



# The Sizewell C Project

## 9.7 Biodiversity Net Gain Report - Yoxford Roundabout

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# BIODIVERSITY METRIC 2.0 CALCULATIONS – YOXFORD ROUNDABOUT – 2021 DESIGN UPDATES

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## EXECUTIVE SUMMARY

Arcadis Consulting (UK) Limited has been commissioned on behalf of SZC Co., to undertake a biodiversity net gain assessment using the Biodiversity Metric 2.0 for the Yoxford Roundabout 'Associated Development' site. The report provides an update in light of the proposed changes to the red line boundary of the site and changes to the extents of proposed post-development typologies.

When considered in isolation it is estimated that at Yoxford Roundabout there would be a predicted decrease in biodiversity unit values of 1.08 units, and a decrease in hedgerow unit values of 0.84 units. However, Yoxford forms part of the wider Sizewell development and should be considered within this context.

In addition to Yoxford Roundabout, the main development site and two off-site associated developments (AD sites) were also assessed via BM 2.0 (specifically the Sizewell Link Road and Two Village Bypass) and these are presented in separate reports. These sites were chosen for assessment via the metric as they are permanent development which 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 AD sites. The achievement of these units scores is reliant upon achieving the target condition for created habitats.

The reduction in units at Yoxford Roundabout is due to the following factors. A decrease in the biodiversity unit value of the broad habitat type Woodland & Forest is predicted, despite increases in the area covered by this habitat. This is due to the risk multipliers associated with habitat creation (i.e. time for the habitat to develop and difficulty of habitat creation). Decreases the biodiversity unit value are predicted for the broad habitat types Grassland and Heathland & Scrub due to a reduction in area.

A decrease in the hedgerow unit value is predicted, despite an increase in total hedge length on the site. This is due to the risk multipliers associated with habitat creation (i.e. time for the habitat to develop and difficulty of habitat creation).

There is no potential for uplift of units on site due to the small development footprint (approximately 2.9ha). Instead this loss has been offset by bigger, better and more joined up habitat elsewhere within the wider Sizewell C Project.

## 1 INTRODUCTION

### 1.1 Overview

1.1.1 Arcadis Consulting (UK) Limited has been commissioned on behalf SZC Co., to update the Biodiversity Metric 2.0 (BM 2.0) calculations carried out for the Yoxford Roundabout (**Volume 7 Annex 7-4** of the **Sizewell C Project Environmental Statement (ES)** [[APP-495](#)]).

1.1.2 The Yoxford Roundabout (hereafter referred to as “the site”) will involve the construction of a new three-arm roundabout at the junction of the A12 and B1122, located to the east of Yoxford. The works would include realignment of the A12 and B1122. The red line boundary is shown in **Plate 1**. The other two 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. In addition to the Yoxford, the other AD sites are:

- A permanent road to bypass Stratford St Andrew and Farnham (referred to as the ‘Two Village Bypass’ (TVB)) to alleviate traffic on the A12 through the villages; and
- A permanent road linking the A12 to the Sizewell C main development site (referred to as ‘Sizewell Link Road’ (SLR)) to alleviate traffic from the B1122 through Theberton and Middleton Moor.

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 – Two Village Bypass – 2021 design updates’ and ‘Biodiversity Metric 2.0 Calculations – Sizewell link road – 2021 design updates’), which supersede those presented as **Volume 2, Chapter 14 Appendix 14E** [[APP-266](#)], **Volume 5, Chapter 7, 5 Annex 7-4** [[APP-426](#)], **Volume 6, Chapter 7, Annex 7-4** [[APP-462](#)] of the **ES**.

Plate 1: Aerial imagery of the site and redline boundary



## 1.2 Site overview

- 1.2.2 The site is approximately 8km to the west of the east coast of Suffolk and 6km to the north-west of the main development site. The site is predominantly comprised of species-poor semi-improved grassland used for pasture and bounded by fences and two hedgerows, as well the A12 and B1122. Roadside Nature Reserve 197 lies immediately adjacent to the southern edge of the site. This site has been designated due to the presence of the Sandy Stilt Puffball fungus (*Battarraea phalloides*), which is listed on Schedule 8 of the Wildlife and Countryside Act (1981, as amended) and are included on the Suffolk Priority habitats and species list (SBIS, 2015).

## 1.3 Proposed scheme

- 1.3.3 The proposed Yoxford Roundabout would be a three-arm roundabout and would replace the existing ghost island for this junction to the east of Yoxford. The roundabout would increase capacity of the existing A12 and B1122 junction to minimise disruption during the peak construction phase of the Sizewell C Project.
- 1.3.4 The new roundabout would be approximately 90m north of the existing junction, largely on grazing land adjacent to the existing A12. It would have a diameter of 60m

and would include a realignment of the A12 in order to connect to the roundabout. The A12 realignment would measure approximately 120m in length to the north and 160m to the south. The roundabout would be in a cutting of up to 2m to the east of the roundabout which becomes shallower where it ties-in to the B1122 to the south-east.

- 1.3.5 The B1122 would also be realigned to join the proposed A12 and B1122 Yoxford Roundabout via a new section of road which would cross the existing agricultural land in a north westerly direction to meet up with the proposed roundabout. The B1122 realignment would measure approximately 220m in length.
- 1.3.6 The new sections of the A12 leading in to the A12 and B1122 Yoxford Roundabout would be 7.3m in width, with the B1122 approach road 6m wide. All three of the approaches would flare to create additional width at their respective give way lines at the proposed A12/B1122 Yoxford roundabout.
- 1.3.7 As part of the works, a new access road, measuring approximately 75m in length, would be provided off the realigned B1122 to the south of the roundabout to maintain access to the row of houses south of the junction including Pinn's Piece and Rookery Lodge, as well as Public Right of Way (PRoW) E-584/020/0.
- 1.3.8 Between the roundabout and the southern access road there would be an infiltration basin.
- 1.3.9 Across the roundabout central island there would be a partially demountable section allowing for Abnormal Indivisible Loads (AILs) to pass through the Yoxford Roundabout. This is required as vehicles transporting AILs would be of a size that could not negotiate the roundabout.
- 1.3.10 The proposed Yoxford Roundabout would be retained following the completion of the Sizewell C main development site as a permanent replacement to the existing A12 and B1122 ghost island junction.

## 1.4 Changes to the scheme

- 1.4.4 The only proposed change is for this site is a minor reduction to the scheme boundary at land west of the northbound A12 is proposed due to a mapping/boundary discrepancy. This involves the removal of 0.0148 Ha of land from the scheme. The change to red line is shown in **Appendix A** of this document.

## 1.5 Biodiversity Targets

- 1.5.5 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).

- 1.5.6 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).
- 1.5.7 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 (ES Volume 7, Chapter 7)** and its associated documents and as updated by the **ES addendum [\[AS-186\]](#)**.

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## 2 METHODOLOGY

### 2.2 Biodiversity metric 2.0

2.2.1 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).

2.2.2 This report supersedes one provided in the application (**Volume 7, Chapter 7 Appendix 7A [APP-495]**) 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.

2.2.3 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.

2.2.4 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.

2.2.5 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).

## 2.3 Unit calculation

2.3.1 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.

2.3.2 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

2.3.3 The size of the different habitats was calculated in GIS. The baseline habitat data was provided by Swift Ecology Ltd using the Phase 1 habitat survey methodology as specified by the Handbook for Phase 1 Habitat Survey (JNCC 2010). The planned

post-construction habitats were supplied by BEA Landscape Design Ltd. The area taken up by scattered trees throughout the site was calculated by inputting the number of scattered trees identified by Swift Ecology Ltd. 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.

a) Habitat distinctiveness

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

i. Area based habitats

2.3.5 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
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. hardstanding or sealed surface

ii. Hedgerows and lines of trees.

2.3.6 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 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**

2.3.7 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**

2.3.8 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

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

ii. Hedgerows

2.3.9 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, but ‘fairly good’ and ‘fairly poor’ are not options.

d) Ecological connectivity assessment

2.3.10 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

2.3.11 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

## 2.4 Baseline calculations

2.4.1 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-495]**, satellite imagery (Google Earth, 2020), and MAGIC (2020) were used to inform these baseline calculations.

## 2.5 Post-development calculations

2.5.1 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 5**. Further detail regarding these multipliers is presented in **Section 2.6** 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.

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

- Illustrative Masterplan of Yoxford Roundabout (**Figure 2.1** of this document)
- **Vegetation Clearance Plan** [\[AS-132\]](#)

## 2.6 Post-Development delivery risks

a) Difficulty of creating or restoring a habitat

2.6.1 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

2.6.2 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.

2.6.3 **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.

2.6.4 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

2.6.5 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.

2.6.6 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

2.6.7 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

Category	Multiplier
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.

## 2.7 ‘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.

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## 2.11 Assumptions and limitations

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

- The difficulty factors applied currently significantly reduce unit 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.
- 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.
- 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

### 3.2 Baseline conditions and valuation

3.2.1 The proposed development is approximately 2.9ha in area. This section describes each of the habitats listed 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 8** 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 5.84 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.

3.2.2 Hedgerows are assessed separately to habitats by the metric. **Table 9** of this document follows the same format as **Table 8** of this document, but details hedgerows, rather than areas of habitat. The baseline currently delivers 2.55 hedgerow units from 0.29km of hedgerows.

#### a) Changes to the site boundary

3.2.3 A minor reduction to the scheme boundary at land west of the northbound A12 is proposed due to a mapping/boundary discrepancy. This involves the removal of 0.0148h of land from the scheme. The scheme boundary and proposed change is shown in **Appendix A** of this document.

#### b) Baseline Habitat typology and condition

3.2.4 The following habitats are present on site:

#### i. Semi-natural broadleaved woodland

##### Habitat Typology

3.2.5 An area of woodland is present in the west of the site. The woodland is likely to be of the 'Other woodland; broadleaved' typology, based upon assessments of desk-based resources. Adjacent woodland is listed as deciduous woodland on the Priority Habitat Inventory (Magic, 2021), however the 'Other woodland; broadleaved' typology is considered to accurately reflect the quality of this thin strip of woodland.

### Condition

- 3.2.6 A precautionary approach was taken to the condition assessment of this woodland habitat, and moderate condition was assumed. Due to the size and location of the woodland good condition was considered to be unlikely. Anthropogenic impacts are clear as trees have been cut back to prevent encroachment over the adjacent footpath and road. Sufficient species richness (3 tree and shrub species per 10m radius) is considered unlikely although poor condition would be an underestimate, as the area is not dominated by non-native species or have a clear planting pattern (condition sheet guidance for poor condition).

#### ii. Dense/continuous scrub

### Habitat Typology

- 3.2.7 An area of bramble scrub is located north of Middleton Road. The “Heathland and shrub – Bramble scrub” typology was applied.

### Condition

- 3.2.8 The area of scrub contains only one species and seems to get regularly mown inhibiting its development. It seems to be made up of one or several bramble plants of a similar age class. As such poor condition is applied.

#### iii. Scattered broadleaved trees

### Habitat Typology

- 3.2.9 Several scattered broadleaved trees are situated along the roads including Lime (*Tilia* sp.), Hawthorn (*Crataegus monogyna*) and Poplar (*Populus* sp.). The “Woodland and forest - Wood-pasture and parkland” typology was applied.

### Condition

- 3.2.10 The condition was assessed as being moderate for the younger and semi-mature trees. No mature trees are present.

#### iv. Scattered coniferous trees

### Habitat Typology

- 3.2.11 Three scattered coniferous trees are present in the southeast corner of the site. The “Woodland and forest - Other coniferous woodland” typology was applied.

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#### Condition

- 3.2.12 The scattered trees do not form a proper woodland and are semi-mature. As such moderate condition was applied.

v. Species-poor semi-improved grassland

#### Habitat Typology

- 3.2.13 Much of the site comprises a pasture field. This habitat was assessed as species-poor semi-improved grassland in which Perennial Rye-grass (*Lolium perenne*) and Yorkshire-fog (*Holcus lanatus*) dominate. The “Grassland – Modified grassland” typology was therefore appropriate.

- 3.2.14 Grassland is also present on verges around the existing roads and is considered to be species-poor semi-improved grassland w. The “Grassland – Modified grassland” typology was therefore appropriate.

#### Condition

- 3.2.15 Due to the agricultural nature of the pasture habitat and the low number of species, poor condition was applied.

- 3.2.16 A precautionary approach was taken to the condition assessment of the road verge grassland areas, and moderate condition was assumed.

vi. Bracken

#### Habitat Typology

- 3.2.17 This area comprises a small area of Bracken (*Pteridium aquilinum*) along Middleton Road. The “Grassland – Bracken” typology was applied.

#### Condition

- 3.2.18 As this patch of habitat comprised solely bracken and was not an important Bracken stand with a rich understorey, poor condition was selected,

vii. Hardstanding

#### Habitat Typology

- 3.2.19 This habitat covers the existing roads and footpaths. These areas align with the “Urban - Developed land; sealed surface” typology.

#### Condition

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

#### c) Hedgerow typology and condition

##### i. Native species-rich hedge with trees

#### Habitat Typology

3.2.21 The “Native Species Rich Hedgerow with trees” typology was applied.

#### Condition

3.2.22 The hedgerow failed three condition categories: hedge width, hedge canopy gaps and hedge base gaps. Hence moderate condition was applied.

##### ii. Species-poor hedge with trees

#### Habitat Typology

3.2.23 The hedgerow consisted of native species and was associated with a bank, the “Native Hedgerow with trees - Associated with bank or ditch” typology was applied.

#### Condition

3.2.24 The hedgerow failed three condition categories: hedge width, hedge canopy gaps and hedge base gaps. Hence moderate condition was applied.

#### d) Strategic Significance

3.2.25 None of the habitats within the site are located within nature conservation areas therefore no habitats receive the score ‘Within area formally identified in local strategy’. The woodland at the western edge of the site is designated as the Priority Habitat Deciduous Woodland and has therefore been assigned the strategic significance of Location ecologically desirable but not in local strategy. All hedgerow habitats are priority habitats within local plans, so these habitats receive a score of ‘Location ecologically desirable but not in local strategy’ All other habitats have been assigned the strategic significance of ‘Area/compensation not in local strategy/ no local strategy’.

3.2.26 The Yoxford Roadside Nature Reserve No. 197 (designated for the rare fungus *Batterrea phalloides*) lies immediately adjacent to the site to the south. This area will be protected with a Code of Construction Practice (CoCP), which will be developed prior to the start of construction works.

**Table 8: Baseline biodiversity units for areas of habitat within the Yoxford Roundabout, 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 broadleaved woodland	Woodland and forest	Other woodland; broadleaved	0.05	Medium	Moderate	Low	Location ecologically desirable but not in local strategy	0.44
Dense scrub	Heathland and shrub	Bramble scrub	0.02	Medium	Poor	Low	Area/compensation not in local strategy/ no local strategy	0.08
Scattered broadleaved trees	Woodland and forest	Wood-pasture and parkland	0.04	High	Moderate	Low	Area/compensation not in local strategy/ Scattered no local strategy	0.48
Scattered coniferous trees	Woodland and forest	Other coniferous woodland	0.01	Low	Moderate	Low	Area/compensation not in local strategy/ no local strategy	0.04
Species-poor semi-improved grassland	Grassland	Modified grassland	1.88	Low	Moderate	Low	Area/compensation not in local strategy/ no local strategy	3.76
Species-poor semi-improved grassland	Grassland	Modified grassland	0.25	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	1.00
Bracken	Grassland	Bracken	0.01	Medium	Poor	Low	Area/compensation not in local strategy/ no local strategy	0.04



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Phase 1 habitat type	UK habs/ broad habitat	UK habs/habitat type	Area (ha)	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Habitat units
Hardstanding	Urban	Developed land; sealed surface	0.67	V. Low	N/A - Other	Low	Area/compensation not in local strategy/ no local strategy	0.00
<b>Totals</b>			<b>2.93</b>					<b>5.84</b>

**NOT PROTECTIVELY MARKED**

**Table 9: Baseline hedgerow units for hedgerows within Yoxford Roundabout, 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
Native species-rich hedge with trees	Native Species Rich Hedgerow with trees	0.25	Medium	Moderate	Low	Location ecologically desirable but not in local strategy	2.20
Species-poor hedge with trees	Native Hedgerow with trees - Associated with bank or ditch	0.04	Medium	Moderate	Low	Location ecologically desirable but not in local strategy	0.35
<b>Total</b>		<b>0.29</b>					<b>2.55</b>

### 3.3 Post-construction habitat conditions and valuation

3.3.1 The proposed post-development habitat typologies are illustrated on **Figure 2.1** of this document.

3.3.2 The sources used to assess the biodiversity value of each of these habitat compartments are presented in **Section 2.5** of this document.

3.3.3 The on-site post development biodiversity units total 4.87, representing a reduction in biodiversity units of 0.97 from the baseline 5.84 units. Further details of the habitat units delivered is presented in **Table 10** of this document.

3.3.4 A total of 1.71 hedgerow units would be delivered from 0.37km of hedgerows post-development from a baseline of 2.55 hedgerow units resulting in a decrease of 0.84 units. Further details of the hedgerow units delivered is presented in **Table 11** of this document.

#### a) Retained habitats

3.3.5 Post-development much of the site will be composed of newly created habitats and areas of built development (i.e. road), but some areas of habitat will be retained.

#### i. Other woodland; broadleaved

3.3.6 The woodland in the west of the site is retained. The assessment of this habitat will therefore not change from the baseline.

#### ii. Urban - Developed land; sealed surface

3.3.7 Some of the hardstanding will likely be retained, such as the sections of roads towards the edge of the site. For ease of calculations, it was assumed that all hardstanding would be lost and replaced. As hardstanding returns no biodiversity units, this assumption has no impact on the biodiversity calculations.

#### b) Retained hedgerows

3.3.8 Small amounts of both hedgerows are retained, in the north and south-east of the site. The assessment of these hedges will not change from the baseline.

#### c) Reinstated habitats

#### i. Modified grassland

3.3.9 Habitats will be reinstated within the area of pasture in the east of the site. This habitat will be reinstated to the baseline state of poor condition modified grassland.

d) Created habitats

3.3.10 The following habitats will be created post-construction (shown in the masterplan (**Figure 2.1** of this document):

i. Roads and footpaths

3.3.11 Areas of highway and footpath will be created, these are considered together as 'Urban – Developed land; sealed surface'. This habitat has a pre-defined condition of 'N/A – Other'. This includes the areas marked as 'Route For Abnormal Indivisible Loads' with hardstanding underneath.

ii. Grassland

3.3.12 Grassland will be the most common post-development broad habitat typology. Much of this will be composed of reinstated agricultural grassland (see **Section 3.2** of this document).

3.3.13 Other grassed areas are proposed in the areas around the roundabout. Due to the requirement to maintain sightlines, it is likely that much of this typology will be short mown. Due to the presence of footpaths adjacent to many of the grassed areas, it is likely that there will be anthropogenic disturbance in the form of trampling, litter and impacts from dogs. Other than the (offsite) protected Yoxford Roadside Nature Reserve verge (see **Section 3.1** of this document, above) which protect the location of the rare fungus *Batterrea phalloides*, the existing road verges are not managed for the benefit of wildlife. Due to these factors, it is assessed that the grassland on the site will all align with Modified grassland of poor condition. It is assumed that the area marked as 'Route For Abnormal Indivisible Loads' within the centre of the roundabout will be grassed, as this is the typology underneath.

3.3.14 The grassed areas surrounding the infiltration basin would be more clearly separated from human impacts and are not expected to have a requirement to be short mown to maintain sightlines. and a sward of greater diversity is achievable. It is expected that a grassland of the 'other neutral grassland' typology could be achieved, through appropriate management. Similarly, it is considered that moderate condition is achievable, with appropriate management (for example, appropriate cutting regime). This condition is considered to reflect ambitious targets while remaining realistic.

iii. Native tree and shrub planting

3.3.15 Areas of tree and shrub planting are proposed on the roundabout and adjacent to the infiltration basin south of the roundabout. These areas will likely have a broadleaved woodland character, so is predicted to be of the "Woodland and Forest - Other woodland broadleaved" typology. It is predicted that moderate condition can

be achieved as native species of tree and shrub will be planted. This aligns with the moderate condition guidance: largely native species, with little age and height structure present (due to small size of woodland) and standing deadwood is not expected to be retained (due to safety concerns adjacent to road). This balances ambitious targets while remaining realistic with what can be achieved due to the small size of the planting patches and urban context.

3.3.16 The scattered trees west of the infiltration basin are likely to be of similar character to those in the baseline, so they are assessed in the same way – of the “Woodland and forest - Wood-pasture and parkland” typology of moderate condition.

3.3.17 The scattered trees proposed in the hedgerow are included in the created hedgerow section in **Section 3.2** of this document.

iv. Infiltration basin

3.3.18 An infiltration basin is proposed south of the roundabout. It is assumed that the infiltration basin will contain water sporadically with heavy rainfall, but that it will be largely dry. It is expected to align with the “Urban - sustainable urban drainage feature” typology. Good quality is targeted as these are likely to be a good example of this habitat within a more natural context than this typology is typically found.

e) Created hedgerows

i. Native species-rich hedgerow with trees

3.3.19 A hedgerow will be created towards the north of the site. The hedgerow will be planted to be species-rich (considered to be readily achievable) and the hedge contains trees within the masterplan shown in **Appendix C** of this document. A condition assessment of moderate is applied to this hedgerow as this is thought to be appropriate, balancing ambitious targets while remaining realistic as the land to the east will still be used for agricultural purposes.

f) Strategic significance

3.3.20 The strategic significance of the site location is not considered to change between the baseline and post-intervention state.

**Table 10: Biodiversity units for Yoxford Roundabout from habitats post-development**

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	Habitat units
Broadleaved semi-natural woodland	Woodland and forest	Other woodland; broadleaved	0.05	Retained	Medium	Moderate	Low	Location ecologically desirable but not in local strategy	N/A	N/A	0.44
Roads and paths	Urban	Developed land; sealed surface	0.99	Created	V. Low	N/A – other	Low	Area/compensation not in local strategy/ no local strategy	0	Low	0.00
Grassland	Grassland	Modified grassland	0.63	Reinstated	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	1	Low	1.22
Grassland	Grassland	Modified grassland	0.88	Created	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	1	Low	1.81
Grassland	Grassland	Other neutral grassland	0.19	Created	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy	10	Low	1.06
Native tree and shrub planting	Woodland and forest	Other woodland; broadleaved	0.07	Created	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy	30	Medium	0.13

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	Habitat units
Native tree and shrub planting	Woodland and forest	Parkland and wood-pasture	0.02	Created	High	Moderate	Low	Area/compensation not in local strategy/ no local strategy	32+	V. High	0.01
Infiltration basin	Urban	Sustainable urban drainage feature	0.06	Created	Low	Good	Low	Area/compensation not in local strategy/ no local strategy	5	Medium	0.20
<b>Totals</b>			<b>2.89**</b>								<b>4.76</b>

\*Habitats taken from the post-development plan (shown in Figure 2.1) that differ from Phase 1 typologies.

\*\*Total surface area post-development differs slightly from the baseline due to fewer scattered trees being present (see Section 2.7)

**Table 11: Hedgerow units for Yoxford Roundabout from hedgerows post-development**

Hedgerow type	Length (km)	Habitat scenario for creation	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Time to target condition	Difficulty	Hedgerow units
Native Species-rich hedgerow with trees	0.015	Retained	Medium	Moderate	Low	Location ecologically desirable but not in local strategy	N/A	N/A	0.13
Species-poor hedgerow with trees	0.02	Retained	Medium	Moderate	Low	Location ecologically desirable but not in local strategy	N/A	N/A	0.18
Native hedgerow with trees	0.34	Created	Low	Moderate	Low	Location ecologically desirable but not in local strategy	10	Low	1.40
<b>Total</b>	<b>0.37</b>								<b>1.71</b>



### 3.4 Changes in broad habitat types

3.4.1 The proposed 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 12** and **Table 13** of this document, below.

3.4.2 The construction of the roundabout increases the area covered by urban habitats, so losses are predicted to occur in other habitats, especially in grassland. Despite the small increase of woodland and forest on the site, a decrease in biodiversity units is predicted due to the penalties paid in the metric to create woodland. Heathland and scrub habitat will not be present post-development.

**Table 12: The changes in the total areas of the broad habitat types**

Broad habitat type	On-site baseline	On-site post-development	Change in area
Grassland	2.14	1.70	-0.44
Heathland and shrub	0.02	0.00	-0.02
Urban	0.67	0.99	0.32
Woodland and forest	0.10	0.14	0.04

**Table 13: 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
Grassland	4.80	3.98	-0.82
Heathland and shrub	0.08	0.00	-0.08
Urban	0.00	0.20	0.20
Woodland and forest	0.96	0.58	-0.38

### 3.5 Areas excluded from assessment

- 3.5.1 No statutory designated sites or 'irreplaceable' habitats were present within the site, so no areas were excluded from the assessment.

## 4 SUMMARY RESULTS

4.2.1 The summary results of the assessment, using the Biodiversity metric 2.0 calculator are presented in **Plate 2**.

### Plate 2: Summary results

<b>On-site baseline</b>	<i>Habitat units</i>	5.84
	<i>Hedgerow units</i>	2.55
	<i>River units</i>	0.00
<b>On-site post-intervention</b> (Including habitat retention, creation, enhancement & succession)	<i>Habitat units</i>	4.76
	<i>Hedgerow units</i>	1.71
	<i>River units</i>	0.00
<b>Off-site baseline</b>	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
<b>Off-site post-intervention</b> (Including habitat retention, creation, enhancement & succession)	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
<b>Total net unit change</b> (including all on-site & off-site habitat retention/creation)	<i>Habitat units</i>	-1.08
	<i>Hedgerow units</i>	-0.84
	<i>River units</i>	0.00
<b>Total net % change</b> (including all on-site & off-site habitat creation + retained habitats)	<i>Habitat units</i>	-18.54%
	<i>Hedgerow units</i>	-32.92%
	<i>River units</i>	0.00%

4.2.2 Under current plans, a reduction of biodiversity units by 1.08 units and a decrease of 0.84 hedgerow units are predicted.

4.2.3 The changes in the area and biodiversity units of each broad habitat type are shown in Table 14. Increases in area are predicted for the broad habitat types 'Urban' and 'Woodland and forest' but despite that a decrease in biodiversity units for Woodland and forest is predicted. This decrease is due to the risk multipliers associated with creating woodland habitats (i.e. small area of woodland and scattered trees) as these habitats take a long time to mature. Decreases in area and biodiversity units are predicted for Grassland and Heathland and scrub.

**Table 14: Changes in area and biodiversity units of broad habitat types**

Broad habitat type	Change in area	Change in biodiversity units
Grassland	-0.44	-0.82
Heathland and shrub	-0.02	-0.08
Urban	0.32	0.20
Woodland and forest	0.04	-0.38

## 5 DEVELOPMENT OVERVIEW RESULTS

5.2.1 The results of this assessment can be considered within the context of the overall Sizewell C Project that has been assessed using the biodiversity metric (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 have potential for permanent habitat loss. **Table 15** 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 associated developments, 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.

**Table 15: 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%
<b>Net</b>	<b>1651.86</b>	<b>319.89</b>	<b>19.37%</b>

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## 6 CONCLUSION

- 6.2.1 Under current proposals it is estimated that for Yoxford Roundabout, there would be potential decrease in biodiversity unit values 1.08 units, and a decrease in hedgerow unit values of 0.84 units.
- 6.2.2 In addition to Yoxford Roundabout, the main development site and a series of other off-site associated developments were also assessed via BM 2.0 (Sizewell Link Road and Two Village Bypass) and these are presented in separate reports. These sites were chosen for assessment via the metric as they would be permanent and have the 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. The achievement of these units scores is reliant upon achieving the target condition for the created habitats.
- 6.2.3 An increase in the biodiversity unit value of urban habitats is predicted. A decrease in biodiversity habitat units is predicted for woodland and forest despite increases in the area covered by this habitat. Decreases in both area and biodiversity habitat units are predicted for the broad habitat types Grassland and Heathland and scrub.

## 7 REFERENCES

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## APPENDIX A: CHANGE TO YOXFORD RED LINE BOUNDARY



## APPENDIX B: BASELINE PHASE 1 MAP (FIGURE 1)

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## APPENDIX C: OPERATIONAL MASTERPLAN (FIGURE 2.1)