A12 Chelmsford to A120 widening scheme

TR010060

6.3 ENVIRONMENTAL STATEMENT APPENDIX 9.14 BIODIVERSITY NET GAIN REPORT

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Volume 6

August 2022

Infrastructure Planning

Planning Act 2008

A12 Chelmsford to A120 widening scheme
Development Consent Order 202[ ]

ENVIRONMENTAL STATEMENT
APPENDIX 9.14 BIODIVERSITY NET GAIN REPORT

Regulation Reference	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010060
Application Document Reference	TR010060/APP/6.3
Author	A12 Project Team & Highways England

Version	Date	Status of Version
Rev 1	August 2022	DCO Application

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1 Executive summary

1.1.1 This report is an appendix of the A12 Chelmsford to A120 widening scheme (the proposed scheme) Environmental Statement.

1.1.2 The purpose of this document is to report on the methodology and results of a biodiversity metric exercise undertaken on the proposed scheme. The assessment presented in this report is based on the design in April 2022.

1.1.3 The proposed scheme comprises improvements to the A12 between junction 19 (Boreham interchange) and junction 25 (Marks Tey interchange), a distance of approximately 24km, or 15 miles. The proposed scheme involves widening the A12 to three lanes throughout (where it is not already three lanes) with a bypass between junctions 22 and 23 and a second bypass between junctions 24 and 25. It also includes safety improvements, including closing off existing private and local direct accesses onto the main carriageway, and providing alternative provision for walkers, cyclists and horse riders to existing routes along the A12, which would be removed.

1.1.4 This report uses the Natural England Metric 3.0 calculation tool to determine if the proposed scheme would likely result in a net gain in biodiversity. The calculation tool has been used to assess biodiversity unit change for area-based habitats, hedgerows and rivers and streams. These three assessments must be considered as stand-alone and units from one assessment cannot be combined with units from another as per the Metric 3.0 User Guide (Panks *et al.,* 2021a).

1.1.5 The following table provides a summary of the forecast biodiversity unit change for each of the three types of biodiversity units assessed. It shows a gain in all three types of biodiversity units.

Summary of biodiversity units per development phase and net change

Development phase	Calculator	Biodiversity units
On-site baseline	Habitat units	2,533.70
	Hedgerow units	423.49
	Rivers and streams units	93.85[1]
On-site post-construction (including habitat retention, creation, and enhancement)	Habitat units	3,167.28
	Hedgerow units	576.20
	Rivers and streams units	240.95[2]
Total net unit change	**Habitat units**	**633.58**
	Hedgerow units	**152.70**
	Rivers and streams units	**147.10[3]**

[1] Rivers: 43.75 units; Ditches: 50.10 units
[2] Rivers: 43.91 units; Ditches: 197.04 units
[3] Rivers: 0.16 units; Ditches: 146.94 units

Development phase	Calculator	Biodiversity units
Total net % change	Habitat units	25.01%
	Hedgerow units	36.06%
	Rivers and streams units	156.73%[4]

1.1.6 At this stage, the metric forecasts should be treated with some caution due to the limitations of the data, the assumptions made to allow a quantitative forecast of biodiversity unit change, and the preliminary nature of the design. However, it is considered that this assessment provides a good indicator of the likely performance of the proposed scheme in terms of net biodiversity, and a precautionary approach has been applied, so the metric provides a realistic 'worst-case' assessment.

1.1.7 It is acknowledged that five 'potential' veteran trees may be lost as part of the development proposals. These trees are considered irreplaceable. Biodiversity net gain should not be claimed in respect of compensation that is provided for the loss of irreplaceable habitat. Compensation for the loss of the 'potential' veteran trees is discussed within Chapter 9: Biodiversity, of the Environmental Statement [TR010060/APP/6.1] and these measures have not been included in calculating biodiversity net gain for the proposed scheme.

1.1.8 There are a number of opportunities for improving both confidence in the forecast and for improving the outcomes for biodiversity as the proposed scheme progresses, which are discussed.

[4] Rivers: 0.36%; Ditches: 293.29%

2 Introduction

2.1 Purpose of the report

2.1.1 This report is an appendix of the A12 Chelmsford to A120 widening scheme (the proposed scheme) Environmental Statement.

2.1.2 The purpose of this document is to report on the methodology and results of a biodiversity metric exercise undertaken on the proposed scheme. The current assessment presented here is based on the design as of April 2022. There have been minor changes to the design and Order Limits since April 2022, however, these changes would not materially affect the conclusions of this report.

2.2 The proposed scheme

2.2.1 The proposed scheme comprises improvements to the A12 between junction 19 (Boreham interchange) and junction 25 (Marks Tey interchange), a distance of approximately 24km, or 15 miles. The proposed scheme involves widening the A12 to three lanes throughout (where it is not already three lanes) with a bypass between junctions 22 and 23 and a second bypass between junctions 24 and 25. It also includes safety improvements, including closing off existing private and local direct accesses onto the main carriageway, and providing alternative provision for walkers, cyclists and horse riders to existing routes along the A12, which would be removed.

2.2.2 The proposed scheme would require new crossings of watercourses and potential improvements to existing culvert and bridge crossings. There are eight crossings of main rivers, six of which comprise existing crossings and two of which comprise new crossings on proposed offline sections of the road. Three of the crossings would require minor realignments at the crossing points.

2.2.3 Land would be required both temporarily and permanently to construct, operate and maintain the proposed scheme. Permanent land-take requirements include the footprint of all the proposed highway infrastructure and associated earthworks, drainage works and access roads, together with environmental mitigation areas such as landscape planting and biodiversity habitat creation.

2.2.4 The proposed scheme is classed as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act (2008), triggering the need to apply for a Development Consent Order (DCO).

2.3 Policy and legislative context

2.3.1 The National Networks National Policy Statement (NNNPS) (Department for Transport, 2014) sets out the need for, and Government's policies to deliver, development of NSIPs on the national road and rail networks in England. Chapter 5 of the NNNPS discusses biodiversity and ecological conservation. There is no specific requirement within the NNNPS for NSIPs to deliver biodiversity net gain (BNG), however, the document states projects should, '*show how the project has taken advantage of opportunities to conserve and enhance biodiversity….interests'*. It also states as a general principle that, '*The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated'*. The NNNPS goes on to say that *'proposals potentially provide many opportunities for building in beneficial biodiversity…. features as part of good design. When considering proposals, the Secretary of State should consider whether the applicant has maximised such opportunities in and around developments.'*

2.3.2 The National Planning Policy Framework (NPPF) (MHCLG, 2021) sets out the government's planning policies for England and how these are expected to be applied. Chapter 15 of the NPPF details core policy principles with respect to conserving and enhancing the natural environment. Paragraph 174 states that planning decisions are required to contribute to and enhance the natural and local environment by *'minimising impacts on and providing net gains for biodiversity'*, and paragraph 179 states that plans should, *'identify and pursue opportunities for securing measurable net gains for biodiversity'.*

2.3.3 The Environment Act 2021 will amend the Planning Act 2008 so as to provide for biodiversity gain objectives to be set out in a statement of government policy for DCO projects, although it is unlikely that this will be in place prior to the determination of the DCO application for the proposed scheme.

2.4 Biodiversity Metric 3.0

2.4.1 A key element of applying BNG is that it should be measurable. As a result, BNG metrics have been developed that allow losses and gains in biodiversity to be measured in an objective and repeatable manner. This report uses the Natural England Biodiversity Metric 3.0 ('Metric 3.0') Calculation Tool (published July 2021) (Panks *et al*., 2021c), to determine if the proposed scheme would likely result in a net gain in biodiversity.

2.4.2 The Metric 3.0 is an updated version of the original Department for Environment, Food and Rural Affairs (Defra) biodiversity metric (Defra, 2012). Biodiversity Metric 3.0 builds upon the knowledge and experience gained across a variety of different sectors since Defra piloted the provisional metric in 2012 and the consultation and feedback provided since the release of a beta test version, Biodiversity Metric 2.0, launched in 2019 (Crosher, *et al*., 2019).

2.4.3 At the time of writing, the Metric 3.0 was the latest version of the Biodiversity Metric available to support standardised quantification of BNG in England in respect of existing policy and emerging legislation. A minor update to the 3.0 version has since been published (version 3.1[5], 21 April 2022), which will subsequently be subject to a Secretary of State consultation on the Metric as required under the Environment Act. The 'final' metric is currently expected to be published in late Autumn 2022.

[5] To note, the information provided with the Metric 3.1 update by Natural England states in the Summary of Changes from Biodiversity Metric 3.0 to Version 3.1, that, *'Metric 3.1 represents a relatively small-scale change from version 3.0, primarily focusing on clarifications to guidance and revisions to the condition assessments. Except for a very small number of select habitats, the metric 3.1 update is unlikely to have a significant impact on the range of overall outputs generated'.*

3 Methodology

3.1 Calculating biodiversity units

3.1.1 This report uses the Metric 3.0 calculation tool to determine if the proposed scheme would likely result in a net gain in biodiversity. The assessment has been conducted in accordance with the methodology set out in the following guidance documents. Where assumptions have had to be made or limitations exist, these are detailed in Section 3.6 of this report.

- The Biodiversity Metric 3.0 – User Guide (Panks *et al.*, 2021a)
- The Biodiversity Metric 3.0 – Technical Supplement (Panks *et al.*, 2021b)

3.1.2 The calculation tool has been used to assess biodiversity unit change for area-based habitats, hedgerows and rivers and streams. These three assessments must be considered as stand-alone and units from one assessment cannot be combined with units from another as per the Metric 3.0 User Guide.

3.1.3 R (programming language), Python (programming language) and RStudio were used to process and analyse the Phase 1 habitats and hedgerow survey data previously collected on site and uploaded in ArcGIS Online. The results of the data analysis were exported in a spreadsheet and loaded into the Metric 3.0 calculation tool to carry out the BNG calculations.

3.2 Mitigation hierarchy

3.2.1 Chapter 3: Assessment of alternatives, of the Environmental Statement [TR010600/APP/6.1] outlines the options selection process and how environmental considerations were taken into account in the selection of the preferred route and how this was then refined further taking into account environmental constraints.

3.2.2 The Retained an Removed Vegetation Plans [TR010060/APP/2.14] show vegetation to be removed by the proposed Scheme, and to be retained. Further areas are at risk of removal, but may be retained, however this cannot be confirmed at this preliminary stage of the design and thus a precautionary approach has been taken in this assessment and these areas are considered to be lost.

3.2.3 A number of commitments have been made as part of the proposed scheme, incorporating standard and additional mitigation measures, which would reduce impacts on the landscape and to habitat and ecology. These commitments are provided in the Register of Environmental Actions and Commitments (REAC), included within the first iteration of the Environmental Management Plan (EMP) [TR010060/APP/6.5].

3.2.4 The REAC includes commitments that are relevant to retention of existing vegetation which would be implemented in accordance with the Retained and Removed Vegetation Plans [TR010060/APP/2.14]. Root protection areas (RPAs) for all existing trees have been identified in Appendix 8.4: Arboricultural impact assessment, of the Environmental Statement [TR010060/APP/6.3].

3.2.5 As the design is refined during the detailed design, further work will be done to avoid loss of habitats where practicable.

3.3 Proposed scheme boundary

3.3.1 The baseline extent of this assessment is defined by the Order Limits of the proposed scheme, as of April 2022, and presented in Annex A of this report (Figure 1). There have been minor changes to the design and Order Limits since April 2022, however, these changes would not materially affect the conclusions of this report.

3.4 Biodiversity baseline

3.4.1 To create an on-site biodiversity baseline, the following data was entered into the Metric 3.0 calculator tool:

- Habitat type and extent (hectares for area habitat or km for hedgerow or river habitats): at which point each habitat is automatically assigned a distinctiveness rating (Very Low-Very High, 0-8)
- Habitat condition multiplier: poor (1), moderate (2), or good (3) (or an intermediate value where appropriate)
- Strategic significance multiplier (area based and hedgerow units): based on proximity to local strategies and how ecologically desirable the habitat is (further information on how this has been assigned is provided below)
- Strategic significance multiplier (rivers and streams only): whether restoration is part of local and/or catchment scale plans (further information on how this has been assigned is provided below)
- Watercourse encroachment (rivers and streams only): where development has replaced natural bank material (e.g. bank reinforcement) or traverses the channel, causing impoundment (e.g. weirs)
- Riparian encroachment (rivers and streams only): whether development is present within the designated bank top area extending 10m from the watercourse

3.4.2 This combination of data produces a total number of units for each habitat, and subsequently how many overall habitat units there are in the biodiversity baseline. Units lost to facilitate proposed permanent and temporary works, and units gained through proposed habitat creation and enhancement, are then subtracted from and added to the baseline. Further information as to how this data was generated is provided below.

Habitat type

Area-based habitats

3.4.3 Phase 1 habitat (JNCC, 2010) surveys were carried out between August 2017 and February 2020. Due to refinements in the proposed scheme design, some land was visited more than once, and where this was the case, the most up-to-date results (February 2020) were used (see Appendix 9.8: Phase 1 habitat survey report, of the Environmental Statement [TR010060/APP/6.3]).

3.4.4 Due to access issues, health and safety considerations and refinements in the Order Limits, some areas of the proposed scheme were not visited for field surveys. In these instances, habitat type has been inferred from aerial imagery, informed by knowledge of the site and its surrounds. Land not covered by field survey included built-up areas (settlements of Copford, Mark's Tey, Feering, Kelvedon, Rivenhall, Witham, Hatfield Peverel, Boreham, and Chelmsford), land along the edge of the A12 (verges and embankments unless accessible by public rights of way), railway embankments, and areas added to later versions of the Order Limits. Area habitat types have been inferred from aerial imagery for c. 23.27% of the Order Limits.

3.4.5 As the field data was recorded following the methodology outlined in the Phase 1 Habitat Handbook (JNCC, 2010), it was subsequently converted to Metric 3.0 habitat types with reference to the conversion tools available in the Metric tool and the UK Habitats Classification Excel spreadsheet resource and informed by professional judgement and knowledge of the habitats within the proposed scheme (see Annex B of this report, Table B.1).

3.4.6 For the land at Colemans Farm Quarry within the proposed scheme Order Limits, the baseline habitat type and condition (see below for further information on condition assessment) have been included in the assessment to reflect the consented version of the quarry restoration plan (i.e. a future baseline). This is considered to be a precautionary approach to ensure the value of the restoration plan is captured in the assessment. The habitat types included in the restoration plans have been translated to Metric 3.0 habitat types and assumed habitat condition applied (see Annex B of this report, Table B.2, and below for further details).

Hedgerows

3.4.7 Hedgerows subject to field surveys were initially identified from the results of the Phase 1 Habitat survey (see Appendix 9.8: Phase 1 habitat survey report, of the Environmental Statement [TR010060/APP/6.3]).

3.4.8 Subsequently, a dedicated hedgerow field survey was undertaken following the methodology outlined in the Hedgerow Survey Handbook (Defra, 2007). Field surveys were carried out between July 2020 and October 2020. Full details are provided in Appendix 9.7: Hedgerow survey report, of the Environmental Statement [TR010060/APP/6.3], including survey limitations such as access constraints.

3.4.9 Hedgerow types for Metric 3.0 were determined from the attributes collected during the hedgerow survey[6], based on the following assumptions:

- If the type of hedgerow was a line of trees, it was classified as such, if not it was classified as a hedgerow. If these trees were mature and considered part of a priority habitat, the line of trees was considered 'Ecologically Valuable'.
- If the hedgerow did not meet the criteria for priority or countryside hedge, then it was classified as ornamental non-native hedgerow. Any other hedges were assumed to be native hedgerows.
- Native hedgerows with an average species richness across all sections of seven or more species were considered 'species-rich'.
- Presence of banks and/or ditches was recorded as a percentage during the field survey. Any area where a bank and/or ditch ran parallel to any of the hedgerows length, the hedgerow was considered 'associated with bank or ditch'.
- Any hedgerows noted to include trees during the field survey were classified as their relevant Metric 3.0 line habitat with trees.

Rivers and streams

3.4.10 Rivers and streams were initially identified during hydromorphological surveys carried out in 2017. MoRPh (Modular River and Physical Habitat) surveys were then carried out in 2020 and 2021 evaluating the condition of rivers identified within the Order Limits. Where the Order Limits changed leading to the identification of additional subreaches, additional MoRPh surveys were undertaken via desk studies using aerial imagery.

3.4.11 The rivers and streams baseline includes all types of watercourses with a hydraulic function, including but not limited to, canals, canalised rivers, and ephemeral rivers such as chalk streams.

3.4.12 The rivers and streams baseline includes ditches, defined as: ‘artificially created linear water-conveyancing features that are less than 5m wide and likely to retain water for more than 4 months of the year. Their hydraulic function is primarily for land drainage, and although partially or fully connected to a river system, they would not have been present without human intervention’ (Panks et al., 2021a).

3.4.13 Ditches are assessed separately to rivers, as trading rules, as per the Biodiversity Metric User Guide, state that any losses along rivers cannot be offset by ditch creation or enhancement, and vice versa. The condition of ditches is assessed using a ditch condition assessment evaluating its condition based on eight criteria defined in the Biodiversity Metric 3.0 Technical Supplement. The condition is determined based on the quantity of criteria observed along the ditch.

[6] Due to the size of this data set, the data is not provided here as an Annex but is available on request.

3.4.14 Culverts on rivers or ditches are treated differently from the open channels. Culverts are input on a separate line in the Metric with their own river type. Limitations with respect to the field surveys, including access, are discussed in Section 3.6 of this report.

Condition assessment

Area-based habitats

3.4.15 Due to the timing of the habitat surveys i.e. largely prior to the publication of either the Natural England Metric 2.0 beta version (29 July 2019) or the Metric 3.0 version (7 July 2021), no condition assessments (as per the Technical Guidance for Metric 2.0 and Metric 3.0) were carried out in the field. Condition has therefore been assumed for area-based habitat types (i.e. assessment is based on habitat type and not individual land parcels) based on a review of the information available against the Metric 3.0 condition criteria for the relevant habitat types.

3.4.16 Given the lack of detailed baseline condition assessment data, or the absence of any field data where habitats have been identified using aerial imagery, a precautionary approach has been taken to condition assessment i.e. erring on the side of a higher condition score rather than a lower one where the criteria suggest this is possible and it cannot be ruled out. In particular, a precautionary approach has been taken in respect of 'High' distinctiveness habitats which have all been assigned 'Good' condition in the Metric 3.0 calculator tool (with the exception of those included in the Coleman's Farm Quarry restoration plan). The condition scores assigned to each metric habitat type along with a justification for this score is provided in Annex B of this report, Table B.1.

3.4.17 For the land at Colemans Farm Quarry within the Order Limits, habitat condition has been assumed based on the information available in the quarry restoration plan (see Annex B of this report, Table B.2).

Hedgerows

3.4.18 Hedgerow condition has been assigned using the detailed information available from the dedicated hedgerow surveys undertaken between July and October 2020 which followed the methodology outlined in the Hedgerow Survey Handbook (Defra, 2007).

3.4.19 A detailed review of the hedgerow data was originally undertaken against the Metric 2.0 criteria for all hedgerows and lines of trees and condition assigned. This assessment has been carried over into Metric 3.0, with no changes, given the limited changes between the Metric 2.0 and 3.0 condition criteria for hedgerows (see Section 3.6 of this report regarding the limitations of this approach).

3.4.20 For lines of trees the condition assessment is more comprehensive in Metric 3.0 i.e. has more criteria, but as not all the necessary information has been collected to make this assessment against the Metric 3.0 condition criteria for lines of trees, it was considered appropriate to use the condition assigned originally against the Metric 2.0 condition criteria (see Section 3.6 of this report regarding the limitations of this approach).

Rivers and streams

3.4.21 For rivers and streams (hereafter referred to as 'rivers'), condition was assessed using the MoRPh method (Cartographer, 2021). For this, field surveys were carried out in November 2021. These surveys determined a preliminary condition score of a subreach along each of the rivers located within the Order Limits. To meet the requirements of the method, it was sometimes necessary to survey multiple subreaches on a river. This ensured full coverage of the rivers that could be impacted and allowed for changes in condition to be captured. The survey assessed conditions along the bank tops (10m back from the bank face), the bank face and the channel bed. Figure 3 (in Annex A of this report) shows where MoRPh surveys were undertaken.

3.4.22 The MoRPh survey data was subsequently followed up by a desk study of a wider reach of channel to determine the river type. The wider reach was defined by significant changes in the channel, for example:

- A major tributary (e.g. contributing >10% flow to the receiving watercourse)
- A major artificial barrier (e.g. >5m tall, likely to significantly change flow or sediment movement)
- A distinct and persistent change in planform (e.g. change from meandering to straight)

3.4.23 The preliminary condition score and the river type were then combined to determine a final condition score. For input into the Metric, the final condition score was converted to one of five corresponding condition categories:

- Good
- Fairly good
- Moderate
- Fairly poor
- Poor

3.4.24 During the survey, individual subreaches where assessed. However, in the Metric the whole length of the rivers within the Order Limits needs to be accounted for. This was done by splitting the rivers into adjoining BNG reaches. The condition for each BNG reach represented by one surveyed subreach. The divisions between the BNG reaches were determined with reference to the river condition categories, changes in river type, the extent of baseline encroachment and knowledge of the proposed scheme (i.e. where interventions are proposed). Figure 4 (in Annex A of this report) exhibits the indicative location of each BNG reach.

3.4.25 As part of the MoRPh method, rivers are assessed on whether their cross-section, or 'shape', describes the channel as being overdeep. If flagged as potentially overdeep, photographs taken on site were consulted. If the channel was confirmed as being overdeep, the final condition category was manually downgraded before input to the Metric. Condition downgrading has taken place on the following reaches (shown on Figure 3 in Annex A of this report):

- Boreham Brook_001 (north of existing A12)
- Boreham Brook_003 (between existing A12 and main road)
- Roman River_001 (upstream of existing A12)
- Roman River_003 (downstream of existing A12)
- Rivenhall Brook_001 (upstream of proposed Rivenhall Brook culvert)
- Rivenhall Brook_002 (channel that would be crossed by proposed offline A12 mainline)
- Rivenhall Brook_003 (downstream of proposed Rivenhall Brook culvert)
- Domsey Brook (west) _001A (furthest west from existing Domsey Brook Bridge)
- Domsey Brook (west) _001 (between confluence with Ordinary Watercourse 34 and proposed realignment site)
- Domsey Brook (west) _002 (proposed realignment site)
- Domsey Brook (west) _004 (downstream of existing Domsey Brook Bridge)
- Domsey Brook (east)_001 (upstream of proposed realignment and culvert site)
- Domsey Brook (east)_002 (proposed realignment and culvert site)
- Domsey Brook (east)_003 (downstream of proposed realignment and culvert site)
- River Blackwater_001 (upstream of Ashmans Bridge)
- River Blackwater_002 (downstream of Ashmans bridge)
- River Blackwater_003 (northern section of the Cadent gas main diversion)
- River Blackwater_004 (southern section of the Cadent gas main diversion)

3.4.26 For watercourses assessed as ditches, condition assessment was based on aerial imagery and photographs taken during hydromorphological surveys in July 2017. Condition was assessed using the ditch habitat condition assessment criteria in the Metric 3.0 Technical Supplement (Panks *et al.,* 2021b).

3.4.27 According to the guidance, all culverts on rivers or ditches are assigned a condition of Poor.

Strategic significance

3.4.28 Strategic significance has been applied for area-based habitats and hedgerows using data for designated sites for nature conservation. Where habitats are within designated sites for nature conservation they have been allocated a 'high' strategic significance. In this case no Sites of Special Scientific Interest (SSSIs) are within the Order Limits and only Local Wildlife Site (LWS) (based on data provided by the Essex Wildlife Trust) has been used in the assessment of strategic significance. Where habitats are outside LWS, they have been allocated a 'low' strategic significance. The 'medium' strategic significance category has not been used as the data collected in the field did not support the application of this assessment.

3.4.29 For rivers and streams, 'high' strategic significance has been applied to watercourses within local, regional or national strategies or plans, including:

- Local Plans
- River Basin Management Plans
- Catchment Plans
- Catchment Planning System
- Priority Habitats for Restoration

3.4.30 As most of the assessed rivers comprise the main channels of individual Water Framework Directive Regulations (WFD Regulations) surface water bodies, it has been assumed that restoration or improvements to channel morphology fall under the Anglian River Basin Management Plan. Exceptions to this are the Ordinary Watercourses (or for the purposes of this assessment, ditches) which all act as hydrological pathways or tributaries to the main channel of the WFD regulations surface water bodies. As such, these watercourses are not assigned to any plans and have been assigned 'low' strategic significance.

Encroachment (rivers and streams only)

3.4.31 There are two types of encroachment in the rivers and streams metric:

- In-watercourse encroachment has been assigned using the guidance in Table 1
- Riparian encroachment has been assigned using the guidance in Table 2

Table 1 Assigning in-watercourse encroachment to baseline rivers and streams data

In-watercourse encroachment band	Multiplier	Description	Examples
No encroachment	1.0	<5% bank length comprising an engineered bank revetment and no encroachment into the watercourse.	-
Minor	0.8	5%-20% bank length comprising engineered bank revetment or encroachment up to 10% of the channel width.	Small headwalls
Major	0.5	>20% bank length comprising an engineered bank revetment or encroachment or >10% of the channel width.	Weirs, large headwalls, bank revetment

Table 2. Assigning riparian encroachment to baseline rivers and streams data

In-watercourse encroachment band	Multiplier	Description
No encroachment	1.00	No development within 10m of bank top.
Minor	0.95	Any development 8-10m from the bank top (up to 100% of area), or where the development footprint occupies 0-10% of the riparian zone within 4-10 from the bank top.
Moderate	0.85	Any development where the footprint occupies between 10-25% of the riparian zone, within 4-10m from the bank top.
Major	0.75	Any development 0-4m from the bank top (except a maximum of 5% footprint for amenity features), or where the development footprint occupies >25% of the total riparian zone.

Habitat lost/retained

3.4.32 For all area-based habitats and hedgerows that fall underneath the new road, within areas where habitats are created as per the Environment Masterplan (Figure 2.1 of the Environmental Statement [TR010060/APP/6.2) or within the temporary land-take area, these are assumed lost with the exception of specific areas and hedgerows identified for habitat retention.

3.4.33 Area and hedgerow habitat retention for the proposed scheme has been identified using the Retained and Removed Vegetation Plans [TR010060/APP/2.14], the data for which is based upon a canopy model, and therefore only shows the retention of trees and scrub. Those areas identified as ‘at risk’ (shown in amber on the plans) have been assumed to be lost during construction, however, where practicable, these would be retained. For this reason, the calculations present a ‘worse-case’ scenario.

3.4.34 For the rivers and streams metric the length of habitat lost was determined by calculating the length of new crossings across the rivers. The remaining channel length was assigned to the length retained.

3.4.35 Rivers and streams would see losses where new culverts or culvert extensions are proposed, as well as where haul roads are proposed to cross via culverts. Such losses are largely identified along ditches. However, the River Brain would also be crossed by two 5m wide, temporary Bailey bridges during the construction period. Given the nature of a bailey bridge, this would not lead to any in-channel habitat loss but would encroach upon the riparian zone and potentially lead to loss in local vegetation. Given time, riparian vegetation is likely to re-colonise the riparian corridor, however, as a precautionary approach, the presence of the bailey bridges has been recorded as habitat loss. A bailey bridge has also been proposed for Domsey Brook, however, this specific sub-reach is to be realigned and enhanced. Therefore, no loss has been recorded along Domsey Brook, associated with the bailey bridge.

3.4.36 Any watercourse, including those watercourses assessed as ditches, that remains and has not been enhanced, realigned or created would be assessed as retained habitat.

3.5 Post intervention

3.5.1 To create an on-site post-intervention unit score, the same data are required in the ‘site-creation’ tab of the Metric calculation tool with the addition of information relating to the timing of habitat creation proposed.

3.5.2 This combination of data produces a total number of units for each habitat, and subsequently how many overall habitat units there are in the biodiversity post-intervention scenario, which can then be used to investigate the total units lost and gained. Further information as to how this data was generated is provided below.

Habitat reinstated

3.5.3 Where habitat within the temporary land-take of the proposed scheme would be lost and then re-instated, it has been assumed that where feasible, the same habitat is created post-construction. However, given the lack of certainty over the future management of habitats in these temporary land-take areas, that would not fall within the permanent ownership of National Highways, a precautionary approach has been taken to assigning post-intervention habitat condition for area-based and hedgerow habitats. In this approach, the following rules have been applied:

- Where habitats have been assigned ‘good’ condition in the baseline, they are assumed to be re-instated in ‘moderate’ condition in the post-intervention scenario
- Where habitats have been assigned ‘moderate’ or ‘poor’ condition in the baseline, they are assumed to be re-instated in the same condition in the post-intervention scenario

3.5.4 In addition, some habitats forecast to be lost are not easy to re-create and therefore, again to be precautionary, alternative habitats have been assumed for the post-intervention assessment as follows:

- Where 'lowland mixed deciduous woodland' is lost, it assumed 'other woodland; broadleaved' in 'moderate condition' habitat would be created as it is not possible at this stage to have certainty that this high distinctiveness habitat could/would be re-created

3.5.5 At Coleman's Farm Quarry, the majority of the site covered by the restoration plan (within the Order Limits) would be lost permanently to the proposed scheme both under new road and to habitats created in the Environmental Masterplan (Figure 2.1 of the Environmental Statement [TR010060/APP/6.2]). Where areas of the quarry are temporarily lost and reinstated, it has been assumed that these habitats will be reinstated as they exist in the consented Coleman's Farm Quarry Restoration Plan.

3.5.6 At this stage of the assessment, habitats lost in the borrow pit areas are assumed to be reinstated with the exception of woodland creation for nitrogen deposition compensation (which is discussed further below).

3.5.7 Table B.3 (Annex B of this report) details how all area based habitats and hedgerows identified as lost, but to be reinstated, have been assessed in the Metric.

3.5.8 No reinstatement is proposed for rivers and streams.

Habitat created

3.5.9 The Environmental Masterplan (Figure 2.1 of the Environmental Statement [TR0100060/APP/6.2]) (as of the design in April 2022) has been used to assess the habitats to be created on land that will be maintained within the permanent boundary of the proposed scheme. Habitat type has been translated to the Metric habitat types based on discussions with the Landscape Architects along with an assumption for condition based on the likely maintenance routines as detailed in the Landscape and Ecology Management Plan (LEMP) (which forms an appendix to the first iteration EMP [TR0100/APP/6.5]). Details of landscape code habitat translations and target condition scores are provided in Tables B.4 and B.5 (Annex B of this report).

3.5.10 The proposed scheme has committed to planting an area of woodland (7.4ha) to offset the potential for impacts of nitrogen deposition on an ancient woodland (Perry's Wood) adjacent to the proposed scheme. This 7.4ha planted area has been included within the post-development area habitats, within the borrow pits, where habitats are otherwise assumed to be reinstated.

3.5.11 Habitat creation is limited in the rivers and streams assessment to new or realigned ditches and new culverts. These have all been measured using the design as of April 2022 and their condition score has been assigned depending on whether the watercourse would remain an open channel or be culverted. Open channel ditches would retain the condition score assigned to them as part of the river condition ditch assessment, as no enhancements are proposed

along them. Culverts are automatically assigned a poor condition score due to the adverse implications a culvert has on riverine habitats.

Habitat enhancement

3.5.12 No habitat enhancement is considered in the assessment in respect of area-based habitats and hedgerows.

3.5.13 For rivers and streams, Section 4.4 and Table B.8 (see Annex B of this report) summarise the enhancements to river condition included in the BNG metric. Enhancements to the watercourses would only be seen along watercourses not assessed as ditches (i.e. Main Rivers in the case of the proposed scheme). The enhancements to river condition recorded for the BNG metric result from direct and/or indirect effects from hydromorphologically appropriate Main River realignments and/or landscaping causing changes to heavily managed groundcover. The measures from which the enhancements arise are set out in the REAC, within the first iteration EMP [TR010060/APP/6.5]).

Timing of habitat creation / enhancement

3.5.14 The Metric calculation tool requires consideration of any advance planting or delays in habitat creation between the time of habitat loss and subsequent creation/re-creation. At this stage of the assessment, the following assumptions have been applied to area-based habitat, hedgerow and rivers and streams:

- Where there will be advanced planting for essential ecological mitigation, habitat creation is assumed to take place one year ahead of construction
- In all other areas, a delay of four years is applied to recognise the current length of the construction phase

3.6 Assumptions and limitations

3.6.1 In general, the Metric calculation tool uses habitats as a proxy for biodiversity and is a simplification of the ‘real world’. Furthermore, while the scoring of habitats is informed by ecological reasoning and the available evidence, the outputs of biodiversity unit calculations are not scientifically precise or absolute values (Panks *et al.*, 2021a). The metric and its outputs should therefore be interpreted, alongside ecological expertise and sound and prudent judgement, as an element of the evidence that informs plans and decisions.

3.6.2 In addition to the acknowledged limitations of the Metric calculation tool, a number of assumptions and limitations exist in respect of the current Metric calculation tool assessment, as summarised below.

Baseline

Area-based habitats

3.6.3 The field data for baseline area-based habitats was collected between 2016 – 2020 and there are a number of limitations which exist in respect of this data:

- Phase 1 habitat survey data was collected in 2017 and 2019 and is therefore more than three years old and could be considered out of date. However, given the land use across the survey area, any changes to habitat type are likely to be the result of agricultural changes and would have occurred in areas of low conservation value, therefore this is deemed unlikely to be substantial as a limitation.

- Some data was collected at sub-optimal times of the year which could result in misidentification of habitat types and potentially under value the baseline. Given the dominant types of habitat are of low and medium distinctiveness, this is unlikely to be a substantial constraint.

- The data was collected using the Phase 1 habitat methodology as opposed to using the UK Habitat (UKHab) classification system (Butcher *et al*., 2020) which the Metric calculation tool is designed to work with. The data on habitat type has therefore had to be translated into the Metric habitat types and this may result in baseline habitat types not being accurately captured in the Metric calculation tool. Given the dominant habitat types are of low and medium distinctiveness, this is unlikely to be a substantial constraint.

- The baseline metric assessment includes some ditches that have been captured as standing water (G1) in the Phase 1 habitat survey and translated as ‘ponds’ in the metric, as it was not possible to split what was ditch versus what was pond using the Phase 1 data.

- As the field data was collected prior to the publication of condition criteria for either Metric 2.0 or 3.0, condition assessment has been applied retrospectively. This is not considered a substantial constraint for the hedgerow data as sufficient information was collected to inform condition assessment. However, for area-based habitat types, condition is assumed for each habitat type based on limited supporting information. To address this constraint, a precautionary approach has been taken which is likely to over-estimate the baseline and therefore raise the requirement in terms of units for achieving a net gain in biodiversity units.

3.6.4 Some areas within the Order Limits were not accessed for field survey for a number of reasons including:

- Health and safety limitations (e.g. road verges)

- Lack of access (i.e. private homes and gardens)

- Refinements to the Order Limits

3.6.5 In these instances, gaps in baseline mapping were filled by digitising features from aerial imagery, checking these areas against desk study data on designated sites and priority habitats, and using professional judgement to interpret an appropriate Phase 1 habitat type. There is a risk that some habitats could be undervalued and in the absence of any field data, condition scores have had to be assumed. Given the dominant habitat types are of low and medium distinctiveness, the use of aerial imagery is unlikely to be a substantial constraint. The precautionary approach taken to condition assessment also mitigates the risk of undervaluing the baseline.

3.6.6 Habitat retention for the proposed scheme has been identified using the Retained and Removed Vegetation Plans [TR010060/APP/2.14], the data for which is based upon a canopy model, and therefore only shows the retention of trees and scrub. Due to the nature of this model, it is likely that the low-lying habitat surrounding this vegetation will also be retained, but it is currently not identified as such in the Metric. This will result in more habitat(s) being counted as lost than is actually likely to occur, and therefore represents a reasonable precautionary estimate.

3.6.7 At Colemans Farm Quarry, the agreed restoration plan for the quarry has been used as opposed to the existing baseline. This is a precautionary approach that raises the value of the baseline as compared to the existing conditions.

Hedgerows

3.6.8 For the hedgerow data, the following limitations apply:

- The hedgerow survey was carried out towards the end of the recommended hedgerow survey period, which is between April and October (Defra, 2007). Some early-flowering woodland herbs may have therefore been present in the hedgerows, but were not identified during the surveys. This is unlikely to substantially affect the assigning of hedgerow type and condition as it is considered sufficient data was collected to assess each of these factors.

- Due to the timing of the field work in 2020, the detailed condition assessment for all hedgerow types, including lines of trees, was carried out using the Metric 2.0 condition criteria. This assessment has been carried across in the Metric 3.0 assessment. The Metric 3.0 condition criteria for hedgerows is the same at Metric 2.0 with the exception of additional criteria for hedgerows with trees which relate to tree age and health. As the information on tree health was not available, it was considered proportionate to carry the 2.0 assessment across into this assessment. Given the limited difference in the condition assessment for hedgerows with trees between the two versions of the metric this is not considered a substantial limitation.

- For lines of trees, the condition assessment is more comprehensive in Metric 3.0 i.e. has more criteria, but as not all the necessary information has been collected to make this assessment against the Metric 3.0 condition criteria for lines of trees, again it was considered appropriate to use the condition assigned originally against the Metric 2.0 condition

criteria. As 'lines of trees' relate to only 1.89km of the 39.24km included in the hedgerow assessment, any limitations as a result of this approach are not considered likely to have a substantial effect on the assessment.

Rivers and streams

3.6.9 Due to access issues, the River Ter (downstream of the existing A12) and Boreham Brook (upstream of the existing A12) were assessed virtually using a combination of aerial imagery and photographs taken during a hydromorphological survey in July 2017 (see Appendix 14.3: Hydromorphology assessment, of the Environmental Statement [TR010060/APP/6.3]). Observations of time scale aerial imagery suggest the channels here have not changed between the time the photographs were taken and the present day. Therefore, the virtual assessment is not considered a substantial limitation to establishing the baseline.

3.6.10 Ditches were assessed virtually using aerial imagery and photographs taken during hydromorphological surveys in July 2017. Although not a limitation in itself, this approach made it difficult to assess whether the ditches did convey flows for four months in the year. This criterium is key to identifying whether a ditch would be considered under rivers and streams or terrestrial habitats. For the purpose of this assessment, any ditch identified within the Detailed River Network and assigned as an Ordinary Watercourse, as per Chapter 14: Road drainage and the water environment [TR010060/APP/6.1] and Appendix 14.3: Hydromorphological assessment [TR010060/APP/6.3] of the Environmental Statement, was assumed as part of the rivers and streams metric.

3.6.11 An exception to culverts and rivers being treated separately was along the River Brain, where the Brain Bridge was incorporated as part of the river, rather than as a culvert. Brain Bridge was incorporated as part river during the MoRPh survey, as the survey pre-dated the decision to treat culverts separately from the river channel, when uncertainty over their treatment remained.

Post-intervention

3.6.12 The Environmental Masterplan (Figure 2.1 of the Environmental Statement [TR0100060/APP/6.2]) illustrates the preliminary environment design and will be refined further at the detailed design stage. Refinement of the environmental design as the proposed scheme progresses could increase or decrease the number of biodiversity units forecast to be generated by the proposed scheme.

Area-based habitats and hedgerows

3.6.13 Where area-based habitat and hedgerows within the temporary land-take of the proposed scheme would be lost and then re-instated, it has been assumed that where feasible, the same habitat is created post-construction. However, given the lack of certainty over the future management of habitats in these temporary land-take areas, that would not fall within the permanent ownership of National Highways, a precautionary approach has been taken to assigning post-intervention habitat condition for area-based and hedgerow habitats. This precautionary approach mitigates the risk of overvaluing post-intervention biodiversity unit forecasts for reinstated habitats.

3.6.14 There are small gaps within the landscape and hard surfaces model. When calculations have been completed regarding which habitats will be reinstated, these small polygon gaps are assumed as reinstated habitat, where they should actually be classified as components of the landscape or hard surfaces model (such as minor planting or access roads). This will cause a minor effect on overall unit change, giving a slightly more positive score than will be true in actuality, but is not considered to affect the overall result substantially.

3.6.15 The Environmental Masterplan (Figure 2.1 of the Environmental Statement [TR0100060/APP/6.2]) (as of the design in April 2022) proposes planting of clusters of and lines of single trees in various locations along the proposed scheme. However, within the UK Habitat Classification, it is not possible to identify singular trees as a primary habitat, and therefore not possible to include these areas in the Metric 3.0. These single trees have not been included in the post-development habitats therefore, and rather have been assumed to form a component of their surrounding habitat. In most cases this surrounding habitat is 'other neutral grassland', in 'good' condition. This is considered sufficient to capture the biodiversity value (in terms of biodiversity units) of these trees.

3.6.16 The baseline metric assessment includes some ditches that have been captured as the Phase 1 habitat survey type standing water (G1) and translated as 'ponds' in the metric as it was not possible to split what was ditch versus what was pond using the Phase 1 data. The Environmental Masterplan does not capture the creation of new drainage ditches (which are a linear feature) and thus the value of drainage ditch creation is not reflected in the post-intervention assessment for area based habitats. Ditch baseline and loss/creation is fully captured in the rivers and streams assessment.

3.6.17 As the baseline habitats and conditions for Colemans Farm Quarry are based on those in the restoration plan, it has been assumed that any reinstated habitats would be restored in the same habitat type and condition as the original baseline. In reality, this may not be practical as the limited areas remaining may be better established as different habitat types to those in the restoration plan, but it is considered that in terms of the metric assessment, using this approach is appropriately precautionary.

3.6.18 At this stage of the assessment, assumptions have been applied in respect of delays to habitat creation and restoration. Excluding those areas identified for advanced planting, for all other areas, a delay of four years is applied to recognise the current length of the construction phase. This is considered precautionary, and it may be that some areas of habitat creation are brought forward sooner than this. If this were the case, this would improve the post-intervention biodiversity unit forecast.

Rivers and streams

3.6.19 Proposed drainage ditches have been included in the rivers and streams metric. This assumes they would meet the definition of ditch, once constructed (see Section 3.4 of this report). However, as more information becomes available on the design of the ditches, there is potential for some of the ditches to not meet the definition of a rivers and streams metric ditch. Instead, it may be necessary for some of the ditches to be included within the hedgerows metric. For example, if a ditch is not anticipated to retain water for more than four months of the year, it would not be classified as a rivers and streams ditch.

3.6.20 A conservative approach has been taken for the condition of the proposed drainage ditches. However, as more information becomes available on the design of the ditches, the condition assessment can be refined.

3.6.21 Where realignments of watercourses have taken place and the river condition has not changed, they have been assessed as retained habitat. However, where the realignments have resulted in an increase in length of a ditch relative to its baseline, an error occurred in the Metric. Therefore, this additional length was added to the river creation element of the BNG Metric. However, this does lead to a limitation as river creations result in a reduced number of river units due to an increased multiplier for difficulty to achieve.

3.6.22 It is assumed that proposed realignment of watercourses would be designed in a hydromorphologically appropriate way and would be connected to the floodplain. Therefore, these watercourses would not be overdeep. If the watercourse to be realigned was considered overdeep in the baseline, the removal of the overdeep nature would increase the condition. This was recorded in the Metric as an enhancement. In addition, where the realigned watercourse includes features on the floodplain, bank face or bed that are an improvement over the baseline features, the watercourse could experience a second enhancement in condition score. Therefore, for these watercourses, it has been possible to improve the condition by two categories from the baseline condition.

3.6.23 At Ordinary Watercourse 34, a new ditch has been proposed flowing from the proposed culvert extension at this location to the existing Inworth Road culvert. Although not defined as a ditch realignment, it has been assumed, given where the proposed ditch ties in with the culvert extension and existing Ordinary Watercourse 34, that this in fact a realignment to Ordinary Watercourse 34.

3.6.24 Ditch realignments have been proposed where no baseline watercourse is present or where an ordinary watercourse has been described as a surface water pathway in the Appendix 14.3: Hydromorphology assessment, of the Environmental Statement [TR010060/APP/6.3]. Although there is no baseline ditch, these watercourses have been assessed as ditch creations.

3.6.25 There is no detailed information on the proposed drainage ditches. A conservative approach has been taken for applying the condition. Therefore, the proposed drainage ditches have been assigned a condition of Poor. More information is available for the proposed drainage ditch extending from Ordinary Watercourse 15, therefore it was possible to assign a condition of Moderate. It would be necessary to refine the condition assessment for ditches when more information is available.

Borrow pits

3.6.26 Using a precautionary approach in this assessment, it has been assumed that the habitat would be reinstated using the rules outlined for other areas of reinstated habitat.

Additionality

3.6.27 This assessment includes biodiversity units generated by 'essential' ecological mitigation areas included within the Order Limits to mitigate and compensate for effects on protected species. Including these areas gives a full assessment of the biodiversity units generated by the current Environmental Masterplan (Figure 2.1 of the Environmental Statement [TR0100060/APP/6.2]). These areas cover c. 46ha. The contribution of this planting to the overall biodiversity unit assessment is presented in Section 4.1 of this report.

3.6.28 This assessment has also included the proposed scheme commitment to create woodland within the Order Limits (within borrow pit F) to offset the potential for impacts of nitrogen deposition on an ancient woodland (Perry's Wood) adjacent to the proposed scheme. As this planting is in compensation for potential nitrogen deposition, it could be argued that it should not be included in the assessment here as it may not be considered 'additional'. Further to this, the assessment does not capture any effects of degradation on the habitats for which this compensation is proposed. However, as this is a proposed scheme commitment, the planting has been included in the assessment to give a full assessment of the proposals. The contribution of this planting to the overall biodiversity unit assessment is presented in Section 4.1 of this report.

Irreplaceable habitats / veteran trees

3.6.29 There are no statutory designated sites or irreplaceable habitats such as ancient woodland within the Order Limits. There are however five 'potential' veteran trees within the Order Limits (see Chapter 9: Biodiversity, of the Environmental Statement [TR010060/APP/6.1]). These are not specifically accounted for in the metric assessment as they do not comprise specific habitat types.

3.6.30 It is acknowledged, however, that five 'potential' veteran trees may be lost as part of the development proposals. 'Potential' veteran trees are not listed on the Ancient Woodland Inventory (Woodland Trust, 2021) as being veteran, but have been identified through the proposed scheme arboriculture surveys (Appendix 8.4: Arboriculture impact assessment, of the Environmental Statement [TR0100060/APP/6.3]) as meeting the criteria for veteran trees. These trees are assumed to be veteran trees for the purposes of the proposed scheme and their

loss is considered to be irreplaceable. As Government policy is that net gain in biodiversity cannot be achieved on areas of development that result in the loss of irreplaceable habitat, the measures proposed to partially compensate (recognising that the loss of irreplaceable features cannot be fully compensated) for the loss of the five trees do not form part of the BNG calculation (see Section 4 of this report).

3.6.31 However, the mitigation proposed for the scheme (Chapter 9: Biodiversity, of the Environmental Statement [TR010060/APP/6.1]) includes measures to compensate for the loss of the 'potential' veteran trees (as committed in the REAC included within the first iteration EMP [TR010060/APP/6.5]) which is accordance with the latest guidance from Natural England and the Forestry Commission (2022). These measures would partially compensate for the loss of this irreplaceable habitat. This compensation is not included within the BNG calculations.

Metric area error

3.6.32 It is acknowledged that there is a minor area error in the metric assessment whereby there is an extra 1.28ha habitat created as compared to that lost. This is due to the need to bring together a number of different data sets for the post-development calculations drawn in different software for different purposes leading to minor gaps and overlaps which are aggregated over the entire area. This is a minor discrepancy (representative of 0.15% of the total area) that will not significantly alter the outputs of the metric assessment.

4 Results

4.1 Summary of results

4.1.1 Table 3 provides a summary of the forecast biodiversity unit change for each of the three types of biodiversity units assessed i.e. area-based habitats units, hedgerow units and river and stream units. It shows a gain in all three types of biodiversity units. Results described in this section are part of committed measures secured through the REAC, within the first iteration EMP [TR010060/APP/6.5].

Table 3 Summary of biodiversity units per development phase and net change

Development phase	Calculator	Biodiversity units
On-site baseline	Habitat units	2533.70
	Hedgerow units	423.49
	Rivers and streams units[7]	93.85[8]
On-site post-construction (including habitat retention, creation, and enhancement)	Habitat units	3167.28
	Hedgerow units	576.20
	Rivers and streams units	240.95[9]
Total net unit change	**Habitat units**	**633.58**
	Hedgerow units	**152.70**
	Rivers and streams units	**147.10[10]**
Total net % change	**Habitat units**	**25.01%**
	Hedgerow units	**36.06%**
	Rivers and streams units	**156.73%[11]**

4.2 Area-based habitats

4.2.1 The current biodiversity unit forecast for area based habitats estimates a 25.01% gain in units as compared to the baseline.

[7] Due to trading rules for rivers and ditches, as explained in Section 2.4 of this report, the biodiversity units have been split further in the following footnotes to distinguish between baseline and post-construction biodiversity units for both rivers and ditches, whilst also distinguishing the total net change and net % change for the two.
[8] Rivers: 43.75 units; Ditches: 50.10 units
[9] Rivers: 43.91 units; Ditches: 197.04 units
[10] Rivers: 0.16 units; Ditches: 146.94 units
[11] Rivers: 0.36%; Ditches: 293.29%

4.2.2 The main driver of the gain forecast is the creation of ‘other neutral grassland’ in ‘good’ condition. Grassland created as part of the landscape design (excluding re-instated grassland) creates 1,947 of the 2,876 biodiversity units created in the post-development assessment i.e. 68% of the biodiversity units created and 61% of the total post-development biodiversity units.

4.2.3 The metric results highlight that trading rules are not met for a number of habitats including ponds, open mosaic habitats on previously developed land, woodland (of different types) and scrub (of different types).

4.2.4 For ponds, the assessment shows a loss of pond extent and biodiversity units despite the creation of a number of ponds in the Environmental Masterplan (Figure 2.1 of the Environmental Statement [TR0100060/APP/6.2]). However, to provide context, the number of ponds to be lost would be eight, compared to 57 new wildlife ponds to be created, in addition to 71 new attenuation ponds. In the current assessment, loss is driven both by the absence of ditch creation in the post-intervention assessment for area-based habitats i.e. some ‘ponds’ included in the baseline would actually be ditches for which habitat creation is addressed in the rivers and streams assessment (see Section 3.6 of this report), and the loss of the lake/pond habitat within the Colemans Farm Quarry restoration plan to be replaced by built surface (i.e. road).

4.2.5 For open mosaic habitats on previously developed land, the 4.74ha identified in the baseline is largely lost permanently and the are no proposals for creation of this habitat.

4.2.6 For woodland, there is an increase in the extent of woodland cover for the proposed scheme as compared to the baseline, however, there is a loss of 119 biodiversity units generated by woodland habitat as compared to the baseline of 648.25. This is due to the loss of areas of semi-natural woodland habitat types being replaced by 'other broadleaved woodland' i.e. woodland generated by planting which generates fewer biodiversity units due to its lower distinctiveness, and due to the risk multipliers applied to woodland creation in the Metric. It should be noted that in the absence of detailed condition data, the value of semi-natural woodland in the baseline was assumed to be ' good' which is likely to have been an over valuation of the baseline for woodland.

4.2.7 Whilst the assessment records a loss in extent and biodiversity units (127) generated by scrub habitats, it should be noted that intermittent tree and shrub planting included in the landscape design is not captured by the metric which only captures the primary habitat type of planting which in this case is grassland. There is >23ha of grassland with intermittent tree and shrub planting proposed in the landscape design which will go some way to offsetting the reduction of scrub habitat as assessed in the Metric.

4.2.8 Planting provided in respect of ‘essential’ ecological mitigation areas generates a forecast 442 biodiversity units in the assessment, so 15% of the total (2,876) biodiversity units created in the post-development assessment and 14% of the total post-development biodiversity units.

4.2.9 Woodland planting provided in respect of nitrogen deposition compensation does not make a significant contribution to the net gain in biodiversity units forecast for the proposed scheme which is driven by grassland creation. Woodland planting for nitrogen deposition compensation generates a forecast 26 biodiversity units in the assessment so <1% of the total (2,876) biodiversity units created in the post-development assessment.

4.3 Hedgerow habitats

4.3.1 The current biodiversity unit forecast for hedgerow estimates a 36.06% gain in units as compared to the baseline. This is driven both by an increase in the extent (km) of hedgerow in the proposed scheme as compared to the baseline in addition to the fact that hedgerow creation would be exclusively of the 'high' distinctiveness hedgerow type, native species rich hedgerow with trees in 'good' condition.

4.4 Rivers and streams

4.4.1 Results associated with the rivers and streams metric are largely driven by a combination of the proposed river realignments, drainage ditch realignments and the proposed creation of drainage ditches. Furthermore, improvements to riparian, channel margin and riverine features, also drive the outcome of the rivers and streams metric.

4.4.2 River realignments largely take place along overdeep channels. Through detailed design informed by a hydromorphologist, these realignments would no longer be overdeep. Instead, realignments would be constructed to replicate a near-natural channel cross-section, more in-line with what the natural channel would exhibit. Therefore, any manual downgrading of the baseline condition score would no longer be required and the proposed realignments would be considered an enhancement to river condition. This is reflected in the enhancements along Rivenhall Brook, Domsey Brook (both eastern and western reaches) and Roman River.

4.4.3 Further improvements to riverine channel margin and channel bed features proposed along the proposed river realignments have led to further upgrading of the river condition score for two of these rivers (BNG reaches: Rivenhall Brook_001 and Domsey Brook (east)_002). Riparian improvements arise from proposed changes to riparian land coverage at the site of the aforementioned realignments through landscaping. Channel margin and channel bed improvements were present at proposed tributary confluences at Domsey Brook, and sediment augmentation proposed to mitigate significant hydromorphological impacts along Rivenhall Brook, respectively.

4.4.4 Other areas of enhancement to the condition score, and leading to an enhancement in biodiversity values, were identified along Domsey Brook (BNG reach: Domsey Brook (east)_003) and the River Ter (BNG reach: River Ter_002). In general, these would involve residual and direct improvements to riparian characteristics as a result of proposed landscaping and changes in groundcover within the 10m riparian buffer zone.

4.4.5 Overall, the main driver of the river units gain is the realignment and creation of drainage ditches proposed throughout the proposed scheme. In total, approximately 42km of new drainage ditch has been proposed, offering potential opportunities for aquatic ecosystems to develop. In addition, there are approximately 3km of proposed drainage culverts. Although, the condition assigned to these new ditches and culverts is Poor, additional river units are provided due to the additional length.

4.4.6 No trading down issues i.e. replacing something lost with a lower distinctiveness habitat, have been identified for the rivers and streams metric.

5 Conclusions

5.1.1 At this stage, the Metric forecasts should be treated with some caution due to the limitations of the data, the assumptions made to allow a quantitative forecast of biodiversity unit change (see Section 3.6 of this report), and the preliminary nature of the design. However, it is considered that this assessment provides a good indicator of the likely performance of the proposed scheme in terms of net biodiversity, and a precautionary approach has been applied. The metric therefore provides a realistic 'worst-case' assessment of BNG. The current forecast change in biodiversity units forecast for the proposed scheme is:

- 25.01% for area-based habitat units
- 36.06% for hedgerow units
- 156.73% for river units

5.1.2 It should be acknowledged, however, that five 'potential' veteran trees may be lost as part of the development proposals. These trees are considered irreplaceable and the measures provided in partial compensation for the loss of these trees has been excluded from the BNG calculation.

5.1.3 There are a number of opportunities for improving both confidence in the forecast and for improving the outcomes for biodiversity as the proposed scheme design is refined at the detailed design, which are discussed below.

5.2 Development of the post-intervention data

5.2.1 This assessment represents the current stage of the proposed scheme and would be updated at key milestones to further develop the forecast for net biodiversity change. Updates to the assessment would be made based on:

- Refinement of the proposed scheme design and construction information
- Development of the LEMP taking into account target habitats and conditions relied upon in the metric assessment

5.2.2 As the proposed scheme is developed, opportunities would be sought to further apply the mitigation hierarchy and in the first instance to avoid loss of habitats, and subsequently to maximise the distinctiveness and condition of the habitats created. Opportunities may also exist to enhance retained habitats.

5.2.3 Actions to improve the biodiversity performance of the proposed scheme would take trading rules into consideration as well as overall metric outputs i.e. look to address current trading failures specifically for woodland habitat.

Hedgerow enhancement

5.2.4 Forty-five of the hedgerows listed to be retained were identified as having potential to be enhanced, aiming to increase their overall condition. The data recorded for each hedgerow was compared against the condition assessment categories for hedgerows.

5.2.5 Three condition assessment categories were selected for potential enhancement, and these were applied to the existing hedgerow data. These categories were B1, B2 and D1. B1 refers to the gaps at the hedge base, B2 to the gaps and hedge continuity, and D1 to the presence/absence of invasive and neophyte species.

5.2.6 These potential enhancements are not currently committed to in REAC, within the first iteration EMP [TR010060/APP/6.5], and are thus not applied to hedgerows in this assessment, but these could potentially be incorporated into the proposed scheme to raise the BNG uplift for hedgerows.

River enhancement

5.2.7 Drainage ditches would require further assessment to confirm whether those currently assessed as ditches under the rivers and streams metric are in-fact terrestrial linear habitats. If this is the case, then review and reassessment of the rivers and streams metric would be required. For the ditches that remain in the rivers and streams metric, a reassessment of the ditch condition would be required, once more design information is available.

5.3 Iterations of the biodiversity metric

5.3.1 It is noted that the Biodiversity Metric 3.1 has recently been released by Natural England, published 21 April 2022, and this tool will be considered for future metric calculations.

References

Butcher, B., Carey, P., Edmonds, R., Norton, L., and Treweek, J. (2020). The UK Habitat Classification User Manual Version 1.1. Available at: http://www.ukhab.org/. Accessed May 2022.

Cartographer (2021). Modular River survey. Available at: https://modularriversurvey.org/. Accessed May 2022.

Crosher, I., Gold, S., Heaver, M., Heydon, M., Moore, L., Panks, S., Scott, S., Stone, D., and White, N. (2019). The Biodiversity Metric 2.0: Auditing and accounting for biodiversity value. Calculation Tool (Beta Version, July 2019). Natural England.

Department for Environment, Food and Rural Affairs (2007). Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Available at: https://www.gov.uk/government/publications/hedgerow-survey-handbook. Accessed May 2022.

Department for Environment, Food and Rural Affairs (2012). Biodiversity Offsetting Pilots Technical Paper: the metric for the biodiversity offsetting pilot in England. Available at: https://www.gov.uk/government/publications/technical-paper-the-metric-for-the-biodiversity-offsetting-pilot-in-england. Accessed May 2022.

Department for Transport (2014). National Policy Statement for National Networks. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-national-networks. Accessed May 2022.

JNCC (2010 – revised 2016). Handbook for Phase 1 habitat survey – a technique for environmental audit. Available at: https://hub.jncc.gov.uk/assets/9578d07b-e018-4c66-9c1b-47110f14df2a. Accessed May 2022.

Ministries of Housing, Communities & Local Government (2021). National Planning Policy Framework. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2. Accessed: March 2022.

Natural England and Forestry Commission (2022). Ancient woodland, ancient trees and veteran trees: advice for making planning decisions. Available at: https://www.gov.uk/guidance/ancient-woodland-ancient-trees-and-veteran-trees-advice-for-making-planning-decisions. Accessed May 2022.

Panks, S., White, N., Newsome, A., Potter, J., Heydon, M., Mayhew, E., Alvarez, M., Russell, T., Scott, S.J., Heaver, M., Scott, S.H., Treweek, J., Butcher, B., and Stone, D. (2021a). Biodiversity metric 3.0: Auditing and accounting for biodiversity. User Guide.

Panks, S., White, N., Newsome, A., Potter, J., Heydon, M., Mayhew, E., Alvarez, M., Russell, T., Scott, S.J., Heaver, M., Scott, S.H., Treweek, J., Butcher, B., and Stone, D. (2021b). Biodiversity metric 3.0: Auditing and accounting for biodiversity. Technical Supplement. Natural England.

Panks, S., White, N., Newsome, A., Potter, J., Heydon, M., Mayhew, E., Alvarez, M., Russell, T., Scott, S.J., Heaver, M., Scott, S.H., Treweek, J., Butcher, B., and Stone, D. (2021c). Biodiversity metric 3.0: Auditing and accounting for biodiversity. Calculation Tool. Natural England.

Woodland Trust (2021). Ancient Tree Inventory. Available at: https://ati.woodlandtrust.org.uk/. Accessed May 2022.

Annex A - Figures

Figure 1 - Area-based baseline habitats

Figure 2 - Hedgerow baseline habitats

Figure 3 - MoRPh survey locations

Figure 4 - BNG reaches assessed as part of the rivers and streams metric

FIGURE 1

Legend

- Order Limits

Biodiversity Metric Habitats

- Cropland - Cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Hawthorn scrub
- Heathland and shrub - Mixed scrub
- Lakes - Ponds (Non- Priority Habitat)
- Lakes - Ponds (Priority Habitat)
- Urban - Developed land; sealed surface
- Urban - Vacant/derelict land/ bareground
- Woodland and forest - Lowland mixed deciduous woodland
- Woodland and forest - Other woodland; broadleaved
- Woodland and forest - Other woodland; mixed

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
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Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HABITATS
SHEET 1 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:12000	DO NOT SCALE	
Jacobs No.	B36601D1	Rev	P01
Client No.	HE551497		

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0180

0 500 m

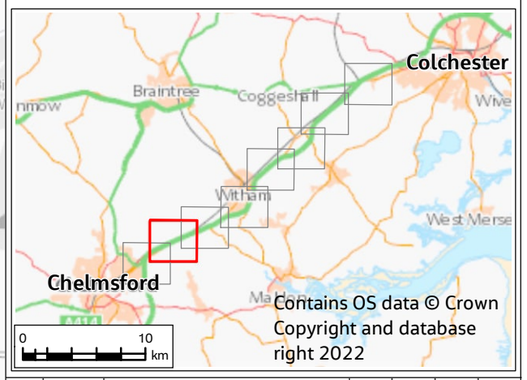
FIGURE 1

Legend

- Order Limits

Biodiversity Metric Habitats

- Cropland - Cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Hawthorn scrub
- Heathland and shrub - Mixed scrub
- Lakes - Ponds (Priority Habitat)
- Urban - Developed land; sealed surface
- Urban - Vacant/derelict land/ bareground
- Woodland and forest - Lowland mixed deciduous woodland
- Woodland and forest - Other woodland; broadleaved



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Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HABITATS
SHEET 2 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

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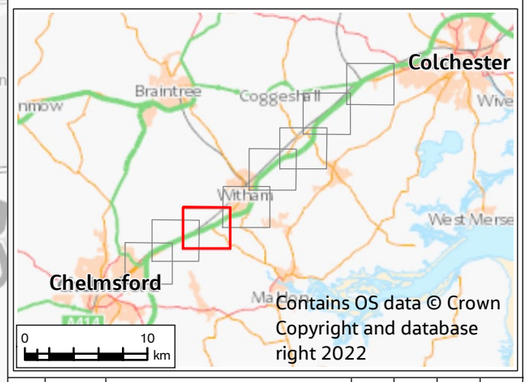
FIGURE 1

Legend

- Order Limits

Biodiversity Metric Habitats

- Cropland - Cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Blackthorn scrub
- Heathland and shrub - Hawthorn scrub
- Heathland and shrub - Mixed scrub
- Lakes - Ponds (Non- Priority Habitat)
- Lakes - Ponds (Priority Habitat)
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Developed land; sealed surface
- Urban - Vacant/derelict land/ bareground
- Urban - Vegetated garden
- Woodland and forest - Lowland mixed deciduous woodland
- Woodland and forest - Other woodland; broadleaved
- Woodland and forest - Other woodland; mixed
- Woodland and forest - Wet woodland



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Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HABITATS
SHEET 3 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0182

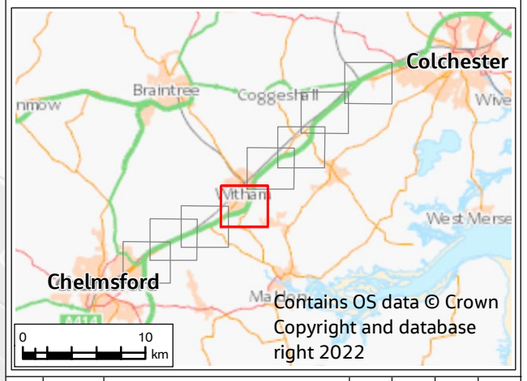
FIGURE 1

Legend

- Order Limits

Biodiversity Metric Habitats

- Cropland - Cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Hawthorn scrub
- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Artificial unvegetated, unsealed surface
- Urban - Developed land; sealed surface
- Urban - Open Mosaic Habitats on Previously Developed Land
- Urban - Vacant/derelict land/ bareground
- Urban - Vegetated garden
- Woodland and forest - Lowland mixed deciduous woodland
- Woodland and forest - Other woodland; broadleaved
- Woodland and forest - Other woodland; mixed



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Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HABITATS
SHEET 4 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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0 500 m

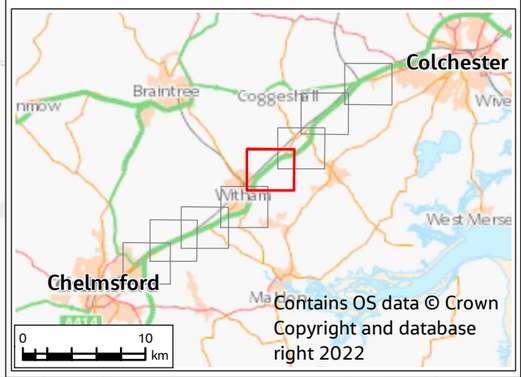
FIGURE 1

Legend

- Order Limits

Biodiversity Metric Habitats

- Cropland - Cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Hawthorn scrub
- Heathland and shrub - Mixed scrub
- Lakes - Ponds (Priority Habitat)
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Developed land; sealed surface
- Urban - Open Mosaic Habitats on Previously Developed Land
- Urban - Vacant/derelict land/ bareground
- Urban - Vegetated garden
- Woodland and forest - Lowland mixed deciduous woodland
- Woodland and forest - Other coniferous woodland
- Woodland and forest - Other woodland; broadleaved
- Woodland and forest - Other woodland; mixed
- Woodland and forest - Wet woodland



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P01	25/07/22	For DCO application	ML	LW	NP	SG

Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HABITATS
SHEET 5 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0184

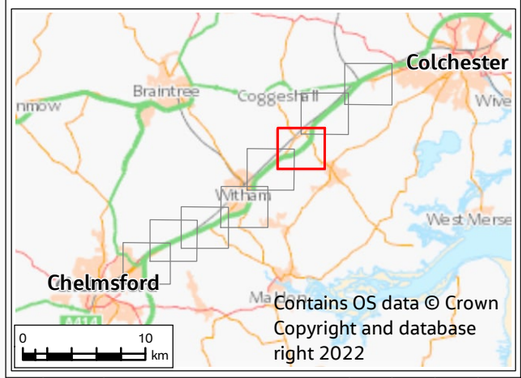
FIGURE 1

Legend

- Order Limits

Biodiversity Metric Habitats

- Cropland - Cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Hawthorn scrub
- Heathland and shrub - Mixed scrub
- Lakes - Ponds (Non- Priority Habitat)
- Lakes - Ponds (Priority Habitat)
- Urban - Developed land; sealed surface
- Urban - Vacant/derelict land/ bareground
- Urban - Vegetated garden
- Woodland and forest - Lowland mixed deciduous woodland
- Woodland and forest - Other coniferous woodland
- Woodland and forest - Other woodland; broadleaved
- Woodland and forest - Other woodland; mixed
- Woodland and forest - Wet woodland



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APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HABITATS
SHEET 6 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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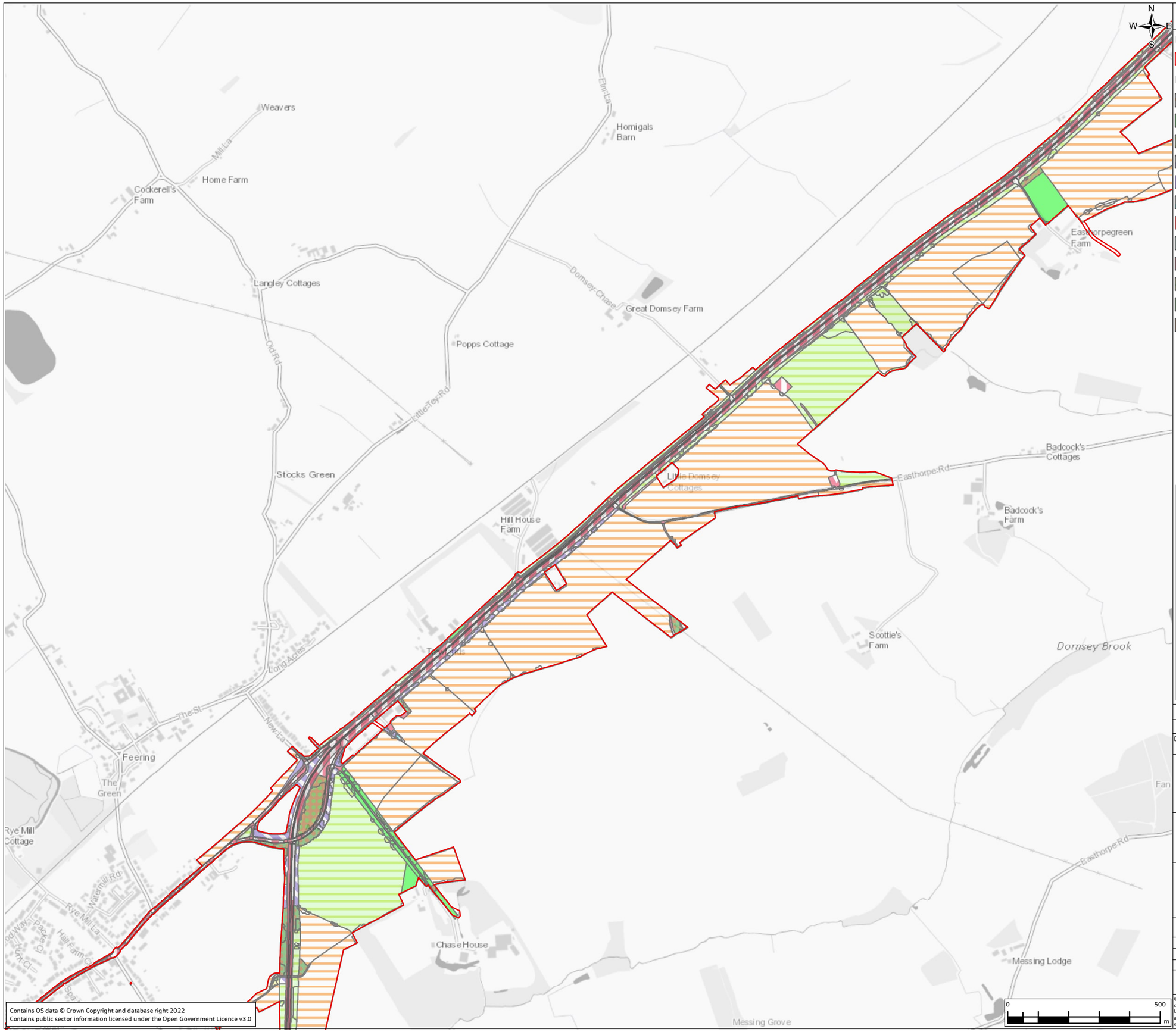
FIGURE 1



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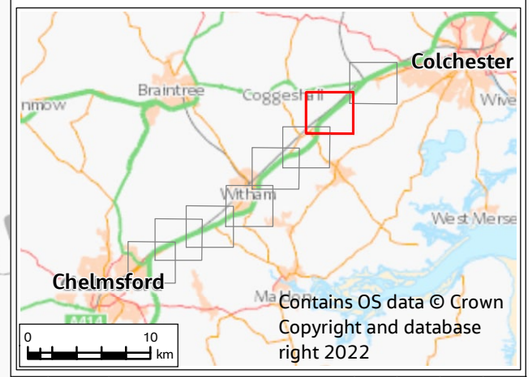
Legend

- Order Limits

Biodiversity Metric Habitats

- Cropland - Cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Hawthorn scrub
- Heathland and shrub - Mixed scrub
- Lakes - Ponds (Non- Priority Habitat)
- Urban - Built linear features
- Urban - Developed land; sealed surface
- Urban - Vacant/derelict land/ bareground
- Woodland and forest - Other coniferous woodland
- Woodland and forest - Other woodland; broadleaved
- Woodland and forest - Other woodland; mixed



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Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HABITATS
SHEET 7 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0186

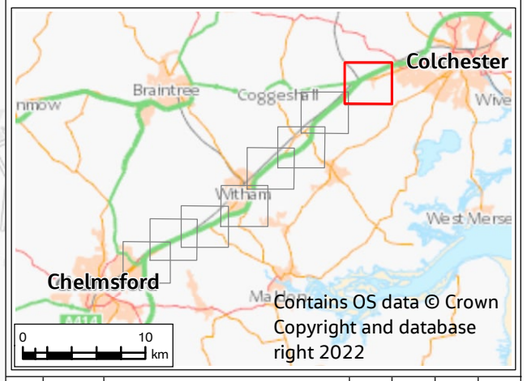
FIGURE 1

Legend

- Order Limits

Biodiversity Metric Habitats

- Cropland - Cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Hawthorn scrub
- Heathland and shrub - Mixed scrub
- Lakes - Ponds (Non- Priority Habitat)
- Urban - Built linear features
- Urban - Developed land; sealed surface
- Urban - Vacant/derelict land/ bareground
- Urban - Vegetated garden
- Woodland and forest - Lowland mixed deciduous woodland
- Woodland and forest - Other coniferous woodland
- Woodland and forest - Other woodland; broadleaved
- Woodland and forest - Other woodland; mixed
- Woodland and forest - Wet woodland



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APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HABITATS
SHEET 8 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Jacobs No.	B36601D1	Rev P01
Client No.	HE551497	

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0187

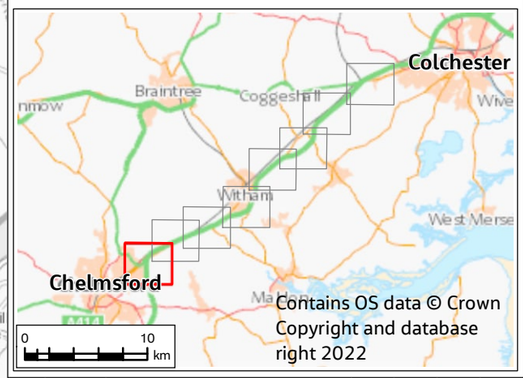
FIGURE 2

Legend

- Order Limits

Biodiversity Metric Habitats

- Hedge Ornamental Non Native
- Line of Trees - Associated with bank or ditch
- Native Hedgerow
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Hedgerow with trees - Associated with bank or ditch
- Native Species Rich Hedgerow with trees
- Native Species Rich Hedgerow with trees - Associated with bank or ditch



Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	25/07/22	For DCO application	ML	LW	NP	SG

Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HEDGEROWS
SHEET 1 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0188

0 500 m

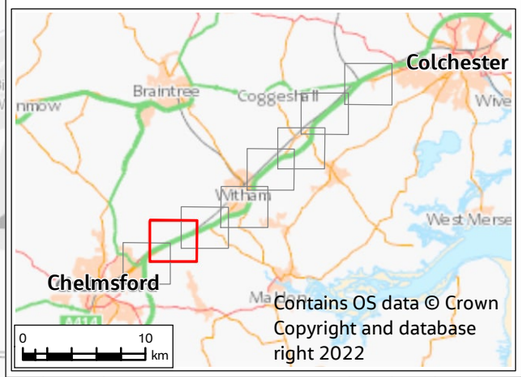
FIGURE 2

Legend

- Order Limits

Biodiversity Metric Habitats

- Line of Trees
- Line of Trees - Associated with bank or ditch
- Native Hedgerow
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Hedgerow with trees - Associated with bank or ditch
- Native Species Rich Hedgerow
- Native Species Rich Hedgerow with trees
- Native Species Rich Hedgerow with trees - Associated with bank or ditch



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Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HEDGEROWS
SHEET 2 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Jacobs No.	B36601D1	Rev P01
Client No.	HE551497	

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0189

FIGURE 2

Legend

- Order Limits

Biodiversity Metric Habitats

- Hedge Ornamental Non Native
- Line of Trees
- Line of Trees (Ecologically Valuable)
- Native Hedgerow
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Hedgerow with trees - Associated with bank or ditch
- Native Species Rich Hedgerow
- Native Species Rich Hedgerow with trees
- Native Species Rich Hedgerow with trees - Associated with bank or ditch

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	25/07/22	For DCO application	ML	LW	NP	SG

Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HEDGEROWS
SHEET 3 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Client No.	HE551497	

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0190

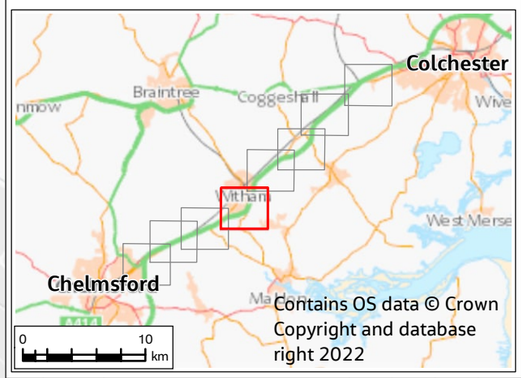
FIGURE 2

Legend

- Order Limits

Biodiversity Metric Habitats

- Hedge Ornamental Non Native
- Line of Trees
- Line of Trees (Ecologically Valuable)
- Line of Trees (Ecologically Valuable) - with Bank or Ditch
- Native Hedgerow
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Hedgerow with trees - Associated with bank or ditch
- Native Species Rich Hedgerow with trees



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Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HEDGEROWS
SHEET 4 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Jacobs No.	B36601D1	Rev P01
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Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0191

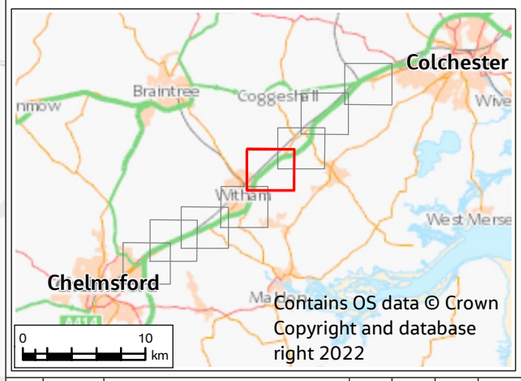
FIGURE 2

Legend

- Order Limits

Biodiversity Metric Habitats

- Hedge Ornamental Non Native
- Line of Trees
- Line of Trees - Associated with bank or ditch
- Line of Trees (Ecologically Valuable)
- Line of Trees (Ecologically Valuable) - with Bank or Ditch
- Native Hedgerow
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Hedgerow with trees - Associated with bank or ditch
- Native Species Rich Hedgerow with trees
- Native Species Rich Hedgerow with trees - Associated with bank or ditch



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Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HEDGEROWS
SHEET 5 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:12000	DO NOT SCALE
Jacobs No.	B36601D1	Rev P01
Client No.	HE551497	

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0192

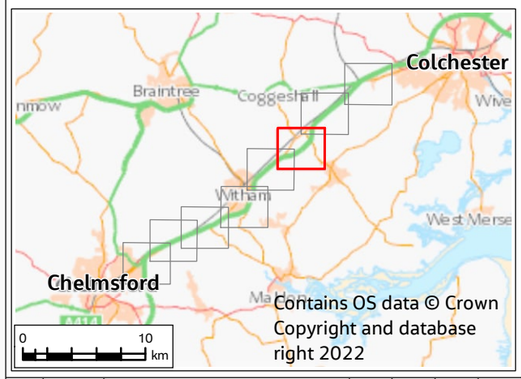
FIGURE 2

Legend

- Order Limits

Biodiversity Metric Habitats

- Line of Trees - Associated with bank or ditch
- Line of Trees (Ecologically Valuable) - with Bank or Ditch
- Native Hedgerow
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Hedgerow with trees - Associated with bank or ditch
- Native Species Rich Hedgerow with trees - Associated with bank or ditch



Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	25/07/22	For DCO application	ML	LW	NP	SG

Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HEDGEROWS
SHEET 6 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:12000		DO NOT SCALE
Jacobs No.	B36601D1	Rev	P01
Client No.	HE551497		

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0193

0 500 m

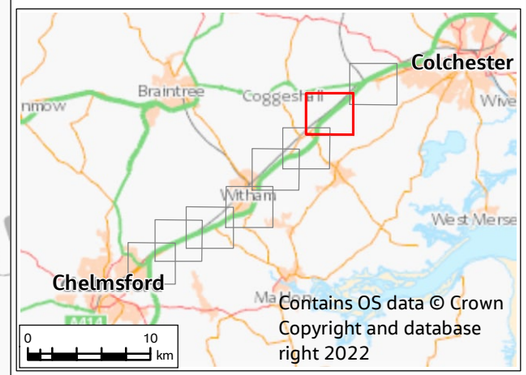
FIGURE 2

Legend

- Order Limits

Biodiversity Metric Habitats

- Hedge Ornamental Non Native
- Line of Trees - Associated with bank or ditch
- Line of Trees (Ecologically Valuable) - with Bank or Ditch
- Native Hedgerow
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Hedgerow with trees - Associated with bank or ditch
- Native Species Rich Hedgerow with trees - Associated with bank or ditch



Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	25/07/22	For DCO application	ML	LW	NP	SG

Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HEDGEROWS
SHEET 7 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:12000	DO NOT SCALE
Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0194

FIGURE 2

Legend

- Order Limits

Biodiversity Metric Habitats

- Hedge Ornamental Non Native
- Native Hedgerow
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Hedgerow with trees - Associated with bank or ditch

P01	25/07/22	For DCO application	ML	LW	NP	SG
Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

Development Consent Order Drawing Number: TR010060/APP/6.3

APFP Regulation: Regulation 5(2)(l)

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title: ENVIRONMENTAL STATEMENT
BIODIVERSITY NET GAIN - BASELINE HEDGEROWS
SHEET 8 OF 8

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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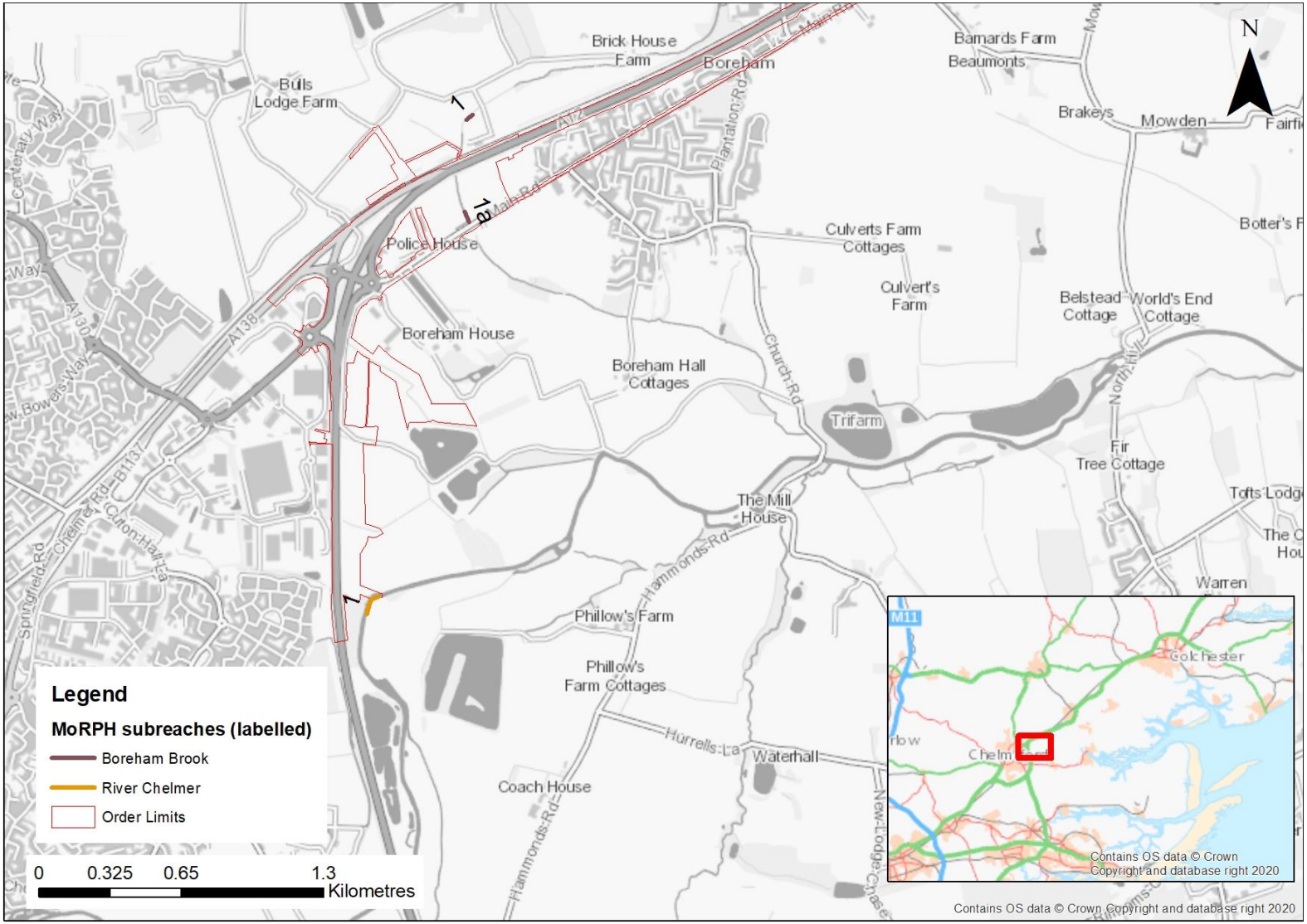
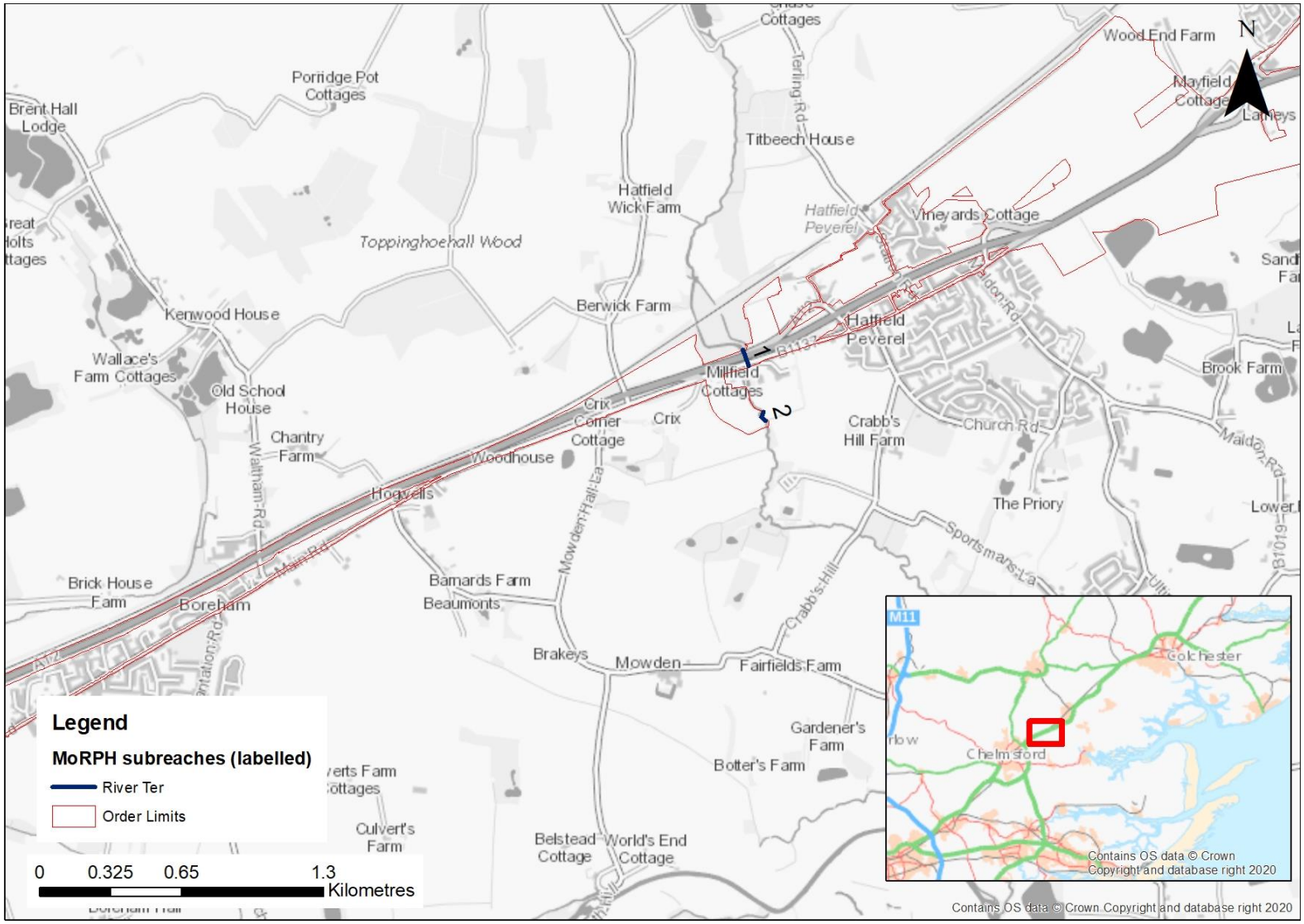
Client No.	HE551497	Rev P01

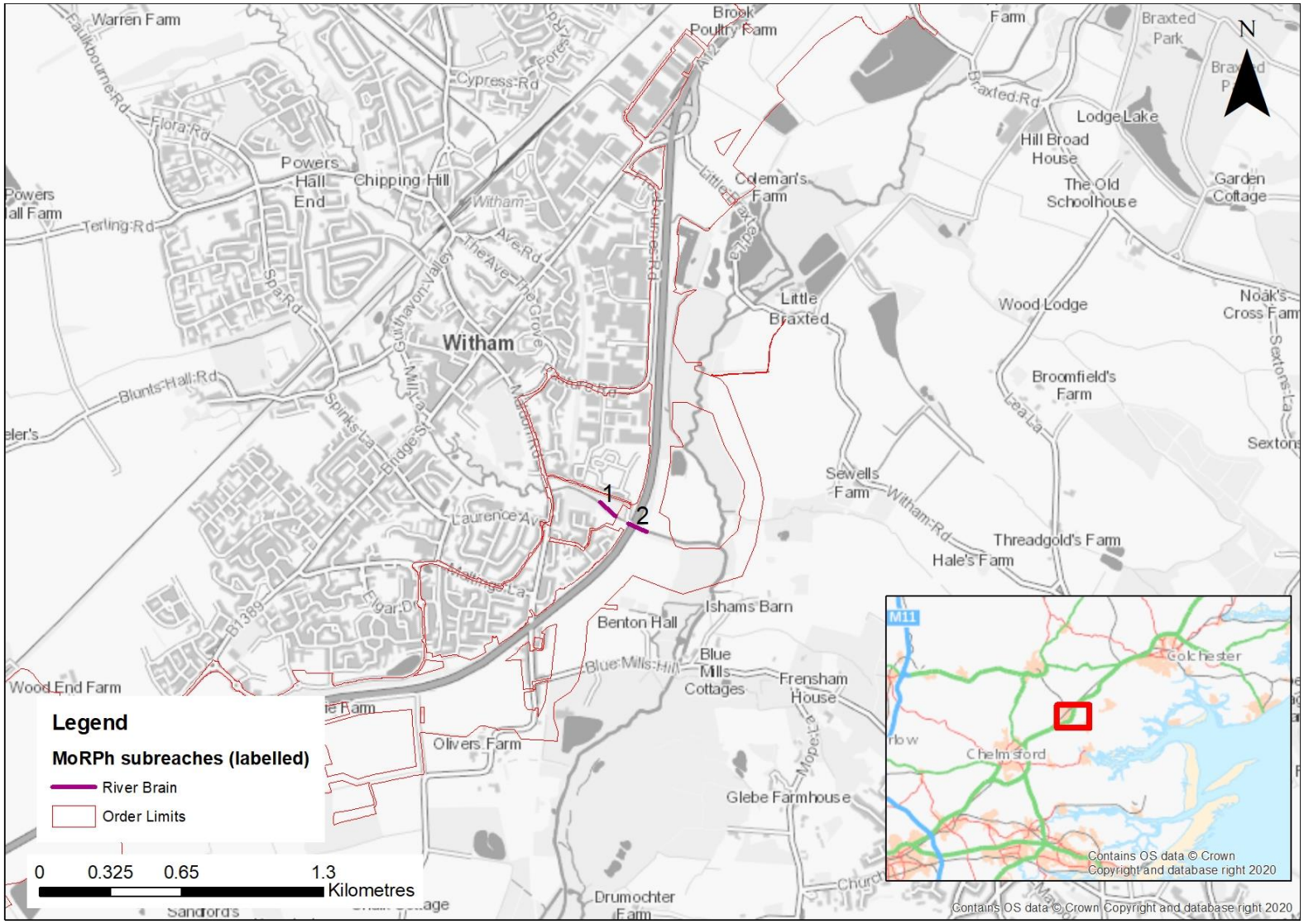
Drawing Number: HE551497-JAC-VES-SCHW-SK-GI-0195

0 500 m

Figure 3. MoRPh survey locations




N
Legend
MoRPH subreaches (labelled)
River Ter
Order Limits
0 0.325 0.65 1.3
Kilometres
Contains OS data © Crown Copyright and database right 2020
Contains OS data © Crown Copyright and database right 2020
Porridge Pot Cottages
Brent Hall Lodge
Toppinghoehall Wood
Kenwood House
Wallace's Farm Cottages
Old School House
Chantry Farm
Hoggvells
Brick House Farm
Boreham
Barnards Farm
Beaumonts
Brakeys
Mowden
Fairfields Farm
Gardener's Farm
Botter's Farm
Culvert's Farm
Belstead Cottage
World's End Cottage
Titbeech House
Hatfield Wick Farm
Hatfield Peverel
Vineyards Cottage
Berwick Farm
Millfield Cottages
Crix
Crix Corner Cottage
Woodhouse
Crabb's Hill Farm
Church Rd
The Priory
Brook Farm
Wood End Farm
Mayfield Cottage
Lanneys
Terling Rd
Maldon Rd
Waltham Rd
Mowden Hall La
Crabbs Hill
Sportsmans La
Main Rd
A12
B1137
B1019
M11
Colchester
Chelmsford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Brook Poultry Farm
Braxted Park
Lodge Lake
Hill Broad House
The Old Schoolhouse
Garden Cottage
Coleman's Farm
Little Braxted
Wood Lodge
Noak's Cross Farm
Broomfield's Farm
Sewells Farm
Threadgold's Farm
Hale's Farm
Powers Hall End
Chipping Hill
Benton Hall
Ishams Barn
Blue Mills Cottages
Frensham House
Olivers Farm
Glebe Farmhouse
Drumochter Farm
Wood End Farm
Sandfords
Cypress Rd
Flora Rd
Terling Rd
Spa Rd
Blunts Hall Rd
Spinks La
Bridge St
Mill La
Guithavon Valley
The Ave
The Grove
Maldon Rd
Laurence Av
Wallace La
Elgar Dr
B1389
Blue Mills Hill
Mope La
Braxted Rd
Witham Rd
Lea La
Sextons La
Sextons
1
2
N
Legend
MoRPh subreaches (labelled)
River Brain
Order Limits
0
0.325
0.65
1.3
Kilometres
M11
Colchester
Chelmsford
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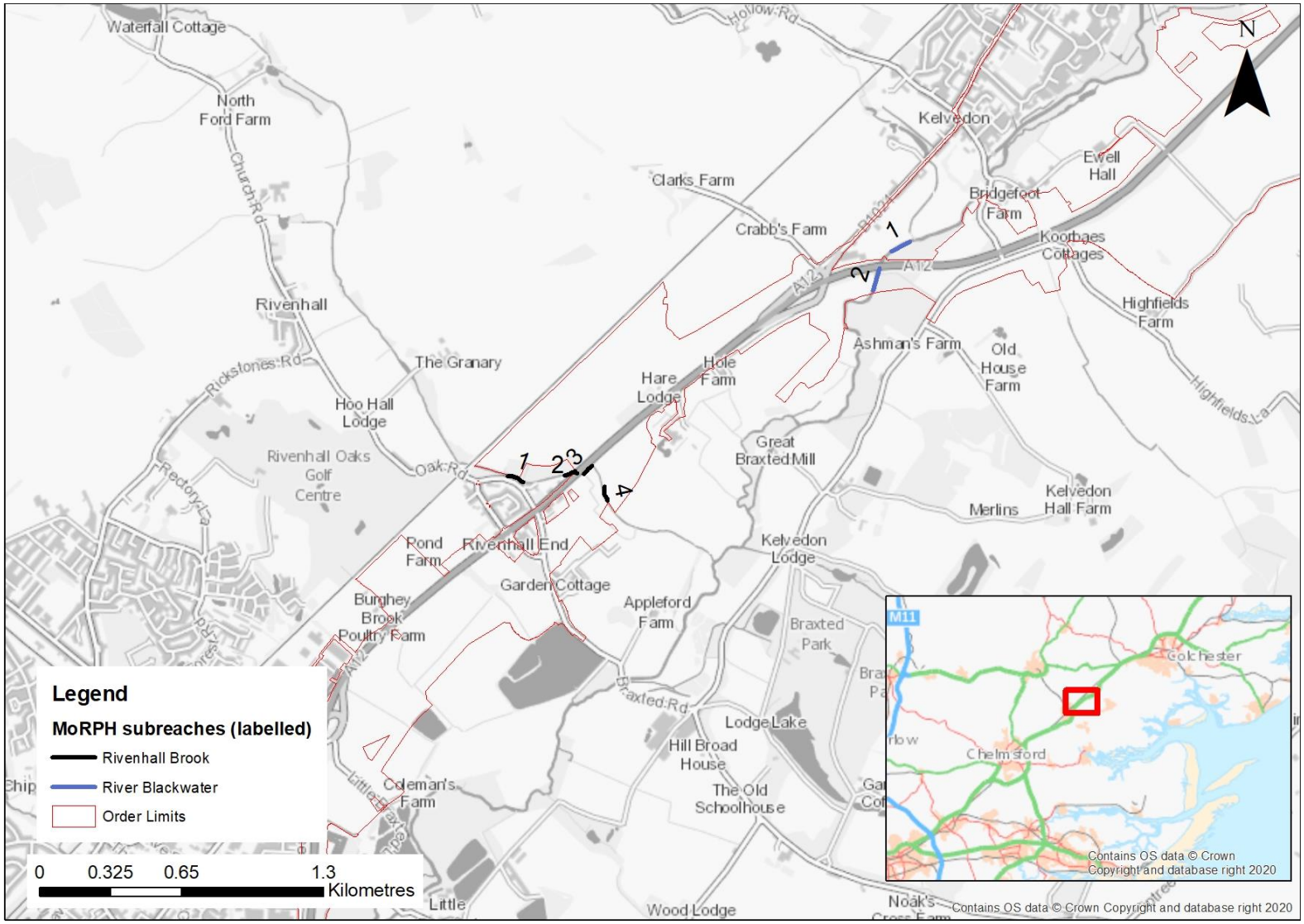
Waterfall Cottage
North Ford Farm
Church Rd
Rivenhall
Rickstones Rd
The Granary
Hoo Hall Lodge
Rivenhall Oaks Golf Centre
Oak Rd
Rectory La
Pond Farm
Rivenhall End
Garden Cottage
Burghey Brook Poultry Farm
Appleford Farm
Braxted Rd
Coleman's Farm
Little Braxted
Wood Lodge
Noak's Cross Farm
Clarks Farm
Crabb's Farm
Kelvedon
Ewell Hall
Bridgefoot Farm
Koorbaes Cottages
A12
Highfields Farm
Ashman's Farm
Old House Farm
Highfields La
Hare Lodge
Hole Farm
Great Braxted Mill
Merlins
Kelvedon Hall Farm
Kelvedon Lodge
Braxted Park
Lodge Lake
Hill Broad House
The Old Schoolhouse
1
2
3
4
N
Legend
MoRPH subreaches (labelled)
Rivenhall Brook
River Blackwater
Order Limits
0 0.325 0.65 1.3
Kilometres
M11
Colchester
Chelmsford
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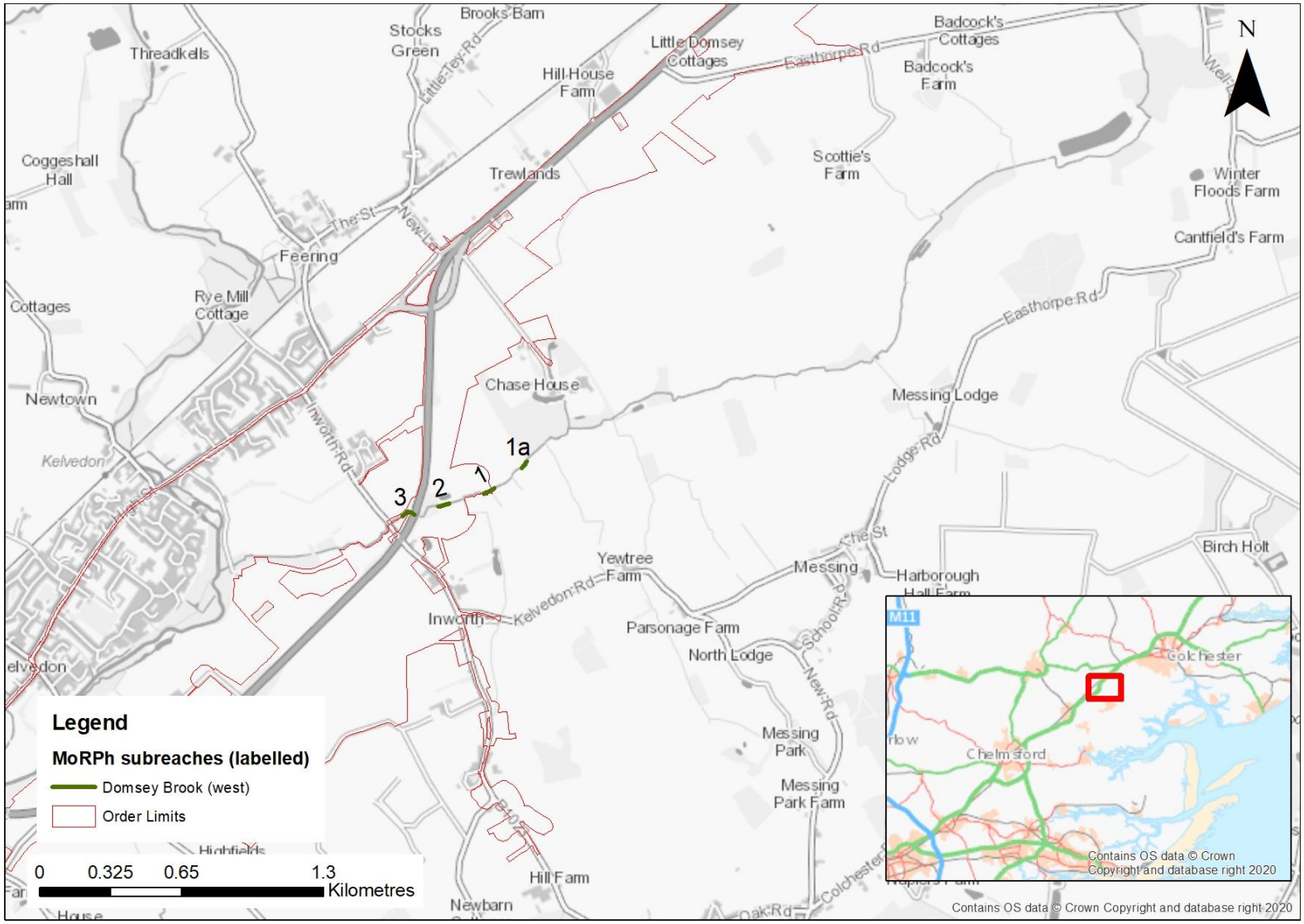
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Brooks Barn
Stocks Green
Threadkells
Little Domsey Cottages
Badcock's Cottages
Badcock's Farm
Hill House Farm
Little Tey Rd
Easthorpe Rd
Coggeshall Hall
Trewlands
Scottie's Farm
Winter Floods Farm
Cantfield's Farm
The St
New Rd
Feering
Rye Mill Cottage
Cottages
Easthorpe Rd
Chase House
Messing Lodge
Newtown
Kelvedon
Inworth Rd
1a
1
2
3
Lodge Rd
The St
Birch Holt
Yewtree Farm
Messing
Harborough Hall Farm
Inworth
Kelvedon Rd
Parsonage Farm
North Lodge
School Rd
New Rd
Messing Park
Messing Park Farm
Hill Farm
Newbarn
Oak Rd
Colchester
Legend
MoRPh subreaches (labelled)
Domsey Brook (west)
Order Limits
0 0.325 0.65 1.3
Kilometres
M11
Colchester
Chelmsford
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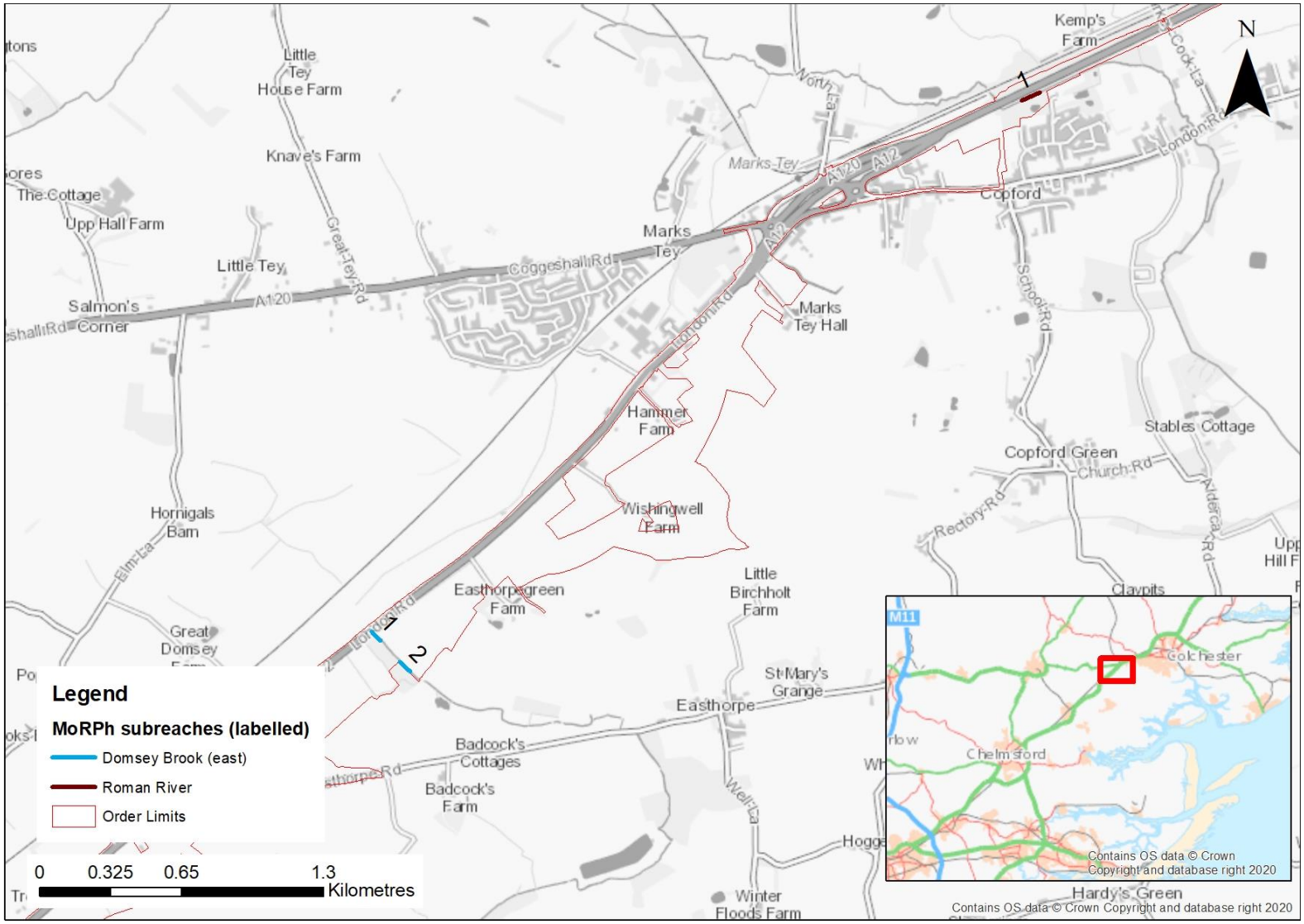
Contains OS data © Crown Copyright and database right 2020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Knave's Farm
The Cottage
Upp Hall Farm
Little Tey
Salmon's Corner
A120
Great Tey Rd
Coggeshall Rd
Marks Tey
Marks Tey Hall
A12
Copford
School Rd
London Rd
Cook La
North La
Hammer Farm
Wishingwell Farm
Stables Cottage
Copford Green
Church Rd
Rectory Rd
Alderca Rd
Hornigals Barn
Elm La
Easthorpe Green Farm
Little Birchholt Farm
Great Domsey
Clay pits
St Mary's Grange
Easthorpe
Badcock's Cottages
Badcock's Farm
Wellca
Winter Floods Farm
Hardy's Green
N
1
2
Legend
MoRPh subreaches (labelled)
Domsey Brook (east)
Roman River
Order Limits
0 0.325 0.65 1.3
Kilometres
M11
Colchester
Chelmsford
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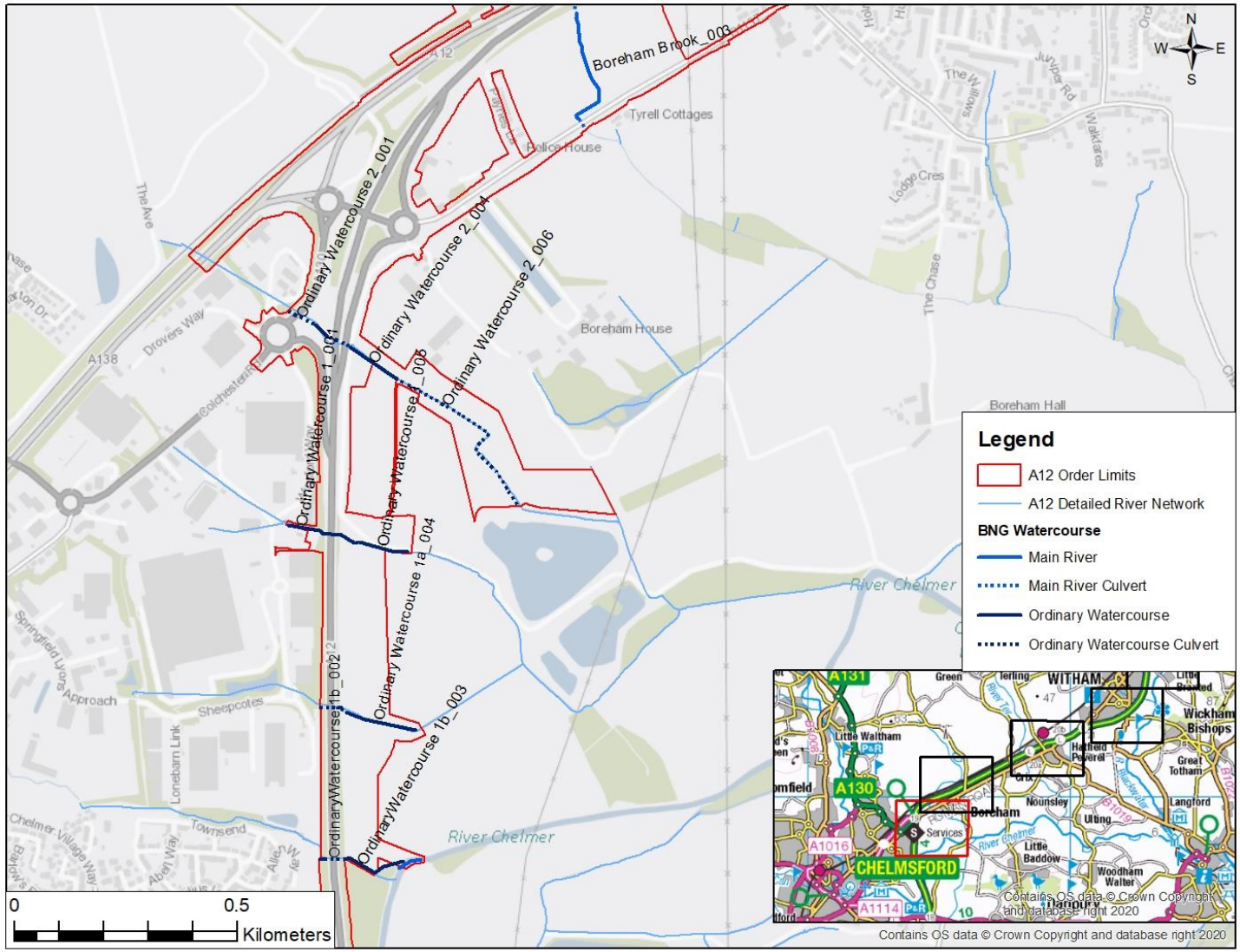
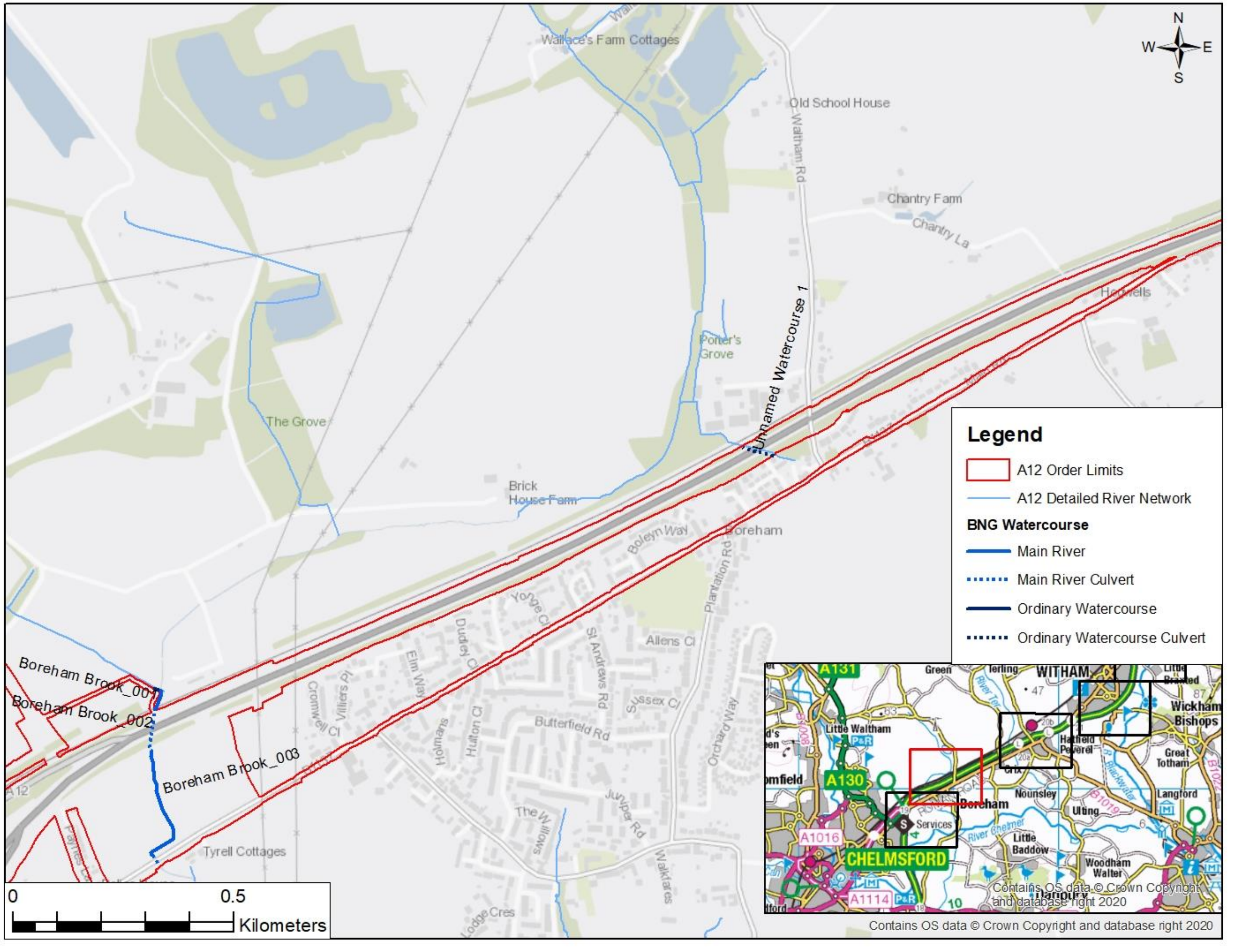
Figure 4. BNG reaches assessed as part of the rivers and streams metric

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A12 Detailed River Network
BNG Watercourse
Main River
Main River Culvert
Ordinary Watercourse
Ordinary Watercourse Culvert
Unnamed Watercourse 1
Boreham Brook_001
Boreham Brook_002
Boreham Brook_003
Wallace's Farm Cottages
Old School House
Chantry Farm
Chantry La
Porter's Grove
The Grove
Brick House Farm
Boreham
Tyrell Cottages
0
0.5
Kilometers
CHELMSFORD
WITHAM
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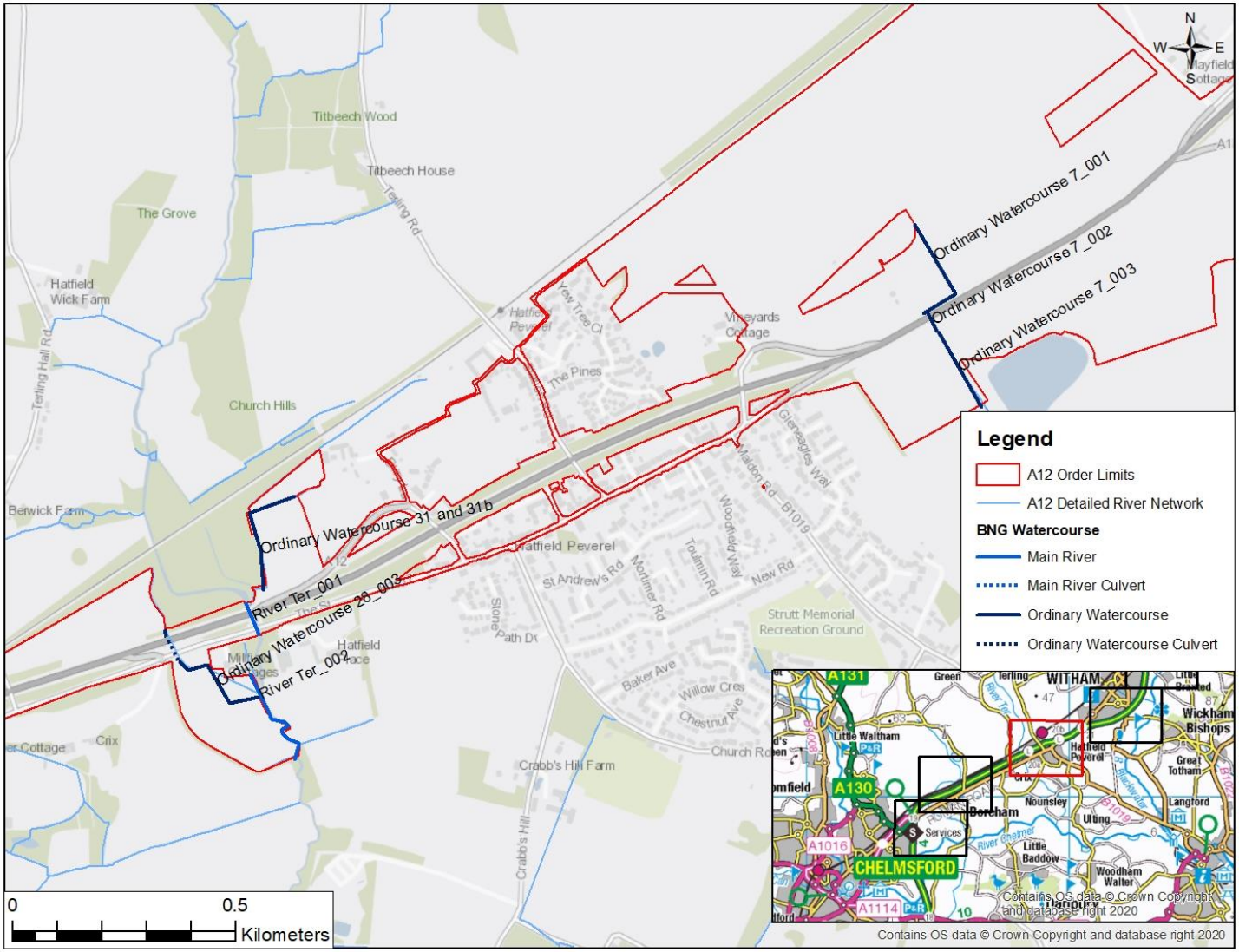
N
W
E
S
Ordinary Watercourse 7_001
Ordinary Watercourse 7_002
Ordinary Watercourse 7_003
Ordinary Watercourse 31 and 31b
River Ter_001
Ordinary Watercourse 26_003
River Ter_002
Titbeech Wood
Titbeech House
The Grove
Hatfield Wick Farm
Church Hills
Berwick Farm
Hatfield Peverel
Vineyards Cottage
The Pines
Strutt Memorial Recreation Ground
Crix
Crabb's Hill Farm
Legend
A12 Order Limits
A12 Detailed River Network
BNG Watercourse
Main River
Main River Culvert
Ordinary Watercourse
Ordinary Watercourse Culvert
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0.5
Kilometers
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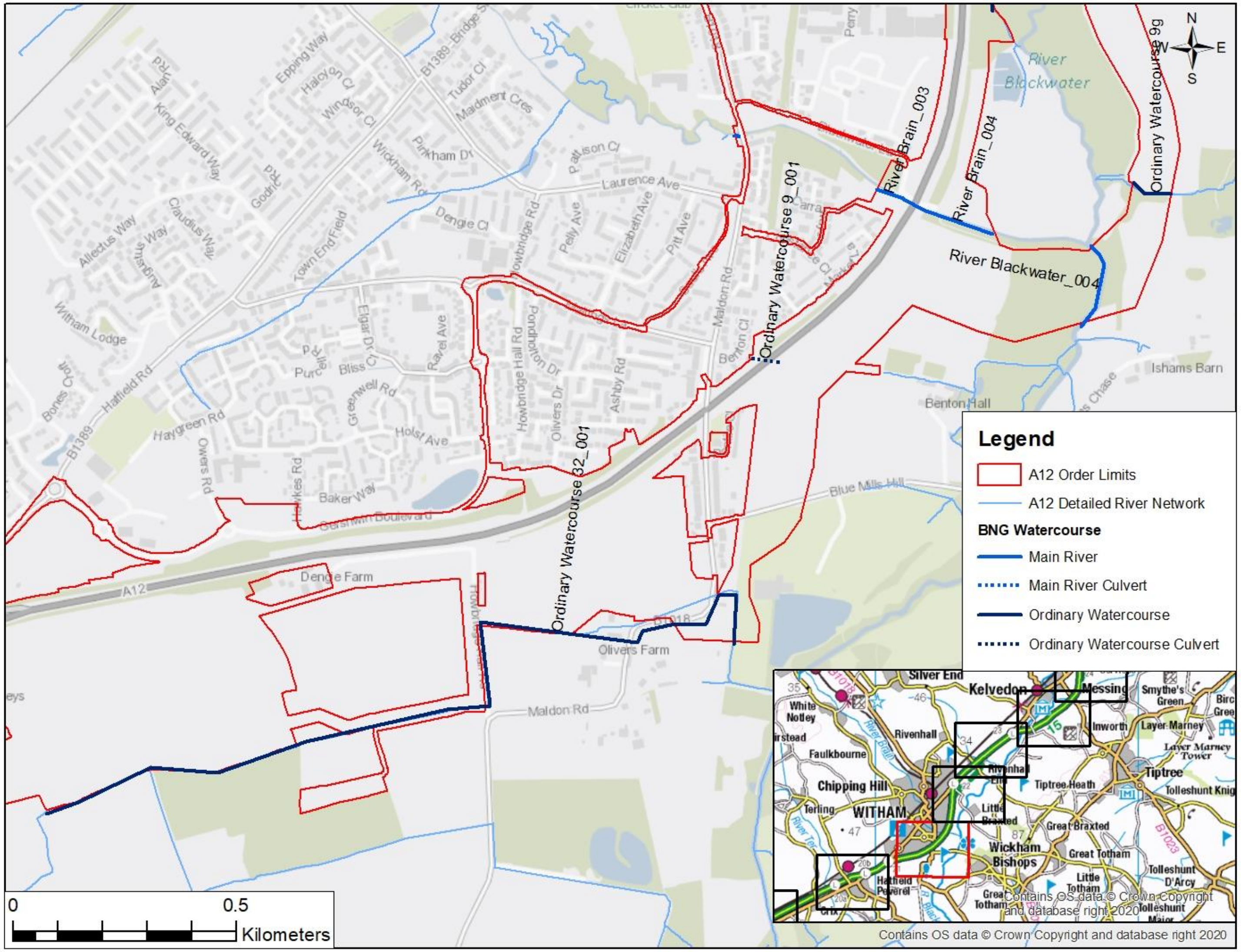
N
E
S
W
River Blackwater
River Brain_003
River Brain_004
River Blackwater_004
Ordinary Watercourse 9g
Ordinary Watercourse 9_001
Ordinary Watercourse 32_001
A12
Dengie Farm
Olivers Farm
Maldon Rd
Benton Hall
Ishams Barn
Blue Mills Hill
Laurence Ave
Witham Lodge
Hatfield Rd
Haygreen Rd
Legend
A12 Order Limits
A12 Detailed River Network
BNG Watercourse
Main River
Main River Culvert
Ordinary Watercourse
Ordinary Watercourse Culvert
Kelvedon
Silver End
Rivenhall
Faulkbourne
Chipping Hill
WITHAM
Terling
Tiptree
Tiptree Heath
Great Braxted
Wickham Bishops
Great Totham
Tolleshunt D'Arcy
Layer Marney
Messing
Inworth
Hatfield Peverel
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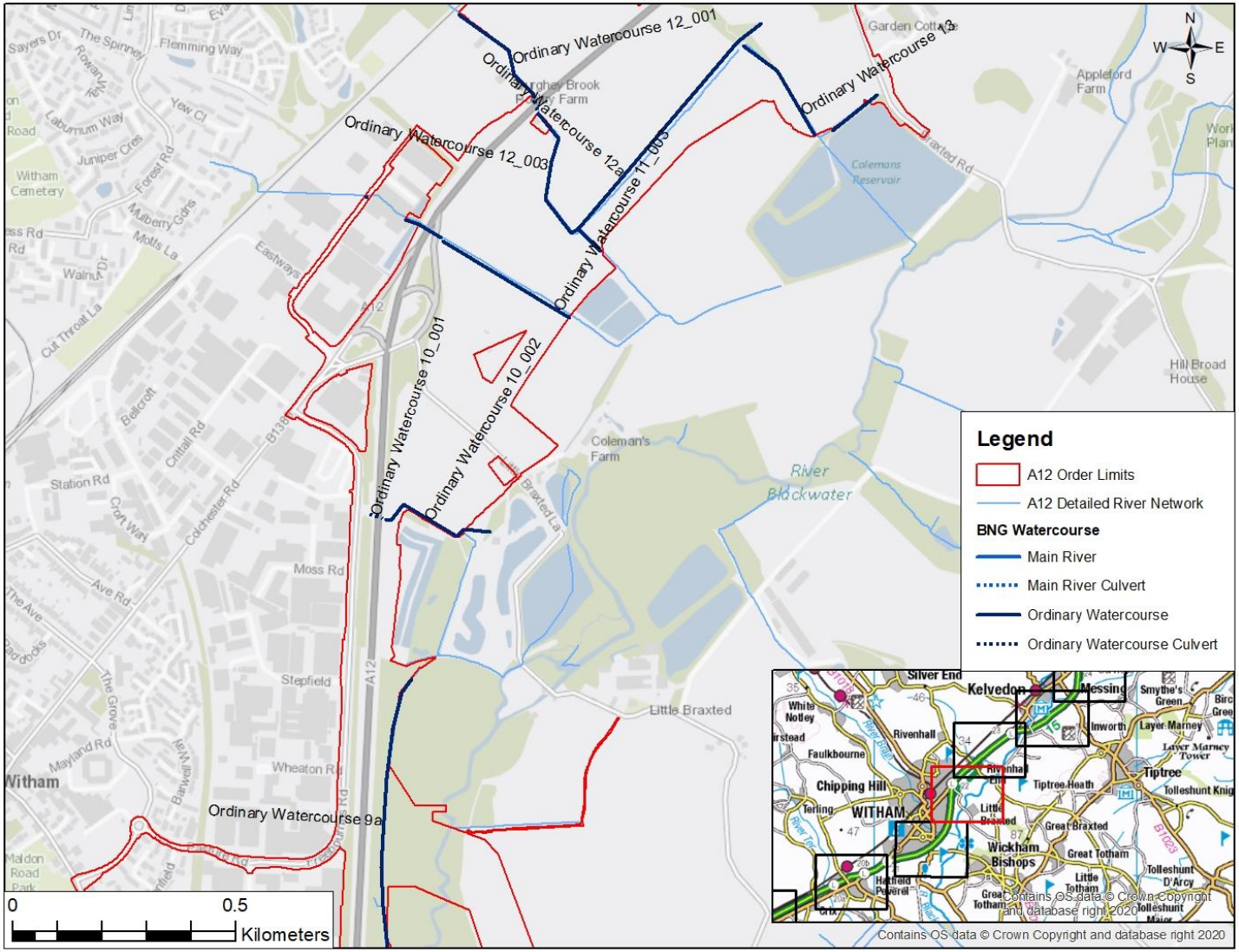
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Ordinary Watercourse 12_003
Ordinary Watercourse 12a
Ordinary Watercourse 11_003
Ordinary Watercourse 10_001
Ordinary Watercourse 10_002
Ordinary Watercourse 9a
Legend
A12 Order Limits
A12 Detailed River Network
BNG Watercourse
Main River
Main River Culvert
Ordinary Watercourse
Ordinary Watercourse Culvert
0
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Kilometers
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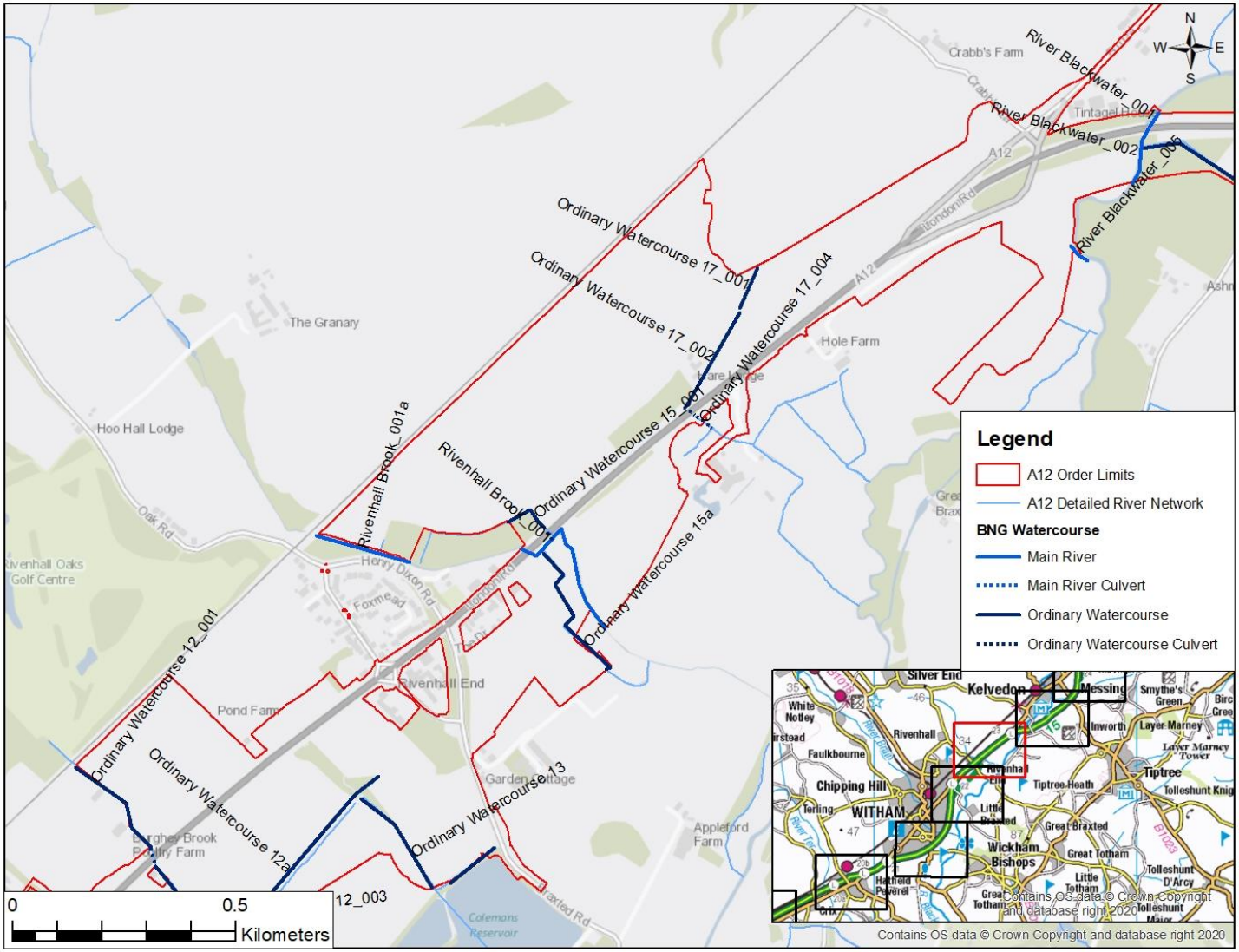
Legend
A12 Order Limits
A12 Detailed River Network
BNG Watercourse
Main River
Main River Culvert
Ordinary Watercourse
Ordinary Watercourse Culvert
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River Blackwater_002
River Blackwater_005
Ordinary Watercourse 17_001
Ordinary Watercourse 17_002
Ordinary Watercourse 17_004
Ordinary Watercourse 15_001
Ordinary Watercourse 15a
Rivenhall Brook_001a
Rivenhall Brook_001
Ordinary Watercourse 12_001
Ordinary Watercourse 12a
Ordinary Watercourse 13
Crabb's Farm
The Granary
Hoo Hall Lodge
Hole Farm
Rivenhall End
Pond Farm
Foxmead
Appleford Farm
Coleman's Reservoir
A12
0
0.5
Kilometers
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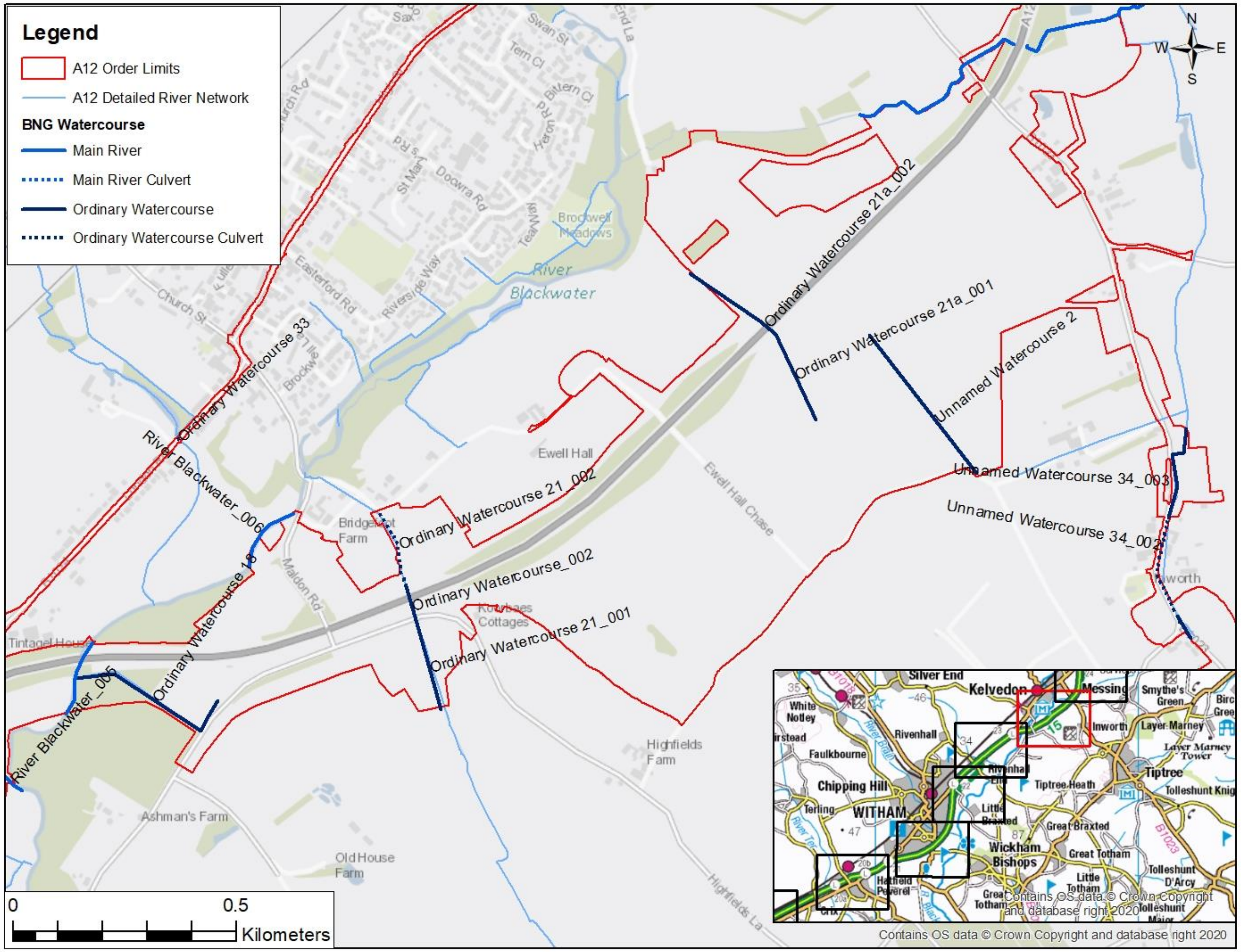
Legend
A12 Order Limits
A12 Detailed River Network
BNG Watercourse
Main River
Main River Culvert
Ordinary Watercourse
Ordinary Watercourse Culvert
Ordinary Watercourse 21a_002
Ordinary Watercourse 21a_001
Unnamed Watercourse 2
Unnamed Watercourse 34_003
Unnamed Watercourse 34_002
Ordinary Watercourse 33
River Blackwater_006
Ordinary Watercourse 18
River Blackwater_005
Ordinary Watercourse 21_002
Ordinary Watercourse_002
Ordinary Watercourse 21_001
River Blackwater
Ewell Hall
Bridgefoot Farm
Highfields Farm
Ashman's Farm
Old House Farm
0
0.5
Kilometers
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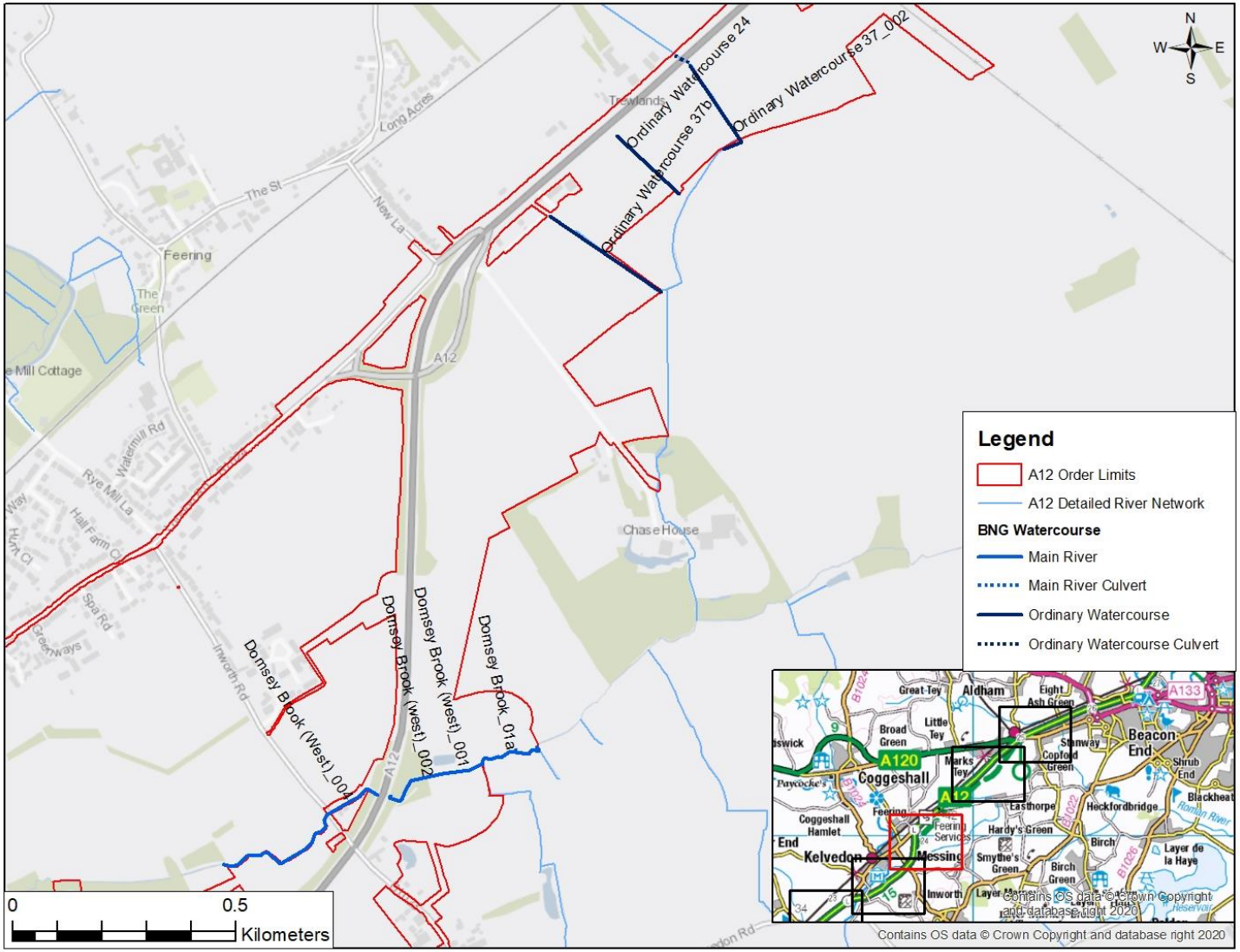
Ordinary Watercourse 24
Ordinary Watercourse 37b
Ordinary Watercourse 37_002
Domsey Brook (West)_004
Domsey Brook (West)_002
Domsey Brook (West)_001
Domsey Brook_01a
Feering
A12
Chase House
Legend
A12 Order Limits
A12 Detailed River Network
BNG Watercourse
Main River
Main River Culvert
Ordinary Watercourse
Ordinary Watercourse Culvert
0
0.5
Kilometers
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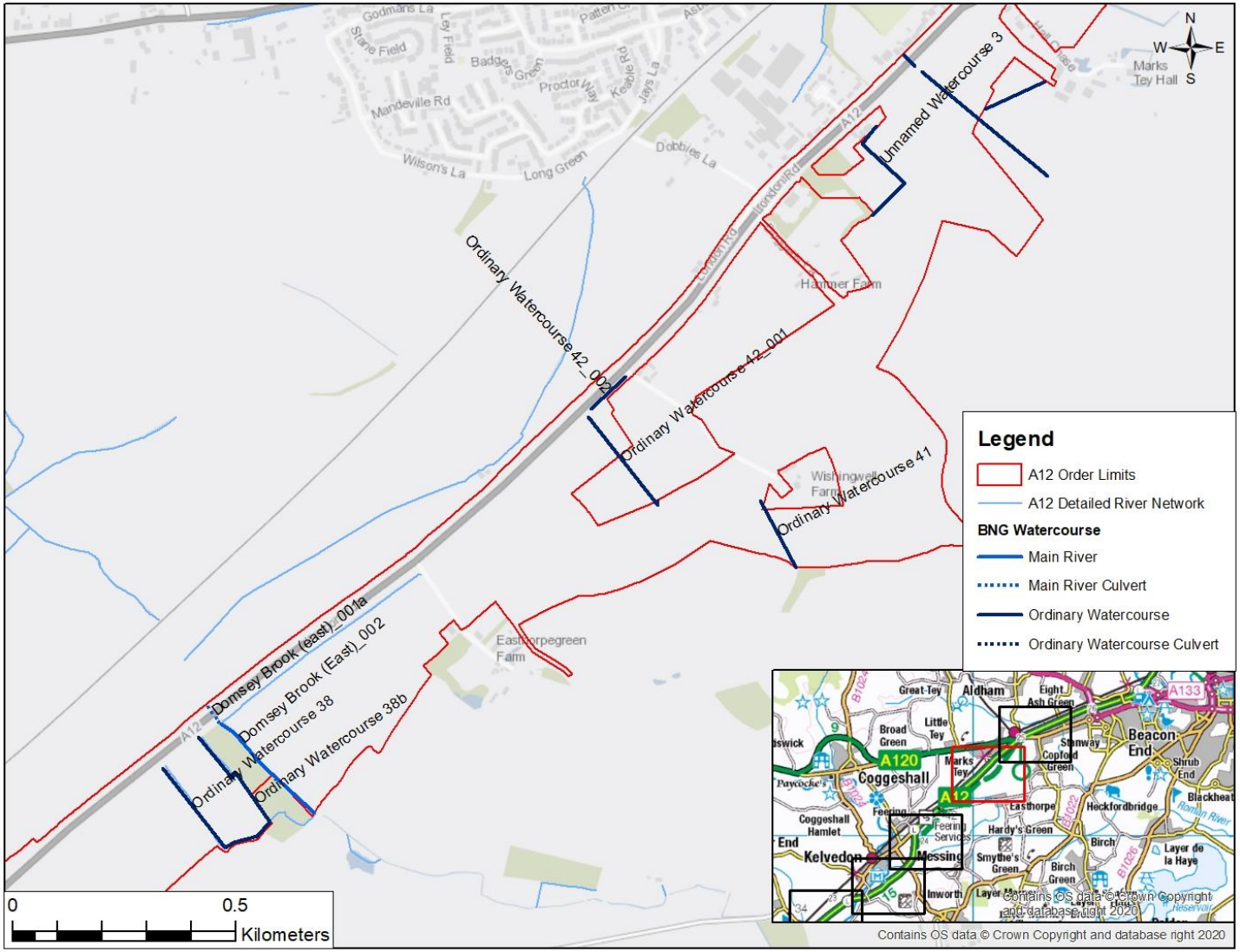
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Domsey Brook (East)_002
Ordinary Watercourse 38
Ordinary Watercourse 38b
Hammer Farm
Wishingwell Farm
Eastorpegreen Farm
Marks Tey Hall
Legend
A12 Order Limits
A12 Detailed River Network
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Main River
Main River Culvert
Ordinary Watercourse
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Kilometers
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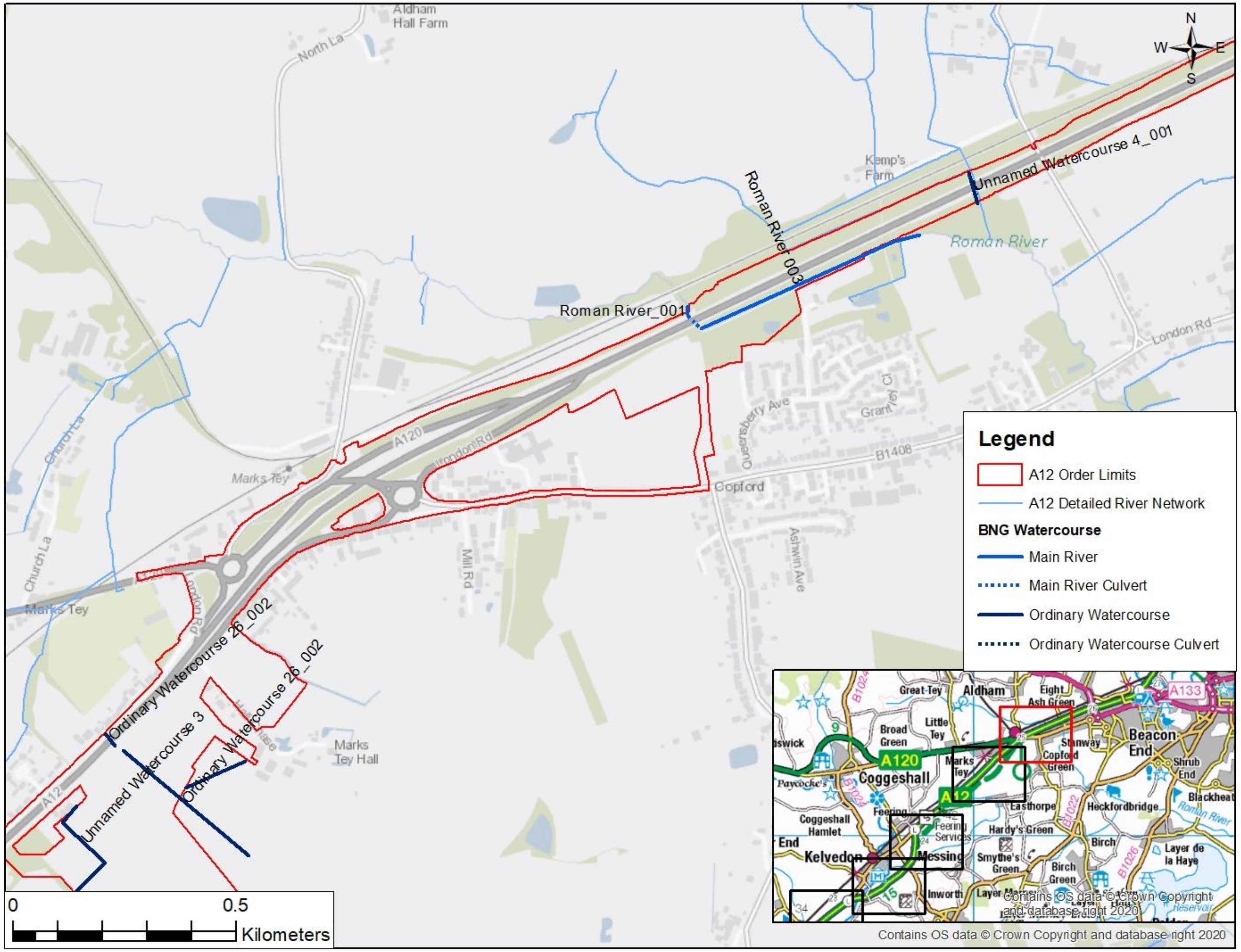
Legend
A12 Order Limits
A12 Detailed River Network
BNG Watercourse
Main River
Main River Culvert
Ordinary Watercourse
Ordinary Watercourse Culvert
Roman River_001
Roman River 003
Unnamed Watercourse 4_001
Ordinary Watercourse 26_002
Unnamed Watercourse 3
Roman River
Copford
Marks Tey
Marks Tey Hall
Kemp's Farm
Aldham Hall Farm
A120
A12
B1408
0
0.5
Kilometers
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Annex B – Tables

Table B.1 Baseline area-based habitat types and condition justification

Table B.2 Coleman's Farm baseline (based on restoration plans)

Table B.3 Reinstatement rules (habitat type and condition)

Table B.4 Environmental Management Plan habitat creation translations

Table B.5 Target condition for habitats created

Table B.6. MoRPh river condition indicators and positive/negative scores

Table B.7. Ditch condition assessment

Table B.8. Rivers and streams enhanced habitat

Table B.9. Rivers and streams created habitat

Table B.1 Baseline area-based habitat type translations and condition justification

Phase 1 habitat type	Metric 3.0 habitat type	Condition score	Justification for condition score
A1.1.1 Woodland – Broadleaved – Semi-Natural	Woodland & forest – Lowland mixed deciduous woodland	Good	Lowland mixed deciduous woodland is a Priority habitat of ‘high’ distinctiveness. Potential to score in 'good' in respect of key condition criteria including age distribution, regeneration, presence of ancient woodland indicators (AWI), vertical structure, veteran trees and deadwood. A precautionary score of 'good' has been applied.
	Woodland & forest – Other woodland; broadleaved	Moderate	Other woodland; broadleaved is of ‘medium’ distinctiveness and is unlikely to score above ‘moderate’ for key condition criteria including age distribution, regeneration, presence of AWI, vertical structure, veteran trees and deadwood.
	Woodland & forest – Wet woodland	Good	Wet woodland is a Priority habitat of ‘high’ distinctiveness. Potential to score in 'good' in respect of key condition criteria including age distribution, regeneration, presence of ancient woodland indicators, vertical structure, veteran trees and deadwood. A precautionary score of 'good' has been applied.
A1.1.2 Woodland – Broadleaved – Plantation	Woodland & forest – Other woodland; broadleaved	Moderate	Other woodland; broadleaved is of ‘medium’ distinctiveness. Woodland identified as plantation is unlikely to score above ‘moderate’ for key criteria including age distribution, regeneration, presence of AWI, vertical structure, veteran trees and deadwood.

Phase 1 habitat type	Metric 3.0 habitat type	Condition score	Justification for condition score
A1.1.2 Woodland – Broadleaved – Plantation	Woodland & forest – Wet woodland	Good	Whilst identified during the Phase 1 survey as A1.1.2, supplementary field survey notes have described this habitat as having wet woodland characteristics. Wet woodland is a Priority habitat of 'high' distinctiveness. Potential to score in 'good' in respect of key condition criteria including age distribution, regeneration, presence of ancient woodland indicators, vertical structure, veteran trees and deadwood. A precautionary score of 'good' has been applied.
A1.2.2 Woodland – Coniferous – Plantation	Woodland & forest – Other coniferous woodland	Poor	Coniferous plantation is a habitat of 'low' distinctiveness. It is unlikely to score above 'poor' for many key criteria including age distribution, regeneration, presence of AWI, vertical structure, veteran trees, deadwood and number and cover of native species.
A1.3.1 Woodland – Mixed – Semi-Natural	Woodland & forest – Other woodland; mixed	Moderate	The habitat is of 'medium' distinctiveness. Semi-natural woodland is described as having been long established making it likely that many of the condition criteria are met in either 'moderate' or 'good' condition. However, as this habitat comprises a significant proportion of non-native species 'moderate' condition is considered appropriate.
A1.3.2 Woodland – Mixed – Plantation	Woodland & forest – Other woodland; mixed	Moderate	The habitat is of 'medium' distinctiveness. Woodland identified as plantation is unlikely to score above 'moderate' for key criteria including age distribution, regeneration, presence of AWI, vertical structure, veteran trees and deadwood. As this habitat has been identified as 'mixed' it is also likely to score 'moderate' or 'poor' for and number and cover of native species.

Phase 1 habitat type	Metric 3.0 habitat type	Condition score	Justification for condition score
A2.1 Scrub – Dense/Continuous	Heathland & shrub – Blackthorn scrub	Poor	Scrub of 'medium' distinctiveness, dominated by single species. Likely to fail condition criteria 1, 2, 4 & 5 relating to number of woody species, age range, edge and clearings.
	Heathland & shrub – Hawthorn scrub	Poor	
	Heathland & shrub – Mixed scrub	Good	Scrub of 'medium' distinctiveness. In the absence of sufficient data to accurately assess condition, mixed scrub habitat has been scored as in 'good' condition as a precautionary approach as it is possible for this habitat type to meet all five condition criteria for scrub habitats.
A3.1 Parkland/Scattered trees - Broadleaved	Other woodland; broadleaved	Moderate	Other woodland; broadleaved is of 'medium' distinctiveness and is unlikely to score above 'moderate' for key condition criteria including age distribution, regeneration, presence of AWI, vertical structure, veteran trees and deadwood.
A3.2 Parkland/Scattered trees - Coniferous	Other coniferous woodland	Poor	Coniferous woodland is a habitat of 'low' distinctiveness. It is unlikely to score above 'poor' for many key criteria including age distribution, regeneration, presence of AWI, vertical structure, veteran trees, deadwood and number and cover of native species.
B2.1 Neutral grassland – Unimproved	Grassland – Other neutral grassland	Good	A habitat of 'medium' distinctiveness, not considered to represent a Priority habitat but described as unimproved. In the absence of sufficient data to accurately assess condition, this habitat has been scored as in 'good' condition as a precautionary approach as it is possible for this habitat type to meet all five condition criteria for grasslands of 'medium' to 'very high' distinctiveness types.

Phase 1 habitat type	Metric 3.0 habitat type	Condition score	Justification for condition score
B2.2 Neutral grassland - Semi-Improved	Grassland – Other neutral grassland	Moderate	A habitat of 'medium' distinctiveness. As this was described as semi-improved grassland it has been scored as 'moderate' condition as distinct from grassland identified as unimproved, as it is less likely to closely match the characteristics of the specific grassland habitat type (as per the UKHab definition).
B3.2 Calcareous grassland – Semi-Improved	Grassland – Lowland calcareous	Moderate	A habitat of 'high' distinctiveness not considered to represent a Priority habitat. As this was described as semi-improved grassland it has been scored as 'moderate' condition as distinct from grassland identified as unimproved, as it is less likely to closely match the characteristics of the specific grassland habitat type (as per the UKHab definition).
B4 Improved grassland	Grassland – Modified grassland	Moderate	A habitat of 'low' distinctiveness. Given the description as 'B4 improved grassland' in the Phase 1 habitat survey, considered unlikely to meet all seven condition criteria required for 'good' condition. Applying 'moderate' condition is considered precautionary.
B5 Marsh/marshy grassland	Grassland – Other neutral grassland	Good	A habitat of 'medium' distinctiveness, not considered to represent a Priority habitat. In the absence of sufficient data to accurately assess condition, this habitat has been scored as in 'good' condition as a precautionary approach as it is possible for this habitat type to meet all five condition criteria.

Phase 1 habitat type	Metric 3.0 habitat type	Condition score	Justification for condition score
B6 Poor semi-improved grassland	Grassland – Other neutral grassland	Poor	Recorded as poor semi-improved grassland which could be translated as 'modified grassland', however the species composition suggests that 'other neutral grassland' is a better fit. A habitat of 'medium' distinctiveness. Condition assigned as 'poor' as likely to fail condition criteria 1, 2, & 5 relating to habitat appearance and composition, sward height and cover of undesirable species.
C3.1 Tall herb and fern – Tall ruderal	Grassland – Other neutral grassland	Poor	As per the Metric Guidance, tall herb habitat that does not meet the definition of Annex 1 habitat 'Tall herb communities (H6430)' should be recoded as 'other neutral grassland' a 'medium' distinctiveness habitat. Whilst grasses are present, common nettle, an undesirable species is dominant and thus a condition score of 'poor' has been applied as the habitat is considered likely to fail condition criteria 1, 2,& 5 relating to habitat appearance and composition, sward height and cover of undesirable species.
F1 Swamp	Grassland – Other neutral grassland	Good	The swamp habitat recorded was considered to best fit 'other neutral grassland' rather than a direct conversion to Fen. Not identified as a Priority habitat. A 'good' condition score has been applied as a precautionary approach in the absence of further information to answer condition criteria.
G1 Standing water (W07 Ponds)	Lakes – High alkalinity lakes	Good	In the absence of sufficient data to assess condition criteria, all water bodies have been scored as in 'good' condition as a precautionary approach.
	Lakes – Ponds (Non-Priority Habitat)	Good	
	Lakes – Ponds (Priority Habitat)	Good	

Phase 1 habitat type	Metric 3.0 habitat type	Condition score	Justification for condition score
G1.1 Standing water – Eutrophic	Lakes – High alkalinity lakes	Good	In the absence of sufficient data to assess condition criteria, all water bodies have been scored as in 'good' condition as a precautionary approach.
	Lakes – Ponds (Non-Priority Habitat)	Good	
	Lakes – Ponds (Priority Habitat)	Good	
	Lakes – Temporary lakes, ponds, and pools	Good	
J1.1 Cultivated/disturbed land - Arable	Cropland – Cereal crops	N/A – Agricultural	N/A
J1.2 Cultivated/disturbed land – Amenity grassland	Grassland – Modified grassland	Moderate	A habitat of 'low' distinctiveness. Given the description as 'J1.2' in the Phase 1 habitat survey, considered unlikely to meet all seven condition criteria required for 'good' condition. Applying a 'moderate' condition score is considered precautionary.
	Grassland – Modified grassland (previously categorised as Urban amenity grassland in Metric 2.0)	Poor	Amenity grassland typically is grown and managed in a way that prevents species and structural diversity and comprises of > 25% ryegrass. Therefore, it is assumed this habitat would fail condition criteria 1, 2, 5 (relating to number of species, sward height and cover of bare ground) as well potentially 4 (physical damage) & 7 (invasive and undesirable species) and therefore a 'poor' condition score has been applied.
	Urban – Vegetated garden	Poor	This 'low' distinctiveness habitat type is restricted in Metric 3.0 to 'poor' condition.

Phase 1 habitat type	Metric 3.0 habitat type	Condition score	Justification for condition score
J1.3 Cultivated/disturbed land – Ephemeral/short perennial	Grassland – Other neutral grassland	Poor	Grasses are present, and the best habitat type fit is considered to be the 'medium' distinctiveness grassland, 'other neutral grassland'. The Phase 1 habitat classification suggests that the habitat parcel is dominated ephemeral/short perennial species. It is assumed the habitat is likely to fail condition criteria 1, 2, & 5, relating to habitat appearance and composition, sward height and cover of undesirable species, and a condition of 'poor' has been applied.
	Sparsely vegetated land – Ruderal/Ephemeral	Poor	This habitat type is of 'low' distinctiveness and described as dominated by common nettle, an undesirable species. It is considered likely to fail condition criteria 1 and 2, relating to vegetation structure and species diversity, and therefore 'poor' condition score has been applied.
	Urban – Open mosaic habitats on previously developed land	Good	This is a 'high' distinctiveness habitat type. The description within the report suggests that the habitat has the potential to be a Priority habitat in 'good' condition. Therefore, as a precautionary approach, a 'good' condition score has been applied.
J3 Built-up areas	Urban – Built linear features	N/A	N/A
	Urban – Developed land; sealed surface	N/A	N/A

Phase 1 habitat type	Metric 3.0 habitat type	Condition score	Justification for condition score
J3 Built-up areas	Urban – Artificial unvegetated, unsealed surface	N/A	N/A
J3 Built-up areas	Urban – Open mosaic habitats on previously developed land	Good	This is a 'high' distinctiveness habitat type. The description within the report suggests that the habitat has the potential to be a Priority habitat in 'good' condition. Therefore, as a precautionary approach, a 'good' condition score has been applied.
J4 Bare Ground	Urban – Vacant/derelict land/bare ground	Poor	Assuming this is completely bare ground, it wouldn't have varied vegetation structure or diverse range of flowering plants. Meets criteria for 'poor' condition under the Metric 3.0 Urban condition sheet.
J5 Other Habitat	Urban - Developed land; sealed surface	N/A	N/A

Table B.2 Coleman's Farm Quarry Baseline (based on restoration plans)

Metric Habitat	Assumed Condition
Grassland - Other neutral grassland	Moderate
Lakes - Ponds (Priority Habitat)	Moderate
Cropland - Cereal crops	N/A -Agricultural
Woodland and forest - Lowland mixed deciduous woodland	Moderate
Woodland and forest - Other woodland; broadleaved	Moderate

Table B.3 Reinstatement rules (habitat type and condition)

Assumptions/Rules	Applicable to:
Anything 'poor' in the baseline will remain poor	Habitats and hedgerows
Anything 'moderate' in the baseline will remain moderate	Habitats and hedgerows
Anything 'good' in the baseline will be considered 'moderate' taking a pre-cautionary approach	Habitats and hedgerows
Some habitats cannot be re-instated as same habitat type	Habitats (see below)

Habitat Type (Metric 3.0)	Condition	Reinstated condition	Notes
Lakes - Ponds (Non- Priority Habitat)	Good	Moderate	-
Lakes - Ponds (Priority Habitat)	Good	Moderate	-
Cropland - Cereal crops	N/A -Agricultural	N/A -Agricultural	-
Grassland - Modified grassland	Moderate	Moderate	-
Grassland - Other neutral grassland	Good	Moderate	-
Grassland - Other neutral grassland	Moderate	Moderate	-
Grassland - Other neutral grassland	Poor	Poor	-
Heathland and shrub - Blackthorn scrub	Poor	Poor	-
Heathland and shrub - Hawthorn scrub	Poor	Poor	-
Heathland and shrub - Mixed scrub	Good	Moderate	-
Sparsely vegetated land - Ruderal/Ephemeral	Poor	Poor	-
NA	Poor	Poor	-
Urban - Artificial unvegetated, unsealed surface	N/A - Other	N/A - Other	-
Urban - Built linear features	N/A - Other	N/A - Other	-

Habitat Type (Metric 3.0)	Condition	Reinstated condition	Notes
Urban - Developed land; sealed surface	N/A - Other	N/A - Other	-
Urban - Open Mosaic Habitats on Previously Developed Land	Good	Moderate	-
Urban - Vacant/derelict land/ bare ground	Poor	Poor	-
Urban - Vegetated garden	Poor	Poor	-
Woodland and forest - Lowland mixed deciduous woodland	Good	Moderate	Reinstated as Woodland and forest - Other woodland; broadleaved (excepting for where this related to Quarry restoration plan, where LMDW will be reinstated).
Woodland and forest - Other coniferous woodland	Poor	Poor	-
Woodland and forest - Other woodland; broadleaved	Moderate	Moderate	-
Woodland and forest - Other woodland; mixed	Moderate	Moderate	-
Woodland and forest - Wet woodland	Good	Moderate	-

Hedgerow Type (Metric 3.0)	Condition	Reinstated condition	Notes
Hedge Ornamental Non-Native	Poor	Poor	-
Line of Trees - Associated with bank or ditch	Poor	Poor	-
Line of Trees (Ecologically Valuable) - with Bank or Ditch	Good	Moderate	-
Native Hedgerow	Good	Moderate	-

Hedgerow Type (Metric 3.0)	Condition	Reinstated condition	Notes
Native Hedgerow	Moderate	Moderate	-
Native Hedgerow	Poor	Poor	-
Native Hedgerow - Associated with bank or ditch	Good	Moderate	-
Native Hedgerow - Associated with bank or ditch	Moderate	Moderate	-
Native Hedgerow - Associated with bank or ditch	Poor	Poor	-
Native Hedgerow with trees	Good	Moderate	-
Native Hedgerow with trees	Moderate	Moderate	-
Native Hedgerow with trees	Poor	Poor	-
Native Hedgerow with trees - Associated with bank or ditch	Good	Moderate	-
Native Hedgerow with trees - Associated with bank or ditch	Moderate	Moderate	-

Table B.4 Environmental Management Plan habitat creation translations (see table B.5 for justification of target condition target)

Landscape Description	Landscape code	Linear or Area	Metric 3.0 Habitat	Condition
Proposed Hedge with trees	LE4.4	Linear	Native Species Rich Hedgerow with trees	Good
Proposed Woodland Planting	LE2.1/LE2.2/LE2.4	Area	Woodland and forest - Other woodland; broadleaved	Moderate
Proposed Woodland Wet	LE6.1	Area	Woodland and forest - Other woodland; mixed	Moderate
Intermittent Tree and shrub planting	LE2.5	Area	Grassland - Other neutral grassland	Good
Waterbodies	LE6.1	Area	Lakes - Ponds (Non- Priority Habitat)	Good
Aquatic and Wetland Planting	LE6.1	Area	Wetland - Reedbeds	Moderate
Proposed Ecology Mitigation Area[12]	E3.2	Area	Heathland and shrub - Mixed scrub	Good
Ecology Pond	LE6.1	Area	Lakes - Ponds (Non- Priority Habitat)	Good
Grassland	LE1.3/LE1.6	Area	Grassland - Other neutral grassland	Good

[12] Confirmed to be proposed mixed scrub by Landscape Team.

Table B.5 Evidence sheets for habitat type target condition used in the metric based on discussion with Landscape Architects

Condition Assessment Criteria for:		Woodland and forest - Other woodland; broadleaved Woodland and forest - Other woodland; mixed			
Indicator		**Good (3 points)**	**Moderate (2 points)**	**Poor (1 point)**	**Score per indicator**
1	Age distribution of trees	Three age classes present	Two age classes present	One age class present	2
2	Wild, domestic, and feral herbivore damage	No significant browsing damage evident in woodland	Evidence of significant browsing pressure is present in 40% or less of whole woodland	Evidence of significant browsing pressure is present in 40% or more of whole woodland	3
3	Invasive plant species	No invasive species present in woodland	Rhododendron or laurel not present, other invasive species < 10% cover	Rhododendron or laurel present, or other invasive species > 10% cover	3
4	Number of native tree species	Five or more native tree or shrub species found across woodland parcel	Three to four native tree or shrub species found across woodland parcel	None to two native tree or shrub species across woodland parcel	3
5	Cover of native tree and shrub species	> 80% of canopy trees and >80% of understory shrubs are native	50-80% of canopy trees and 50-80% of understory shrubs are native	< 50% of canopy trees and <50% of understory shrubs are native	3
6	Open space within woodland	10 – 20% of woodland has areas of temporary open space, unless woodland is <10ha in which case lower threshold of 10% does not apply	21- 40% of woodland has areas of temporary open space	More than 40% of woodland has areas of temporary open space	3
7	Woodland regeneration	All three classes present in woodland; trees 4-7cm dbh, saplings and seedlings or advanced coppice regrowth	One or two classes only present in woodland	No classes or coppice regrowth present in woodland	1

Condition Assessment Criteria for:		Woodland and forest - Other woodland; broadleaved Woodland and forest - Other woodland; mixed			
Indicator		**Good (3 points)**	**Moderate (2 points)**	**Poor (1 point)**	**Score per indicator**
8	Tree health	Tree mortality less than 10%, no pests or diseases and no crown dieback	11% to 25% mortality and/or crown dieback or low risk pest or disease present	Greater than 25% tree mortality and or any high risk pest or disease present	3
9	Vegetation and ground flora	Ancient woodland flora indicators present	Recognisable NVC plant community present	No recognisable NVC community	1
10	Woodland vertical structure	Three or more storeys across all survey plots or a complex woodland	Two storeys across all survey plots	One or less storey across all survey plots	2
11	Veteran trees	Two or more veteran trees per hectare	One veteran tree per hectare	No veteran trees present in woodland	1
12	Amount of deadwood	50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Between 25% and 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Less than 25% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	1
13	Woodland disturbance	No nutrient enrichment or damaged ground evident	Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground	More than 1 hectare of nutrient enrichment and/or more than 20% of woodland area has damaged ground	1
				Total score (out of 39)	**27 - Moderate**

Condition Assessment Result	Condition Assessment Score
Total score >32 (33 to 39)	Good (3)
Total score 26 to 32	Moderate (2)
Total score <26 (13 to 25)	Poor (1)

Condition Assessment Criteria for:	**Grassland - Other neutral grassland**	
Indicator		**Pass/Fail**
1	The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.	1
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	1
3	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.	1
4	Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.	1
5	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species1 and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.	1
	Total score (out of 5)	**5 - Good**

Condition Assessment Result	Condition Assessment Score
Passes 5 of 5 criteria	Good (3)
Passes 3 or 4 of 5 criteria	Moderate (2)
Passes 0, 1 or 2 of 5 criteria	Poor (1)

Condition Assessment Criteria for:	**Heathland and shrub - Mixed scrub**	
Indicator		**Pass/Fail**
1	Habitat is representative of UKHab description (where in its natural range). There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be up to 100% cover).	1
2	There is a good age range – all of the following are present: seedlings, young shrubs and mature shrubs.	0
3	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species1 make up less than 5% of ground cover.	1
4	The scrub has a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).	1
5	There are clearings, glades or rides present within the scrub, providing sheltered edges.	1
	Total score (out of 5)	**4 - Moderate**

Condition Assessment Result	**Condition Assessment Score**
Passes 5 of 5 criteria	Good (3)
Passes 3 or 4 of 5 criteria	Moderate (2)
Passes 0, 1 or 2 of 5 criteria	Poor (1)

Condition Assessment Criteria for:		**Hedgerows - Hedgerow with trees**	
Indicator		**Criteria to pass**	**Score per indicator**
A1	Height	>1.5 m average along length	1
A2	Width	>1.5 m average along length	1
B1	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	1
B2	Gap - hedge canopy continuity	Gaps make up <10% of total length AND No canopy gap >5m	1
C1	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: measured from outer edge of hedgerow, and is present on one side of the hedge (at least)	1
C2	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	1
D1	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	1
D2	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	1
E1	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	0
E2	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	1
		Total score (out of 10)	**9 - Good**

Condition Assessment Result	Condition Assessment Score
No more than 2 failures in total; AND no more than 1 failure in any functional group.	Good (3)
No more than 5 failures in total; AND does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1, C2 & E1 = Moderate condition).	Moderate (2)
Fails a total of more than 5 attributes; OR fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition).	Poor (1)

Condition Assessment Criteria for:	**Wetland - Reedbeds**	
Indicator		**Pass/Fail**
1	The water table is at or near the surface throughout the year, this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. NB - this criterion is non-negotiable for achieving good condition.	0
2	The appearance and composition of the vegetation closely matches characteristics of the specific wetland habitat type (see definitions and links above). Indicator species for the specific wetland habitat type1 are very clearly and easily visible.	1
3	The water supplies (groundwater, surface water and/or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	0
4	Cover of scrub and scattered trees less than 10%.	1
5	Cover of bare ground less that 5%.	1
6	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species make up less than 5% of ground cover.	1
7c	The reedbed has a diverse structure with between 60 and 80% reeds. Other areas may include open water (at least 10%), species-rich fen and/or wet woodland.	1
	Total score (out of 7)	**5 - Moderate**

Condition Assessment Result	Condition Assessment Score
Passes 5/6 **PLUS** additional (7c) criteria	Good (3)
Passes 4/5 of 7 criteria, OR passes 6/7 **excluding** 1 or 7c	Moderate (2)
Passes 0, 1, 2, or 3 of 7 criteria	Poor (1)

Condition Assessment Criteria for:	**Ponds - Pond (Non-priority habitat)**	
Indicator		**Pass/Fail**
1	The pond is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution. Turbidity is acceptable if the pond is grazed by livestock.	1
2	There is semi-natural habitat (i.e. moderate distinctiveness or above) for at least 10 m from the pond edge.	1
3	Less than 10% of the pond is covered with duckweed or filamentous algae.	1
4	The pond is not artificially connected to other waterbodies, either via streams, ditches or artificial pipework.	1
5	Pond water levels should be able to fluctuate naturally throughout the year. No obvious dams, pumps or pipework.	1
6	There is an absence of non-native plant and animal species.	1
7	The pond is not artificially stocked with fish. If the pond naturally contains fish, it is a native fish assemblage at low densities.	1
8	In non-woodland ponds, plants, be they emergent, submerged or floating (excluding duckweeds)3, should cover at least 50% of the pond area that is less than 3 m deep.	1
9	The surface of non-woodland ponds is no more than 50% shaded by woody bankside species.	1
	Total score (out of 9)	**9 - Good**

Condition Assessment Result	Condition Assessment Score
Passes 9 of 9 criteria	Good (3)
Passes 6-8 of 9 criteria	Moderate (2)
Passes 0-5 of 9 criteria	Poor (1)

Table B.6 MoRPh baseline river condition indicators and positive/negative scores

Location	Indicator code, description and positive/negative categorisation	River Chelmer	Boreham Brook		River Ter		River Brain		Rivenhall Brook				River Blackwater		Domsey Brook (west)				Domsey Brook (east)		Roman River
		MoRPh Subreach 1	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 4	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1
Bank top	B1: Bank top vegetation structure (+)	2	1	2	2	2	3	2	2	3	2	2	2	3	1	3	1	2	2	2	3
	B2: Bank top tree feature richness (+)	0	0	0	2	2	2	0	1	2	1	0	3	2	0	2	0	2	1	1	3
	B3: Bank top water related features (+)	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	B4: Bank top Non-native Invasive Species (-)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B5: Bank top managed ground cover (-)	-4	-3	-3	-4	-4	-2	-4	-4	-4	-4	-3	-2	-3	-3	-2	-2	-4	-3	-1	-1
Bank face	C1: Bank face riparian vegetation structure (+)	1	2	3	2	2	2	3	2	3	3	3	3	2	2	3	1	4	3	2	3

Location	Indicator code, description and positive/negative categorisation	River Chelmer	Boreham Brook		River Ter		River Brain		Rivenhall Brook				River Blackwater		Domsey Brook (west)				Domsey Brook (east)		Roman River
		MoRPh Subreach 1	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 4	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1
	C2: Bank face tree feature richness (+)	0	0	3	1	1	2	0	3	3	1	2	2	1	3	3	1	1	2	2	3
	C3: Bank face natural bank profile extent (+)	2	2	2	2	2	3	1	3	2	1	3	3	2	3	3	2	1	3	1	3
	C4: Bank face natural bank profile richness (+)	2	1	2	4	4	3	2	4	3	3	3	3	3	2	4	1	2	2	1	3
	C5: Bank face natural bank material richness (+)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
	C6: Bank face bare sediment extent (+)	0	0	3	0	0	2	0	1	2	2	4	2	1	3	2	1	1	1	2	3
	C7: Bank face artificial bank profile extent (-)	0	0	0	-3	0	0	-4	0	-3	-4	0	0	-3	0	0	0	-4	-2	-3	0
	C8: Bank face reinforcement extent (-)	0	0	0	-4	0	-1	-4	0	-3	-2	0	0	-2	0	0	0	-4	-3	0	0

Location	Indicator code, description and positive/negative categorisation	River Chelmer	Boreham Brook		River Ter		River Brain		Rivenhall Brook				River Blackwater		Domsey Brook (west)				Domsey Brook (east)		Roman River
		MoRPh Subreach 1	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 4	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1
	C9: Bank face reinforcement material severity (-)	0	0	0	-4	0	-2	-4	0	-2	-2	0	0	-2	0	0	0	-3	-2	0	0
	C10: Bank face Non-native Invasive Species Cover (-)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water margin	D1: Channel margin aquatic vegetation extent (+)	2	3	0	2	2	2	3	2	2	1	1	3	3	0	1	2	2	0	1	1
	D2: Channel margin aquatic morphotype richness (+)	1	2	0	2	2	2	2	3	1	1	1	1	1	0	1	3	2	0	0	1
	D3: Channel margin physical feature extent (+)	0	0	0	1	1	0	0	0	1	1	1	1	1	0	1	0	1	1	0	1
	D4: Channel margin physical feature richness (+)	0	0	0	1	1	0	0	0	1	1	1	2	1	0	2	0	1	1	0	1

Location	Indicator code, description and positive/negative categorisation	River Chelmer	Boreham Brook		River Ter		River Brain		Rivenhall Brook				River Blackwater		Domsey Brook (west)				Domsey Brook (east)		Roman River
		MoRPh Subreach 1	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 4	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1
	D5: Channel margin artificial features (-)	0	0	0	0	0	-1	-1	0	0	-1	0	0	0	-1	0	0	-1	-1	-2	0
Channel Bed	E1: Channel aquatic morphotype richness (+)	2	2	0	2	2	2	2	2	2	1	1	2	2	0	1	2	2	1	1	0
	E2: Channel bed tree feature richness (+)	1	0	2	3	3	2	2	3	3	2	2	3	2	2	2	1	1	4	2	3
	E3: Channel bed hydraulic features richness (+)	0	1	2	2	2	2	0	2	2	2	1	2	2	1	2	0	2	2	1	2
	E4: Channel bed natural features extent (+)	0	0	0	1	1	2	0	0	1	0	0	0	0	0	1	0	2	0	0	0
	E5: Chanel bed natural features richness (+)	0	0	0	1	1	2	0	0	1	0	0	0	0	0	1	0	1	0	0	0
	E6: Channel bed material richness (+)	2	1	2	3	3	2	3	3	3	2	3	0	0	2	4	1	1	2	2	2

Location	Indicator code, description and positive/negative categorisation	River Chelmer	Boreham Brook		River Ter		River Brain		Rivenhall Brook				River Blackwater		Domsey Brook (west)				Domsey Brook (east)		Roman River
		MoRPh Subreach 1	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 4	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1
	E7: Channel bed siltation	0	0	0	0	0	0	-4	-2	-4	-4	-2	0	0	0	-1	0	-2	-4	-4	-2
	E8: Channel bed reinforcement extent (-)	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0
	E9: Channel bed reinforcement severity (-)	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0
	E10: Channel bed artificial features severity (-)	0	0	0	-2	0	0	-4	0	-4	0	0	0	-2	0	0	0	-4	-4	0	0
	E11: Channel bed Non-native Invasive Species (-)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	E12: Channel bed filamentous algae extent (-)	0	0	0	0	0	0	0	-3	-2	-4	-2	0	0	0	0	0	0	0	0	0
Average Positive		0.8	0.8	0.9	1.7	1.7	1.8	1.1	1.7	1.9	1.3	1.5	1.7	1.4	1.1	2.0	1.0	1.6	1.4	1.1	1.8
Average Negative		-0.3	-0.2	-0.2	-1.6	-0.3	-0.5	-1.9	-0.7	-1.7	-1.6	-0.5	-0.2	-0.9	-0.3	-0.2	-0.2	-1.7	-1.8	-0.8	-0.2
Preliminary Score		0.5	0.6	0.7	0.1	1.4	1.3	-0.8	1.0	0.2	-0.3	1	1.6	0.5	0.7	1.8	0.9	-0.1	-0.3	0.2	1.6

Location	Indicator code, description and positive/negative categorisation	River Chelmer	Boreham Brook		River Ter		River Brain		Rivenhall Brook				River Blackwater		Domsey Brook (west)				Domsey Brook (east)		Roman River
		MoRPh Subreach 1	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 4	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1a	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 3	MoRPh Subreach 1	MoRPh Subreach 2	MoRPh Subreach 1
Preliminary Condition		Moderate	Moderate	Moderate	Fairly poor	Moderate	Moderate	Fairly poor	Moderate	Fairly poor	Fairly poor	Moderate	Fairly good	Moderate	Moderate	Fairly good	Moderate	Fairly poor	Fairly poor	Fairly poor	Fairly good
Overdeep		Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Final Condition		Fairly poor	Fairly poor	Fairly poor	Fairly poor	Moderate	Moderate	Fairly poor	Fairly poor	Poor	Poor	Fairly poor	Moderate	Fairly poor	Fairly poor	Moderate	Fairly poor	Poor	Poor	Poor	Moderate

Table B.7. Ditch condition assessment

Parcel ref.	Time	U/S NGR	D/S NGR	Meets ditch criteria	Condition Assessment Criteria (see below)								Score (1,2 or 3)	Notes (any adverse conditions, access and visibility issues, photo refs.)
					1	2	3	4	5	6	7	8		
N/A	N/A	TL 7404 0796	TL 7423 0795	Yes	Y	N	N	N	Y	N	N	Y	1	Ordinary Watercourse 1a – Based on LiDAR data. No evidence of being natural.
N/A	N/A	TL 7397 0871	TL 7424 0865	Yes	Y	N	Y	N	Y	N	N	Y	1	Ordinary Watercourse 1 – Heavily vegetated. No view of the channel in aerial imagery. Assumptions based on finding from Ordinary Watercourse 1a.
N/A	N/A	TL 7397 0919	TL 7449 0875	Yes	Y	N	Y	N	Y	N	N	N	1	Ordinary Watercourse 2 – Assumptions made based on photos of watercourse and nearby ditches. Same assumptions as Ordinary Watercourse 1a, given its close proximity to the watercourse and general similarities found in the hydromorphological assessment.
N/A	N/A	TL 7814 1149	TL 7835 1134	Yes	Y	N	Y	N	N	Y	N	Y	1	Ordinary Watercourse 28 – Based on aerial imagery. Some assumptions based on nearby ditches. Ephemeral in nature. Same assumptions as Ordinary Watercourse 1a, given its close proximity to the watercourse and general similarities found in the hydromorphological assessment.
N/A	N/A	TL 7843 1179	TL 7836 1158	Yes	N	N	Y	N	Y	N	Y	Y	1	Ordinary Watercourse 31/31b – Based on aerial imagery. Appears to be ephemeral. Same assumptions as Ordinary Watercourse 1a, given its close proximity to the watercourse and general similarities found in the hydromorphological assessment.

Parcel ref.	Time	U/S NGR	D/S NGR	Meets ditch criteria	Condition Assessment Criteria (see below)								Score (1,2 or 3)	Notes (any adverse conditions, access and visibility issues, photo refs.)
					1	2	3	4	5	6	7	8		
N/A	N/A	TL 7982 1240	TL 7997 1199	Yes	Y	N	Y	N	Y	N	Y	Y	1	Ordinary Watercourse 7 – Based on aerial imagery. Appears ephemeral in aerial imagery.
N/A	N/A	TL 8341 1376	TL 8332 1377	Yes	Y	N	Y	N	Y	Y	N	Y	1	Ordinary Watercourse 9g – Based on aerial imagery and photographs. Likely an ephemeral channel.
N/A	N/A	TL 8317 1626	TL 8349 1573	Yes	N	N	Y	N	Y	N	N	Y	1	Ordinary Watercourse 12 – Based on site photographs. Heavily vegetated channel with ephemeral flow regime. Some dry patches. Standing water also observed
N/A	N/A	TL 8470 1738	TL 8450 1703	Yes	Y	N	Y	N	Y	Y	N	Y	1	Ordinary Watercourse 17 – Based on site photographs and LiDAR data. Photos downstream of the Order Limits but not much change according to LiDAR and aerial imagery. Channel appears ephemeral.
N/A	N/A	TL 8801 1801	TL 8805 1821	Yes	Y	N	Y	N	Y	Y	N	Y	1	Ordinary Watercourse 34 – Based on aerial imagery. Channel appears ephemeral.
N/A	N/A	TL 7404 0796	TL 7423 0795	Yes	Y	N	Y	N	Y	N	N	Y	1	Ordinary Watercourse 1b – Based on aerial imagery, (no photographs are available). Aerial images show an ephemeral channel, whilst LiDAR suggests the channel is not as well defined as neighbouring ditches.

Parcel ref.	Time	U/S NGR	D/S NGR	Meets ditch criteria	Condition Assessment Criteria (see below)								Score (1,2 or 3)	Notes (any adverse conditions, access and visibility issues, photo refs.)
					1	2	3	4	5	6	7	8		
N/A	N/A	TL 7463 1000	TL 7463 1000	Yes	Y	N	N	N	Y	N	N	Y	1	Ordinary Watercourse 3 – Based on aerial imagery. Appears similar to Ordinary watercourse 1a in appearance. Same assumptions as Ordinary Watercourse 1a, given its close proximity to the watercourse and general similarities found in the hydromorphological assessment.
N/A	N/A	TL 8089 1237	TL 8243 1275	Yes	Y	N	N	N	Y	Y	N	Y	1	Ordinary Watercourse 32 – Based on aerial imagery. Channel appears ephemeral.
N/A	N/A	TL 8297 1514	TL 8324 1510	Yes	Y	N	N	N	Y	N	N	Y	1	Ordinary Watercourse 10 – Based on aerial imagery on the A12. Channel appears ephemeral.
N/A	N/A	TL 8313 1576	TL 8342 1558	Yes	N	N	N	N	N	N	N	Y	1	Ordinary Watercourse 11 – Based on both aerial imagery and site photographs. Appears heavily vegetated, over vegetated in parts. Channel also appears ephemeral.
N/A	N/A	TL 8385 1624	TL 8344 1578	Yes	Y	N	N	N	Y	N	N	Y	1	Ordinary Watercourse 12a – Based on aerial imagery. Channel appears ephemeral.
N/A	N/A	TL 8381 1619	TL 8397 1599	Yes	Y	N	N	N	Y	N	N	Y	1	Ordinary Watercourse 13 – Based on aerial imagery. Channel appears ephemeral.
N/A	N/A	TL 8623 1802	TL 8630 1785	Yes	Y	N	N	N	Y	N	N	Y	1	Ordinary Watercourse 21 – Based on site photographs. Ephemeral ditch, some wet sands suggest it does however receive flow from upstream or from adjacent surface water pathways.

Parcel ref.	Time	U/S NGR	D/S NGR	Meets ditch criteria	Condition Assessment Criteria (see below)								Score (1,2 or 3)	Notes (any adverse conditions, access and visibility issues, photo refs.)
					1	2	3	4	5	6	7	8		
N/A	N/A	TL 8630 1785	TL 8685 1869	Yes	Y	N	N	N	Y	N	N	Y	1	Ordinary Watercourse 21a – Based on aerial imagery. Ephemeral ditch. Scour present on the banks.
N/A	N/A	TL 8805 2037	TL 8830 2020	Yes	Y	N	N	Y	Y	N	N	Y	1	Ordinary Watercourse 37b – Based on aerial imagery. Lined by agricultural fields. Some trees are visible along the banks. Channel appears ephemeral.
N/A	N/A	TL 8837 2071	TL 8844 2052	Yes	Y	N	N	Y	Y	N	N	Y	1	Ordinary Watercourse 37 – Based on aerial imagery. Channel appears ephemeral.
N/A	N/A	TL 8955 2172	TL 8979 2160	Yes	Y	N	N	Y	Y	N	N	Y	1	Ordinary Watercourse 38 – Based on aerial imagery and site photographs. Lined by vegetation.
N/A	N/A	TL 8963 2179	TL 8979 2160	Yes	Y	N	N	Y	Y	N	N	Y	1	Ordinary Watercourse 38b – Based on aerial imagery and site photographs. Lined by vegetation.
N/A	N/A	TL 9089 2232	TL 9097 2217	Yes	Y	N	N	Y	Y	N	N	Y	1	Ordinary Watercourse 41 – Based on aerial imagery. Largely shaded by trees. Channel appears ephemeral. Where visible.
N/A	N/A	TL 9066 2231	TL 9066 2232	Yes	Y	N	N	Y	Y	N	N	Y	1	Ordinary Watercourse 42 – Based on aerial imagery. Largely shaded by trees. Channel appears ephemeral, where visible.
N/A	N/A	TL 9056 2252	TL 9059 2260	Yes	N	N	N	N	N	Y	Y	Y	1	Ordinary Watercourse 26 – Based on aerial imagery. No vegetation along the banks so water quality could be an issue. Channel appears ephemeral.

Parcel ref.	Time	U/S NGR	D/S NGR	Meets ditch criteria	Condition Assessment Criteria (see below)								Score (1,2 or 3)	Notes (any adverse conditions, access and visibility issues, photo refs.)
					1	2	3	4	5	6	7	8		
N/A	N/A	TL 8414 1681	TL 8422 1680	Yes	N	N	Y	Y	Y	N	N	Y	1	Ordinary Watercourse 15 – Based on aerial imagery. Channel appears ephemeral.
N/A	N/A	TL 8422 1674	TL 8436 1648	Yes	N	Y	Y	Y	Y	N	N	Y	1	Ordinary Watercourse 15a – Based on aerial imagery. Heavily vegetated channel. Channel appears ephemeral.
N/A	N/A	TL 8247 1339	TL 8254 1338	Yes	N	N	Y	Y	Y	N	N	Y	1	Ordinary Watercourse 9 – Based on aerial imagery. Vegetated channel. Channel appears ephemeral.
N/A	N/A	TL 8308 1476	TL 8301 1417	Yes	N	N	Y	Y	Y	N	N	Y	1	Ordinary Watercourse 9a – Based on aerial imagery. Vegetated channel. Channel appears ephemeral.
N/A	N/A	TL 8411 1608	TL 8401 1600	Yes	N	N	Y	Y	Y	N	N	Y	1	Ordinary Watercourse 13a – Based on aerial imagery and photographs. Channel appears ephemeral and silted.
N/A	N/A	TL 8588 1760	TL 8556 1765	Yes	N	N	Y	Y	Y	N	N	Y	1	Ordinary Watercourse 18 – Based on aerial imagery and photographs. Channel appears ephemeral, where visible, and over vegetated.
N/A	N/A	TL 9315 2458	TL 9317 2451	Yes	N	N	Y	Y	Y	N	N	Y	1	Unnamed Watercourse 4 – Based on aerial imagery. Heavily vegetated. Channel appears ephemeral, where visible.

Table B.8 Rivers and streams enhanced habitat

Watercourse	BNG subreach number	River condition	Enhanced river condition	Length enhanced (km)	River Units delivered from enhancement	Enhancement summary
River Ter	002	Moderate	Fairly good	0.202	3.78	• Proposed landscaping will lead to an improved vegetated riparian zone, as trees have been proposed to line the right bank top of the River Ter.
Rivenhall Brook	001	Poor	Moderate	0.071	0.74	• Realignment designed to be hydromorphologically appropriate and replace over deep channel. • Sediment augmentation along BNG subreach 001 is proposed mitigate potentially significant hydromorphological effects and would also lead to improved channel bed features. • Proposed landscaping would lead to improved presence of lightly managed riparian vegetation coverage and remove artificial/heavily managed ground cover.
	003	Fairly Poor	Moderate	0.040	0.49	
Domsey Brook (west)	002	Fairly poor	Moderate	0.127	1.16	• Realignment designed to be hydromorphologically appropriate and replace over deep channel.

Watercourse	BNG subreach number	River condition	Enhanced river condition	Length enhanced (km)	River Units delivered from enhancement	Enhancement summary
Domsey Brook (east)	002	Poor	Moderate	0.030	0.31	• Proposed landscaping would lead to improved presence of lightly managed riparian vegetation coverage and remove artificial/heavily managed ground cover. • Realignment designed to be hydromorphologically appropriate and replace over deep channel. • Tributary proposed along both realignments.
	003	Poor	Fairly poor	0.168	1.47	• Landscaping proposed to replace artificial groundcover with lightly managed groundcover. This would, over time, then lead to increased variation in bank top, riparian, vegetation along the right-bank. Including the increased presence of mosses.
Roman River	0.258	Moderate	Fairly good	0.258	4.04	• Realignment designed to be hydromorphologically appropriate and replace over deep channel.

Table B.9 Rivers and streams created habitat

Watercourse	BNG subreach number (if present)	Watercourse type	Proposed river condition	Length created (km)	River Units delivered from creation	Notes
Rivenhall Brook	002	Culvert	Poor	0.064	0.08	Culvert - automatic Poor condition.
Domsey Brook (west)	002	Culvert	Poor	0.035	0.06	
Domsey Brook (east)	002	Culvert	Poor	0.077	0.13	
Roman River	003	Culvert	Poor	0.014	0.02	
Ordinary Watercourse 15	N/A	Ditch	Moderate	0.053	0.23	Based on aerial imagery of the location and potential flow paths.
Ordinary Watercourse 1a	002	Culvert	Poor	0.001	0.00	Culvert - automatic Poor condition.
				0.007	0.01	
Ordinary Watercourse 7	001	Culvert	Poor	0.021	0.04	
				0.028	0.05	
Ordinary Watercourse 9	002	Culvert	Poor	0.013	0.02	
				0.009	0.02	

Watercourse	BNG subreach number (if present)	Watercourse type	Proposed river condition	Length created (km)	River Units delivered from creation	Notes
Ordinary Watercourse 10	002	Culvert	Poor	0.014	0.02	
Ordinary Watercourse 11	003	Culvert	Poor	0.245	0.41	
Ordinary Watercourse 12	003	Culvert	Poor	0.005	0.01	
		Ditches	Poor	0.241	0.81	Based on aerial imagery and condition of ditches in area.
		Culvert	Poor	0.102	0.17	Culvert - automatic Poor condition.
Ordinary Watercourse 17	001	Culvert	Poor	0.033	0.06	
				0.103	0.17	
		Ditches	Poor	0.126	0.42	Based on aerial imagery and condition of ditches in area.
				0.155	0.52	
	003	Culvert	Poor	0.005	0.01	Culvert - automatic Poor condition.
	004	Ditches	Poor	0.011	0.04	Based on aerial imagery and condition of ditches in area.
Ordinary Watercourse 21	001	Culvert	Poor	0.016	0.03	

Watercourse	BNG subreach number (if present)	Watercourse type	Proposed river condition	Length created (km)	River Units delivered from creation	Notes
Ordinary watercourse 21a	001	Culvert	Poor	0.202	0.34	Culvert - automatic Poor condition.
Unnamed Watercourse 2	N/A	Ditches	Poor	0.198	0.66	Based on aerial imagery and condition of ditches in area.
Ordinary Watercourse 34	003	Culvert	Poor	0.004	0.01	Culvert - automatic Poor condition.
Ordinary Watercourse 34b	N/A	Ditches	Poor	0.269	0.90	Based on aerial imagery and condition of ditches in area.
				0.115	0.38	
				0.014	0.05	
		Culvert	Poor	0.015	0.03	Culvert - automatic Poor condition.
Ordinary Watercourse 34c	N/A	Ditches	Poor	0.216	0.72	Based on aerial imagery and condition of ditches in area.
Ordinary Watercourse 37b	N/A	Ditches	Poor	0.136	0.46	
Ordinary watercourse 24	001	Culvert	Poor	0.056	0.09	Culvert - automatic Poor condition.
Ordinary Watercourse 37	002	Ditches	Poor	0.079	0.26	Based on aerial imagery and condition of ditches in area.

Watercourse	BNG subreach number (if present)	Watercourse type	Proposed river condition	Length created (km)	River Units delivered from creation	Notes
Ordinary Watercourse 38b and 38	001	Ditches	Poor	0.422	1.41	Combined due to the realignment of these watercourses upstream of the proposed A12.
Ordinary Watercourse 41	N/A	Ditches	Poor	0.102	034	Based on aerial imagery and condition of ditches in area.
Ordinary Watercourse 26a	001	Ditches	Poor	0.028	0.09	
Proposed drainage ditches	N/A	Ditches	Poor	42.17	141.16	Ditches were assigned poor as a precautionary measure. See Appendix 14.6: Surface water drainage strategy, of the Environmental Statement [TR10600/APP/6.3] for further information and plan.
Proposed drainage culverts	N/A	Culvert	Poor	2.89	4.84	