Norwich Western Link

Environmental Statement

Chapter 10: Biodiversity

Appendix 10.33: Biodiversity Net Gain Technical Report

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Foreword

The following appendix details the results of the Biodiversity Net Gain assessment for the Proposed Scheme, which:

- Quantifies and compares the baseline biodiversity value and the proposed post-development biodiversity value to provide a prediction of quantitative net loss, no net loss, or a net gain for biodiversity on the Proposed Scheme; and
- Determines whether the Proposed Scheme is predicted to achieve a qualitative net gain by evidencing compliance with the Principles.

A biodiversity net gain assessment for watercourses has been completed and the results of this are included within this report. Compensation for River Biodiversity Units, contribution to Water Framework Directive (WFD) objectives and bespoke compensation for statutory sites are all considered.

The outcomes of the quantitative BNG assessment are:

- 10.97% net gain in Area Habitat Biodiversity Units (AHBUs);
- 39.90% net gain for lines of trees and Hedgerow Biodiversity Units (HBU);
- 12.99% net gain for River Biodiversity Units (RBU); and
- Overall, the Proposed Scheme is categorised as achieving a 10.97% net gain for non-irreplaceable habitats.

The Proposed Scheme has been assessed against the BNG good practice principles. Compliance has been shown for nine of the ten principles with one not able to be achieved. Due to impacts on irreplaceable habitats (veteran trees), it is therefore not possible for the Proposed Scheme to achieve a Scheme-wide BNG outcome, in accordance with industry good practice guidance.

Glossary of Abbreviations and Defined Terms

Term	Definition
Temporary construction areas	These are areas within the Redline Boundary that are intended for use during the construction period but reinstated on completion of the construction phase. These include construction compounds.
Red Line Boundary	All areas of land required temporarily or permanently for the construction and operational activities of the Proposed Scheme would be contained within the Red Line Boundary. This includes the main works in the Site Boundary, areas for temporary use during construction and additional areas of environmental mitigation and enhancement.
River Wensum Viaduct	(BR1). Viaduct crossing the River Wensum Special Area of Conservation and floodplain (approximately 490m long). The ten-span bridge design includes piled piers within the floodplain.
NCC	Norfolk County Council
'The Proposed Scheme'	The proposed Norwich Western Link scheme.
SAC	Special Area of Conservation; protected areas in the UK designated under the Conservation of Habitats and Species Regulations 2017 (as amended).
BNG	Biodiversity Net Gain
NVC	National Vegetation Classification

Term	Definition
BU	Biodiversity Units
BM	Biodiversity Metric 3.1
ES	Environmental Statement
UKHab	UK Habitat Classification
Irreplaceable habitat	Habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity.
Net Gain	Net gain is an approach to development, and / or land management, which aims to leave the natural environment in a measurably better state than beforehand.
WFD	Water Framework Directive
AHBU	Area habitat biodiversity unit. The unit of measurement used for 'Area habitats' in biodiversity metric 3.1.
HBU	Hedgerow biodiversity unit. The unit of measurement used for hedgerows and lines of trees in biodiversity metric 3.1.
RBU	River biodiversity unit
RCA	River condition assessment

1 Executive Summary

1.1.1 Biodiversity Net Gain (BNG) is the desired result of a process applied to a development so that overall, there is a positive outcome for biodiversity. This report sets out the BNG assessment, providing both a quantitative and qualitative assessment, using the Biodiversity Metric and assessing the Proposed Scheme against the Biodiversity Net Gain Good Practice Principles (CIEEM, 2019) ("the Principles").

1.1.2 Norfolk County Council (NCC) are proposing the Norwich Western Link Road (herein referred to as the "Proposed Scheme"), which is a highway linking the A1270 Broadland Northway from its junction with the A1067 Fakenham Road to the A47 trunk road near Honingham.

1.1.3 WSP was commissioned by NCC to carry out a BNG assessment of the Proposed Scheme and produce a report which:

1. Quantifies and compares the baseline biodiversity value and the proposed post-development biodiversity value to provide a prediction of quantitative net loss, no net loss, or a net gain for biodiversity on the Proposed Scheme; and
2. Determines whether the Proposed Scheme is predicted to achieve a qualitative net gain by evidencing compliance with the Principles.

1.1.4 Due to the timing of the evolution of mandatory BNG in relation to the project development, the Proposed Scheme was developed using Natural England's Biodiversity Metric 3.1 Calculation Tool (Natural England, 2021) (herein referred to as "the Metric"), and the results from this calculation are presented in the main body of the report. The data from Metric 3.1 were copied into the Statutory Metric (published 30.11.2023) following guidance available at the time (December 2023), and the results are set out in Appendix J.

1.1.5 The Metric has been used to quantify the biodiversity value of existing habitats present on site and those proposed under the post-development

landscape designs (Appendix G, and Appendix A, Figures 1-2) and which are secured pursuant to the Landscaping Design Plans (Planning reference 2.07.00).

1.1.6 The Proposed Scheme has been assessed against the BNG good practice principles. Compliance has been shown for nine of the ten principles with one not able to be achieved on account of the impact on veteran trees.

1.1.7 Extensive ecological assessment work has been carried out including Phase 1, UKHab and National Vegetation Classification (NVC) habitat surveys, with condition assessment and River Condition Assessment (RCA) surveys. Alongside this, detailed protected species work such as reptile, Great Crested Newt *Triturus cristatus*, Badger *Meles meles* bait marking, Desmoulin's Whorl Snail *Vertigo moulinsiana*, breeding and wintering bird, invertebrate, lichen, fungi, Otter *Lutra lutra*, Water Vole *Arvicola amphibius*, and bat surveys amongst others has been undertaken.

1.1.8 A biodiversity net gain assessment for watercourses has been completed and the results of this are included within this report. Compensation for River Biodiversity Units, contribution to Water Framework Directive (WFD) objectives and statutory sites are all considered.

1.1.9 The outcomes of the quantitative BNG assessment, as summarised in **Table 1-1** are:

- 10.97% net gain in Area Habitat Biodiversity Units (AHBUs);
- 39.90% net gain for lines of trees and Hedgerow Biodiversity Units (HBU);
- 12.99% net gain for River Biodiversity Units (RBU); and
- Overall, the Proposed Scheme is categorised as achieving a 10.97% net gain for non-irreplaceable habitats.

Table 1-1 Overall Proposed Scheme biodiversity unit change summary

Biodiversity unit type	Baseline units	Post development units	Percentage gains
Area habitat	1332.32	1478.50	10.97%
Linear habitat – hedgerows or lines of trees	83.58	116.92	39.90%
Linear habitat - Rivers	34.58	39.07	12.99%

1.1.10 Copying the data into the Statutory Biodiversity Metric Tool (Defra, 2023a) has shown a slightly greater net gain in watercourses (12.99% to 17.04%) and area habitats (10.97% to 11.58%) compared to the results in **Table 1-1** Details of the Statutory Biodiversity Metric Tool calculation are included in Appendix J.

1.1.11 Anticipated impacts on purple moor grass and rush pasture habitats, which is assigned as a very high distinctiveness habitat, have been excluded from the Metric in line with the Metric User Guide. Bespoke mitigation measures have been developed to address impacts on these habitats as described in the Environmental Statement biodiversity chapter (Environmental Statement **Chapter 10: Biodiversity - Appendix 32: Ecological Mitigation Strategy**, Appendix 10.32, and NCC Essential Environmental Mitigation plan PK1002-NCC-GEN-FSC-DR-CH-0050). The excluded areas are shown on the habitat maps (Appendix A).

1.1.12 The Proposed Scheme is expected to impact veteran trees. Veteran and ancient trees are considered to be an irreplaceable habitat and the BNG calculations do not assess impacts on these highly valuable habitats. An outline bespoke compensation strategy for veteran trees has been prepared.

1.1.13 The River Wensum Special Area of Conservation (SAC) is also within the Red Line Boundary but is excluded from the BNG calculation as it is a statutory

designated site. The SAC is subject to a Habitat Regulations Assessment (HRA) Report for the Proposed Scheme (document reference 4.03.00). Additionally, the River Wensum is assessed in relation to the Proposed Scheme in detail within the Water Framework Directive (WFD) assessment (document reference 3.12.03). The proposed enhancements on the River Wensum would contribute to WFD water body objectives and the River Wensum Restoration Strategy.

1.1.14 Due to impacts on irreplaceable habitats (veteran trees), it is therefore not possible for the Proposed Scheme to achieve a Scheme-wide BNG outcome, in accordance with industry good practice guidance. However, a net gain position has been achieved for all non-excluded habitats (i.e. those which are not irreplaceable, very high distinctiveness or within statutory designated sites).

2 Introduction

2.1 Project Background

2.1.1 The Norwich Western Link Road (NWL) is a highway scheme linking the A1270 Broadland Northway from its junction with the A1067 Fakenham Road to the A47 trunk road near Honingham.

2.1.2 The NWL, hereafter referred to as the Proposed Scheme, would comprise:

- Dualling the A1067 Fakenham Road westwards from its existing junction with the A1270 to a new roundabout located approximately 400m to the northwest.
- Construction of a new roundabout.

2.1.3 Constructing a dual carriageway link from the new roundabout to a new junction with the A47 near Honingham.

2.1.4 As part of a separate planned scheme, National Highways proposes to realign and dual the A47 from the existing roundabout at Easton to join the existing dual carriageway section at North Tuddenham. This scheme was consented in August 2022 and National Highways would construct the Honingham junction, with the Scheme connecting to the north-eastern side of that junction.

2.1.5 The Proposed Scheme consists of all land within the Red Line Boundary, covering 273.02ha. For the purpose of the BNG assessment, this figure is exclusive of 5.42ha of purple moor grass and rush pasture habitat within the baseline, and an 8.72ha area outlined for the mitigation of this habitat type, which is excluded from the Metric in baseline and post development calculations. This area is defined by the Red Line Boundary shown in Appendix A.

2.1.6 This assessment has been completed and assured by ecologists competent in BNG, with multiple years' experience of BNG assessment.

2.2 Biodiversity Net Gain

2.2.1 BNG is an approach to development which aims to leave the natural environment in a measurably better state than beforehand. The process follows the mitigation hierarchy, which sets out that everything possible must be done to firstly avoid, secondly minimise and thirdly restore / rehabilitate losses of biodiversity on site. Only as a last resort, residual losses are compensated for using offsite habitat enhancement or creation.

2.2.2 To undertake the assessment the Biodiversity Metric Calculation Tool is used to quantify the biodiversity losses and gains resulting from development and a qualitative assessment is undertaken to review adherence to Biodiversity Net Gain Good Practice Principles (CIEEM, 2019) (hereafter referred as “the Principles”).

2.3 Scope of Report

2.3.1 This report uses the Metric and the Principles to produce an assessment report that:

1. Establishes the total number of baseline Area Habitat Biodiversity Units (AHBU), Hedgerow Biodiversity Units (HBU) and River Biodiversity Units (RBU) within the Proposed Scheme;
2. Establishes the total number of AHBU, HBU and RBU which would be retained, enhanced, and created as a result of the Proposed Scheme’s landscape design;
3. Determines whether the Proposed Scheme would result in a quantitative net loss, no net loss, or a net gain for biodiversity; and
4. Determines whether the biodiversity outcomes of the Proposed Scheme comply with the Principles.

2.3.2 It is important to recognise that the quantification of BU is one of several factors to be considered when assessing the impact of the Proposed Scheme on biodiversity. Please note that this BNG assessment report does not cover

wider potential impacts of the Proposed Scheme on protected species, designated sites and indirect effects on habitats. These are covered within the Habitat Regulation Assessment (HRA) and Environmental Statement (ES) (document references 4.03.00 and 3.10.00 respectively).

2.3.3 This assessment has been compiled with reference to relevant legislation and policy relating to nature conservation and BNG, provided in Appendix B.

2.3.4 The Proposed Scheme has a net gain target of 10% in line with the Environmental Act, under which this level of gain is a mandatory requirement as a condition of planning permission under the Town and Country Planning Act 1990 from 12 February 2024 (Appendix B).

2.3.5 An assessment of River Biodiversity Units and river habitats has been completed. The details of this assessment are included within this report, with the methodology outlined in Section 5 and the results outlined in Section 6 and 7. The river aspect considers impacts and compensation for River Biodiversity Units within the Red Line Boundary, and contribution to WFD waterbody objectives (including No Net Loss).

3 Methodology

3.1 Overview

3.1.1 This BNG assessment uses the following industry recognised good practice guidance:

- CIEEM, IEMA & CIRIA (2016) Biodiversity Net Gain: Good Practice Principles for Development;
- Natural England (2022) Biodiversity Metric 3.1, following the methodology set out within the Metric 3.1 User Guide and Technical Supplement;
- British Standard 8683 Process for designing and implementing Biodiversity Net Gain – Specification (2021); and
- CIEEM (2021) Biodiversity Net Gain Reporting and Audit Templates (CIEEM BNG Report and Audit-template, accessed 29.11.2022).

3.1.2 Due to the timing of the evolution of mandatory BNG in relation to the project development, the Proposed Scheme was developed using Natural England's Biodiversity Metric 3.1 Calculation Tool (Natural England, 2021) (herein referred to as "the Metric"), and the results from this calculation are presented in the main body of the report. The data from Metric 3.1 were copied into the Statutory Metric (published 30.11.2023) (Defra, 2023a) following guidance on which metric to use (Defra, 2023b) available at the time (December 2023), and the results are set out in Appendix J.

3.1.3 Details regarding River Biodiversity Units assessment methods are given in Section 5 and details of the River Condition Assessment are shown in Appendix D.

3.2 Distinctiveness

3.2.1 The distinctiveness of a habitat was generated by assigning distinctiveness categories based on the Metric Calculation Tool. These broadly follow the categories set out in **Table 3-1**. Each band has a number associated with it as shown in **Table 3-1**. This is the starting point for calculating the number of biodiversity units per hectare for each habitat.

Table 3-1 Habitat distinctiveness band and score

Distinctiveness Band	Distinctiveness score	Example of Habitat Type Covered, Area Habitats
Very High	8	Priority habitats as defined in Section 41 of the NERC Act that are highly threatened, internationally scarce and require conservation action e.g. blanket bog HPI, and purple moor grass and rush pastures HPI
High	6	Priority Habitat (as defined in Section 41 of the NERC Act.)
Medium	4	Semi-natural habitat (broadleaved woodland, species-rich grassland) not included in Section 41 of the NERC Act
Low	2	Managed habitats (arable, amenity grassland)
Very Low	0	Habitats and land cover of little or no value to wildlife e.g. developed land sealed surface

3.3 Condition

3.3.1 The condition of a habitat is a measure of its quality. For example, it is assumed that a habitat is in poor condition if it fails to support the notable / protected species for which it is valued or if it is in unfavourable condition due to degradation from external factors, such as pollution, erosion or invasive species.

3.3.2 Habitat condition scores are set out in **Table 3-2** (Natural England 2022a).

Table 3-2 Habitat condition scores

Habitat Condition	Area-based Habitat and River Condition Score
Good	3
Fairly Good*	2.5
Moderate	2
Fairly Poor*	1.5
Poor	1
N/A - Other	0

- (Asterisk) Interim values applicable to river condition only.

3.4 Strategic significance

3.4.1 With respect to strategic significance (SS) the following approach, detailed in **Table 3-3**, has been taken to identify the relevant category. Appendix D outlines the approach regarding SS for rivers.

Table 3-3 Method for assigning strategic significance

Strategic significance	Category (score)	Method
Within an area formally identified in local strategy	High (1.15)	In the absence of local guidance on the implementation of strategic significance, or published local nature recovery strategy, it has been assumed that sites within the CWS were of this SS. In addition, the local Biodiversity Action Plan adopts relevant Habitats of Principal Importance (HPI) into the local strategy and therefore were automatically assigned this level of SS. Where specific habitats are not specified in relation to the identified area, all habitats which are located within the formally identified area are assigned to this level.
Area not in a local strategy	Low (1)	The remaining habitats did not fall into either of the above categories and were assigned this level of strategic significance.

3.5 Risk

3.5.1 The time to target condition for each created habitat type present within the post-development landscape design reflects the time taken between starting creation or enhancement and a habitat reaching its target condition and / or distinctiveness.

3.5.2 The construction of the Proposed Scheme is expected to take place in phases over a total of approximately three years. However, each phase is expected to be significantly shorter than three years, and less than one year in some instances, therefore the time period between habitat loss and commencement of creation/enhancement will be less than the total project built out period of

three years. Consequently, temporal risk has been factored into the calculations by the inclusion of a delay in starting habitat creation / enhancement two years after habitat clearance.

3.5.3 The temporary works platform on the Wensum floodplain is expected to be in place throughout the construction period, with a four-year delay factored into calculations for habitats within the platform's footprint. This additional time to target condition therefore results in a minor reduction in BU for created habitats.

3.5.4 The application of the temporal risk factor is a precautionary approach, and the construction programme is likely to result in delays of less than a year in some instances which in reality would result in a betterment to the BU outcomes.

3.5.5 The default values for the difficulty of habitat recreation were used and no spatial risk was applied as all assessed habitats are within the Red Line Boundary.

3.6 Trading rules

3.6.1 Within the calculator, trading rules are factored in to ensure loss of habitat is replaced in alignment with the 'like for like' or 'like for better' principle, these rules can be summarised as follows:

- Low distinctiveness habitat - Same distinctiveness or better habitat required;
- Medium distinctiveness habitat - Same broad habitat or a higher distinctiveness habitat required;
- High distinctiveness habitat - Same habitat required; and
- Very high distinctiveness habitat - Bespoke compensation required.

3.7 Data sources

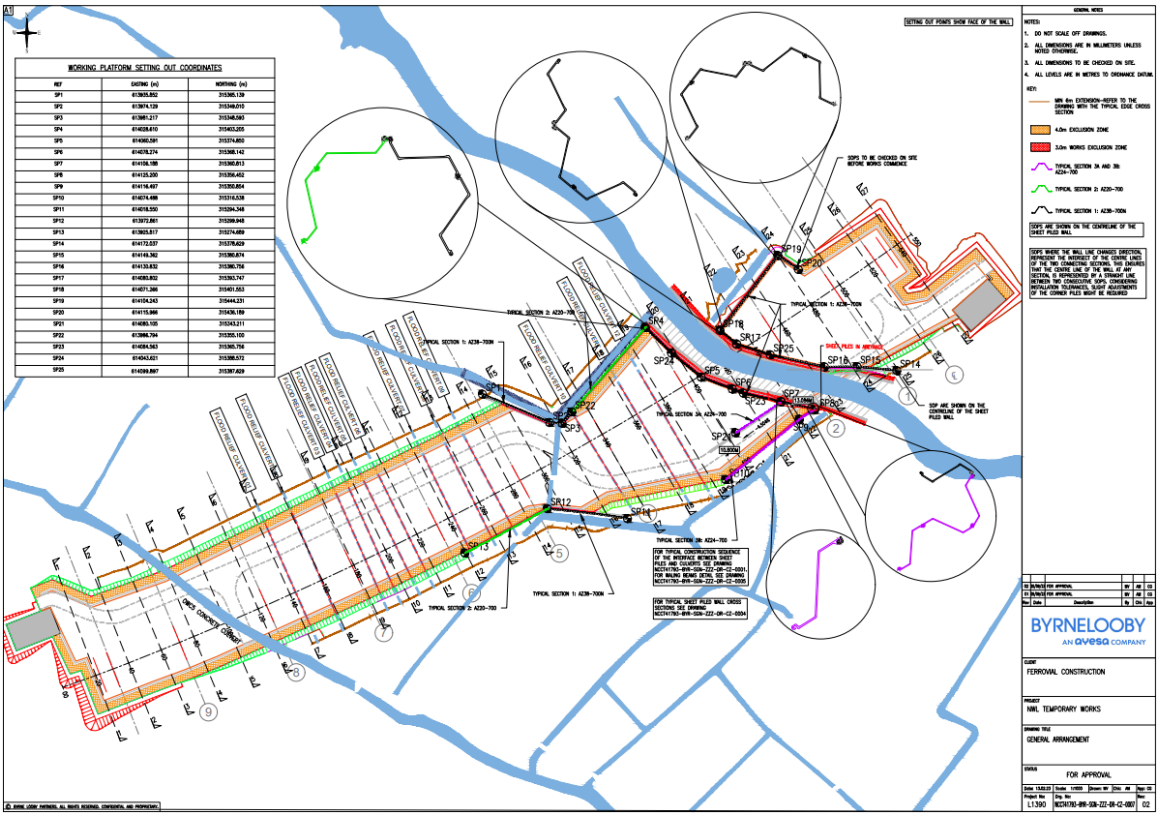
3.7.1 The following data sources have been used to complete the BNG assessment:

1. Publicly available (Open-Source Natural England) datasets for Habitats of Principal Importance (HPI), ancient woodland (classed as irreplaceable habitat), and statutory designated sites for nature conservation. A data search provided by the Norfolk Biodiversity Information Service (NBIS) was used for information pertaining to locally designated sites i.e., County Wildlife Sites (CWS). Full details of the desk study method are provided within the **Chapter 10: Biodiversity** of the ES. The results of the desk study have been used to inform the strategic significance value in line with the methodology detailed within Biodiversity Metric 3.1.
2. UK Habitat Classification (UKHab) surveys were undertaken across several dates in May and June 2022 for the Proposed Scheme habitats, and in November 2022 for areas included for additional mitigation (protected species, WFD, and arboriculture) (Document Reference 3.10.31).
3. The UKHab surveys were undertaken by experienced WSP ecologists following best practice guidelines survey provided a baseline habitat database which details the habitat types of present, their area (ha) and their geographic distribution (Appendix A, Figure 1). Full details of the survey method are provided within the ES.
4. A habitat condition assessment was completed concurrently with the habitat surveys, following the methodology detailed within Biodiversity Metric 3.1.
5. A National Vegetation Classification (NVC) survey was undertaken in April and June 2021 by an experienced botanical specialist from WSP (Document Reference 3.10.18). This report was used as a reference to aid in determining habitat distinctiveness.

6. The post-development landscape plan habitats were translated into BNG habitat types for use in the assessment (Appendix A, Figure 2). The post-development landscape mitigation plan has undergone iterative improvements to improve biodiversity outcomes. The landscape designs used for the post-development BNG calculations was provided on the 14.04.2023 (Document Reference 2.07.00), with an updated Essential Environmental Mitigation Plan (Document Reference 2.12.00) for 'offline' mitigation areas incorporated in February 2024. This information was provided as CAD data that was subsequently converted to shapefiles for use in GIS.
7. The temporary works platform footprint is assumed to be as per the indicative drawing in Figure 3-1, which is based on current knowledge. This information was used to inform the post development footprint and delay in habitat creation associated with the temporary works platform.

3.7.2 Data sources used to complete the river aspect of the BNG assessment are referenced in Appendix D.

Figure 3-1 Temporary Works Platform Footprint



3.8 Irreplaceable habitats, statutory designated sites and very high distinctiveness habitats

3.8.1 In accordance with the Biodiversity Metric 3.1 user guidance (paragraph 4.32) and the BNG Good Practice Principles (section 9.5), impacts on irreplaceable habitats, statutory designated sites and very high distinctiveness habitats have been excluded from the calculations, as have the associated compensation areas. This is because these habitats and their impacts are not adequately measured by this metric and bespoke compensation needs to be agreed separately. This is also in line with advice from Natural England (email from Lead Adviser – Norfolk & Suffolk Team, 27th April 2023) in relation to proposed enhancements to the River Wensum which stated that BNG cannot be undertaken on an interest feature of a designated site. The River Wensum, a statutory designated site, has been included within a separate river BNG assessment to help identify losses and enhancements to inform enhancements for the SAC and WFD, but does not contribute to the overall

calculations and scoring in this assessment. Proposed enhancements would contribute to improvements to the River Wensum SAC.

3.8.2 Full details of the impacts on these excluded habitats are provided within Document Reference 3.10.32. The impact assessment on the SAC is covered separately within the Habitat Regulations Assessment (HRA) (Document Reference 4.03.00).

3.8.3 It is important to note that industry good practice guidance and the British Standard on BNG (British Standards Institute, 2021) recommends that scheme-wide biodiversity net gain is not achieved if there is loss of an irreplaceable habitat or a loss of habitat from within statutory designated sites, as is the case for the Proposed Scheme. Bespoke compensation has been designed for the loss of veteran trees.

3.9 Limitations and assumptions

3.9.1 The following limitations and assumptions have been applied when using the above methodologies.

Baseline biodiversity

3.9.2 Relatively small areas (approximately 4.2ha in total) of habitat have not been subject to direct UKHab assessment. However, these areas were directly connected to areas that had been subject to UKHab survey, and approximately 70% of this area comprised cropland. Therefore, a well-informed estimate of the condition and distinctiveness could be applied here, using survey data from the adjacent areas supplemented with aerial imagery, in order to base the calculations for the full Red Line Boundary.

3.9.3 Baseline UKHab surveys and condition assessment surveys for mitigation areas incorporated for protected species were undertaken in November 2022, which is outside of the optimal survey season for recording information on flowering plants for both grassland and woodland habitats. However, this was not considered a significant limitation, as it was possible to vegetatively identify floristic indicator species and apply condition assessment criteria

which often relate to structural and management aspects of the habitat. It was also possible to draw on knowledge / data collected from adjacent habitats in optimal months from the UKHab surveys. The seasonality of habitats is particularly relevant where grasslands are concerned as key indicator species can be missed, however the grasslands surveyed in these areas comprised coastal and floodplain grazing marsh (CFGM), a habitat for which species composition is not a key identifying criterion. Therefore, although it is likely the full botanical diversity of these areas would have not been captured, it is not considered a significant limitation in determining their overall UKHab (distinctiveness) and condition.

3.9.4 Grassland habitats near the River Wensum towards the north of the Proposed Scheme were classified as Deschampsia neutral grassland (UKHab code g3c7) and Holcus – Juncus neutral grassland (UKHab code g3c8) types. As this area is included within Natural England's habitat inventory for CFGM, and matches the HPI definition comprising a seasonally inundated, grazed pasture within the floodplain of a river; this area was attributed as CFGM within the calculator. Therefore, this grassland area is valued as a high distinctiveness habitat, the biodiversity unit losses of which must be compensated for with the same habitat type.

3.9.5 To the south of Foxburrow plantation, a wet grassland area was surveyed for the purpose of UKHab and condition assessed under BM 3.1. The species composition of this habitat did not match well with a particular UKHab, and by extension, BNG habitat definition. The habitat presented as a transitional / degraded wet pasture grassland, with encroaching scrub and nutrification. However, relics of a valuable wetland habitat remain. The NVC report classified this area as NVC type M23, which is a community that can be found in the purple moor and rush pasture HPI. Therefore, a precautionary approach was adopted and this area has been classified as purple moor grass and rush pasture, a very high distinctiveness habitat.

3.9.6 Hedgerows, ditches and rivers were recorded as linear habitat features; consequently, the physical area they encompass is not captured and there

would be a minor overestimation of adjacent habitat areas extended to account for this space, in the baseline and post development calculations.

Post-development biodiversity

3.9.7 Areas within the Red Line Boundary that are included within temporary construction compound areas within the landscape plans have been assumed to be lost and returned to the same baseline habitat post development.

3.9.8 Only direct impacts within the Red Line Boundary were considered at this time. Any impacts on protected species, and indirect habitat impacts (e.g. noise disturbance, dust, shading) have been addressed in the ES and are not considered within this report.

3.9.9 Habitat prescriptions within the post development Landscape Design plans (Planning reference 2.07.00) and Essential Environmental Mitigation Plan (Figure 10.5) were translated into BNG habitat types which is detailed in **Table 3-4** below. The translation was informed by taking into consideration the baseline habitat information, landscape design, the location, extent, and likely management of these areas to determine an appropriate estimation of habitat type and quality. The management would be confirmed in a habitat management and monitoring plan (HMMP) as part of the Biodiversity Gain Plan which would be submitted to discharge the pre-commencement biodiversity gain condition.

3.9.10 Due to the timing of the evolution of mandatory BNG in relation to the project development, the Proposed Scheme was developed and assessed and reported using Natural England's Biodiversity Metric 3.1 Calculation Tool (Natural England, 2021). The data was subsequently copied directly from Metric 3.1 into the Statutory Metric version published in November 2023 (Defra, 2023a), following guidance available in December 2023, as presented in Appendix J. This approach is justified on account of the guidance available at the time of assessment, and the February 2024 Statutory Metric and guidance will be followed in order to produce the Biodiversity Gain Plan and discharge the Biodiversity Gain Condition.

Table 3-4 Post development landscape design to BNG 3.1 translation

Post Development Landscape Plan Habitat	BNG 3.1 UKHab Translation	Distinctiveness	Target condition	Rationale
Woodland	Lowland mixed deciduous woodland	High	Poor	A high distinctiveness woodland habitat in poor condition was considered appropriate. The use of a native species mix and design informed by arboriculture, ecology, and landscape disciplines justifies the categorisation as a high distinctiveness woodland habitat. The poor condition reflects a realistic assumption of the woodlands condition (based on BNG condition criteria) within the BNG assessment period (30 years minimum). For woodland enhanced from medium distinctiveness to high distinctiveness under Metric 3.1 a precautionary approach was taken and the targeted condition was maintained at poor under Metric 3.1 (see Appendix J for Statutory Metric), Note this assumption is based on BNG condition criteria which are specific to the BNG assessment, and do not relate to the suitability of the habitat to function as mitigation or compensation for example in relation to protected species or air quality.
Scrub	Mixed scrub	Medium	Moderate	This habitat distinctiveness and condition is considered a suitable translation, with a mix of native species planted. Moderate condition would be achievable with occasional management.
Species rich grass	Other neutral grassland	Medium	Good	This habitat within the landscape plans is to be sown with a species rich wildflower grassland mix, therefore, a medium distinctiveness habitat in good condition has been used as a best fit to reflect this.
Public Right of Way (PRoW)	Modified grassland	Low	Poor	The PRoW shall be surfaced appropriate to their use, in instances where this is not hard landscaping soft landscaping has been assumed, as such a low distinctiveness grassland in poor condition.

Post Development Landscape Plan Habitat	BNG 3.1 UKHab Translation	Distinctiveness	Target condition	Rationale
Verge	Modified grassland	Low	Moderate	This habitat comprises the verges of the Proposed Scheme alignment, likely to be kept as short sward and regularly mown.
Wet grassland	Other neutral grassland	Medium	Moderate	With grassland habitat maintained in within a wetland context it is likely to be of sufficient species diversity and quality to achieve a medium distinctiveness and moderate condition.
Wetland scrub	Mixed scrub	Medium	Moderate	This habitat distinctiveness and condition is considered a suitable translation, with a mix of native species planted moderate condition would be achievable with occasional management.
Developed land	Developed land	Very Low	NA	NA
Proposed access track and NMU Route	Artificial unvegetated, unsealed surface	Very Low	NA	NA
Reedbed	Reedbed	High	Poor	Small areas included within the landscape design were labelled reedbed, these were located adjacent to created SUDS ponds therefore poor condition is targeted as a precautionary approach.
Temporary Construction area	N/A	N/A	N/A	This classification within the landscape designs were factored in by assuming a loss in the baseline habitat followed by replacement of that habitat to create the same habitat in the same condition within 30 years. These areas total 57.40ha, comprising cereal crops.

4 River Methodology

4.1 Summary of Assessment process For Rivers

4.1.1 In order to complete the BNG assessment for rivers, a bespoke assessment unique to river habitats must be undertaken, therefore the methods and results for this aspect have been reported separately to the main assessment. The BNG assessment for rivers uses the same good practice guidance listed in Section 4.1.1.

4.1.2 Details of the methodology related to the data collection to inform the BNG metric calculations, such as the River Condition Assessment (including MoRPh5 surveys and River Typing), ditch condition assessment and scenario testing can be found in Appendix D. Additionally, methodology relating to the assessment process for the River Wensum is also detailed within Appendix D.

4.1.3 The BNG assessment process for rivers follows the same mitigation hierarchy as set out in Section 3.2.1. The assessment uses the Biodiversity Metric 3.1 Calculation Tool (Appendix C) and adheres to the Principles, as per Section 3.2.2. The data was also copied into the Statutory Biodiversity Metric (Appendix J).

4.2 Water Framework Directive

4.2.1 It should be noted that ‘No Net Loss’ and contribution to water body objectives are recommended as best practice to demonstrate Water Framework Directive compliance. Therefore, the assessment and enhancement strategies set out in this report for the river aspect of BNG would support the completion of the WFD assessment and work towards WFD compliance.

4.2.2 It is best practice under the Water Framework Directive (WFD) to contribute to enhancements where practicable or achieve a ‘No Net Loss’ of habitat where this is not feasible. In order for a development to demonstrate WFD compliance, practicable WFD mitigation should be undertaken within the impacted water bodies and as close to the impact sites as possible.

Therefore, this assessment has assumed that any mitigation would, where possible, be undertaken adjacent to the Proposed Scheme in line with best practice and to maximise the benefit from the mitigation. Measures to achieve 'No Net Loss' would need to be created in perpetuity.

4.3 River Condition Assessment

4.3.1 The River Condition Assessment requires field-based MoRPh5 surveys as well as desk based River Typing and scenario testing. The details of each process are described in Appendix D.

4.4 Ditch Condition Assessment

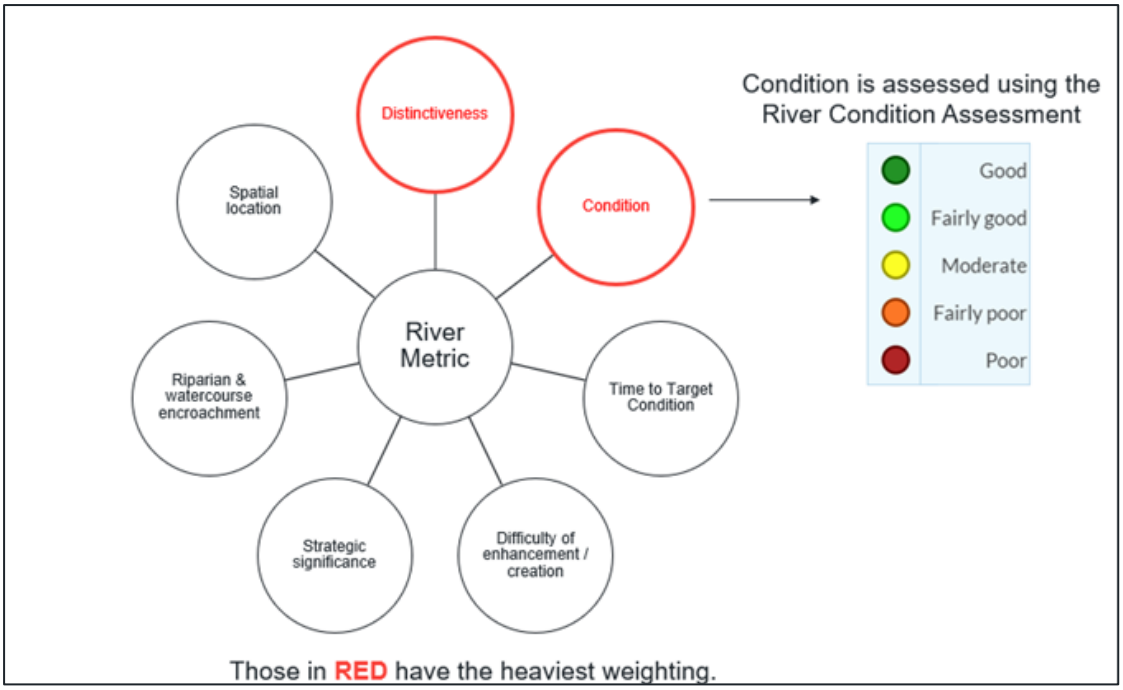
4.4.1 Ditch habitats are assessed using a standard proforma outlined in Biodiversity Metric 3.1 - User Guide (Natural England, 2022b). The details of the methodology and criteria are outlined in Appendix D.

4.4.2 Based on the number of criteria met, the ditch would be given a classification of either "good" (8 of 8 criteria), "moderate" (6 or 7 of 8 criteria) or "poor" (5 or less of 8 criteria).

4.5 Completing The Biodiversity Metric 3.1

4.5.1 There are several input parameters for BM3.1 which contribute to the value of biodiversity units in the baseline and post-development scenarios (displayed in **Figure 4-1**). The methodology for determining each of these parameters is explained in Appendix D. The same process is followed for baseline, river creation and river enhancement.

Figure 4-1 Components of the River metric-



4.6 Identifying Enhancement Opportunities

4.6.1 Enhancement opportunities have been identified for areas immediately upstream and downstream of the Proposed Scheme, along the River Wensum, Foxburrow Stream and River Wensum floodplain ditches. Multiple types of enhancements have been considered and proposed as part of a tailored approach to watercourse enhancement (the details of which are included within Appendix D) such as:

- Removing artificial bank top cover;
- Increasing the extent and variety of vegetation on the bank top and bank face;
- Reducing the extent of artificial bank profiles to a more natural cross-section;
- Introduction of large wood features and wood dam structures to enhance in-channel morphology;
- Gravel augmentation and creation of a varying river bed topography;

- Reduction of encroachment in the riparian zone and in the watercourse (e.g. remove redundant bank protection features or structures, set back land use, reduce maintenance);
- Improvement of the distinctiveness of the watercourse within the site (e.g., change back from culvert to a natural open channel), improving floodplain connectivity and reduction of impacts from overdeeping;
- Restoration of a meander on the River Wensum.

4.6.2 All enhancement areas are located within the Red Line Boundary and, therefore, are treated as 'Onsite'. These enhancements have been selected as the preferred strategy for achieving River BNG targets for the Proposed Scheme.

4.7 Limitations and assumptions

4.7.1 The following limitations and assumptions have been applied when using the above methodologies.

4.7.2 For the River BNG calculations, a precautionary approach based on current Natural England guidance has been adopted, where the most limiting possibilities can still be accounted for. For example, the 3.1 guidance indicates ditches do not have a riparian zone and therefore it has been assumed that Riparian encroachment factor on ditches cannot be reduced. However, enhancements to the adjacent land to the ditch are proposed but not quantified within the metric as a beneficial action. Additionally, the length of the proposed culverts (CU2 and MA1) was assessed using a precautionary approach, whereby the length was a maximum extent between the footprint of each apron.

4.7.3 Existing watercourses within the Red Line Boundary that are included within the temporary works platform area would be temporarily culverted during construction for approximately 4 years. These watercourses have been assumed to be lost and returned to the same baseline habitat condition post development, as recorded in the creation tab.

4.7.4 Consultation has been undertaken with landowners, tenant land users, the Internal Drainage Board, Natural England and the Environment Agency to ensure enhancement proposals are suitable and acceptable to stakeholders and other interested parties. This consultation would continue through the detailed design stage and enhancement designs would be adapted to accommodate stakeholder feedback on detailed proposals.

4.7.5 The enhancements on the River Wensum cannot be included within the calculator as it is Priority Habitat (very high distinctiveness) and within a SAC, and therefore requires a bespoke assessment and enhancement strategy. However, to record baseline conditions and enhancement scenarios, the River Wensum has been included within the River Condition Assessment (Appendix D) and entered within a separate calculator to inform the bespoke assessment. Therefore, the River Wensum does not contribute to the baseline RBUs or post-development RBUs.

5 Results

5.1.1 This section provides a summary of quantitative assessment, along with a qualitative assessment against the Principles. Further details regarding the watercourse quantitative assessment results are included in Section 7.

5.2 Quantitative assessment

Strategic significance – terrestrial habitats

5.2.1 The desk study identified the following formally identified areas within the Proposed Scheme, full details on the desk study results are provided within the ES:

- Site Name: Broom and Spring Hills CWS, habitats of relevance: Lowland mixed deciduous woodland and other woodland; broadleaved.
- Site Name: Fakenham Roadside Nature Reserve, habitats of relevance: Other neutral grassland.
- Site Name: Land Adjoining Foxburrow Plantation CWS, habitats of relevance: Reedbeds, lowland mixed deciduous woodland, and modified grassland.
- Site Name: Primrose Grove Ringland CWS, habitats of relevance: Other woodland; mixed.
- Site Name: River Wensum Pastures CWS, habitats of relevance: Other neutral grassland.

5.2.2 Where located within the above identified areas the habitats of relevance have been assigned a strategic significance of “within area formally identified in local strategy” with a multiplication value of 1.15.

Baseline biodiversity – Terrestrial Habitats

5.2.3 UKHab habitat surveys identified the presence of 17 UKHab habitat types within the Proposed Scheme. These included a mixture of arable, grassland, woodland, scrub, wetland, riparian (River Wensum and River Tud),

hedgerows, buildings, and hardstanding habitat types (WSP UK Ltd, 2022). The tabs within the accompanying Metric (Appendix C) provide details on the habitat baseline and should be referred to for full details on the habitats present. In this instance, please refer to tabs: A-1 Site Habitat Baseline and B-1 Site Hedge Baseline. See Appendix A - Figure 1 for baseline habitat map.

5.2.4 A 0.29ha area of CFGM was excluded from the calculations as it falls within the boundary of the River Wensum SAC. This terrestrial habitat is not a qualifying or supporting feature of the SAC designation, which are exclusively for aquatic features, however it is part of the River Wensum SSSI citation within the same area, and its exclusion retains consistency with the river BNG approach. The area required as compensation for impacts on the River Wensum SAC is also excluded from the calculation.

5.2.5 The Proposed Scheme includes impacts on veteran trees, an irreplaceable habitat, as well as purple moor grass and rush pasture, a very high distinctiveness habitat which have been excluded from the baseline calculations as shown in **Table 5-1**.

Table 5-1 Compensation for very high distinctiveness habitat, excluded from the calculations

Baseline habitat	Habitat to be lost	Area required as compensation	Total area excluded
Purple moor grass and rush pasture	2.18ha	8.72ha	10.9ha

5.2.6 A 0.96ha area of purple moor grass and rush pasture habitat is considered lost due to construction of the Proposed Scheme. A 1.22ha area is to be lost as a result of essential mitigation for bats which requires the planting of woodland in this location to tie into a bat underpass.

5.2.7 The area required as compensation is considered necessary to reflect the scarcity and very high distinctiveness of the habitat.

Post-development biodiversity – terrestrial habitats

5.2.8 The post-development habitats expected on site after construction are based on the landscape plan (Planning reference 2.07.00) and are shown as UKHab types in Appendix A (Figure 2). The landscape mitigation plan identifies where baseline habitats would be retained or enhanced as well as the locations for the creation of new habitats.

5.2.9 The tabs within the accompanying Metric provides details on the retained, enhanced and created habitats. In this instance, please refer to tabs: A-2 Habitat Creation, A-3 Site Habitat Enhancement, B2 Site Hedge Creation, and B-3 Site Hedge Enhancement.

5.2.10 To facilitate the compensation requirement of 8.72ha (excluded from the calculator) for purple moor grass and rush pasture habitat shown in **Table 5-1**, an area of the River Wensum floodplain to the northwest of the Proposed Scheme has been secured in order to provide a suitable location to compensate for this. This area currently comprises medium and low distinctiveness grasslands which are seasonally inundated and managed by cattle grazing. This habitat is contained within Natural England's HPI inventory for CFGM. Purple moor grass and rush pasture is a HPI and wetland habitat, concurrent with CFGM in terms of its hydrological requirements, botanical niches, and value to birds and invertebrates. Therefore, it is considered an appropriate candidate site for the successful recreation of purple moor grass and rush pasture habitat that has the potential to qualify for, and not detract from the CFGM inventory.

5.2.11 The area of creation for CFGM within the Metric accounts for reinstatement of the habitat where temporary loss is required to facilitate the construction of the viaduct. The successful recreation of this habitat is considered achievable here as the hydrological regime would be maintained post-development and is the crucial limiting factor determining this habitat's location. Part of this restoration is excluded from the calculator as it is within the River Wensum SAC (as detailed in Appendix D).

5.2.12 A Temporary Works Platform (TWP) would be required to facilitate the construction of the viaduct over the River Wensum within the north of the Scheme. It is anticipated that this TWP would encompass a 4.43ha area and be in place for the duration of construction. Therefore, post-development habitats that intersected with this area (4.32ha of CFGM and 0.11ha of modified grassland) were assigned a four-year delay in habitat creation. This would extend the time to target condition and reduce the BU value these habitats achieve within the Metric.

5.3 Summary of overall biodiversity change

5.3.1 The below image shows the headline results from the Metric (Appendix C) and summarises the changes in BU generated for the broad habitat categories present within the Red Line Boundary during the baseline and post-development mapping, the change in units for all area based and linear habitats, along with details on the overall quantitative outcome.

On-site baseline	*Habitat units*	1332.32
	Hedgerow units	83.58
	River units	34.58
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	1478.50
	Hedgerow units	116.92
	River units	39.07
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	10.97%
	Hedgerow units	39.90%
	River units	12.99%
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*	146.18
	Hedgerow units	33.35
	River units	4.49
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	10.97%
	Hedgerow units	39.90%
	River units	12.99%
Trading rules Satisfied?	Yes ✓	

5.3.2 The Proposed Scheme would result in a total habitat net % change of; 10.97% gain in AHBU, a 39.90% gain in HBU, and 12.99% gain in RBU. In conclusion, the Proposed Scheme as assessed achieves a quantitative biodiversity net gain. The Proposed Scheme also satisfies the trading rules.

5.3.3 The raw data used in the assessment is available within Appendix I.

5.3.4 Appendix J shows the outcome of the calculation after copying the data into the Statutory Metric (version published 30th November 2023). This shows a slightly greater net gain in area habitats and watercourses.

5.4 Qualitative BNG assessment

5.4.1 **Table 5-2** sets out the qualitative assessment against the principles and provides a review to determine if wider biodiversity net gain obligations (i.e. in addition to the measurable net gain) have been met.

Table 5-2 Evidence of Proposed Scheme compliance with the principles (adapted from biodiversity net gain: good practice principles for development (CIEEM, CIRIA, and IEMA, 2016)

Principle	Description	Evidence	Current outcome
1. Apply the mitigation hierarchy	Do everything possible to first avoid and then minimise impacts on biodiversity. Only as a last resort, and in agreement with external decision-makers where possible, compensate for losses that cannot be avoided. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then offset biodiversity losses by gains elsewhere.	1. The landscape design for the Proposed Scheme: Avoids impacts to existing biodiversity value by avoiding areas of high distinctiveness habitats where possible. A UKHab map showing areas of HPI and high distinctiveness habitats was used to advise engineers on what areas to avoid when identifying temporary construction areas (e.g., access tracks, topsoil bunds). A viaduct over the River Wensum and its associated habitats is a design feature that has avoided significant areas of sensitive and internationally important habitats. Additionally, scour protection was discounted further to discussions with Natural England. Bespoke mitigation measures for the River Wensum SAC have been proposed, which are included in the separate metric calculation in Appendix H and summarised in the HRA. 2. Compensates for negative impacts by creating new, biologically valuable habitats within the Proposed Scheme. This would be ensured by landscape design and a monitoring strategy for newly created habitats. A walkover survey of landscape and habitat creation areas including reinstated, created, and enhanced habitats would be completed in years 1, 3, 5,10, and 30 following completions of the construction phase. This would assess the success of habitat mitigation measures. Where habitats are temporarily lost to development, the habitats are replaced like-for-like or better. 3. Enhances moderate and poor condition habitats in the mitigation areas and creates habitats of higher distinctiveness on low value areas such as cropland. 4. Has been refined following discussions, meetings, and presentations with internal and external parties to avoid habitats of higher distinctiveness and maximise the biodiversity value of recreated habitats post-development.	Achieved

Principle	Description	Evidence	Current outcome
2. Avoid losing biodiversity that cannot be offset by gains elsewhere	Avoid impacts on irreplaceable biodiversity – these impacts cannot be offset to achieve No Net Loss or Net Gain.	The Proposed Scheme could not avoid the loss of an irreplaceable habitat – veteran and ancient trees (Document Reference 3.04.00). A total of seven veteran and ancient trees cannot be retained within the Proposed Scheme design. Re-engineering by the Contractor was aimed at limiting the impact on veteran trees. This led to bund re-design that has increased veteran tree retention, reducing the number of trees lost from twelve initially to seven. The Outline Compensation Strategy for trees, including bespoke compensation for veteran trees, is included in the arboricultural impact assessment (Document Reference 03.10.35).	Not achieved
3. Be inclusive and equitable	Engage stakeholders early, and involve them in designing, implementing, monitoring, and evaluating the approach to Net Gain. Achieve Net Gain in partnership with stakeholders where possible and share the benefits fairly among stakeholders.	Local biological record centre data and information pertaining to locally important sites, species, and strategies for biodiversity have driven the design of habitats from which the BU gains are derived. Section 3, of Document Reference 3.10.00 details the dialogue of the Ecology Liaison Group. Table 10-1 in this section contains key topics and outcomes of discussions with relevant consultees including the BNG lifecycle with the Norfolk Wildlife Trust. The Environment Agency, Natural England, Internal Drainage Board, landowners, tenant land users and other interested parties have been engaged regarding watercourse enhancement designs, implementation, monitoring and maintenance.	Achieved

Principle	Description	Evidence	Current outcome
4. Address risks	Mitigate difficulty, uncertainty, and other risks to achieving Net Gain. Apply well-accepted ways to add contingency when calculating biodiversity losses and gains in order to account for any remaining risks, as well as to compensate for the time between the losses occurring and the gains being fully realised.	Within Metric 3.1 risk multipliers are applied with respect to time to target condition to account for the time required for habitats to reach any given condition, along with risk multipliers associated with the difficulty to create any given habitat. A variety of locally relevant habitats were incorporated into the landscape design, for both creation and enhancement including woodland, wetland, and hedgerow HPI that would also increase habitat connectivity. Additionally, an ecosystem approach was adopted for Foxburrow Stream enhancements, focusing on restoring natural processes and encouraging floodplain reconnection. Investigations into soil contamination within the floodplain was undertaken to ensure the proposed enhancements were suitable and reduced the risk of not delivering net gain for this watercourse.	Achieved
5. Make a measurable Net Gain contribution	Achieve a measurable, overall gain for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities.	The BNG assessment determined a quantitative net gain: see Section 6.3 for measurable gains achieved. Contributions are made towards nature conservation priorities for example through retention, creation and enhancement if HPIs.	Achieved

Principle	Description	Evidence	Current outcome
6. Achieve the best outcomes for biodiversity	Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge to make clearly justified choices when: Delivering compensation that is ecologically equivalent in type, amount and condition, and that accounts for the location and timing of biodiversity losses; Compensating for losses of one type of biodiversity by providing a different type that delivers greater benefits for nature conservation; Achieving Net Gain locally to the development while also contributing towards nature conservation priorities at local, regional and national levels; Enhancing existing or creating new habitat; Enhancing ecological connectivity by creating more bigger, better, and joined areas for biodiversity.	For area-based habitats, most habitat types have compensated for using the “like-for-like or better approach”. The majority of the losses within the Proposed Scheme have come from large areas of cereal crop, a low distinctiveness habitat. Habitat creation and enhancement has been designed in a way that is supportive to existing local habitat networks. Increasing quality, size, and connectivity of locally valuable ecosystem networks. Trading Rules have been satisfied. This is considered to be achievable as significant woodland creation and enhancement areas are currently proposed. For example, the planting strategy, which would be provided as part of the Landscape Ecological Management Plan (LEMP) / habitat management and monitoring plan, where possible would use a native mix of species, spaced appropriately for good woodland development, and allowing access for watering which would increase tree vitality. This would enable the creation of lowland mixed deciduous woodland. Identification of bespoke mitigation measures for the River Wensum SAC have been proposed, which are detailed in Appendix D, and summarised in the HRA.	Achieved

Principle	Description	Evidence	Current outcome
7. Be additional	Achieve nature conservation outcomes that demonstrably exceed existing obligations (i.e., do not deliver something that would occur anyway).	The nature conservation outcomes within the legislation and policy (Appendix B) have been met. Approximately 110ha within the Red Line Boundary has been included for the purpose of protected species, WFD, and arboriculture mitigation. These areas are beyond the land required for the construction of the Proposed Scheme and associated landscaping and demonstrate significant benefits in terms of habitat creation and enhancement. The recent government response to consultation on BNG suggests that in order to achieve additionality within BNG, at least 10% of the total post-development biodiversity score should be measures which are not undertaken to address impacts on protected species or protected sites. This is evidenced by 90.73ha of the total Scheme area which is attributable to habitat creation within the Red Line Boundary that is unrelated to protected species or site mitigation / compensation. This has been demonstrated as the landscaping intrinsic to the Proposed Scheme has been designed to incorporate significant areas of medium and high distinctiveness habitats that would be largely created on land which was arable within the baseline. This yields significant unit benefits attributable to the Proposed Scheme in areas not used for protected species mitigation.	Achieved

Principle	Description	Evidence	Current outcome
8. Create a Net Gain legacy	Ensure Net Gain generates long-term benefits by: Engaging stakeholders and jointly agreeing practical solutions that secure Net Gain in perpetuity: Planning for adaptive management and securing dedicated funding for long-term management: Designing Net Gain for biodiversity to be resilient to external factors, especially climate change: Mitigating risks from other land uses: Avoiding displacing harmful activities from one location to another: Supporting local-level management of Net Gain activities.	The delivery of Biodiversity Net Gain has been ensured by early engagement with landowners with the aim of securing the land required for habitat creation and enhancements in perpetuity (30 years minimum for BNG). Ultimately, if required, the land would be compulsorily acquired to secure the delivery of BNG. The habitats proposed within the landscape designs are being designed to be resilient in response to a changing climate, for example in species selection and proposed management (3.16.00 - Environmental Statement Chapter 16: Climate Resilience). Bespoke measures for the Foxburrow Stream, River Wensum SAC and supporting floodplain ditch network have been proposed, (detailed in Appendix D), which contribute to WFD objectives, river basin management plans and the River Wensum Restoration Strategy.	Achieved
9. Optimise sustainability	Prioritise Biodiversity Net Gain and, where possible, optimise the wider environmental benefits for a sustainable society and economy.	This BNG assessment is being used to inform the Proposed Scheme's design to provide better outcomes for biodiversity. The landscape plan considers the BNG requirements as well as sustainability requirements and aims to address the two so that they are delivered together where possible. Wider environmental and sustainability benefits of the Proposed Scheme are discussed in the ES.	Achieved
10. Be transparent	Communicate all Net Gain activities in a transparent and timely manner, sharing the learning with all stakeholders.	The BNG assessment for the Proposed Scheme has been an adaptive process, where managing iterative changes and communicating the implications of these on BNG was necessary to maximise the BU achieved. Meetings, presentations, collaborative drawings etc. were consistently shared across disciplines and stakeholders as the Proposed Scheme progressed in order to allow sufficient time for discussion and implementation. Appendix I contains the raw BNG data used in the assessment.	Achieved

6 River Results

6.1 Overview

6.1.1 There are three watercourse types crossed by the Proposed Scheme, the River Wensum which is classified as Priority Habitat (very high distinctiveness), Foxburrow Stream which is classified as 'Other Rivers and Streams' (high distinctiveness), and the ditches within the River Wensum floodplain (medium distinctiveness).

6.1.2 Each watercourse type was assessed to have a baseline condition score as below:

- Foxburrow Stream – Moderate (811m) and Poor (17m);
- River Wensum – Fairly Good (177m) and Moderate (680m); and
- Ditches – Moderate (1.2 kilometres) and Poor (2.9 kilometres).

6.1.3 The assessment of the pre-development habitat concludes there are 48.45 River Biodiversity Units (RBU) within the Red Line Boundary (document reference 2.02.00), including the River Wensum SAC. Of which, 34.58 RBU are considered the BNG baseline, which includes other rivers and streams (8.97 RBU) and ditches (25.61 RBU). The River Wensum (13.87 RBU) has been excluded from the BNG baseline for this assessment as it is a statutory designated site (SAC).

6.1.4 The operational design of the Proposed Scheme includes several permanent structures that would or have the potential to reduce the river condition and distinctiveness of the river habitat within the current Site Boundary. These include:

- Installation of a culvert (totalling a maximum of 22m in length, including erosion protection) on Watercourse 5 (IDB reference DRN112G0102, hereafter referred to as 'WC5');

- Installation of a culvert (totalling a maximum of 72m in length, including apron and wingwalls) on Foxburrow Stream;
- Installation of a 25m wide viaduct over the River Wensum;
- Five outfalls with associated scour protection in Foxburrow Stream;
- Two outfalls with associated scour protection in WC5; and
- One outfall with associated scour protection in Watercourse 7 (hereafter referred to as 'WC7').

6.1.5 Furthermore, the proposed culverting of Foxburrow Stream would involve straightening the channel and therefore, also result in a loss of length (5m) from the baseline scenario.

6.1.6 Post Development scenarios where no enhancement measures are implemented (Section 3, Appendix D) estimated a loss of 1.48 RBU (excluding consideration of the River Wensum).

6.1.7 Enhancement scenarios to compensate this loss demonstrate a net gain of 4.49 RBU, a +12.99% biodiversity net gain. Details of the results of the data collection to inform the BNG metric calculations, such as the River Condition Assessment (including MoRPh5 surveys and River Type Pro), ditch condition assessment and scenario testing can be found in Appendix D. Results relating to the River Wensum are also detailed within Appendix D, separately to the River BNG results.

6.2 BNG Calculations

6.2.1 The baseline and post development enhancement scenario RCA data have been used to complete the Biodiversity Metric 3.1 toolkit. The baseline river units are shown in Section C1 - Site River Baseline and river units provided by the Proposed Scheme in the enhancements scenario are shown in Section C3 - Site River Enhancement. Section C2 - River Creation includes lengths of watercourses associated with actions that do not enhance the watercourse. For example, features with a reduced condition, distinctiveness or

encroachment value due to culverting or artificial features. A summary of the assumptions associated with the metric are outlined in the text below.

6.2.2 The baseline river units were divided into 35 discrete assessment units. These assessment unit lengths were identified based on similar distinctiveness, condition and encroachment values. The river condition used within the metric is based on the final condition score from the River Condition Assessment, inclusive of any changes following a review of the river shape where appropriate (see Appendix D).

6.2.3 The watercourses (Other Rivers and Streams) identified within the Red Line Boundary have been separated into 10 discrete sections, each representing changes in condition, length, distinctiveness, Riparian or Watercourse encroachment or a combination of each. Due to the realignment of the Foxburrow Stream channel and design constraints, there is a small unavoidable loss of watercourse length for 'Other Rivers and Streams'. However, overall, there is an improvement in condition and habitat distinctiveness which results in a predicted +17.98% biodiversity net gain for 'Other Rivers and Streams' units.

6.2.4 Alternative design scenarios have been considered in the river BNG calculations in order to minimise the net loss of the Proposed Scheme. This has included the consideration of bridges and opportunities to reduce culvert length through consultation with the design team. The opportunity to reduce culvert length and artificial encroachment has been realised in the current design. Additionally, although not contributing to BNG, the installation of a viaduct minimises habitat loss within the River Wensum floodplain.

6.2.5 A 3m dilapidated bridge has been included within the baseline and the removal of this feature is proposed as part of the enhancement scenario. Riparian and Watercourse encroachment are recorded as Major for this feature as it covers both banks and has collapsed within the channel. Removal of the bridge represents an opportunity to restore natural channel processes by reducing encroachment.

6.2.6 In the enhancement scenario, an existing 7m pipe culvert (located at National Grid Reference TG 10535 13311) has been removed to restore 7m of fairly good condition 'Other Rivers and Streams' habitat length.

6.2.7 As noted in Section 4.7.3, WC5 is to be temporarily lost for 4 years due to temporary culverting associated with the temporary works platform on the Wensum floodplain. It is assumed the culverted section (excluding the permanent crossing and outfall scour protection lengths) would be returned to its baseline condition once the culvert has been removed. This is recorded as a loss and creation in the metric, with a 4-year delay added to the creation tab. For those sections of WC5 associated with the temporary culvert, all sections have been recreated with 'Low potential / action not identified in any plan' strategic significance due to association with the scheme structure, with the exception of 33m, which has retained the baseline strategic significance of 'Delivery within River Basin Management Plan'.

6.2.8 The Riparian encroachment factors have increased in the post development scenarios due to the proposed outfalls and scour protection on the banks of the Foxburrow Stream and WC5. This is because the outfalls and scour protection represent artificial structures within 10m of the watercourse or within the channel of the watercourse and have therefore been recorded as encroachment, as stated within the metric guidance. The five outfalls on Foxburrow Stream amounted to a 20m length of 'Other Rivers and Streams' being recorded as Major Watercourse and Riparian encroachment in the post-development scenario. The scour protection relating to the two outfalls on WC5 amounted to 45m length of ditch being recorded as Major Watercourse and Riparian encroachment in the post-development scenario. It should be noted that Watercourse encroachment is recorded as 'not applicable' within the metric for culverts (Natural England, 2022).

6.2.9 A number of sections within the enhancement scenarios proposed a reduction in Riparian encroachment from Major to No Encroachment as a result of reductions or exclusion of livestock pressures (such as poaching or grazing).

6.2.10 The condition score of ditches have been improved through enhancement measures through identifying enhancement measures that target ditch condition criteria to achieve a Moderate condition (at least 6 out of the 8 condition criteria).

6.2.11 A number of discrete assessment units have had restrictions such as existing fencing, sensitive features or incompatibility with enhancements identified and have therefore not been enhanced to the same extent as other more viable sections of watercourse.

6.2.12 Enhancements would be secured through a Habitat Management and Monitoring Plan as part of the Biodiversity Gain Plan which will be submitted to discharge the pre-commencement Biodiversity Gain Condition (Appendix B).

6.2.13 The River Wensum has not been included within the same Biodiversity metric as the other habitats and does not count towards the calculations. However, enhancement scenarios (detailed in Appendix D) have been tested within a separate toolkit to test meander restoration scenarios. The toolkit with details on enhancements are shown in Appendix H. As above, the baseline river units are shown in Section C1 - Site River Baseline and river units provided by the Proposed Scheme are shown in Section C3 Site River Enhancement.

6.2.14 The enhancements to the River Wensum are considered to contribute positively to the River Wensum Restoration Strategy (Natural England, 2009). This states an ambition to restore the river and return it to a favourable ecological condition, by restoring a measure of hydrological functioning so that it can sustain wildlife and fisheries characteristic of the river type.

6.2.15 The watercourse data and separate River Wensum data have both been copied into the Statutory Metric, included in Appendix J. The output from this shows a slightly higher result for watercourses compared to the Metric 3.1 calculations (12.99% to 17.04%) , and a slightly lower result for the separate River Wensum calculation (21.65% to 17.41%).

7 Conclusions

7.1.1 The Proposed Scheme has followed the mitigation hierarchy to avoid losses in biodiversity and achieve a positive outcome where possible for BNG. Extensive habitat survey work completed to inform the baseline allowed for an accurate appraisal of the Proposed Scheme. A continued influence in the design process allowed the requirements of BNG to be understood and reflected in the post-development landscape designs.

7.1.2 Creation and enhancement areas have been designed to mitigate and compensate for impacts within the Red Line Boundary. Where impacts on very high distinctiveness habitats, irreplaceable habitats and statutory sites (River Wensum SAC and SSSI) were unavoidable, bespoke strategies will be agreed to compensate for the loss, and these areas of impacts and associated compensation were excluded from the quantitative calculation following best practice.

7.1.3 The Proposed Scheme is predicted to achieve a quantifiable 10.97% BNG outcome for the non-excluded habitats. The Proposed Scheme complies with nine out of the ten Principles; however, it cannot comply with one of the principles as it cannot avoid the loss of veteran trees, an irreplaceable habitat.

7.1.4 A habitat management and monitoring plan would be submitted as part of the Biodiversity Gain Plan to discharge the biodiversity gain planning condition, to secure the habitat creation and management.

7.1.5 The BNG assessment has returned a Proposed Scheme biodiversity baseline of 1332.32AHBU, 83.58HBU, and 34.58RBU. Based on the Landscape Plans (Document Reference: 2.07.00) it has been predicted that the Proposed Scheme would result in an overall post-development value of 1478.50AHBU, 116.92 HBU and 39.07RBU overall, this results in a total net unit change of +146.18 (+10.97%) AHBU, +33.35 (39.90%) HBU, and +4.49 (12.99%) RBU.

7.1.6 The River Wensum has been assessed separately to the main BNG assessment through the HRA and a separate BM3.1 calculation, and this demonstrated a +3.01 (21.65%) net unit change in RBUs.

7.1.7 Copying the data into the Statutory Metric, following Defra guidance from December 2023, shows a similar level of net gain for all habitat types (Appendix J).

7.1.8 Opportunities to deliver river units within the Red Line Boundary have been identified, and these would be secured as part of the habitat management and monitoring plan which would be submitted to discharge the Biodiversity Gain Condition. These units would be achieved by proposals to enhance watercourses to improve their condition, removing artificial structures and restoring historic features. These enhancements would also contribute to WFD objectives and River Basin Management Plans, and also include bespoke measures for the River Wensum.

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