



The Sizewell C Project

9.6 Biodiversity Net Gain Report - Two Village Bypass

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BIODIVERSITY METRIC 2.0 CALCULATIONS – TWO VILLAGE BYPASS – 2021 DESIGN UPDATES

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EXECUTIVE SUMMARY

Arcadis Consulting (UK) Limited has been commissioned on behalf of SZC Co., to undertake an update of the Biodiversity Metric 2.0 (BM 2.0) calculations of the Two Village Bypass due to recent design changes.

Under the proposals for the Two Village Bypass site it is estimated that there is a predicted decrease in biodiversity unit values for habitats of 8.27%, an increase in hedgerow unit values of 65.15% and no change in river units. The reduction in habitat units is driven by the loss of floodplain grassland habitat adjacent to the River Alde. The large increase in hedgerow units is largely due to the quantity of on-site hedgerows approximately doubling from 3.79km in the baseline to a predicted 7.90km.

In addition to the Two Village Bypass, the Main Development Site (and a series of other off-site associated developments (AD sites) were also assessed via the BM 2.0 (Sizewell Link Road and Yoxford Roundabout) and these assessments are presented in separate reports. These sites were chosen for assessment via the metric as they are permanent developments which have potential for permanent habitat loss (the other AD sites will be returned to their baseline states post construction). When considered as a whole there is predicted to be an approximate 19% increase in biodiversity units across the Main Development Site and three associated developments. The achievement of these units scores is reliant upon achieving the target condition for created habitats.

An increase in area is predicted for the most valuable habitats on the site; grassland and woodland and forest. An increase in the biodiversity unit value of grassland is also predicted. Cropland is predicted to undergo reductions in area and unit value. The approach taken to the assessment of the floodplain grassland habitats results in either an increase or decrease in overall biodiversity units within the scheme, depending on whether they are assessed as higher or lower distinctiveness habitats.

1 INTRODUCTION

1.1 Overview

1.1.1 Arcadis Consulting (UK) Limited has been commissioned on behalf of SZC Co., to update the Biodiversity Metric 2.0 (BM 2.0) calculations carried out for the Two Village Bypass at **Volume 5 Chapter 7, Annex 7-4 [APP-426]** of the **Sizewell C Project Environmental Statement (ES)**. The update was required due to changes to the red line boundary and design.

1.1.2 The Two Village Bypass will comprise a new bypass road around Stratford St Andrew and Farnham. The red line boundary is presented in **Plate 1** of this document. Two other associated developments (AD sites) and the Main Development Site were assessed via the BM 2.0, presented in separate reports. These sites were chosen for assessment via the metric as they will be permanent and have the potential for permanent habitat loss (the other AD sites will be returned to their baseline states post construction). In addition to the Two Village Bypass these other assessed associated developments are:

- A permanent road linking the A12 to the Sizewell C Main Development Site (referred to as 'Sizewell ink road') to alleviate traffic from the B1122 through Theberton and Middleton Moor; and
- Permanent highway improvements at the junction of the A12 and B1122 east of Yoxford (referred to as the 'Yoxford Roundabout' (Yoxford)).

1.1.3 Updated Reports are provided for the Main Development Site ('Biodiversity Metric 2.0 Calculations – Main Development Site – 2021 design updates') and the two AD sites listed above ('Biodiversity Metric 2.0 Calculations – Sizewell Link Road – 2021 design updates' and 'Biodiversity Metric 2.0 Calculations – Yoxford Roundabout – 2021 design updates'), which supersede those presented as **Volume 2, Chapter 14 Appendix 14E [APP-266]**, **Volume 6, Chapter 7 [APP-462]**, **Annex 7-4, Volume 07, Chapter 7, Annex 7-4 [APP-495]** of the **ES**.

Plate 1: Aerial imagery of the site and redline boundary



1.2 Site overview

1.2.1 The proposed development site is approximately 12km inland from the east coast of Suffolk. The site, presented in **Plate 1** and in **Figure 1** of this document, comprises intensively managed arable fields with small areas of heavily grazed semi-improved grassland, species-poor semi-improved floodplain grassland and interspersed patches of tall ruderal and scattered scrub. The arable fields are bounded by fences and hedgerows. Several woodland blocks are present, within and adjacent to the site. No designated sites are present within the site, however, Foxburrow Wood County Wildlife Site (CWS) an area of ancient woodland is located immediately adjacent to the east of the site.

1.3 Proposed scheme

1.3.2 The proposed development, shown in **Figures 5.2.2 – 5.2.5** of this document, would comprise a new single carriageway road, approximately 2.4km in length. The proposed route of the Two Village Bypass would be 7.3 metres (m) in width, with additional 1m hardstrips and 2.5m grassed verges. Swales approximately 3-3.5m wide would also be provided along the earthworks for the length of the proposed route of the Two Village Bypass for highway drainage. The upgraded or new side roads off the Two Village Bypass would be approximately 6m in width and are sufficient in width such that laybys would not be required for vehicles to pass one another.

1.4 Changes to the scheme

1.4.1 Two changes to the red line boundary have been proposed comprising a small increase near the centre of the site and changes to an access route in the east of the site. Changes are also proposed around the soft and built estate within the red line boundary.

1.5 Biodiversity Targets

1.5.1 This report has been prepared in response to SZC Co., government and stakeholder interest around quantifying biodiversity. Defra (Department for Environment Food and Rural Affairs) has presented their intentions for biodiversity, in their summary of responses to the biodiversity net gain consultations published in July 2019 (Defra, 2019).

1.5.2 A requirement to commit to a 10% increase in biodiversity units to achieve net gain for new developments is likely to be mandated through the upcoming Environment Bill (the bill is currently in the reporting stage in the House of Commons), with exemptions made for Nationally Significant Infrastructure Projects (NSIPs).

1.5.3 The scope of this report and analysis is to present the biodiversity unit change due to the proposed development. The ecological impacts and associated mitigation to ensure legislative and policy compliance are presented in the **Sizewell C Project ES (Volume 5, Chapter 7 [APP-425])** and its associated documents and as updated by the **ES addendum [AS-184]**.

2 METHODOLOGY

2.1 Biodiversity metric 2.0

2.1.1 The purpose of this document is to evaluate the potential of the proposed development to achieve biodiversity net gain. This approach utilises information on the habitats and features of the site before and after the Development to calculate a biodiversity value, utilising this information to calculate a change in the biodiversity value of the Outline Planning Area (OPA).

2.1.2 This report supersedes one provided in the application (**Volume 5, Chapter 7 Appendix 7A [APP-426]**) of the **ES** and is provided to account for updated red line boundaries, provide greater clarity around assumptions and justifications and to reflect comments made by Natural England and others on the earlier report. It had originally been intended to update the assessments to use an updated Biodiversity Metric but a delay in the release of that metric means that has not yet been possible.

2.1.3 The calculations were therefore undertaken using the Biodiversity Metric 2.0 issued by Defra and Natural England (details can be found at Crosher et al., 2019 a and b) a spreadsheet-based tool into which data can be entered to carry out biodiversity net gain calculations. The version used for these calculations is that released in December 2019. The calculations were carried out using the same methodology as those within the ES, with the exception of where updated guidance has been provided (Natural England, 2020). Such instances are made clear in the relevant sections below.

2.1.4 When considering baseline conditions, the metric takes account of several factors, detailed below. The numbers in brackets show the multipliers used by the metric for each category.

- Habitat type;
- Size of habitat parcel;
- The distinctiveness of the habitat type
 - Value predetermined for each habitat type on a scale of Very Low (0), Low (2), Medium (4), High (6) and Very High (8).
 - Distinctiveness considers the rarity of the habitat, the amount of the percentage of habitat protected in SSSIs, the UK Priority Habitat Status and the European Red List Categories for the habitat.
- The condition of each habitat parcel;

- Value assigned based on a scale of Poor (1), Fairly Poor (1.5), Moderate (2), Fairly Good (2.5) and Good (3). For some habitat types this is pre-determined.
- Condition sheets (provided in Crosher et al., 2019b) were used where possible to assess the condition.
- How ecologically connected the parcels are; and
 - Value assigned based on a scale of Low (1), Medium (1.1) and High (1.15).
- Whether the parcels are in locations identified as local nature priorities.
 - Value assigned based on a scale of Low (1), Medium (1.1) and High (1.15) strategic importance.

2.1.5 Data is entered into the metric under the UK habitat classification typologies. Baseline data was largely collected under Phase 1 Habitat survey typologies. A conversion was carried out using a table within the tool and using the guidance document produced by UK Habitat Classification Working Group (2018).

2.1.6 The following resources were used to inform the assessment:

- **Sizewell C Project Environmental Statement - Volume 6 Chapter 7, Technical Appendix Baseline 7A: Annex 7A.4: Biodiversity Metric Calculations – Two Village Bypass** [[APP-426](#)];
- **Sizewell C Project – Environmental Statement Volume 6 Chapter 7, Technical Appendix Baseline 7A: Annex 7A.3: Primary Data** [[APP-426](#)];
- Aerial imagery (Google Earth, 2020);
- MAGIC (2020) mapping;
- **Sizewell C Project – Environmental Statement Addendum Volume 2 Chapter 5 – Two Village Bypass** [[AS-184](#)]; and
- **Vegetation Clearance and Retention Plans - Environmental Statement Addendum Volume 2 Chapter 5 figures 5.2.6 and 5.2.7** [[AS-197](#)].

2.2 Unit calculation

2.2.1 To calculate the biodiversity units of the site as a whole, the unit for each of the habitat types is calculated and then multiplied by the size of this habitat, with a connectivity factor included (as described within Crosher et al., (2019a)). The unit

number is based upon the habitat’s distinctiveness, condition, ecological connectivity and strategic significance. For non-linear habitats, such as woodland or grassland, the area of the habitat is used to assess its size, whereas length is used for linear habitats, such as hedgerows and rivers. The biodiversity unit numbers of area-based habitats and linear hedgerows and/or rivers are separate and cannot be summed. As such they should be evaluated separately. Area based habitats and hedgerows are largely assessed in the same way and any differences are highlighted below.

2.2.2 This section describes how this proxy unit for biodiversity has been applied to the existing ‘before’ habitats and the proposed ‘after’ (post-intervention) habitats. Full details of the BM 2.0 can be found in Crosher et al. (2019a and b).

a) Habitat size

2.2.3 The size of the different habitats was calculated in GIS. The area taken up by scattered trees throughout the site was calculated by inputting the number of scattered trees into the ‘Street Tree Helper Tool’, included in the Biodiversity Metric 2.0 calculation tool. Medium size was selected for all these trees based on on-site observations.

b) Habitat distinctiveness

2.2.4 The metric assigns a pre-defined distinctiveness band to each of the habitats and linear features.

i. Area based habitats

2.2.5 As detailed in Crosher et al. (2019a), this is assessment is based upon “species richness, rarity (at local, regional, national and international scales), and the degree to which a habitat supports species rarely found in other habitats”. **Table 1** of this document, below, provides detail of the bandings to which each area-based habitat is assigned.

Table 1: Area based habitat distinctiveness valuation bandings

Distinctiveness band	Multiplier	Typical habitats
Very High	8	Priority habitats as defined in Section 41 of the Natural Environment and Rural Communities (NERC) Act (HMSO, 2006) that are highly threatened, internationally scarce and require conservation action e.g. blanket bog
High	6	Priority habitats as defined in Section 41 of the NERC Act (HMSO, 2006) requiring conservation action e.g. lowland fens

Distinctiveness band	Multiplier	Typical habitats
Medium	4	Semi-natural habitats not classed as a Priority Habitat
Low	2	Habitat of low biodiversity value. Temporary grass and clover ley; intensive orchard; rhododendron scrub
Very low	0	Little or no biodiversity value e.g. hard standing or sealed surface

ii. Hedgerows and lines of trees.

2.2.6

The distinctiveness of hedgerows and lines of trees is based upon their physical structure, the woody species composition and any association with physical features, such as banks and ditches. An assessment of ground flora is not included within the metric. **Table 2** of this document, below, details the distinctiveness categories of each of the types of hedgerows and line of trees. Guidance is not provided on how “Line of trees” should be differentiated from “Line of trees (ecologically valuable)”. It was assumed that non-native and ornamental lines of trees were considered not to constitute ecologically valuable lines of trees. Further detail is provided in Crosher et al. (2019a).

Table 2: Hedgerow distinctiveness categories and multipliers

Associated features	Woody plant structural composition				
	Species rich hedgerow (inc. hedgerow with trees)	Native species hedgerow	Other hedgerow (ornamental / non-native species)	Line of trees (ecologically valuable)	Line of trees
Associated earth bank or ditch	High 6	Medium 4	Low 2	Medium 4	Low 2
None	Medium 4	Low 2	Very Low 1	Medium 4	Low 2

c) Habitat condition assessment

2.2.7

The condition of the habitat is defined as: “the biological ‘working-order’ of a habitat type judged against the perceived ecological optimum state for that particular habitat.” (Crosher et al., 2019b). This provides a measure of variation in the quality of areas of the same habitat type.

i. Area based habitats

2.2.8 A habitat condition assessment sheet is provided for each habitat type within Crosher et al. (2019b), which should be used to assign each habitat parcel to each of the categories detailed in **Table 3** of this document, below. Each condition sheet is composed of a list of pass/fail criteria. The ratio of ‘passes’ to ‘fails’ is used to determine the habitat condition.

Table 3: Condition bandings for the habitats on the site

Category	Multiplier
Good	3
Fairly good	2.5
Moderate	2
Fairly poor	1.5
Poor	1
N/A – Agriculture	1
N/A – other	0

ii. Hedgerows

2.2.9 A single condition sheet is provided for hedgerows, although lines of trees have a separate sheet. Both of these can be found in Crosher et al. (2019a), along with the pass/fail ratios for both types of linear feature. The condition categories and multipliers are the same as shown in **Table 3** of this document, below, but ‘fairly good’ and ‘fairly poor’ are not options.

d) Ecological connectivity assessment

2.2.10 Version 2.0 of the metric included a valuation of ‘ecological connectivity’. The connectivity factor relates to the relationship of a “particular habitat patch to other surrounding similar or related semi-natural habitats facilitating flows of species and ecosystem services” (Crosher et al., 2019b). Increased connectivity with the surrounding area corresponded to a higher value for the ecological connectivity factor. Higher habitat connectivity increases the value of a habitat, all else being equal. For example, a well-connected area of woodland will likely have a higher biodiversity than an equivalent, unconnected woodland. However, in the Biodiversity

Metric 2.0 - Beta Test: Summary Consultation Response (Natural England, 2020) the decision was taken to fix connectivity at Low (x1 multiplier) for all habitats until the metric is next reviewed. Therefore, the connectivity applied to all habitats identified on site was set at Low (1x multiplier).

e) Strategic significance assessment

2.2.11 Strategic significance assesses the value of habitats from the point of view of environmental objectives and preferred locations for biodiversity. Local and national policy was reviewed to quantify the strategic significance of each habitat area. **Table 4** of this document, based upon Table 5-5 in Crosher et al. (2019a), was used to assist with this assessment.

Table 4: Strategic significance categories and multipliers

Category	Description	Multiplier
High	Within area formally identified in local strategy	1.15
Medium	Location ecologically desirable but not in local strategy	1.1
Low	Area/compensation not in local strategy/ no local strategy	1

2.3 Baseline calculations

2.3.1 The number of biodiversity units provided by each habitat currently within the proposed development site is calculated by multiplying the values for Distinctiveness, Condition, Connectivity, Strategic location and the size of each habitat in hectares (ha). Hedgerows are evaluated in the same way, but base upon their length (in km), rather than area. This value represents the baseline condition of the site, in terms of biodiversity units. Further detail can be found in Crosher et al. (2019a and b). **Appendix 7A** of the **ES [APP-426]**, satellite imagery (Google Earth, 2020), and MAGIC (2020) were used to inform these baseline calculations.

2.4 Post-development calculations

2.4.1 The site is then reassessed for the post-development conditions that will be present after the landscape treatments are implemented. The number of biodiversity units provided by each habitat within the proposed development site is calculated in the same way as the baseline habitats, but with the additional multipliers detailed in **Table 6** of this document. Further detail regarding these multipliers is presented in **Section 2.5** of this document. Post-development plans provided by the client were used to inform post-development calculations.

Table 5: Risk components included in post-developments calculations

Risk factor	Description
Difficulty of creating or restoring a habitat	A standard score based on how difficult the habitat type is to create.
Temporal risk	A standard score based on how long the habitat type takes to establish.

2.4.2 The following sources were used to assess the on-site conditions after the landscape treatments are implemented:

- Illustrative Masterplan of Sizewell Link Road (**Figures 5.2.2.- 5.2.5** of this document)

2.5 Post-Development delivery risks

a) Difficulty of creating or restoring a habitat

2.5.1 This 'risk' relates to the difficulty of the habitat restoration or recreation. There are four bands from Low difficulty, to Very high difficulty, with the value multiplier shown below in **Table 6** of this document, below.

Table 6: Difficulty categories and multiplier

Category	Multiplier
Very high	0.1
High	0.33
Medium	0.67
Low	1

2.5.2 There is also different terminology and different treatment for the mechanism by which habitat are created. For example, different biodiversity change scenarios carry different levels of risk and the multipliers are applied differently to reflect this. Three distinct biodiversity habitat change scenarios are recognised in the biodiversity metric 2.0:

- **Habitat creation.** Where one habitat type is replaced by another or the habitat is destroyed (e.g. by development works) and the same habitat is recreated.
- **Habitat enhancement** of an existing habitat to improve its distinctiveness and / or condition. An example of restoration would be the transformation of a derelict chalk grassland dominated by scrub and coarse grasses to a

continuous area of chalk grassland with isolated woody species and an abundance of fine-leaved grasses.

- **Accelerated habitat succession.** This recognises that certain interventions are comparable with ecological succession processes which result in a more distinctive habitat type (for example, grassland changing into scrub and ultimately woodland). The biodiversity value of the original habitat is not abruptly lost, but gradually changes as the new habitat type emerges. Accelerated succession interventions are subject to 'trading down' principles. Accelerated succession is a purposeful sustained intervention and it is envisaged that there are a limited number of situations where this would apply. For example, the planting of an existing grassland with thorny shrubs to facilitate natural tree regeneration to establish a woodland without removing the grassland.

2.5.3 Habitat creation and accelerate succession have the greatest risk, while enhancement carries less risk. It should be noted that accelerated succession is not recognised as an option for hedgerows.

b) Temporal risk

2.5.4 Many factors influence how long a habitat takes to go from the point of creation or restoration to the desired end point condition. Factors are often site dependent but can include soil nutrient status, soil types and pH, site preparation, climate and the neighbouring habitats and species matrix available to colonise the new or restored habitat. The timeframe is also resource dependent. With sufficient time and money most habitats can be recreated more rapidly but allowing a more gradual process may be more beneficial to wildlife in the longer term.

2.5.5 For the purposes of the Defra Biodiversity Metric 2.0 average time estimates need to be used, accepting that there will be variation from this central estimation. For example, some sites will take longer, where conditions are more nutrient enriched or higher altitude or north facing. Average estimates of the time to target condition were largely expert driven and build upon the considerations that shaped judgements of the difficulty to create or restore a habitat. They were additionally informed by field experience, industry case studies and a body of practical experience. The time to target condition varies between 0 and greater than 32 years, with 0 years having a multiplier of 1. The multiplier decreases by 3.5% per year.

c) Spatial risk

2.5.6 A separate risk multiplier is applied to post-development sites outside of the Main Development Site. This incentivizes the utilisation of sites nearby to the development, for ecological and social reasons. Sites within the same local planning authority area (LPA) or National Character Area (NCA), it is deemed sufficiently

close to address ecological and social concerns. Higher multipliers are assigned to more distant sites, as shown in **Table 7** of this document, below.

Table 7: Off-site risk categories (LPA – local planning authority area, NCA – National Character Area)

Category	Multiplier
Compensation inside LPA or NCA of impact site.	1
Compensation outside LPA or NCA of impact site but in neighbouring LPA or NCA.	0.75
Compensation outside LPA or NCA of impact site and beyond neighbouring LPA or NCA.	0.5

This multiplier does not apply to the calculations carried out here as no off-site areas were included.

2.6 River assessment

2.6.1 River units are calculated in the same manner as area and hedgerow units, combining distinctiveness, condition, connectivity and strategic significance. The River Alde is present in the west of the site. As outlined within the BM 2.0 User Guide (Crosher et al., 2019a), in instances where impacts to the river are avoided, a low risk condition assessment can be made. In such cases, moderate condition is assumed in the baseline and post-development state.

2.6.2 Several other mapped watercourses are present within the site. These were all of an agricultural ditch character and professional judgement was used to determine the most appropriate way to classify and assess these areas. Details of these assessments is presented in **Section 3** of this document.

2.7 ‘Pseudo’ double counting areas

2.7.1 The total area input into the tool can be greater than the total area of the site. This is due to the three-dimensional nature of certain habitats. For example, the area covered by a tree is approximately the area covered by its canopy, but if an area of grassland is underneath, both should be included in the metric. As such the area under the tree is ‘counted’ twice and can result in the area in the metric being larger than the area of the site.

2.8 Calculation of gains or losses

2.8.1 The net change in biodiversity or hedgerow units on and off-site is calculated within the tool by subtracting the baseline units from the post-development units. The overall net change is the sum of the change in units on-site and off-site. The

percentage net gain is then calculated by dividing this overall net change by the number of baseline units on the site, as shown in the equation below:

$$\text{overall percentage net gain} = \frac{\text{change in units on site} + \text{change in units off site}}{\text{baseline units on site}} \times 100$$

2.8.2 A positive value indicates a net gain has been made and a negative value indicates a net loss has been made.

2.9 Changes in broad habitat type calculations

2.9.1 The UK habitat classification system is hierarchical in structure, so specific habitat types can be grouped into broad habitat types. The changes in area and biodiversity units associated with each of these broad habitat types was calculated using the baseline and post-development data.

2.10 Areas excluded from the assessment

2.10.1 The metric is not designed to assess impacts to habitats within statutory designated sites or “irreplaceable” habitats, as defined in Baker et al. (2019). There are no irreplaceable habitats, such as ancient woodland, or statutory designated sites present on the proposed development.

2.11 Assumptions and limitations

2.11.1 The following assumptions, were made to complete the assessment:

- The difficulty factors applied currently significantly reduce units calculations for habitats such as acid grassland, calcareous grassland and heathland, resulting in a lower overall unit values when attempting to create or enhance to these habitats. In the Main Development Site dry acid grassland is a large component of the target community and has resulted in such a unit reduction. The habitat assessments in BM 2.0 may be amended in the future with the release of BM 3.0 to more evenly weight these units.
- Arcadis have used third party data as part of the assessments of the post-development and off-site habitats.
- Assumptions on the condition of the baseline habitats are inferred from existing data. No specific surveys or assessments were undertaken.
- The tool released by Natural England for assessing ecological connectivity was released in December 2019, but it was found to be non-functional. As such in the Biodiversity Metric 2.0 - Beta Test: Summary Consultation Response

(Natural England, 2020) the decision was taken to fix connectivity at Low (x1 multiplier) for all habitats until the metric is next reviewed.

- Baseline data was largely collected in the format of a Phase 1 Habitat Survey, but a conversion was required to UK habitat classification typology to enter this data into the metric.

2.11.2 It is not considered that these assumptions introduce a level of uncertainty into the assessment that would affect the veracity of the assumptions.

3 BIODIVERSITY CHANGE RESULTING FROM EXISTING PLANS

3.1 Baseline conditions and valuation

3.1.1 The Two Village Bypass is approximately 55ha in area. This section describes each of the habitats on site, shown in **Figure 1** of this document. Codes utilised in this section are those from the JNCC Phase 1 Habitat Survey Handbook (JNCC, 2010). **Table 10** of this document details the UK habitat classification types used in the Defra Metric 2.0 and how they relate to the Phase 1 Habitat Types. Also presented are the valuations of the condition, ecological connectivity and strategic significance of each habitat type. The baseline currently delivers 160.61 biodiversity units for habitats. When data was entered into the tool, some of the habitat parcels were divided up for the purposes of data handling.

3.1.2 Rivers and hedgerows are assessed separately to area-based habitats by the metric. Rivers are assessed in **Table 11** of this document, which follows the same format as **Table 10** of this document, but details length rather than areas of habitat. The current baseline delivers 7.87 river units.

3.1.3 Hedgerows are assessed in **Table 11** of this document, which also details lengths of hedgerows, rather than areas of habitat. The baseline currently delivers 28.41 hedgerow units from 3.78km of hedgerows.

a) Changes to site boundary

3.1.4 A number of minor changes to the site boundary and designs of the Two Village Bypass site have been introduced since the previous Biodiversity Net Gain report (Volume 05 Annex 7-4). These changes are outlined below in **Table 8** of this document, below:

Table 8: Proposed changes to Two Village Bypass site boundary

Proposed Change (since last BNG assessment conducted)	Baseline Habitat	Post-Development Habitat
It is proposed to expand the scheme boundary to the west of the existing access road which will join the Two Village Bypass at the proposed 'north-west staggered junction'. The additional land would be to the north of the bypass, on the eastern side of Nuttery Belt woodland	The proposed change expands the red line boundary to include a further 245m ² of woodland and some arable field	This habitat would be replaced by grassed areas and hedgerow

Proposed Change (since last BNG assessment conducted)	Baseline Habitat	Post-Development Habitat
Changes to the public right of way PRoW E-243/011/0 are also proposed. This involves expanding the scheme boundary to formalise this public right of way	The public right of way follows a track through arable field	This public right of way would be replaced by a permanent public right of way

b) Habitat typology and condition

3.1.5 The following habitats are present on site:

i. Semi-natural broad-leaved woodland

Habitat Typology

3.1.6 Four areas of semi-natural broad-leaved woodland are present within the site boundary: Nuttery Belt, Whin Covert, The Belt and an unnamed small copse at the intersection of Friday Street and the A12. The “Woodland and forest - Lowland mixed deciduous woodland” typology was applied.

Condition

3.1.7 The woodlands are all relatively young and comprised mainly native species such as Beech (*Fagus sylvatica*), Hazel (*Corylus avellana*) and Field Maple (*Acer campestre*). Locally a well-developed ground-layer with species such as Dog’s Mercury (*Mercurialis perennis*) and Bluebell (*Hyacinthoides non-scripta*). The age structure is not diverse enough to classify the woods as good condition, but the precautionary method was used and fairly good condition was selected.

ii. Scattered broad-leaved trees

Habitat Typology

3.1.8 There are a number of scattered broad-leaved trees present on site. Species include Ash (*Fraxinus excelsior*), Pedunculate Oak (*Quercus robur*), Elm (*Ulmus sp.*) and Field Maple. The “Woodland and forest - Wood-pasture and parkland” typology was applied to the area containing these trees.

Condition

3.1.9 The condition was assessed as being Good for mature trees (mostly Pedunculate Oaks) and as moderate for younger and semi-mature trees.

iii. Scattered coniferous trees

Habitat Typology

- 3.1.10 The “Woodland and forest - Other coniferous woodland” typology was the most appropriate method of assessing scattered coniferous trees. This is supported by guidance within the BM 2.0.

Condition

- 3.1.11 The scattered semi-mature trees do not form a woodland and as such poor condition was applied.

iv. Dense scrub

Habitat Typology

- 3.1.12 A small area of dense bramble scrub is present next to an existing highway. The “Heathland and shrub – Bramble scrub” typology was applied to this habitat.

Condition

- 3.1.13 A condition score of poor was applied to this habitat, as this non-woody scrub failed all of the condition criteria.

v. Scattered scrub

Habitat Typology

- 3.1.14 There are 17 patches of scattered scrub throughout the site, mainly located in field margins. The scattered scrub mainly comprised Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Bramble (*Rubus fruticosus* agg.). Scattered scrub was assessed as a part of the habitat it was present in, e.g. grassland or ruderal habitat.

Condition

- 3.1.15 Scattered scrub was assessed as a part of the habitat it was present in, e.g. grassland or ruderal habitat and the condition of scattered scrub as an independent habitat type was not assessed.

vi. Introduced shrub

Habitat Typology

- 3.1.16 A small area of Cherry Laurel (*Prunus laurocerasus*) is present to the south of a woodland block to the east of the River Alde. This aligns with the “Urban – introduced shrub” typology. The total area of this habitat is less than 0.004h and as the Biodiversity Metric 2.0 Calculation Tool uses areas with only two decimal points this habitat was inserted into the Calculation Tool as 0.00h.

Condition

- 3.1.17 This habitat typology has a pre-defined condition of poor assigned by the metric.

vii. Tall ruderal

Habitat Typology

- 3.1.18 This habitat comprised common ruderal species such as Common Nettle (*Urtica dioica*) and Alexanders (*Smyrniololium olusatrum*). The “Sparsely vegetated land - Ruderal/Ephemeral” typology was applied.

Condition

- 3.1.19 Ruderal habitats can be of low or moderate condition depending on how biodiverse they are. The areas of ruderal are dominated by Common Nettle and other common species, such as Cow Parsley (*Anthriscus sylvestris*), Cleavers (*Galium aparine*), Docks (*Rumex* spp.) and Willowherbs (*Epilobium* spp.). The diversity in these areas is low, so poor condition was applied.

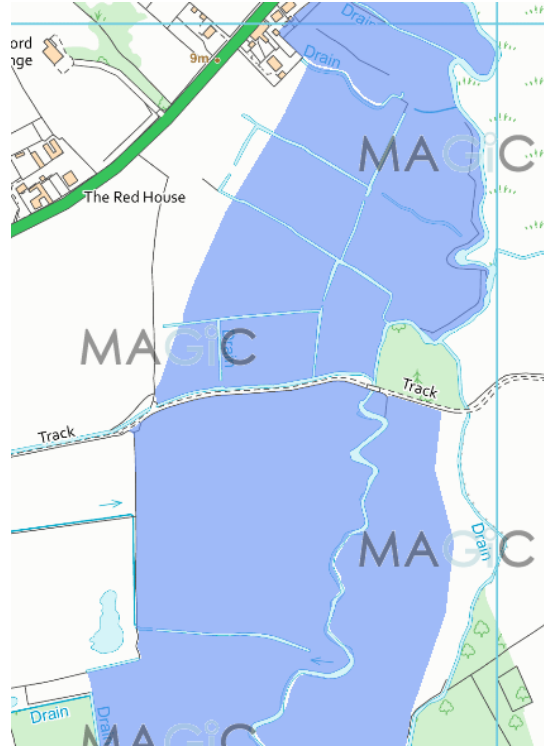
viii. Improved and semi-improved grassland

- 3.1.20 Two areas of grassland are present in the west of the site, adjacent to the River Alde. The southern pair of fields were assessed as improved grassland and the northern field was assessed as poor semi-improved grassland in the Phase 1 habitat survey.

- 3.1.21 A further area of poor semi-improved grassland is present in the north-east of the site. This agricultural grassland was assessed as aligning with the ‘Grassland – Modified grassland’ typology. The agricultural nature of this area and extensive bare ground means this habitat was assessed as being of poor condition.

- 3.1.22 A proportion of the fields either side of the River Alde are listed as Coastal and Floodplain Grazing Marsh (CFGM) in the Priority Habitat Inventory (PHI) (Magic, 2021). This is shown below in **Plate 2**, in blue.

Plate 2: Coastal and Floodplain Grazing Marsh (blue areas) in the Priority Habitat Inventory (MAGIC, 2021)



3.1.23 CFGM is defined as follows within the UK BAP (JNCC, 2008):

“Grazing marsh is defined as periodically inundated pasture, or meadow with ditches which maintain the water levels, containing standing brackish or fresh water. The ditches are especially rich in plants and invertebrates. Almost all areas are grazed and some are cut for hay or silage. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities, but not extensive areas of tall fen species like reeds; although they may abut with fen and reed swamp communities.”

3.1.24 This habitat is predominantly defined by the hydrology, aquatic or marginal aquatic diversity and location of the site, rather than the terrestrial species present. The definition also highlights the value of this habitat for breeding waders.

3.1.25 An NVC survey was carried out of the area in June 2019. This found the grassland to align with the MG7 *Lolium perenne* - *Trifolium repens* community and is typical of a highly improved agricultural pasture. The grassland comprised abundant Perennial Rye-grass (*Lolium perenne*) and White Clover (*Trifolium repens*). The species present are shown in **Table 9** of this document with a DAFOR assessment of their abundance.

Table 9: Species present within MG7 NVC community

Scientific Name	Common Name	DAFOR ¹
<i>Lolium perenne</i>	Perennial Rye-grass	A
<i>Bromus hordeaceus</i>	Common Soft-brome	O
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	O
<i>Dactylis glomerata</i>	Cock's-foot	O
<i>Trifolium repens</i>	White Clover	O
<i>Alopecurus pratensis</i>	Meadow Foxtail	R
<i>Rumex obtusifolius</i>	Broad-leaved Dock	R
<i>Heracleum sphondylium</i>	Hogweed	R
<i>Taraxacum officinale</i> agg.	Dandelion	R
<i>Cirsium arvense</i>	Creeping Thistle	R LA

3.1.26 These species present are not indicative of regular inundation. The areas are heavily grazed and/or cut, resulting in the short and low diversity sward present, as can be seen in **Plate 3** and **Plate 4** of this document.

¹ DAFOR (Ref. 2) – Dominant, Abundant, Frequent, Occasional and Rare. 'L' denotes 'Locally' in the case of LD, LA, etc.

Plate 3: Typical grassland sward within floodplain area



Plate 4: View of northern grassland field, with ditch in centre



- 3.1.27 Within the UK habitat classification system, this community would be assessed as modified grassland, with the secondary code 25 (Coastal and floodplain grazing marsh). However, the BM2.0 utilises an altered version of the UK habitat classification system, in which some secondary codes can be used as primary habitats. The technical supplement guides the assessment of areas of CFGM within the PHI as ‘Grassland - Floodplain Wetland Mosaic (CFGM)’.
- 3.1.28 The fields present are of low diversity and the species make up indicates infrequent inundation. The NVC survey of the River Alde found the S14 *Sparganium erectum* swamp community to dominate, while the bankside was dominated by tall ruderal species including False Oat-grass (*Arrhenatherum elatius*), Common Nettle, Dock species, Reed canary-grass (*Phalaris arundinacea*) and Common Reed (*Phragmites australis*), with many areas having a thick layer of dead leaf litter. Two NVC communities were recorded within the ditches in the northern field: S7 - *Carex acutiformis* community and M23 - *Juncus effusus/acutiflorus*. The ditches were shallow with little water present and evidence of poaching was recorded. The vegetation present within the S7 *Carex acutiformis* community comprised abundant Lesser Pond-sedge (*Carex acutiformis*). Other species associated with this community such as Soft-rush (*Juncus effusus*) and Water Mint (*Mentha aquatica*) were also present, albeit at lower frequencies. However, this community is degraded with other common species such as *Juncus* species. The vegetation present within the M23 - *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture community was dominated by Hard Rush (*Juncus inflexus*) however, other species such as Soft Rush associated with this community were also present in abundance. There is therefore evidence of higher diversity associated with the water courses, but they would not be classified as “especially rich” as described within the priority habitat definition (this can be seen in **Plate 4** of this document).
- 3.1.29 A breeding bird survey was carried out in 2019 of the site. A single snipe was identified within these fields, indicating they do not have a high value to breeding waders.
- 3.1.30 In light of the information outlined above, the areas marked as CFGM within the PHI are classified as ‘Grassland - Floodplain Wetland Mosaic (CFGM)’. The areas of these fields beyond the CFGM extent are classified as ‘modified grassland’, due to their drier nature and species-poor communities. The areas of CFGM is assessed as being of poor condition, as it is evidently highly degraded, as outlined above. The wetland condition sheet guides the assessment of improved grassland swards as being of poor condition. Similarly, the ‘modified grassland’ is also assessed as being of poor condition due to its low diversity and agricultural character.

ix. Amenity grassland

Habitat Typology

- 3.1.31 One area of amenity grassland is present in the northeast part of the site, south of Friday Street. The typology “Urban – Amenity Grassland” was applied.

Condition

- 3.1.32 The habitat comprised of a species-poor, short-mown lawn that fit the criteria to be assigned of poor condition.

x. Arable

Habitat Typology

- 3.1.33 This habitat comprises the areas of arable land, the most common Phase 1 habitat on site. Crops comprise mostly cereals and as such the “Cropland – Cereal crops” typology was applied.

Condition

- 3.1.34 This habitat typology has a pre-defined condition set to N/A – Agricultural.

iv. Hardstanding

Habitat Typology

- 3.1.35 This habitat covers the existing roads. The “Urban - Developed land; sealed surface” typology was applied.

Condition

- 3.1.36 This habitat typology has a pre-defined condition set to N/A – Other.

xii. Ditch

Habitat Typology

- 3.1.37 Several ditches containing a small amount of standing water are present on site. The habitat typology “Lakes- Ditches” was applied to these habitats. A width of 1m was assumed.

Condition

3.1.38 These ditches were nearly dry and not botanically diverse. Therefore, they were assigned a condition score of poor.

a) River typology and condition

i. River Alde

3.1.39 No significant negative impacts on the watercourse is expected as a clear span bridge is proposed. Construction impacts will be prevented through the implementation of appropriate construction phase management plans. The land either side of the river is currently used as intensive grazing pasture, resulting in a short, species-poor sward and poaching of banks. Existing tracks can be seen through these areas, where cattle have been moved around the site. Post-development, the 2.95ha area of land adjacent to the river, around the bridge crossing will be managed more sympathetically, with reduced grazing pressure, targeting a more species rich sward and reducing the negative impacts from the presence of cattle. As such, the most appropriate method of assessing this feature is to consider the river and the terrestrial elements separately. The water course typology and condition are assessed below. The terrestrial elements are assessed within **Section 3.1** of this document as coastal and floodplain grazing marsh.

Habitat Typology

3.1.40 The River Alde is present towards the western extent of the site, running north to south. The river is slow flowing, with earth banks and emergent vegetation and scattered trees along its banks. This stretch of the river is not canalised and flows between areas of improved and semi-improved grassland grazed by cattle. Physical naturalness was scored a 3. Although the river does meander, certain sections within the site boundary seem to have been at least slightly straightened.

3.1.41 Hydrological naturalness was scored a 3. The river is impacted by discharge and agricultural runoff from the ditches it is connected to.

3.1.42 Chemical naturalness was scored a 4. The Catchment Data Explorer from the Environment Agency shows that the section of the River Alde, between its source near Brundish to where it merges with the River Ore, failed the assessments for two priority hazardous substances: polybrominated diphenyl ethers (PBDE) and mercury and its compounds in 2019. Previous assessments. It also shows high levels of phosphates and ammonia and the level of dissolved oxygen is low. As such this section of the river was scored as Moderate for the ecology assessment and a Fail in the chemical assessment by the Environment Agency.

3.1.43 Biological naturalness was scored a two. The only criterion for this seems to be the absence of invasive species. No invasive plant species were noted in the river or along its banks. No specific surveys have been undertaken to confirm the presence of non-native crayfish but none were found during the aquatic invertebrate sampling in 2019. Surveys in 2019 record the presence of water voles, otters (**ES Vol. 5, Chapter 7, App 7A, Annex 7A3**) and the aquatic invertebrate fauna of the river was of 'high conservation value' (**ES Vol. 5, Chapter 7**).

3.1.44 As such the "Rivers - Class 2 or 3 -River Naturalness Assessment" typology was applied.

Condition

3.1.45 As outlined above negative impacts to the River Alde are not predicted and are scoped out. As such a low-risk condition assessment approach was therefore taken. Moderate condition was therefore assumed for the baseline and post-development states.

c) Hedgerow typology and condition

3.1.46 Further details regarding the hedgerows can be found in **Chapter 7 Annex 7A** of the **Environmental Statement**.

i. Defunct species-poor hedgerow

Habitat Typology

3.1.47 The "Native Hedgerow" or "Native Hedgerow - Associated with bank or ditch" habitat typologies were applied to the hedgerows categorised as "defunct species poor" depending on associated bank/ditch features or lack thereof.

Condition

3.1.48 These hedgerows were assessed as poor condition as they failed the hedge base gaps, hedge canopy continuity, height, and current damage criterion, due to them being 'defunct'.

ii. Defunct species-rich hedgerow

Habitat Typology

3.1.49 There is one defunct species rich hedgerow on site. The "Native Species Rich Hedgerow with trees" typology was applied as it contained trees.

Condition

- 3.1.50 A moderate condition assessment was assigned, as it failed the assessment criteria related to hedge base gaps and hedge canopy continuity criterion due to being 'defunct' and thus aligns with a moderate assessment.

iii. Hedge with trees species-poor

Habitat Typology

- 3.1.51 The "Native Hedgerow with trees" typology was assigned to hedgerows categorised as 'Species poor hedgerow with trees'.

Condition

- 3.1.52 These hedgerows were assigned a condition score of moderate as a precautionary approach as they likely met the majority of the hedgerow criteria.

iv. Hedge with trees native species-rich

Habitat Typology

- 3.1.53 The "Native Species Rich Hedgerow with trees" or "Native Species Rich Hedgerow with trees - Associated with bank or ditch" typologies were applied to these hedgerows depending on associated bank/ditch features or lack thereof.

Condition

- 3.1.54 These hedgerows were assigned a condition score of good as they likely met the majority of the criteria laid out in the hedgerow assessment.

v. Intact hedge species-poor

Habitat Typology

- 3.1.55 These are mainly small sections of hedgerow at the end of other types of hedgerow. The habitat typology "Native Hedgerow" was applied.

Condition

- 3.1.56 A precautionary condition score of moderate was assigned to these hedgerows.

vi. Intact native species-rich hedge

Habitat Typology

- 3.1.57 The habitat typology of “Native Species Rich Hedgerow - Associated with bank or ditch” was assigned to both the intact native species rich hedge on site.

Condition

- 3.1.58 A condition score of good was assigned to the hedgerow due to their high level of biodiversity and assessment as ‘important’ according to the Hedgerow regulations 1997.

d) **Strategic significance**

- 3.1.59 No habitats within the scheme boundary fall within a statutory or non-statutory designated site for nature conservation and therefore no parcels receive a significance score of ‘Within area formally identified in local strategy’. Several habitat types are regarded as a priority habitats in local plans and thus receive a score of ‘Location ecologically desirable but not in local strategy’. These habitats are lowland mixed deciduous woodland, coastal and floodplain grazing marsh and all hedgerow habitats. All other habitat types receive a strategic significance score of ‘Area/compensation not in local strategy/ no local strategy’.

Table 10: Baseline biodiversity units for areas of habitat within the Sizewell C Two Village Bypass site, detailing the Phase 1 habitat and UK habitat conversions

Phase 1 habitat type	UK habs/ broad habitat	UK habs/habitat type	Area (ha)	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Habitat units
Semi-natural broad-leaved woodland	Woodland and forest	Lowland mixed deciduous woodland	0.79	High	Fairly good	Low	Location ecologically desirable but not in local strategy	13.04
Scattered broad-leaved trees	Woodland and forest	Wood-pasture and parkland	0.32	High	Moderate	Low	Area/compensation not in local strategy/ no local strategy	3.82
Scattered broad-leaved trees	Woodland and forest	Wood-pasture and parkland	0.01	High	Good	Low	Area/compensation not in local strategy/ no local strategy	0.18
Scattered coniferous trees	Woodland and forest	Other coniferous woodland	0.01	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	0.02
Dense scrub	Heathland and shrub	Bramble scrub	0.04	Medium	Poor	Low	Area/compensation not in local strategy/ no local strategy	0.16
Introduced shrub	Urban	Introduced shrub	0.00	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	0.00
Tall ruderal	Sparsely vegetated land	Ruderal/ephemeral	0.68	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	1.36
Improved and semi-improved grassland	Grassland	Modified grassland	3.54	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	7.08

Phase 1 habitat type	UK habs/ broad habitat	UK habs/habitat type	Area (ha)	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Habitat units
Improved and semi-improved grassland	Grassland	Floodplain Wetland Mosaic (CFGM)	9.32	High	Poor	Low	Location ecologically desirable but not in local strategy	61.51
Amenity grassland	Urban	Amenity grassland	0.36	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	0.72
Arable	Cropland	Cereal crops	36.13	Low	N/A - agricultural	Low	Area/compensation not in local strategy/ no local strategy	72.26
Hardstanding	Urban	Developed land; sealed surface	3.92	V. low	N/A – other	Low	Area/compensation not in local strategy/ no local strategy	0.00
Ditch	Lakes	Ditches	0.11	Medium	Poor	Low	Area/compensation not in local strategy/ no local strategy	0.44
Totals			55.23					160.61

Table 11 Baseline river units for areas of habitat within the Sizewell C Two Village Bypass site, detailing the Phase 1 habitat and UK habitat conversion

Phase 1 habitat type	River type	Length (km)	Distinctiveness	Condition	Ecological connectivity	Strategic significance	River units
River	Class 2 or 3 -River Naturalness Assessment	0.38	High	Moderate	Low	Within Catchment Plans	7.87

Table 12: Baseline hedgerow units for hedgerows within Sizewell C Two Village Bypass site, detailing the Phase 1 habitat and UK habitat conversions

Phase 1 habitat type	Hedgerow type	Length (km)	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Hedgerow units
Defunct species-poor hedgerow	Native hedgerow	1.008	Low	Poor	Low	Location ecologically desirable but not in local strategy	2.22
Intact hedge species-poor	Native hedgerow	0.605	Low	Moderate	Low	Location ecologically desirable but not in local strategy	2.66
Defunct species-poor hedgerow	Native Hedgerow - Associated with bank or ditch	0.066	Medium	Poor	Low	Location ecologically desirable but not in local strategy	0.29
Hedge with trees species-poor	Native Hedgerow with trees	0.661	Low	Moderate	Low	Location ecologically desirable but not in local strategy	2.91
Intact native species-rich hedge	Native Species Rich Hedgerow - Associated with bank or ditch	0.199	High	Good	Low	Location ecologically desirable but not in local strategy	3.96

Phase 1 habitat type	Hedgerow type	Length (km)	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Hedgerow units
Defunct species-rich hedgerow;	Native Species Rich Hedgerow with trees	0.221	Medium	Moderate	Low	Location ecologically desirable but not in local strategy	1.94
Hedge with trees native species-rich	Native Species Rich Hedgerow with trees	0.879	Medium	Good	Low	Location ecologically desirable but not in local strategy	11.61
Hedge with trees native species-rich	Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.143	High	Good	Low	Location ecologically desirable but not in local strategy	2.84
Total		3.78					28.41

3.2 Post-construction habitat conditions and valuation

3.2.1 The illustrative masterplan, shown in **Figures 5.2.2 – 5.2.5** of this document, was used as the basis for these calculations.

3.2.2 The sources used to assess the biodiversity value of each of these habitat compartments are presented in Section 2.4.

3.2.3 The on-site post development biodiversity units total 147.32, representing a decrease of 13.28 biodiversity units from the baseline 160.61 units. This is an 8.27% decrease. Further details of the biodiversity units delivered is presented in **Table 13** of this document.

3.2.4 As the River Alde is not affected by the development and river units will be unchanged from the 7.87 baseline river units.

3.2.5 A total of 64.92 hedgerow units would be delivered from 7.90km of hedgerows post-development from a baseline of 28.41 hedgerow units resulting in an increase of 18.51 units. This is a 65.15% increase. Further details of the hedgerow units delivered is presented in **Table 14** of this document.

a) Changes to the post-construction plan

3.2.6 Minor changes are proposed to the precise extents of the soft and built estate typologies from the typologies presented in the previous Two Village Bypass net gain report (**Volume 5, Chapter 7, Annex 7-4 [APP-426]** of the **ES**). The key change is in the 'Indicative floodplain grassland mitigation area' which comprises an area of retained grassland of 2.95 ha around the River Alde crossing. In this area increased species richness in the grassland sward will be targeted [[AS-263](#)].

b) Retained Habitats

3.2.7 The following habitats will either be fully or partially retained within the scheme:

i. Lakes – Ditches

3.2.8 Two dry ditches are partially retained by the scheme. Neither of these ditches were botanically diverse and thus align with the poor condition assessment criteria.

ii. Woodland and forest – Lowland mixed deciduous woodland

3.2.9 Some areas of lowland mixed deciduous woodland habitat are partially retained by the scheme. These are small areas spread over the site made up of relatively diverse tree species and understory. This habitat largely aligned with the good habitat

condition assessment and this area was assessed as being in fairly good condition in line with its baseline assessment.

iii. **Woodland and forest – Wood-pasture and parkland**

3.2.10 Several scattered trees will be retained during the development. These are assessed as in the baseline.

iv. **River Alde**

3.2.11 The River Alde will be protected during construction and will be retained in its baseline state.

c) **Retained Hedgerows**

i. **Native Hedgerow**

3.2.12 Native hedgerows are being retained on site. These hedgerows are assigned a condition score of moderate in line with their baseline assessment.

ii. **Native Hedgerow with trees**

3.2.13 Native hedgerow with trees is present on site and will be retained. This was assessed as being in moderate condition in line with its baseline assessment.

iii. **Native Species Rich Hedgerow with trees**

3.2.14 Native species rich hedgerow with trees is present on site and will be retained. This was assessed as being in good condition in line with its baseline assessment.

iv. **Native Species Rich Hedgerow with trees – Associated with bank or ditch**

3.2.15 Native species rich hedgerow with trees associated with a bank or ditch are present on site and will be retained. This was assessed as being in good condition in line with its baseline assessment.

d) **Reinstated Habitats**

i. **Cropland - Cereal crops**

3.2.16 Some areas of arable field will be lost in construction and then later reinstated. Cropland has a pre-assigned condition in the metric of “N/A- Agricultural”.

ii. Flood compensation areas

3.2.17 If used, these areas will be lost during the construction phase. The habitats present in the baseline will be re-instated to their baseline typologies and conditions i.e. 'Cropland - Cereal crops', 'Grassland - Floodplain Wetland Mosaic (CFGM)' and 'Grassland - Modified grassland'.

iii. Grassland – Modified grassland

3.2.18 Several areas of modified grassland outside of the flood compensation areas would be reinstated. This habitat will be returned to its baseline condition of poor.

iv. Heathland and shrub – Bramble scrub

3.2.19 A small area of bramble scrub will be lost to the development. This habitat will not be actively recreated, but it is likely that they will develop in the long term at the field edge. To reflect this, this typology is included in the post-development state. As in the baseline, the habitat is assessed as being of poor condition.

v. Sparsely vegetated land – Ruderal/Ephemeral

3.2.20 Some areas of tall ruderal habitat will be lost in construction. These habitats will not be actively recreated, but it is likely that they will develop in the long term within an agricultural landscape, for example at field edges. To reflect this, this typology is included in the post-development state. Conditions are assumed to be the same as the baseline conditions: i.e. poor.

vi. Urban – Amenity grassland

3.2.21 An area of amenity grassland will be lost in construction and then partially reinstated. This habitat will be returned to its baseline condition of poor.

vii. Woodland and forest – Lowland mixed deciduous woodland

3.2.22 Small areas of lowland mixed deciduous woodland habitat will be lost and then reinstated within the scheme. Reinstated habitat will target baseline typologies and condition, i.e. Lowland mixed deciduous woodland of fairly good condition.

e) Created Habitats

i. Proposed planting

3.2.23 New areas of woodland would be established through planting. The new woodlands would buffer and link existing areas of woodland within the site, as well as provide visual screening, and would be predominantly native broadleaved with a small component of mixed woodland (to increase climate change resilience). It would have

structural and species diversity, and management would be aimed at enhancing biodiversity value. These areas are largely relatively small areas adjacent to the road. As such, it is unlikely that a more distinctive typology than 'Other woodland; broadleaved' is achievable. As these areas will be managed for biodiversity value, good condition is considered to be achievable.

3.2.24 New areas of scattered trees are proposed around some road junctions and infiltration basins in order to provide a transition between broadleaved woodland and grassland. The trees would be native broadleaved, with species diversity, and management would be aimed at enhancing biodiversity value. These trees are assessed in the same manner as the baseline. Their broadleaved character mean they area predicted to align with the 'Woodland and forest - Wood-pasture and parkland' typology. Biodiversity will be targetted and it is assumed that the trees will be allowed to mature and as such are assessed of being of good condition (following the approach for the baseline).

ii. **Grassed embankments/cuttings**

3.2.25 Grassed embankments will be created along the road. These are assigned the habitat typology 'Grasslands – modified grassland'. They have been assigned poor condition as it was thought that due to the habitat's location so close to the highway and likely frequent mowing throughout the year, a higher score is unlikely to be achieved.

iii. **Grassed Areas**

3.2.26 Following completion of construction, those sections of the post-construction area comprising clay soils (to the west of the River Alde) would be seeded to create species rich grassland, that is neutral semi-improved grassland. There would be different end use requirements dependant on specific locations of the grassland e.g. around infiltration basins and swales or at created ponds. The grassland would comprise a native species mix including the following grass species: Crested Dog's-tail (*Cynosurus cristatus*), Quaking-grass (*Briza media*), Sweet Vernal-grass (*Anthoxanthum odoratum*), Yellow Oat-grass (*Trisetum flavescens*), Red Fescue (*Festuca rubra*) and Common Bent (*Agrostis capillaris*). Forb species would include the following: Common Knapweed (*Centaurea nigra*) Oxeye Daisy (*Leucanthemum vulgare*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Lady's Bedstraw (*Galium verum*), Common Sorrel (*Rumex acetosa*), Meadow Vetchling (*Lathyrus pratensis*), Meadow Buttercup (*Ranunculus acris*), Ribwort Plantain (*Plantago lanceolata*), Cowslip (*Primula veris*) and Cat's-ear (*Hypochaeris radicata*). This grassland is predicted to align with the 'other neutral grassland' typology. Positive habitat creation and management would allow good condition to be achieved.

3.2.27 Those sections of the alignment which sit on free draining acid soils would be seeded to create species-rich grassland, that is semi-improved acid grasslands. The

grassland would comprise a native species mix including the following grass species: Sheep's Fescue (*Festuca ovina*), Slender Red Fescue (*Festuca rubra* subsp. *litoralis*), Common Bent, Crested Dog's-tail, Sweet Vernal Grass and Wavy Hair-grass (*Avenella flexuosa*). Forb species would include the following: Yarrow (*Achillea millefolium*), Autumn Hawkbit (*Scorzoneroides autumnalis*) Common Knapweed, Ribwort Plantain, Lady's Bedstraw, Cat's-ear, Common Bird's-foot-trefoil, Meadow Buttercup, Ragged-Robin (*Silene flos-cuculi*), Common Sorrel, Sheep's Sorrel (*Rumex acetosella*), Devil's-bit Scabious (*Succisa pratensis*) and Tufted Vetch (*Vicia cracca*). This grassland is predicted to align with the 'other lowland acid grassland' typology. Positive habitat creation and management would allow good condition to be achieved.

iv. **Hardstanding**

- 3.2.28 Areas of hardstanding relating to the highway and associated tracks will be created. This is assigned the habitat typology of 'developed land; sealed surface'. This habitat type has a pre-determined condition score of 'N/A- Other' assigned by the metric. This typology returns no biodiversity units, so to simplify the calculations, it is assumed that all hardstanding is lost and replaced.

v. **Infiltration basin**

- 3.2.29 Three infiltration basins will be created within the scheme. These are assigned the 'Urban – Sustainable urban drainage feature'. This is predicted to achieve a condition score of good as it will be planted and managed with ecological requirements in mind and is likely to be a good example of this kind of habitat in a more natural context than this typology is normally found.

vi. **Swale**

- 3.2.30 Bioswales will be created along the much of the road. Targeting moderate condition is considered to be appropriate, balancing ambitious targets while remaining realistic given the drainage element of these areas is the overriding priority.

vii. **Floodplain grassland mitigation areas**

- 3.2.31 The grassland adjacent to the River Alde crossing within the site boundary would be enhanced to create floodplain grassland to mitigate for the loss of improved floodplain grassland during construction. The existing floodplain grassland within this area is of low value, comprising predominantly a sown agricultural ley of perennial ryegrass and the focus would be on the creation of higher quality habitats, through improving the diversity of the grassland sward [[AS-263](#)]
- 3.2.32 . This habitat is predicted to align with the 'Grassland - Floodplain Wetland Mosaic (CFGM)' and moderate condition is considered to be achievable.

viii. Ponds

- 3.2.33 Approximately four new wildlife-friendly ponds will be created on site for net gain purposes. A precautionary approach has been taken, by which it is assumed that the ponds will not achieve priority habitat quality and are therefore predicted to align with the 'Ponds (Non- Priority Habitat)' typology. It is expected that the ponds created and managed primarily for biodiversity purposes will achieve good condition, Key condition criteria related to the presence of native species, absence of invasive species, allowance for water levels to fluctuate and water quality are largely expected to be met.

ix. Tracks

- 3.2.34 Several tracks will be created. These are expected to be bare ground areas. These are expected to be areas of bare earth. As such, they are predicted to align with the 'Vacant/derelict land/ bareground' typology. They are expected to fail all of the condition criteria and therefore are predicted to be of poor condition.

f) River typology and condition

- 3.2.35 Impacts to the River Alde have been scoped out, as appropriate construction phase management plans will prevent negative impacts to the River Alde and riparian zone (see **Section 3.1** of this document, above). As such, a low-risk condition assessment approach was taken, wherein the habitat is retained at the baseline status (i.e. 'Rivers - Class 2 or 3 -River Naturalness Assessment' of moderate condition).

g) Created Hedges

i. Proposed hedge

- 3.2.36 Hedges are proposed within the soft estate along the edges of the site and will contain native species and be species rich. It is assumed that the hedges will be managed to allow some emergent trees to become established. The majority of these hedges are located adjacent to a bioswale and are therefore associated with a bank or ditch. These are predicted to align with the 'Native Species Rich Hedgerow with trees - Associated with bank or ditch' typology. Those not adjacent to such a bioswale are predicted to align with the 'Native Species Rich Hedgerow with trees' typology.
- 3.2.37 Many of these hedges will border agricultural land, so a precautionary approach was taken to predicted condition of these two hedge typologies. Targeting moderate condition is considered appropriate, balancing ambitious targets while remaining realistic.

h) Strategic significance

- 3.2.38 The strategic significance is assessed as in the baseline. No habitats within the scheme boundary fall within a statutory or non-statutory designated site for nature conservation and therefore no parcels receive a significance score of 'Within area formally identified in local strategy'. Several habitat types are regarded as a priority habitats in local plans and thus receive a score of 'Location ecologically desirable but not in local strategy'. These habitats are lowland mixed deciduous woodland, coastal and floodplain grazing marsh and all hedgerow habitats. All other habitat types receive a strategic significance score of 'Area/compensation not in local strategy/ no local strategy'.

Table 13: Biodiversity units for Sizewell C Two Village Bypass from habitats post-development

Habitat type*	UK habs/ broad habitat	UK habs/habitat type	Area (ha)	Habitat scenario for creation	Distinctiven ess	Condition	Ecological connectivity	Strategic significance	Time to target condition	Difficulty	Biodiversity units
Ditches	Lakes	Ditches	0.07	Retained	Medium	Poor	Low	Area/compen sation not in local strategy/ no local strategy	N/A	N/A	0.28
Semi-natural broadleaved woodland	Woodland and forest	Lowland mixed deciduous woodland	0.21	Retained	High	Fairly Good	Low	Location ecologically desirable but not in local strategy	N/A	N/A	3.47
Scattered broadleaved trees	Woodland and forest	Wood-pasture and parkland	0.13	Retained	High	Moderate	Low	Area/compen sation not in local strategy/ no local strategy	N/A	N/A	1.56
Arable*	Cropland	Cereal crops	17.87	Reinstated	Low	N/A - Agricultural	Low	Area/compen sation not in local strategy/ no local strategy	1	Low	34.49

NOT PROTECTIVELY MARKED

Habitat type*	UK habs/ broad habitat	UK habs/habitat type	Area (ha)	Habitat scenario for creation	Distinctiven ess	Condition	Ecological connectivity	Strategic significance	Time to target condition	Difficulty	Biodiversity units
Flood compensation areas	Grassland	Modified grassland	2.33	Reinstated	Low	Poor	Low	Area/compen sation not in local strategy/ no local strategy	1	Low	4.50
Poor semi-improved grassland	Grassland	Modified grassland	0.8	Reinstated	Low	Poor	Low	Area/compen sation not in local strategy/ no local strategy	1	Low	1.66
Dense scrub	Heathland and shrub	Bramble scrub	0.04	Reinstated	Medium	Poor	Low	Area/compen sation not in local strategy/ no local strategy	1	Low	0.15
Tall ruderal	Sparsely vegetated	Ephemeral/ruderal	0.28	Reinstated	Low	Poor	Low	Area/compen sation not in local strategy/ no local strategy	1	Low	0.54
Amenity grassland	Urban	Amenity grassland	0.24	Reinstated	Low	Poor	Low	Area/compen sation not in local strategy/	1	Low	0.46

NOT PROTECTIVELY MARKED

Habitat type*	UK habs/ broad habitat	UK habs/habitat type	Area (ha)	Habitat scenario for creation	Distinctiven ess	Condition	Ecological connectivity	Strategic significance	Time to target condition	Difficulty	Biodiversity units
								no local strategy			
Semi-natural broadleaved woodland	Woodland and forest	Lowland mixed deciduous woodland	0.01	Reinstated	High	Fairly good	Low	Location ecologically desirable but not in local strategy	32+	High	0.02
Proposed planting	Woodland and forest	Other woodland; broadleaved	2.06	Created	Medium	Good	Low	Area/compen sation not in local strategy/ no local strategy	32+	Medium	5.30
Proposed planting	Woodland and forest	Wood-pasture and parkland	0.23	Created	High	Good	Low	Area/compen sation not in local strategy/ no local strategy	32+	V. High	0.13
Grassed embankment/ cuttings	Grassland	Modified grassland	7.49	Created	Low	Poor	Low	Area/compen sation not in local strategy/ no local strategy	1	Low	14.46

NOT PROTECTIVELY MARKED

Habitat type*	UK habs/ broad habitat	UK habs/habitat type	Area (ha)	Habitat scenario for creation	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Time to target condition	Difficulty	Biodiversity units
Grassed areas	Grassland	Other neutral grassland	3.16	Created	Medium	Good	Low	Area/compensation not in local strategy/ no local strategy	15	Low	22.22
Grassed areas	Grassland	Other lowland acid grassland	5.51	Created	Medium	Good	Low	Area/compensation not in local strategy/ no local strategy	15	Low	38.75
Hardstanding	Urban	Developed land; sealed surface	5.93	Created	V. Low	N/A – Other	Low	Area/compensation not in local strategy/ no local strategy	1	Low	0.00
Infiltration basin	Urban	Sustainable urban drainage feature	0.97	Created	Low	Good	Low	Area/compensation not in local strategy/ no local strategy	5	Medium	3.26
Swale	Urban	Bioswale	1.39	Created	Low	Moderate	Low	Area/compensation not in local strategy/	1	Medium	3.59

NOT PROTECTIVELY MARKED

Habitat type*	UK habs/ broad habitat	UK habs/habitat type	Area (ha)	Habitat scenario for creation	Distinctiven ess	Condition	Ecological connectivity	Strategic significance	Time to target condition	Difficulty	Biodiversity units
								no local strategy			
Floodplain mitigation areas***	Grassland	Floodplain Wetland Mosaic (CFGM)	2.95	Reinstated/cr eated	High	Moderate	Low	Location ecologically desirable but not in local strategy	20	High	6.30
Floodplain compensation areas***	Grassland	Floodplain Wetland Mosaic (CFGM)	3.03	Reinstated/cr eated	High	Poor	Low	Location ecologically desirable but not in local strategy	10	High	4.62
Ponds	Lakes	Ponds (Non - Priority Habitat)	0.05	Created	High	Good	Low	Area/compen sation not in local strategy/ no local strategy	5	Low	0.75
Tracks	Urban	Vacant/ derelict land/ bare ground	0.42	Created	Low	Poor	Low	Area/compen sation not in local strategy/ no local strategy	1	Low	0.81
Totals			55.23								147.33

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- *Habitats from the post-development plans (shown in **Figures 5.2.2 – 5.2.5** of this document) that are differ from Phase 1 typologies.
 - **Area includes cropland area from floodplain compensation area.
 - ***Area given reflects all areas that are down as the UK Habs habitat type 'Grassland – Floodplain Wetland Mosaic (CFGM)'.

Table 14: Hedgerow units for Sizewell C Two Village Bypass from hedgerows post-development

Hedgerow type	Length (km)	Scenario for creation	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Time to target condition	Difficulty	Hedgerow units
Native Hedgerow	0.541	Retained	Low	Poor	Low	Location ecologically desirable but not in local strategy	N/A	N/A	1.19
Native Hedgerow	0.554	Retained	Low	Moderate	Low	Location ecologically desirable but not in local strategy	N/A	N/A	2.44
Native Hedgerow with trees	0.611	Retained	Low	Moderate	Low	Location ecologically desirable but not in local strategy	N/A	N/A	2.69
Native Species Rich Hedgerow with trees	0.118	Retained	Medium	Moderate	Low	Location ecologically desirable but not in local strategy	N/A	N/A	1.04
Native Species Rich Hedgerow with trees	0.657	Retained	Medium	Good	Low	Location ecologically desirable but not in local strategy	N/A	N/A	8.68
Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.091	Retained	High	Good	Low	Location ecologically desirable but not in local strategy	N/A	N/A	1.81

Hedgerow type	Length (km)	Scenario for creation	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Time to target condition	Difficulty	Hedgerow units
Native Species Rich Hedgerow with trees	1.906	Created	Medium	Moderate	Low	Location ecologically desirable but not in local strategy	10	Moderate	7.87
Native Species Rich Hedgerow with trees - Associated with bank or ditch	3.425	Created	High	Moderate	Low	Location ecologically desirable but not in local strategy	10	Moderate	21.21
Total	7.90								46.92

3.3 Changes in broad habitat types

3.3.1 The development will result in changes to the amount and quality of the habitats on the site. The UK habitat classification system used within the metric contains a tiered system, grouping similar habitats into “Broad habitats” and more specific “Habitat types”. For example, “Grassland” is a “Broad habitat”, that can contain “Other lowland acid grassland” and “Other neutral grassland”, among others. The area and biodiversity unit changes in these broad habitat types are shown in **Table 15** and **Table 16** of this document, below.

3.3.2 The highest value habitats, woodland and forest and grassland would increase in area. Despite the increase in area, a reduction in the biodiversity units associated with woodland and forest is predicted. This is due to the penalty paid in the metric to create woodland as the habitat is difficult to create and takes time to develop. Cropland is considered to be the least valuable habitat and reductions in the area of cropland are predicted. An increase in the area and biodiversity units associated with lakes is predicted, due to the creation of new ponds. For the remaining habitats only small changes in area and units are predicted.

Table 15: The changes in the total areas of the broad habitat types

Broad habitat type	On-site baseline	On-site post-development	Change in area
Cropland	36.13	17.87	-18.26
Grassland	12.86	25.33	12.47
Heathland and shrub	0.04	0.04	0
Lakes	0.11	0.12	0.01
Sparsely vegetated land	0.68	0.28	-0.4
Urban	4.28	8.95	4.67
Woodland and forest	1.13	2.64	1.51

Table 16: The changes in the total biodiversity unit values of the broad habitat types

Broad habitat type	On-site baseline	On-site post-development	Change in biodiversity units
Cropland	72.26	34.49	-37.77
Grassland	68.59	92.51	23.92
Heathland and shrub	0.16	0.16	0
Lakes	0.44	0.93	0.49
Sparsely vegetated land	1.36	0.54	-0.82
Urban	0.72	8.12	7.4
Woodland and forest	17.08	10.48	-6.6

3.4 Areas excluded from assessment

3.4.1 No statutory designated sites or ‘irreplaceable’ habitats were present within the site, so no areas were excluded from the assessment.

4 SUMMARY

4.1 Summary

4.1.1 The summary results of the assessment, using the Biodiversity metric 2.0 calculator are presented in **Plate 5** of this document, below.

Plate 5: Summary results

On-site baseline	Habitat units	160.61
	Hedgerow units	28.41
	River units	7.87
On-site post-intervention (Including habitat retention, creation, enhancement & succession)	Habitat units	147.32
	Hedgerow units	46.92
	River units	7.87
Off-site baseline	Habitat units	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation, enhancement & succession)	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)	Habitat units	-13.28
	Hedgerow units	18.51
	River units	0.00
Total net % change (including all on-site & off-site habitat creation + retained habitats)	Habitat units	-8.27%
	Hedgerow units	65.15%
	River units	0.00%

4.1.2 Under current plans, an 8.27% decrease in area-based habitat biodiversity units and 65.15% increase in hedgerow units is predicted. No change in river units is predicted, as no significant impacts are predicted.

4.1.3 A decrease in biodiversity units is predicted, whereas the previous assessment (**Volume 05 Annex 7-4**) predicted an increase in biodiversity units. This is due to the changes made to the baseline calculations for habitats adjacent to the River Alde. This area has priority habitat status on MAGIC as Coastal and Floodplain Grazing Marsh although in reality botanically it does not match this status. The habitats were correctly assessed as being of low quality (*Lolium perenne* dominated improved pasture). However, in response to stakeholder feedback the precautionary approach was taken to reassess the habitats with a higher distinctiveness option, rather than the lower distinctiveness option had been applied previously (That is Floodplain Wetland Mosaic (CFGM) rather than modified grassland). This change of assumed distinctiveness results in an increase in the baseline biodiversity units and leads to a net reduction of overall units.

4.1.4 The changes in the area and biodiversity units of each broad habitat type are shown in **Table 17** of this document, below. Only cropland is predicted to undergo a large decrease in area. Grassland is predicted to show increases in both area and biodiversity units. The remaining habitats show small changes in areas and biodiversity units, with the exception of woodland and forest. This broad habitat type is predicted to show reductions in biodiversity unit values, despite a predicted increase in area. This is due to the penalty paid due to the difficulty of creating woodland. Cropland is considered to be the least valuable habitat and the largest losses are in cropland.

Table 17: Changes in area and biodiversity units of broad habitat types

Broad habitat type	Change in area	Change in biodiversity units
Cropland	-18.26	-37.77
Grassland	12.47	23.92
Heathland and shrub	0	0
Lakes	0.01	0.49
Sparsely vegetated land	-0.4	-0.82
Urban	4.67	7.4
Woodland and forest	1.51	-6.6

4.2 Impact of Floodplain Wetland Mosaic (CFGM) habitat

4.2.1 An assessment was carried out to assess the impact of assessing the habitats adjacent to the River Alde as 'Grassland - Floodplain Wetland Mosaic (CFGM)' habitat, as opposed to 'Grassland - Modified grassland'. For this assessment it was assumed that the baseline habitat was poor condition modified grassland, to reflect the low diversity pasture habitat present within this area. Post-development it was assumed that habitats would be returned to their baseline state of poor condition modified grassland. Under this scenario, a 24.66% increase in biodiversity units is predicted, representing a 29.50 biodiversity unit increase. This contrasts greatly with the 8.27% decrease in biodiversity units predicted when these habitats are assessed as CFGM as is presented above. This demonstrates the substantial impact that the classification of this habitat has on the overall biodiversity unit outcome of the assessment.

5 DEVELOPMENT OVERVIEW RESULTS

5.1 Results

5.1.1 The results of this assessment can be considered within the context of the overall Sizewell C development that has been assessed using the BM 2.0 (i.e. Main Development Site and three of the AD sites). The three AD sites were chosen for assessment via the metric as they are permanent and are have potential for permanent habitat loss. **Table 18** of this document, below, shows the changes in biodiversity units for each of these assessed elements. An increase of approximately 320 units is predicted across these Main Development Site and AD sites, corresponding to an approximate 19% increase in biodiversity units. This increase demonstrates that the portion of the development that has been assessed using the biodiversity metric, is predicted to have a positive impact on biodiversity value.

Table 18: Overview of entire development results

Site	Baseline units	Change in units	Percentage change
Main Development Site	1244.45	224.33	18.03%
Two Village Bypass	160.61	-13.28	-8.27%
Sizewell Link Road	240.96	109.92	45.62%
Yoxford Roundabout	5.84	-1.08	-18.48%
Net	1651.86	319.89	19.37%

6 CONCLUSION

6.1 Conclusion

- 6.1.1 Under current proposals it is estimated that for the Two Village Bypass there would be a predicted decrease in biodiversity unit values for habitats of 8.27%, an increase in hedgerow unit values of 65.15% and no change in river units. The reduction in habitat units is driven by the loss of habitat adjacent to the River Alde and the assumptions made around the designation of flood plain grasslands. The approach taken to the assessment of these habitats results in either an increase or decrease in overall biodiversity units within the scheme. The large increase in hedgerow units is largely due to the quantity of on-site hedgerows approximately doubling from 3.79km in the baseline to a predicted 7.90km.
- 6.1.2 In addition to the Two Village Bypass, the Main Development Site and a series of other off-site associated developments were also assessed via the BM 2.0 (Sizewell Link Road and Yoxford Roundabout) and these are presented in separate reports. These sites were chosen for assessment via the metric as they were considered to have potential for permanent habitat loss. When considered as a whole there is predicted to be an approximate 19% increase in biodiversity units across the Main Development Site and three associated developments.
- 6.1.3 An increase in area is predicted for the most valuable habitats on the site; grassland and woodland and forest. An increase in the biodiversity unit value of grassland is also predicted. Cropland is predicted to undergo reductions in area and unit value. The achievement of these units scores is reliant upon achieving the target condition for created habitats.
- 6.1.4 An increase in area is predicted for the most valuable habitats on the site; grassland and woodland and forest. An increase in the biodiversity unit value of grassland is also predicted. Cropland is predicted to undergo reductions in area and unit value. The approach taken to the assessment of the floodplain grassland habitats results in either an increase or decrease in overall biodiversity units within the scheme, depending on whether they are assessed as higher or lower distinctiveness habitats.

7 REFERENCES

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APPENDIX A: CHANGE TO TWO VILLAGE BYPASS RED LINE BOUNDARY

APPENDIX B: BASELINE PHASE 1 MAP (FIGURE 1)

APPENDIX C: OPERATIONAL MASTERPLANS (FIGURES 5.2.2 - 5.2.5)