5
	5

Land use change over time from OS Mastermap

A rudimentary assessment of land use change has also been carried out using two versions of Ordnance Survey Mastermap (OSMM), for 2014 and 2020. This is a very detailed map of the whole of the UK that also holds considerable detail on natural habitats (e.g. mapping coniferous and broadleaved trees, scrub, rough grassland, heath and marsh). Analysis of changes over time is complex, because of changes in the OSMM categories and accuracy during the period analysed. However, it is possible to conclude that over 2,700 ha of natural or agricultural land was converted to sealed surfaces and buildings in just the six years between 2014 and 2020. Further natural land would have been lost to other urban habitats such as gardens and amenity grassland.

As well as biodiversity loss, this habitat loss causes release of carbon stored in soils and vegetation. Even if all the land converted to sealed surfaces was arable, with a relatively low carbon content of 66 t C/ha, this would equate to a loss of 178,880 tonnes of carbon, equivalent to 29,813 tonnes per year, which reduces the net annual sequestration by Oxfordshire's ecosystems from 115,000 to 85,000 tC/y (Hampton et al., 2021).

How effective is BNG?

Detailed analysis of previous BNG projects by six early adopter councils (including three in Oxfordshire) has concluded that 95% of BNG units are currently delivered on-site (zu Ermgassen et al., 2021). This is in line with the mitigation hierarchy, which encourages retention of existing features in-situ and, failing that, creation of new habitats nearby in order to maintain their value for local people and local species. However, BNG delivered on-site may be at a higher risk of not being correctly delivered or maintained (zu Ermgassen et al., 2021). This is for a number of reasons.

1. Under current plans, the Government register of BNG units will not include on-site units, only off-site units, making it harder to monitor and enforce delivery of onsite units.
2. Local councils currently lack the resources (especially trained ecologist time) to monitor and enforce delivery and maintenance of BNG.
3. Enforcement of onsite gains is intended to be carried out through the planning process, but councils are encouraged take enforcement action only if there is "serious harm to a local public amenity", which may exclude failure of habitats to reach the planned condition under BNG. Onsite gains may therefore be legally unenforceable.
4. Contractors may fail to maintain on-site habitats correctly (e.g. incorrect mowing, trimming or pruning).
5. Urban habitats and the species that depend on them may be damaged by air and water pollution, compaction, noise, light pollution, traffic collisions, litter, and disturbance by people and their pets.

Delivering units off-site could be more effective than delivering on-site units if:

1. This is done as part of strategic habitat creation, e.g. to create sites within the Nature Recovery Network.
2. Offsets are delivered in areas that can be protected and managed by a trusted organisation, e.g. the local wildlife trust.

However, delivering compensation some distance away from the original habitats carries a risk that species with low dispersal distances may not be able to translocate to the new habitats. This is especially true if there is a time lag between habitat loss and habitat compensation.

For all these reasons, a nominal biodiversity net gain of the minimum 10% may not actually deliver 10% in practice. According to Rampling et al. (2023), 26% of biodiversity units delivered on site are 'risky', in that they risk not meeting the desired condition and are also legally unenforceable. Therefore to be confident in delivering a 10% net gain, a target of 36% BNG would be needed.

New preliminary analysis has estimated the biodiversity units that could be delivered through a 10% BNG target and compared this to the estimated costs of delivering the 30x30 nature recovery target for Oxfordshire (Hawkins et al., 2023). This indicates that even with an optimistic analysis, the BNG units generated through a 10% target could only fund between 1% and 11% of the estimated costs of creating enough new habitats to reach the 30x30 nature recovery target (30% of land protected and managed for nature by 2030). This range depends on the percentage of units delivered off-site: the low estimate of 1% is if the current level (7%) of biodiversity offset units were generated off-site, and the high end is if 50% of units were delivered off-site. This is an optimistic estimate because it includes only the costs of creating habitats and maintaining them for 30 years, not the additional costs of purchasing land or compensating landowners for opportunity costs. It also assumes that no habitats that could contribute to the 30x30 target would be lost to development (otherwise the target would need to be even higher). [Please note: this is a preliminary estimate only and these figures could be revised as the methodology is refined].

Therefore this calls for a BNG target considerably greater than 10%. This does not imply that BNG should fund the entire cost of nature recovery, however, because BNG cannot occur without loss of existing habitats. It is far preferable to avoid loss of existing habitats as far as possible, but where this does occur, BNG of greater than 10% will be required to fully offset the damage caused.

Conclusions

This analysis has shown that Oxfordshire is highly nature-depleted, with far lower proportions of priority habitats and protected areas than the average for England as a whole. Also, the remaining semi-natural habitats in the county are at risk of further loss and fragmentation due to development. Therefore we conclude that the national minimum target of 10% BNG will not be sufficient to reverse the historic losses caused by development during the current local plan periods, and make a meaningful contribution to delivering the national and local biodiversity targets for 2030. Other councils in a similar position have also selected higher targets, e.g. 20% in Surrey. Even higher targets could be needed to be confident that

genuine gains will be delivered, when the governance issues associated with delivering on-site habitats are taken into account.

References

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