

Biodiversity Net Gain Assessment

Project: Land West of Yarnton

Technical Note TN03: Biodiversity Net Gain Assessment Using Defra Biodiversity Metric 3.1 Calculation Tool

Date: 31st May 2022

1. Introduction

- 1.1. Aspect Ecology was commissioned by Merton College Oxford in February 2022 to undertake a Biodiversity Net Gain Assessment (BNGA) for the proposed development of land at Yarnton, Oxfordshire. The proposals are for the construction of up to 540 dwellings with associated access, landscaping and green open space.
- 1.2. The proposals has previously been assessed against the DEFRA 2.0 Biodiversity Impact Calculation Tool, the results of which demonstrated the scheme would achieve a 16.84% net gain in habitat units and 9.42% net gain in hedgerow units: the assessment was set out within Technical Note TN01 titled 'Biodiversity Impact Assessment Using Defra Biodiversity Metric 2.0 Calculation Tool' dated October 2020, and was submitted alongside the outline planning application in April 2021. Consultation responses were received on the 23rd December 2021 and 3rd December 2021 from Natural England and the Wildlife Trust respectively advising the scheme be assessed against the DEFRA 3.0 metric which had been released for use in July 2021. Since these consultation responses have been received, further versions of the metric have been released with the latest being version 3.1 that was last updated on the 18th May 2022.
- 1.3. Accordingly, the latest version of the DEFRA 3.1 Biodiversity Impact Calculation Tool has been used to conduct the BNGA. It is understood that Cherwell District Council does not currently have its own calculator, and therefore use of the DEFRA calculation tool is appropriate and accords with the advice of consultees referenced above. This note accompanies the BNGA Calculator and provides a summary of the results and rationale for the choice of habitat types and conditions.

2. Approach and Methodology

- 2.1. To quantify the level of biodiversity net gain that can be delivered under the proposed development, the change in biodiversity value resulting from the scheme has been calculated using the Defra Biodiversity Metric 3.1 calculation tool and associated user guide¹. This takes account of the size, distinctiveness and ecological condition of existing and proposed habitat areas to provide a proxy measure of the present and forecast biodiversity value of a site, and therefore determine the overall change in biodiversity value. These calculations are provided at the end of this note.

¹ Natural England (April 2022) *Natural England Joint Publication JP039. Biodiversity Metric 3.1: Auditing and accounting for biodiversity – User Guide*

- 2.2. To establish the habitat baseline, broad habitat areas have been identified based on the survey work undertaken at the site, the results of which are set out with Aspect Ecology's Ecological Baseline, dated October 2020 (see Plan 5436/BNGA 1 'Pre-development Metric Habitat Plan'). Technical Briefing Note TN04 dated 31st May 2022, section 3.2, confirms the habitats and ecological features as described within the Ecological Baseline remain accurate and thus appropriate for reference within the DEFRA metric calculation tool. Habitat conditions have then been assigned based on the guidance set out in the Technical Supplement², other appropriate guidance, and professional judgement.
- 2.3. The post-development information has been taken from the Illustrative Master Plan (see Post-development Metric Habitat Plan at Appendix 5436/2). This enables the change in 'Biodiversity Units' for habitats both pre- and post-development to be measured and provides indicative values and percentage of loss/gain of 'Total Biodiversity Units' to quantify the ecological impact of the proposed development.

² Natural England (April 2022) *Natural England Joint Publication JP039. The Biodiversity Metric 3.1: auditing and accounting for biodiversity – Technical Supplement.*

3. Biodiversity Net Gain Assessment

- 3.1. The following section provides a systematic review of the input information, rationalising the habitat categories and their condition chosen from the drop-down menus of the BNGA calculator. Worksheets from the completed DEFRA 3.1 Biodiversity Impact Assessment Calculation Tool are provided at Appendix 5436/1 of this Technical Note.

A-1 Site Habitat Baseline (Pre-development)

Habitat	Rationale for Habitat Type	Condition	Condition Rationale
Cropland – Cereal Crops	Arable land that is intensively managed for crop production.	N/A	No assessment required.
Grassland – Modified Grassland	Improved grassland dominated by a low diversity of common and widespread species typically associated with improved grassland.	Moderate	The grassland passes five of the assessment criteria for this habitat type but fails two as it does not exhibit a varied sward and comprises >5% undesirable species. The grassland has therefore been allocated a condition of 'moderate'.
Grassland – Other Neutral Grassland	Semi-improved grassland dominated by coarse grass species. Whilst the grassland does contain a number of indicator species for good quality grassland, these are localised and not sufficiently abundant for the grassland to qualify as a Priority Habitat	Moderate	The grassland passes five of the assessment criteria for this habitat type but fails two as it does not closely match the characteristics of the specific habitat type and does not exhibit a varied sward. Based on the above, the Technical Supplement advises a condition of 'poor'. However, considering the presence of grassland species on some interest, e.g. Lady's Bed Straw, the grassland has been allocated a condition of 'moderate' as a precaution.
Heathland and Shrub – Mixed Scrub'	Dense and scattered scrub comprising a limited diversity of species that both common and widespread in the local and national context. This habitat within the site does not meet the 'high environmental value' categorisation defined within the Farm Environment Plan (FEP) Manual.	Poor	The scrub fails all assessment criteria for this habitat type. It is dominated by a single woody species, does not exhibit a good age range, comprises >5% non-desirable species, does not have a well-developed edge with scattered scrub tall grassland/herbs and there are no clearings, glades or rides present.

Woodland and Forest – Other Woodland; Broadleaved	Woodland comprising a mix of native, broadleaved woody species.	Good	The woodland is in relatively good condition with no invasive species or significant damage caused by browsing. The species within the woodland are native and there are a number of veteran age trees within the woodland. The woodland has therefore been allocated a condition of 'good'.
Lakes – Ponds (Non-Priority Habitat)	Ephemeral ponds which do not support aquatic vegetation.	Moderate	The standing water features pass eight of the nine assessment criteria. They fail one of the criteria for non-woodland ponds as emergent, submerged or floating plants do not cover at least 50% of the pond area that is less than 3m deep. The ponds have therefore been allocated a condition of 'moderate'.

A-2 Site Habitat Creation (Post-development)

Habitat	Target Condition	Condition Rationale
Woodland and Forest – Other Woodland; Mixed	Moderate	The scheme will include areas of new woodland planting comprising a diverse mix of native species. It is anticipated that the woodland will meet the majority of the assessment criteria, with the exception of those relating to veteran/ancient trees. As such, the woodland is considered likely to achieve a ‘moderate’ condition.
Grassland – Other Neutral Grassland	Good	Areas of wildflower grassland will be created within the site, including meadowland and at the edge of the development. The grassland will be managed based on ecological principles and, on this basis, it is anticipated that the grassland will pass all of the assessment criteria, such that a condition of ‘good’ is considered achievable.
Urban – Sustainable Urban Drainage	Moderate	Numerous sustainable urban drainage features are to be created as part of the proposed development and it is anticipated that they will meet two of the three core condition assessment criteria for this habitat type and will therefore achieve a score of ‘moderate’.
Urban – Developed Land; Sealed Surface	N/A – Other	No assessment required. <i>Note: Area coded accounts for 70% of the residential area, the remaining 30% of residential area is coded as ‘Urban – Vegetated Garden’.</i>
Urban – Vegetated Garden	N/A – Other	No assessment required. <i>Note: Area coded accounts for 30% of residential area, the remaining 70% is coded as ‘Urban – Developed Land’ Sealed Surface</i>

A-3 Site Habitat Enhancement (Post-development)

Existing Habitat	Proposed Habitat	Condition Change	Condition Rationale
Grassland – Modified Grassland	Grassland – Other Neutral Grassland	Moderate - Good	Areas of retained modified grassland will be brought under an appropriate management regime, based on ecological principles. This will aim to reduce the nutrient content of the soil over time by removing arisings following cutting at appropriate times of the year, such that a more diverse and varied sward can establish, whilst reducing the number of undesirable species. It is anticipated that the enhanced grassland will meet all condition assessment criteria for this habitat type and can therefore achieve a ‘good’ condition.
Grassland – Modified Grassland and Grassland – Other Neutral Grassland	Woodland and Forest – Lowland Mixed Deciduous Woodland	Moderate – Moderate	Areas of retained modified grassland and semi-improved grassland will be planted with a diverse range of native tree saplings and allowed to establish as woodland over time. The habitat will be subject to ongoing ecological management and it is anticipated to meet the majority of the condition assessment criteria for this habitat type, with the exception of those criteria relating to veteran/ancient trees. As such, the woodland is considered likely to achieve ‘moderate’ condition. <i>Note: This habitat has a time to target condition greater than 30years, although this woodland habitat will be under stewardship of the local community.</i>
Grassland – Other Neutral Grassland	Grassland – Other Neutral Grassland	Moderate – Good	Areas of retained neutral grassland will be brought under an appropriate management regime based on ecological principles. This will aim to create a varied sward height, with the grassland cut on a rotational basis such that areas of longer sward grassland are present. The introduction of an appropriate management regime will also allow the characteristics of the grassland to more closely match the specific habitat type. It is anticipated that the enhanced grassland will meet all condition assessment criteria for this habitat type and can therefore achieve a ‘good’ condition.
Lakes – Ponds (Non-Priority Habitat)	Lakes – Ponds (Non-Priority Habitat)	Moderate - Good	The retained standing water features will be enhanced through the introduction of an appropriate management regime to encourage a diverse and abundant aquatic flora to develop, including emergent, submerged and floating plants. This will involve management of bankside vegetation to reduce shading and may involve planting of new

			native species within the features. On this basis, it is considered that the features will meet all assessment criteria for this habitat type and achieve a 'good' condition.
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B-1 Site Hedgerow Baseline (Pre-development)

Habitat	Rationale for Habitat Type	Condition	Condition Rationale
Native Species-rich Hedgerow with Trees	The hedgerows within the site are relatively substantial in nature and contain a number of standard trees. The hedgerows comprise native woody species and are species-rich.	Good	The hedgerows within the site do not fail more than two of the condition assessment criteria, and no more than one in any functional group. The hedgerows are well-connected, substantial features, associated with a number of veteran-age standard trees. As such, the hedgerows have been allocated a condition of 'good'.

B-2 Site Hedgerow Creation (Post-development)

Habitat	Target Condition	Condition Rationale
Native Species-rich Hedgerow with Trees	Moderate	New native hedgerow planting will be undertaken at the site as part of the proposed development, connecting with existing hedgerows and other habitats to enhance connectivity within and around the site. The hedgerows will be managed based on ecological principles and it is considered that the hedgerows will meet the majority of the condition assessment criteria, with the exception of those relating to mature standard trees. As such, a condition of 'moderate' is considered achievable.

4. Strategic Significance

- 4.1. The document 'Biodiversity and Planning in Oxfordshire' (V2.0, March 2014) lists which UK Priority Habitats are found in Oxfordshire. Accordingly, where habitats on this list are present or proposed, such as woodland, hedgerows and ponds, '*Formally identified in local strategy*' has been coded under the category Strategic Significance, whilst habitats not listed (e.g. Urban – vegetated garden) have been coded '*Area/compensation not in local strategy/no local strategy*'.

5. Biodiversity Net Gain Assessment - Results

- 5.1. In summary, the DEFRA 3.1 Biodiversity Impact Assessment Calculator indicates that the development will result in a **net gain of 13.98% Habitat Units** and a **net gain of 14.56% Hedgerow Units**. There are no rivers within the site currently and no such features are proposed, such that there is no change in the river units for the site. In addition, the output from the metric concludes that the trading rules are satisfied.

	Change in Units	% Change
Habitats	+36.01	+13.98%
Hedgerows	+14.65	+14.56%
Rivers/Streams	No Change	No Change
Trading Rules Satisfied	Yes	

- 5.2. The Biodiversity Net Gain Assessment set out herein demonstrates that the residential development proposal at Land West of Yarnton could secure a net biodiversity gain for both habitats and hedgerows. It has been prepared on the basis of an initial concept plan and does not preclude alternative schemes coming forward that would result in an alternative score being achieved. In this context, the gains set out in this calculation should not be treated as targets against which a development proposal is considered against.
- 5.3. In addition to the measurable habitat benefits described above, it is anticipated that the development will deliver a number of qualitative benefits; however, it is not possible to quantify these benefits with the DEFRA 3.1 Biodiversity Impact Assessment Calculator. The qualitative biodiversity benefits of the proposed development include installation of faunal enhancements targeted to specific species such as bat boxes, which would provide new roosting opportunities for a number of both National and Local Priority Species such as Soprano Pipistrelle *Pipistrellus pygmaeus*, in addition to bird boxes, Hedgehog nest domes, invertebrate boxes and hibernacula/log piles for reptiles and amphibians.

6. Summary

- 6.1. The Biodiversity Net Gain Assessment finds that the development proposals themselves deliver a quantifiable net gain for biodiversity in relation to habitats and hedgerows. In addition to these quantifiable net gains, a range of faunal specific gains can be delivered on site such as the provision of faunal enhancements targeted to national and local Priority Species. Accordingly, it is considered the development proposals comply with existing local and national policies and legislation.

Plans and Appendices:

- Plan 5436/BNGA1: Pre-development Metric Habitat Plan
- Plan 5436/BNGA2: Post-development Metric Habitat Plan
- Appendix 5436/1 – Completed BNGA Calculator

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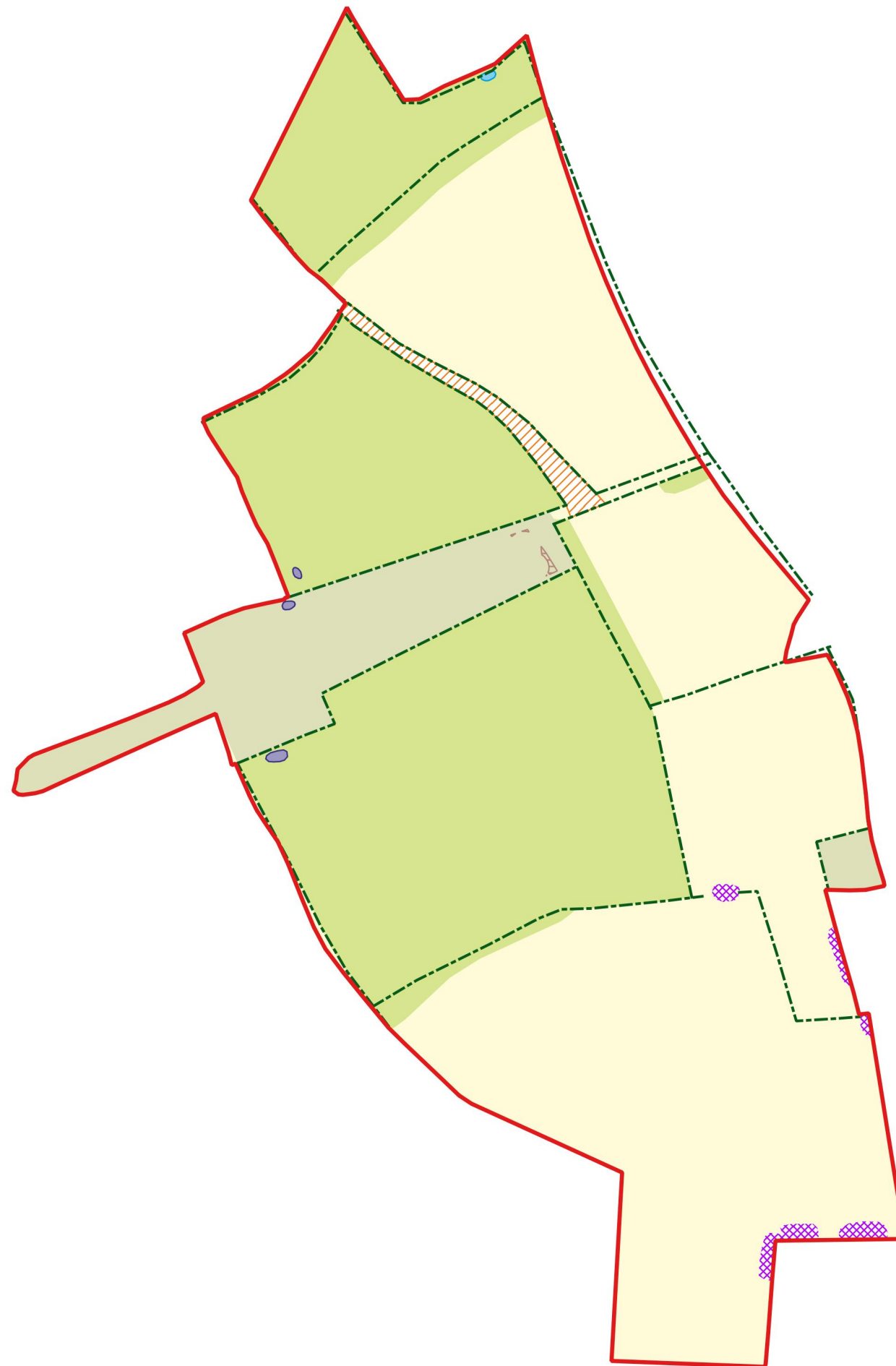
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Plan 5436/BNGA 1:

Pre-development Metric Habitat Plan



Key:

- Site Boundary
- Cropland - cereal crops
- Grassland - modified grassland
- Grassland - other neutral grassland
- Heathland & scrub - mixed scrub
- Woodland & forest - other woodland; broadleaved
- Lakes - ponds (non-priority habitat) (wet pond)
- Lakes - ponds (non-priority habitat) (dry pond)
- Hedgerow



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Land at Yarnton

Existing Measurements

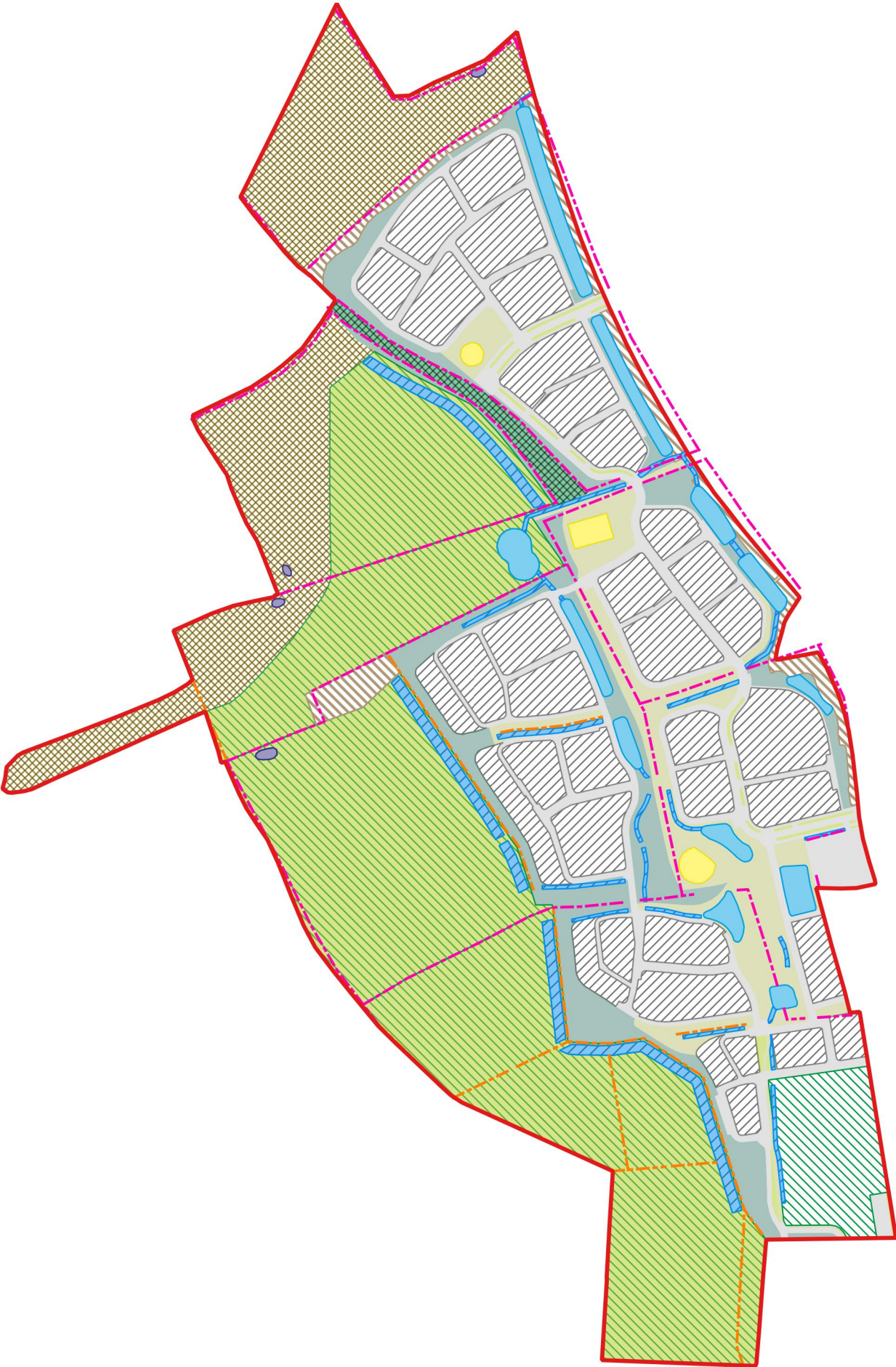
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September 2020

Plan 5436/BNGA 2:

Post-development Metric Habitat Plan



- Key:
- Site Boundary
 - Woodland & forest - other woodland; broadleaved (community woodland)
 - Woodland & forest - other woodland; mixed
 - Woodland & forest - other woodland; broadleaved (retained)
 - Grassland - other neutral (meadowland)
 - Grassland - other neutral
 - Urban - developed land - sealed surface
 - Urban - developed land - sustainable urban drainage feature (attenuation basin)
 - Urban - developed land - sustainable urban drainage feature (swale)
 - Lakes - ponds (non-priority habitat) (retained)
 - Urban - suburban mosaic of developed natural surface, comprising
 - Amenity Grass
 - Open Space
 - LEAP
 - Roads
 - Houses & Gardens
 - Retained Hedgerow
 - New Hedgerow



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Land at Yarnton	PROJECT
Post-development Habitat Measurements	TITLE
5436/BIA2	DRAWING NO.
F/JP	REV
May 2022	DATE



Appendix 5436/1:

Completed BNGA Calculator

Land West of Yarnton

Headline Results

Return to results menu

On-site baseline	Habitat units	257.52
	Hedgerow units	100.64
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	293.53
	Hedgerow units	115.30
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	Habitat units	13.98%
	Hedgerow units	14.56%
	River units	0.00%
Off-site baseline	Habitat units	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	36.01
	Hedgerow units	14.65
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	13.98%
	Hedgerow units	14.56%
	River units	0.00%
Trading rules Satisfied?	Yes ✓	

Land West of Yarnton

Detailed Results

[Return to results menu](#)

Summary Figures

Net project biodiversity units
(including all on-site & off-site habitat retention/creation)

<i>Habitat units</i>	36.01
<i>Hedgerow units</i>	14.65
<i>River units</i>	0.00

Total project biodiversity % change
(including all On-site & Off-site Habitat Creation + Retained Habitats)

<i>Habitat units</i>	13.98%
<i>Hedgerow units</i>	14.56%
<i>River units</i>	0.00%

Combined habitat retention and enhancement

	Habitats	Hedgerows	Rivers
Total on-site and off-site baseline area / length	55.04	4.86	0.00
Total on-site and off-site baseline units	257.52	100.64	0.00
Total on-site and off-site baseline area / length retained	0.59	4.60	0.00
Total on-site and off-site baseline units retained	8.13	95.14	0.00
Area / length proposed for enhancement	18.09	0.00	0.00
Baseline units proposed for enhancement	126.44	0.00	0.00
Total on-site and off-site baseline area / length lost	36.36	0.27	0.00
Total on-site and off-site baseline units lost	122.95	5.51	0.00

Total area lost (excluding area of Urban trees and Green walls)	36.36
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Land at Yarnton

A-2 Site Habitat Creation

Condense / Show Columns

Condense / Show Rows

Main Menu

Instructions

Post development/ post intervention habitats									
Broad Habitat	Proposed habitat	Area (hectares)	Distinctiveness	Condition	Strategic significance	Temporal multiplier	Difficulty		Habitat units delivered
			Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of creation	
Woodland and forest	Other woodland; mixed	1.2653	Medium	Moderate	Within area formally identified in local strategy	Standard time to target condition applied	30	Low	4.00
Grassland	Other neutral grassland	3.886	Medium	Good	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	10	Low	32.66
Grassland	Other neutral grassland	7.043	Medium	Good	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	10	Low	59.19
Urban	Sustainable urban drainage feature	3.0378	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	3	Medium	7.32
Urban	Developed land; sealed surface	5.3028	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	0	Medium	0.00
Urban	Developed land; sealed surface	1.511	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	0	Medium	0.00
Urban	Developed land; sealed surface	9.93132	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	0	Medium	0.00
Urban	Vegetated garden	4.25628	Low	Poor	Area/compensation not in local strategy/ no local strategy	Standard time to target condition applied	1	Low	8.21
	Total area	36.23							111.37

Strategic significance				Habitat units delivered	
Strategic significance	Temporal risk multiplier		Difficulty risk multipliers		Habitat units delivered
	Standard or adjusted time to target condition	Final time to target condition/year	Final difficulty of enhancement		
Areal/compensation not in local strategy/ no local strategy	Standard time to target condition applied	15	Low		23.82
Formally identified in local strategy	Standard time to target condition applied	30+	High		10.31
Areal/compensation not in local strategy/ no local strategy	Standard time to target condition applied	10	Low		89.23
Formally identified in local strategy	Standard time to target condition applied	30+	High		50.32
Formally identified in local strategy	Standard time to target condition applied	4	Medium		0.54
					174.22

B-1 Site Hedge Baseline

Condense / Show Columns

Condense / Show Rows

Main Menu

Instructions

UK Habitats - existing habitats				Habitat distinctiveness	Habitat condition	Strategic significance	Suggested action to address habitat losses	Ecological baseline Total hedgerow units	Retention category biodiversity value					
Baseline ref	Hedge number	Hedgerow type	Length (km)	Distinctiveness	Condition	Strategic significance			Length retained	Length enhanced	Units retained	Units enhanced	Length lost	Units lost
1		Native Species Rich Hedgerow with trees	4.862	High	Good	Formally identified in local strategy	Like for like or better	100.64	4.596		95.14	0.00	0.27	5.51
2														
3														
4														
5														
6														
			4.86					100.64	4.60	0.00	95.14	0.00	0.27	5.51

B-2 Site Hedge Creation

Condense / Show Columns

Condense / Show Rows

Main Menu

Instructions

		Proposed habitats		Habitat distinctiveness	Habitat condition	Strategic significance	Temporal multiplier		Difficulty risk multipliers	Hedge units delivered	
Baseline ref	New hedge number	Habitat type	Length (km)	Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of creation		
1		Native Species Rich Hedgerow with trees	2.086	High	Moderate	Formally identified in local strategy	Standard time to target condition applied	10	Low	20.16	
2											
3											
4											
5											
6											
			2.09								20.16