A12 Chelmsford to A120 widening scheme TR010060

6.3 ENVIRONMENTAL STATEMENT

APPENDIX 9.6 DORMOUSE SURVEY 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 9.6 DORMOUSE SURVEY REPORT

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

Version	Date	Status of Version
Rev 1	August 2022	DCO Application

LIST OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 Executive Summary

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

1.1.2 The report presents an evaluation on the presence/likely absence of hazel dormice *Muscardinus avellanarius* based on field surveys undertaken in 2017 and 2020. It presents the policy and legislative context within which the Environmental Impact Assessment (EIA) process is being carried out. The likely significant effects of the proposed scheme on the local hazel dormouse population, and appropriate mitigation strategies for hazel dormice, are considered in Chapter 9 of the ES.

1.1.3 The study area for hazel dormice was defined as the area within the construction boundary for the proposed scheme, including borrow pits, and a 250m buffer (Figure 1).

1.1.4 Habitat suitability assessments identified 41 areas in 2017 and 28 areas in 2020 with sub-optimal or optimal hazel dormouse habitat within the study area. These areas were subject to further survey work. Nest tube surveys were subsequently carried out to identify the presence or likely absence of hazel dormice in the study area. Hazel dormice were surveyed following species best practice guidance from Bright *et al*. (2006).

1.1.5 No records of hazel dormice were returned from the desk study which included a 2km radius of the study area. No evidence of dormice was found during the field based survey work conducted in both 2017 and 2020.

1.1.6 A hazel dormouse population has been identified 3km south of the proposed scheme (south of junction 17 of the A12). It is unlikely that the hazel dormice from this population move freely to the study areas due to the poor connectivity between the two locations.

1.1.7 As hazel dormice are elusive in nature, with natural population fluctuations, the species can be difficult to detect. This survey should therefore be used to determine the likely absence of dormice from the study area as hazel dormice are able to colonise areas after surveys are complete.

1.1.8 Hazel dormice are considered likely absent from the study area.

2 Introduction

2.1 Background

2.1.1 The A12 Chelmsford to A120 widening scheme (hereon referred to as the 'proposed scheme') comprises improvements to the A12 between junction 19 (Boreham) at TL741094, and junction 25 (Marks Tey) at TL917238, approximately 24km, or 15 miles. The proposed scheme involves widening the A12 to three lanes throughout. It includes safety improvements, including closing of existing at grade accesses, and reducing access to cyclists along the dual carriageway by providing an alternative route for walkers, cyclists, and horse riders.

2.1.2 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 road. Three of the crossings would require minor realignments at the crossing points.

2.1.3 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.

2.1.4 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).

2.1.5 The selection criteria in the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 have been used to screen the proposed scheme and identify the potential for significant effects. The proposed scheme is therefore required to be accompanied by an Environmental Statement to provide information on likely significant effects.

2.1.6 The Scoping Report (National Highways, 2020a), informed by an Extended Phase 1 Habitat Survey (National Highways, 2020b) identified several ecological receptors which have the potential to be impacted by construction or operation of the proposed scheme.

2.1.7 Ecological surveys are required to establish an accurate baseline against which the impacts of the proposed scheme could be assessed in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance for Ecological Impact Assessment (EcIA) (CIEEM, 2019) and DMRB LA 108 – Biodiversity (National Highways, 2020).

2.1.8 Scoping opinions received from statutory and non-statutory consultees during this process were taken into consideration (refer to Chapter 9 of the ES).

2.1.9 The Extended Phase 1 Habitat Survey confirmed the requirement to undertake the following suite of ecological surveys for the proposed scheme:

a. Botanical surveys of potential UK Biodiversity Action Plan (BAP) priority habitats

b. Hedgerow

c. Freshwater macro-invertebrates

d. Freshwater fish

e. Freshwater macrophytes

f. White-clawed crayfish

g. River habitat survey

h. Pond habitat survey

i. Terrestrial invertebrates

j. Birds (breeding and wintering)

k. Barn owls

l. Bats (bat activity, bat roost potential, and roost characterisation surveys)

m. Dormice

n. Water vole

o. Otter

p. Badger

2.2 Purpose of the report

2.2.1 This report is an appendix of the A12 Chelmsford to A120 widening scheme ES. It presents the results of the hazel dormouse (hereon referred to as 'dormice') surveys undertaken by Jacobs in both 2017 and 2020.

2.2.2 An evaluation of the status of dormice associated with the proposed scheme has been conducted, based on a desk-based review of records and the field survey results.

2.2.3 The report presents the policy and legislative context within which the EIA is carried out. Likely significant effects on, and mitigation for dormice, are considered in Chapter 9 of the ES.

2.3 Survey Objectives

2.3.1 The key objectives of this survey were to:

a. determine the presence or likely absence of dormice within the study area

b. identify dormouse distribution and status in the study area

c. identify any areas of key connective habitat for dormice within the study area

d. provide an evaluation for the dormouse population in the study area

e. inform the assessment of potential impacts on dormice associated with the proposed scheme (as detailed within the ES)

f. provide sufficient field data for the development of appropriate mitigation if necessary (as detailed in the ES)

3 Dormouse ecology

3.1.1 The hazel dormouse is the only native species of dormouse to be found in Britain. Dormice were once widespread throughout England and Wales but over the last 100 years the species has declined in both distribution and abundance. This is due to a significant loss of their primary habitat including deciduous woodland and hedgerows. Dormice are relatively widespread throughout the southern British counties, yet the species is still uncommon and patchily distributed (Bright *et al.*, 2006).

3.1.2 Dormice are traditionally associated with hazel woodland, although they are found in a variety of woody habitats including semi-natural woodland, standard oaks, species-rich scrub, and hedgerows. Dormice have also been recorded in 'atypical' habitats such as reedbeds and gorse scrub. Dormice are an arboreal species, spending most of their lives within the tree-tops, only descending to the ground to hibernate during the winter months. Dormice feed on a wide variety of foods including berries, nuts, nectar, pollen, and insects (Bright *et al.*, 2006).

4 Legislation and policy

4.1 Legislation

4.1.1 Hazel dormice are a European Protected Species (EPS). Hazel dormice and their habitats are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017. It is an offence to deliberately kill, capture, or disturb a dormouse. It is illegal to damage or destroy its breeding site or resting place, and to disturb a dormouse intentionally or recklessly in its nest or obstruct access to a dormouse nest.

4.1.2 Licences can be granted by Natural England, the licensing authority in England, to allow activities that would otherwise be illegal (e.g. the destruction of dormouse habitat because of development activity), to take place. The activities must be carried out in accordance with the provisions of the licence whereby the favourable conservation status of the species is maintained.

4.1.3 Section 40 of the Natural Environment and Rural Communities Act 2006 (NERC) places a duty on all public bodies to have regard to the conservation of biodiversity in England, when carrying out their normal functions (the biodiversity duty).

4.2 National planning policy framework

4.2.1 The National Networks National Policy Statement (NNNPS) sets out the Government's policies to deliver the development of NSIP on the national road and rail networks in England. The Secretary of State uses the NNNPS as the primary basis for making decisions on DCO applications.

4.2.2 Paragraph 5.22 of the NNNPS states that the applicant's assessment should describe any likely significant effects on internationally, nationally, and locally designated sites of ecological conservation importance; protected species; habitats (including irreplaceable habitats such as ancient woodland and veteran trees); and other species identified as being of principal importance for the conservation of biodiversity. The surveys described in this report will inform the assessment of significant effects within the ES.

4.2.3 In addition to the national policy set out in the NNNPS, the proposed scheme has also had regard to relevant legislation and local plans and policy.

4.3 Priority species

4.3.1 Dormice are a 'Species of Principal Importance for the conservation of biodiversity' listed under Section 41 of the NERC. This act places a responsibility on local authorities and government departments to consider the purposes of conserving biodiversity in a manner consistent with their normal duties, such as policy and decision-making, and ties together wildlife legislation and planning policies.

5 Methodology

5.1 Desk Study

5.1.1 A desk study was undertaken to obtain information pertaining to dormice in the study area and surrounding landscape.

5.1.2 The extent of the data search included the length of the proposed scheme and an additional 2km buffer. This search area also included potential borrow pits.

5.1.3 The following organisations were contacted to provide desk study records:

a. Essex Wildlife Trust Record Centre (EWTRC) (2020)

b. Essex Field Club (EFC) (2020)

5.1.4 A search on the Multi-Agency Geographical Information for the Countryside (MAGIC) online tool for dormouse mitigation licences within 2km of the scheme boundary was undertaken.

5.1.5 The Essex and Suffolk dormouse group were consulted to provide additional data if available.

5.1.6 Aerial imagery from 2020 was used to analyse the connectivity of suitable dormouse habitat within, and surrounding, the proposed scheme. Aerial imagery was also used to assess the connectivity of habitats between dormouse records and the proposed scheme.

Limitations

5.1.7 Although the data provided by the consultees are the most complete set of species data available, the absence of records should not be taken as an indication of absence of species.

5.2 Field Study

5.2.1 All dormouse surveys were led by suitably qualified and experienced dormouse licenced ecologists. The surveys were undertaken between June and November (inclusive) in both 2017 and 2020. The surveys were carried out in the recommended survey season for dormice, as set out in the Dormouse Conservation Handbook (Bright *et al*. 2006).

5.2.2 All land extending up to 250m either side of the Provisional Order Limits (POL), including potential borrow pit locations, comprise the survey area and is hereafter referred to as ‘the study area’ (Figure 1).

5.2.3 A habitat suitability assessment was undertaken to identify the quality of habitats within the study area, initially from aerial imagery and then ratified by site visits. Categories assigned were:

a. Optimal Habitat: Habitat that provides a range of food sources, summer nesting, and hibernation sites (ie. they can support dormice all year round). Habitats may include diverse deciduous woodland with a good understorey, intact species-rich hedgerows, or dense scrub.

b. Sub-Optimal Habitat: Habitat that provides most, but not all requirements for dormice. Habitats may include planation woodland or species poor/heavily managed hedgerows.

c. Low Potential Habitat: Habitat that offers one or two components of the requirements for dormice such as providing habitat connectivity for dispersal. Habitats may include defunct hedgerows or arable crops.

5.2.4 The above categories were devised and decided upon using information on factors affecting dormouse presence given in the Dormouse Conservation Handbook (Bright *et al.* 2006) which are shown (as amended) in Table 5.1.

5.2.5 Photographs of examples of sub-optimal and optimal dormouse habitat found are shown in Annex A.

Table 5.1 Factors affecting the probability of dormouse being present within their known range (Dormouse Conservation Handbook, 2006)

Increased Probability	Decreased Probability
• Large Woodlands; area over 50ha – very likely; at least 20ha – likely; between 2 and 20ha – possible; • Adjacent to ancient woodland or planted ancient woodland site (including conifer *Pinophyta sp*.), scrub or early successional stage woodland, including conifer; • Variety of broadleaved tree species; • Range of tree ages; • Species-rich shrub layer; • Species-rich edge strip; • Thick, wide hedgerow connections to nearby woodland; and/or • Hazel *Corylus avellana* or sweet chestnut *Castanea sativa* coppice	• Small wood, mostly conifer; • Isolated from other woodland; • Little or no shrub understorey; • No fruiting broadleaved trees; • High local deer population; • Presence of cattle, sheep, or pigs; and/or • Seasonally waterlogged ground

5.2.6 Dormouse surveys were carried out within areas recorded as having sub-optimal and optimal habitat, as shown in Annex B. Forty-one hedgerows/woodlands were surveyed in 2017 and 28 were surveyed in 2020. The areas surveyed in 2020 considered changes to the proposed schemes route alignment and new borrow pit locations which gave a more extensive coverage in survey area (Figure 2).

5.2.7 The study area was split into nine survey areas in 2020, A-I (Figure 1). These areas represent optimal and sub-optimal dormouse habitat. The survey areas were further split into transects with identifying numbers (eg. A1, C2, F3 etc.). The references, assigned dormouse potential, habitat description and number of tubes deployed for each transect are detailed in Annex B. The location of the nest tube transects carried out in 2017 and in 2020 are shown in Figure 2.

5.2.8 Some transects extended outside the study area where suitable dormouse habitat linkages were identified and were deemed of value to survey.

5.2.9 A total of 1,119 nest tubes were installed across the study area in the 2017 survey. Of these nest tubes, 1,046 were installed in May 2017 and 73 were installed in September 2017. The additional nest tubes installed in September were for transects 45 and 46 and were added due to new locations for the siting of borrow pits for the proposed scheme (Annex C, Table C.1).

5.2.10 In 2020, 1,269 nest tubes were installed as part of the survey. Of these nest tubes 1,020 were installed in May 2020 and 249 were installed in June 2020 (Annex C, Table C.2).

5.2.11 Nest tubes were deployed at a minimum of 20m intervals in accordance with good practice guidelines (Chanin and Woods, 2003) in suitable habitat along hedgerows and within woodland. The number of tubes in 2017 and 2020 combined is summarised in Table 5.2, and for all but one survey areas exceed the minimum recommended 50 tubes per survey site (Chanin and Woods, 2003).

Table 5.2 Total number of nest tubes (in 2017 and 2020 combined) within each survey area

Survey Area	Total number of nest tubes
A	249
B	295
C	523
D	269
E	258
F	318
G	162
H	274
I	10 (see limitations)

5.2.12 Nest tubes were numbered and attached to the underside of branches using cable ties or wire. The opening of the tube pointed downwards, and at an angle no greater than 45 degrees. Where possible, the entrance of the tube faced the trunk of the tree.

5.2.13 For every nest tube deployed a GPS point was recorded using ArcGIS Collector. Notes and photographs were recorded to assist future surveyors to find the tubes.

5.2.14 In accordance with the Dormouse Conservation Handbook, each month of the dormouse survey season is assigned a value which indicates the probability of finding dormice present in nest tubes (Table 5.3). This score was devised to indicate how thorough the survey effort should be and to give confidence in the results obtained. A minimum total score of 20 is required at the end of the dormouse surveys to ensure sufficient confidence in the survey results.

Table 5.3 Index of probability of finding dormice present in nest tubes in any one month (Bright *et al*., 2006)

Month	Index of Probability (50 nest tubes per Survey Area)	Index of Probability (100 nest tubes per Survey Area)
April	1	2
May	4	8
June	2	4
July	2	4
August	5	10
September	7	14
October	2	4
November	2	4

5.2.15 Lead ecologists undertaking the dormouse nest tube surveys held a Natural England dormouse licence. The surveys were carried out monthly where possible and exceptions are detailed in Annex C, Tables C.1 and C.2.

5.2.16 Each nest tube was carefully inspected. If evidence of activity of any small mammal (eg. nests, movement, and droppings) was found, the tube was taken down and opened within a large plastic bag. This method allowed closer examination of the contents of the box/tube and prevents animals present from escaping. It ensures that animals can be placed back into the nest following inspection.

5.2.17 If any dormice were encountered, they were weighed and sexed with the age class of each animal recorded. The age of young dormice was determined according to weight and appearance (ie. eyes closed, eyed open, fur, or no fur). Dormice weighing between 10g and 15g with greyish brown colouring that are recorded from July onwards are regarded as juveniles. Dormice are recorded as adults after their first winter hibernation (Büchner *et al*., 2003).

5.2.18 Any wood mice *Apodemus sylvaticus*, yellow-necked mice *Apodemus flavicollis*, shrew *Sorex* sp., bank vole *Myodes glareolus* or field vole *Microtus agrestis* nests or individuals encountered were removed from the tubes, unless a litter was present. Bird nests were not disturbed until chicks had fledged, at which point the nest was removed. Any hornet *Vespa crabro*, bee or wasp hive was left to vacate naturally.

Limitations

5.2.19 Land access to specific study areas was refused in some months during the survey season. This led to an incomplete suite of dormouse surveys over the survey period for specific study areas. Tables C.1 and C.2. in Annex C list the study areas which were impacted by land access refusal. The overall number of nest tubes placed in suitable habitats throughout the proposed scheme is considered sufficient to form conclusions of the likely status of the species in the study area and therefore the limitation is not considered significant.

5.2.20 Full land access to complete each monthly survey was sometimes restricted for reasons including shooting and farming activities. Survey visits with restricted land access are detailed in Annex C, Tables C.1 and C.2. Restricted land access was factored into calculations of survey effort (Table 6.1) and as a result more tubes were originally deployed to offset this limitation. Dormouse signs such as nests often persist within tubes for several months and, as most of the survey visits were undertaken, restricted land access is not considered a significant limitation to the survey.

5.2.21 The route of the Cadent gas main diversion was not included in the 2017 or 2020 surveys as it was only incorporated into proposals in 2021. Surveys of this section of the Order Limits will be undertaken in 2022.

5.2.22 It was not possible to install the minimum recommended 50 nest tubes within Survey Area I due to a lack of suitable dormouse habitat. However, due to a lack of habitat there is high confidence in the results for this part of the proposed scheme.

5.2.23 In 2017, some nest tubes were not deployed until September 2017 (transects 45 and 46). These tubes were deployed in new locations within the transects in response to new borrow pit locations being announced. These tubes were only surveyed twice, in comparison to potentially six surveys for tubes deployed in May. This was not a significant limitation to the survey as other transects within 200m of these were surveyed all year in 2017. In addition, the proposed scheme was subsequently surveyed in 2020 and additional survey areas were surveyed within 200m of these transects (E2, E3 and F1).

5.2.24 Nest tubes for transects F3, F4, H2 and H4, surveyed in 2020, were deployed in June as opposed to May so were only surveyed five times (Annex C, Table C.2). This was due to combination of COVID-19 restrictions limiting the time in May that could be used for fieldwork and some land access only being granted in June. This was not considered a significant limitation as both survey areas F and H had enough tubes deployed over sufficient months to achieve index of probability scores for a robust survey effort in these areas (Section 6.2, Table 6.1).

5.2.25 Surveys can only be used to determine likely absence of dormice from any given area. This is due to their elusive nature and natural population fluctuations, allowing colonisations of areas following the completion of surveys. An absence of dormice, or their field signs, found during a survey does not confirm with absolute certainty the absence of dormice.

5.2.26 The findings of this report represent the professional opinion of qualified ecologists and do not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this document.

5.2.27 This report should be read in full and excerpts may not be representative of the findings.

5.2.28 This report has been prepared exclusively for Jacobs' client and no liability is accepted for any use or reliance on the report by third parties.

6 Results

6.1 Desk Study

6.1.1 No dormouse mitigation licences were found within 2km of the proposed scheme from a search on the MAGIC online tool.

6.1.2 Consultation with The Essex and Suffolk Dormouse group revealed a healthy population of dormice over 3km south of the proposed scheme (as 'the crow flies', however Chelmsford fragments connectivity in this direction). The distance between the dormouse record and Order Limits measured along the A12 is 8km. This population was identified in summer 2018 where 17 nests and six individuals were found in 60 deployed nest tubes. These records occurred south of junction 17 on the verge of the A12 Chelmsford bypass, south of Galleywood.

6.1.3 Aerial imagery shows that the River Chelmer poses as a barrier to dispersal for dormice between the proposed scheme and the population of dormice recorded 8km south along the A12. The connectivity of suitable dormouse habitat between the two locations is broken in several other locations including a gap of approximately 90m in the roadside vegetation on the western carriageway verge. The vegetation on the eastern carriageway is suboptimal, with gaps in woody vegetation of at least 25m. The road verges between J19 and J20 contain sporadic gaps in vegetation.

6.2 Field Study

Habitat suitability assessments

6.2.1 The habitat suitability assessments carried out in 2017 identified 41 optimal and sub-optimal habitat areas. In 2020, a further 28 optimal and sub-optimal habitats were identified. All areas identified were subject to further nest tube surveys. The descriptions of each habitat is shown in Annex B, Tables B.1 and B.2.

Dormouse nest tube survey

6.2.2 The 2017 survey data returned an index score of 40. This score is above the minimum survey effort score of 20 which is required to determine presence/likely absence of the species according to Bright *et al*. (2006).

6.2.3 In 2020, the study area was split into nine survey areas. Table 6.1 shows the index of probability score for each survey area individually and for the overall study area. These scores were calculated using the number of nest boxes set out in each area, and the months in which they were checked (as set out in Table 5.2) in accordance with Bright *et al*. (2006).

Table 6.1 Dormouse index of probability scores for 2020 (Dormouse Conservation Handbook, 2006)

Survey area (refer to figure 1)	Index of probability score
Overall study area	40
A	36
B	30
C	40
D	20
E	20
F	36
G	40
H	36
I	1

6.2.4 All the individual survey areas for 2020 achieved a score of 20 or more except for survey area I where surveys were restricted due to land access. The overall study area scored an index of probability score of 40 which is over the minimum survey effort of 20 required to determine presence or likely absence following Bright *et al*. (2006).

6.2.5 No dormice or evidence of dormice were recorded during the surveys carried out between June and November 2017, and between June and November 2020. Numerous wood mice, yellow necked mice, and bird nests were discovered in the nest tubes during these surveys.

7 Discussion

7.1 Summary

7.1.1 Recent records of dormouse from 8km south along the A12, found on the verge of the A12 Chelmsford bypass south of Galleywood in 2018 were considered. The habitat connectivity is severed by the roads at junctions 17 and 18 of the A12. The River Chelmer between the record and the proposed scheme poses as a barrier to dormouse dispersal towards the proposed scheme.

7.1.2 No further dormouse records were identified within 2km of the proposed scheme from the last 10 years.

7.1.3 Roadside vegetation on both the western and eastern carriageway is considered suboptimal and contains significant gaps. Road verges between junction 19 and junction 20 contain sporadic gaps in vegetation. Due to the combination of all the above, fragmentation it is considered unlikely that dormice freely move between this location and the study area.

7.1.4 No dormice or evidence of dormice were recorded during the surveys carried out in 2017 and 2020 (following current species best practice guidelines (Bright *et al*. 2006)).

7.1.5 The surveys included a nest tube survey where 1,119 and 1,269 nest tubes were deployed in 2017 and 2020 respectively. Despite being refused access on occasion to some areas within the study area, the distribution and number of tubes deployed in suitable habitat was appropriate to have sufficient confidence in the survey result (Figure 2 and Annex C).

7.1.6 Following best practice guidance, the calculated index of probability score for the nest tube surveys across the overall study area was 40 for both 2017 and 2020. This score is over the threshold of 20 for a survey effort to be considered sufficiently robust to conclude a likely absent result (Bright *et al*. 2006).

7.1.7 After analysing the survey results and desk study records, this report concludes that dormice are likely absent across the parts of the study area surveyed in 2017 and 2020. As discussed in Section 5.2, dormouse surveys of the Cadent gas main diversion will be undertaken in 2022.

8 References

a. Bright, P., Morris, P., and Mitchell-Jones, T. (2006). *The Dormouse Conservation Handbook – 2nd Edition.* English Nature, Peterborough.

b. Büchner, Sven & Stubbe, M. and Striese, D. (2003). *Breeding and biological data for the Common Dormouse (Muscardinus avellanarius) in Eastern Saxony (Germany).* Acta Zoologica Academiae Scientiarum Hungaricae. 49. 19-26.

c. Chanin, P. and Woods, M. (2003). *Surveying dormice using nest tubes. Results and experiences from the South West Dormouse Project*.

d. CIEEM (Chartered Institute of Ecology and Environmental Management) (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Version 1.1 Chartered Institute of Ecology and Environmental Management, Winchester.

e. Multi-Agency Geographical Information for the Countryside (MAGIC) interactive map. Available at https://magic.defra.gov.uk/MagicMap.aspx. Accessed March 2021

f. National Highways (formally Highways England) (2020a). *A12 Chelmsford to A120 Widening Scheme Environmental Scoping Report.* Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010060/TR010060-000006-A12%20-%20Environmental%20Scoping%20Report.pdf. Accessed January 2021

g. National Highways (formally Highways England) (2020b). *A12 Chelmsford to A120 Widening Scheme Extended Phase 1 Habitat Survey Report*

h. Natural England. (2015). *Hazel or Common Dormice: Surveys and Mitigation for Development Projects.* [online] Available at https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects Accessed January 2021

i. National Planning Policy Framework (NPPF). (2019). [online] Available at https://www.gov.uk/government/publications/national-planning-policy-framework--2. Accessed January 2021

j. ODPM (Office of the Deputy Prime Minister) (2005). *Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and the Impact within the Planning System*. [online] Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7692/147570.pdf. Accessed January 2021

Annex A: Photographs

Table A.1 Photographs of areas classified as optimal and sub-optimal dormouse habitats

Photograph	Habitat description
	Mature and semi-natural woodland with connected understory (Optimal)
	Plantation woodland with sparse understory (Sub-optimal)
	Livestock grazed pasture with mature trees and scrub (Optimal)

Photograph	Habitat description
	Arable field edge with dense connected hedgerow (Optimal)
	Dense connected scrub (Optimal)

Annex B: Dormouse transect details 2017 and 2020

Table B.1 2017 Dormouse transect details

2017 Transect reference	Survey Area (A-I)	Habitat Description	Habitat suitability	No. of tubes
4	H	Hedgerow with trees bordering a main road and managed grassland. Species include blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna,* hazel *Corylus avellana*, sycamore *Acer pseudoplatanus*, English elm *Ulmus minor,* common lime *Tilia x europaea,* and beech *Fagus sylvatica*. This hedgerow connects transects 5, 6, 7 and 34.	Optimal	35
5	H	Mixed woodland with areas of conifer and deciduous trees. Species include ash *Fraxinus excelsior*, hazel, horse chestnut *Aesculus hippocastanum*, English oak *Quercus Robu*, silver birch *Betula pendula* and sycamore. This area of woodland connects transects 4, 6, 7 and 34.	Optimal	10
6	H	Managed hedgerow with trees following a private driveway. Species include elder *Sambucus nigra*, hawthorn, holly *Ilex aquifolium*, rhododendron species *Rhododendron ponticum* and hazel. Hedgerow connects transects 4, 5, 7 and 34.	Optimal	5
7	H	Hedgerow with trees adjacent to managed grassland. Species include elder, sycamore, beech, ash, hawthorn, and a prunus species *Prunus sp*. Hedgerow connects transects 4, 5, 6 and 34.	Optimal	17
8	G	Hedgerow with tree bordering arable fields and private gardens. Species include field maple *Acer campestre*, sycamore, hawthorn, English oak, ash, elder, guelder rose *Viburnum opulus* and beech.	Optimal	25
9	F	Hedgerow with tree bordering arable fields and providing screening for kennels. Species include hawthorn, bramble *Rubus fruticosus agg.*, prunus species, hazel, field maple, elder, beech, English oak and English elm. Hedgerow is connected to transect 10 via an area of mature broadleaved woodland and other connecting arable field margins.	Optimal	25
10	F	Hedgerow bordering arable field. Species include alder *Alnus glutinosa*, hawthorn, elder, holly, field maple, blackthorn, and silver birch. Hedgerow indirectly connected to transect 18 via mature trees within A12 road verge with associated scrub and into Area 45 via arable field margins.	Optimal	15

2017 Transect reference	Survey Area (A-I)	Habitat Description	Habitat suitability	No. of tubes
11	F	Hedgerow bordering Gershwin Boulevard and pre-development land. The hedgerow has been recently planted and was dominated by hawthorn and blackthorn.	Sub-optimal	25
12	E	Hedgerow and plantation woodland with trees connecting into Area 46 and the corridor of the River Blackwater. Species include blackthorn, prunus species, elder, sycamore, hawthorn, blackthorn, willow *Salix sp.,* field maple, bramble, and oak species. Hedgerow directly connects into transect 46.	Optimal	30
13	D	Flailed hedgerow and woodland edge. Woodland edge section connected to plantation woodland that still has a dense understory in most areas. Hedgerow section is trimmed and dense dominated by hawthorn.	Optimal	30
14	D	Shrubby hedgerow with trees surrounding fields, untrimmed and dense in most parts with outgrowth, gaps between sections. English elm, blackthorn, and bramble present.	Optimal	30
15	C	Planted woodland strip on south embankment beside A12, trees densely packed and semi mature, limited understory. Field maple and hawthorn present.	Sub-optimal	40
16	C	Planted woodland strip on north embankment beside A12, trees densely packed and semi mature, limited patchy understory. Species include field maple and hawthorn with a few coniferous trees also present.	Sub-optimal	30
17	C	Thin strip of woodland surrounding a house's grounds. Lots of mature trees indicating the woodland has been present for a long time. Mostly connected understory and hazel present. Species include English oak, blackthorn, hazel, ash, and field maple.	Optimal	59
18	E/F	Hedgerow with trees bordering arable field and the A12. Species include blackthorn, bramble, hawthorn, ash, elm, silver birch, sycamore, and yew *Taxus baccata*. Hedgerow indirectly connected to transect 10 via mature trees within A12 road verge with associated scrub and transect 45 via arable field margins.	Optimal	25
19	C	Thin strip of semi mature planted woodland on bank beside the A12, scrubby in places, connected to woodland beside river to the east. Species include field maple, hazel, and hawthorn.	Optimal	10

2017 Transect reference	Survey Area (A-I)	Habitat Description	Habitat suitability	No. of tubes
20	C	Hedgerow leading to thin strip of woodland beside the A12. Some veteran trees. Quite a few gaps in the hedgerow section with a limited understory. Borders a plantation of willow to the north and west. Species include hawthorn, elder, ash and English elm.	Sub-optimal	15
21	C	Woodland surrounding a lake mostly semi mature trees with a connected understory, scrubby in places. Connected to woodland by road by heavily managed hedge. Species include ash, hawthorn, and wild cherry *Prunus avium*.	Optimal	10
22	C	Mature dense hedgerow consisting mostly of trees connected well to habitat in the wider landscape. Species include hawthorn English elm, blackthorn, ash, and field maple.	Optimal	42
23	H	Hedgerow with scattered trees bordering grazed horse fields. The hedgerow connects to woodland in the west. Species include bramble, hawthorn, elder, holly, and prunus species.	Optimal	10
24	E/D	Hedgerow and young strip of woodland beside A12 slip road. Fragmented and limited connectivity due to gaps. Vegetation dense and mostly made up of trees. Species include elder, alder, hazel, and field maple.	Sub-optimal	75
25	B	Hedgerow heavily managed beside the A12 and Easthorpe road, small area of trees to far north-east of the transect. Hedgerow dense and dominated by hawthorn with blackthorn, bramble, ash, and hazel present.	Sub-optimal	23
26	A	Hedgerow and strip of woodland with some gaps and limited connected understory. Dense in places and species include blackthorn, common ivy *Hedera helix*, English elm, and bramble.	Sub-optimal	20
27	D	Hedgerow that leads from the river to the A12 roadside following a watercourse. Hedgerow is tall and untrimmed with mature trees along most of its length. Well connected to wider landscape. Species include willow, field maple, hawthorn, blackthorn, ash, and hazel.	Optimal	25
28	D	Hedgerow with young trees, dense in most parts with a few small gaps. Connected to vegetation running alongside the river and multiple other hedgerows. Species include ash, blackthorn, and elder.	Optimal	15
29	E	Woodland between the River Blackwater and the A12 with connected understory and semi-mature trees. Species include willow, field maple, and hawthorn.	Optimal	55

2017 Transect reference	Survey Area (A-I)	Habitat Description	Habitat suitability	No. of tubes
30	B	Mature hedgerow and strip of woodland mostly made up of trees with a dense understory. Species include hazel, field maple, and English elm.	Optimal	27
31	B	Tall well-established hedgerow bordering arable fields, extends to woodland strip in places, flailed in places and outgrown in others. Species include blackthorn, elder, elm, and oak.	Sub-optimal	35
32	B	A wide, dense, and unmanaged hedgerow with well-connected understory and good species diversity. Species include elder, elm, field maple, ash, hazel, and blackthorn.	Sub-optimal	13
33	I	Hedgerow with trees bordering arable field and landscaped gardens. Species include bramble, hawthorn, lime, horse chestnut, sycamore, and sweet chestnut.	Sub-optimal	10
34	H	Hedgerow and woodland connecting into transects 4 and 5 bordering arable fields and Mowden Hall Lane. The hedgerow is mainly dominated by blackthorn, hawthorn, and field maple. The woodland consists of hawthorn, blackthorn, prunus species, sycamore, elm, ash, holly, and oak. Woodland connects transects 4, 5, 6 and 7 as well as the wider environment via mature hedgerows.	Optimal	60
35	C	Woodland surrounding a house, mostly semi mature trees with a connected understory and small section of hedgerow. Area connected to woodland next to road via transect 21 habitat and heavily managed hedge. Species include ash, hawthorn, and field maple.	Optimal	10
36	B	Bank with a mixture of scrub and trees. Connected understory which seems undisturbed. Species include bramble, field maple, and hawthorn.	Optimal	15
37	D	Area of woodland beside the A12 extending to small area of trees in grounds of derelict pub. Understory not well connected to the wider landscape. Species include bramble, field maple, and hawthorn.	Sub-optimal	10
38	C	Strip of woodland around the outside of an arable field borders the A12 to the south and the railway to the north. Mostly connected understory and well connected to wider landscape. Species include hawthorn, oak, ash, hazel, and elm.	Optimal	14
39	D	Mature area of woodland beside the A12. Connected understory especially around the edges. Species include field maple, hazel, oak, and blackthorn	Optimal	18

2017 Transect reference	Survey Area (A-I)	Habitat Description	Habitat suitability	No. of tubes
40	C	Hedgerow with gaps along the side of the A12. Not very well connected to the wider landscape. Species include field maple, bramble, elm, and blackthorn	Sub-optimal	39
41	C	Strip of trees and scrub linking from the A12 roadside to the railway. Species include bramble, field maple, and hawthorn.	Sub-optimal	9
42	B	Hedgerow along the north side of the A12, managed but has areas of outgrowth. Well-connected understory but part of original roadside planting and dominated by hawthorn. Species include hawthorn, ash, elder, and field maple.	Sub-optimal	40
43	B	Managed hedgerows between farmers arable fields with frequent standard trees. Species include hawthorn, oak and blackthorn.	Sub-optimal	45
45	F	Hedgerow bordering arable field. The hedgerow is mainly dominated by blackthorn with the occasional mature ash tree. Hedgerow indirectly connected to transect 10 and 18 via arable field margins.	Optimal	27
46	E	Hedgerow with trees bordering arable fields and a residential area. Species include ash, blackthorn, dog rose *Rosa canina*, willow species and dog wood *Cornus sanguinea*. Hedgerow connects to transect 12.	Optimal	46

Table B.2 2020 Dormouse transect details

2020 Transect reference	Habitat description	Habitat suitability	No. of tubes
A2	Hedgerow with a variety of species over a ditch. Species include rose *Rosa sp.,* hawthorn, common ivy, nettle *Urtica dioica*, bramble, elder, blackthorn, willow, and ash. Hedgerow connects to woodland beside the A12.	Optimal	40
A3	Open woodland beside the A12 with sparse understory and some short sections of hedgerow. Species include sycamore, ash, hazel, elder, hawthorn, and honeysuckle *Lonicera periclymenum*.	Sub-optimal	114
A4	Woodland with areas of dense understory and lots of hazel connected to dense continuous hedge. Species include hawthorn, blackthorn, bramble, hazel, elm, elder, field maple, nettle, bramble, ash, holly, elder, oak, and blackthorn.	Optimal	75
B1	Dense shrubby hedge with good species diversity but with a few gaps at its northern end. Species include hazel, bramble, hawthorn, oak, and field maple. Limited connectivity to wider landscape.	Optimal	37

2020 Transect reference	Habitat description	Habitat suitability	No. of tubes
B2	Woodland with suitable connected understory and a section of dense hedge well connected to the wider landscape. Species include hazel, field maple, oak, elder, beech, blackthorn, hawthorn, nettles, dog mercury *Mercurialis perennis*, and conifer.	Optimal	22
B3	Area of woodland and dense hedgerow with connected understory. Species include oak, ash, elder, blackthorn, hawthorn, dogwood, rose, hazel, and elm. Good habitat connectivity to the wider landscape.	Optimal	38
C1	Young plantation woodland with limited understory connected to hedgerow with some gaps. Species include ash, elm, bramble, maple, elder, oak, hazel, and blackthorn. Limited connectivity to the wider landscape.	Sub-optimal	49
C6	Dense hedgerow connected to small woodland with some understory connectivity a good diversity of species including hazel, field maple, elder, holly, yew hawthorn, lime, dogwood, snowberry *Symphoricarpos albus*. Good connectivity to the wider landscape.	Optimal	91
C8	Small area of woodland and hedgerow adjacent to the A12, no hazel seen. Limited understory and species variety. Species included wild cherry, birch, nettle, and brambles.	Sub-optimal	18
C9	Dense hedgerow and plantation woodland beside the A12. Hedgerow had a few gaps but good connectivity and species diversity. Species include hazel, willow, hawthorn, oak, bramble, elder, sycamore, and wild cherry.	Optimal	87
D1	Dense tall hedgerow with a variety of species including occasional hazel and good connectivity to wider landscape. Species include field maple, hawthorn, bramble, hazel, common ivy, rose and elm.	Optimal	15
D2	Dense tall hedgerow extending to a thin strip of woodland in parts, with lots of hazel throughout. Gaps in hedgerow in places. Species include blackthorn, hazel, elm, ash, field maple, hawthorn, bramble, nettles, apple *Malus domestica*, and oak.	Optimal	36
D3	Dense unkept hedgerow widening into a thin woodland at its eastern end. Good, connected understory apart from railway gap in the middle and good connectivity to wider landscape. Species included sycamore, horse chestnut, hawthorn, blackthorn, common ivy, and hazel.	Optimal	35
E1	Strip of woodland beside the A12 with limited understory in places, but unkept and well connected with nature reserve nearby. Species included field maple, hawthorn, garlic mustard *Alliaria petiolata*, ash, poplar *Populus sp.,* bramble, nettle, alder, hazel, blackthorn and elder.	Sub-optimal	31
E2	Strip of unkept woodland to the west of the fishing lake on golf course with good understory and connectivity to the wider landscape. Species include bramble, oak, willow, elder, elm, hawthorn, blackthorn, and gooseberry *Ribes uva-crispa*.	Optimal	30

2020 Transect reference	Habitat description	Habitat suitability	No. of tubes
E3	Area of managed woodland with limited understory, a good number of species but no hazel. Good connectivity to wider landscape. Transect area also includes small section of tall dense hedge in the golf course with limited habitat connectivity. Species include sycamore, hawthorn, blackthorn, rose, bramble, nettles, oak, alder, and willow.	Sub-optimal	33
F1	Area of mature woodland surrounded by species rich hedgerow and a separate area of hedgerow to the west. Good species diversity and continuity of shrub layer. Limited connectivity to surrounding habitat. Species include hazel, hawthorn, blackthorn, elder, holly, oak, common ivy, bramble, rose, field maple, ash, sycamore, honeysuckle, elm, and poplar.	Optimal	81
F2	Small area of mature woodland with some hazel coppice on its eastern boundary. Good species diversity but limited understory and connectivity to wider habitat. Species included hawthorn, field maple, willow, hazel, alder, and oak.	Sub-optimal	31
F3	Woodland with tall trees, limited understory, and limited connectivity to the wider landscape. Species included poplar, bramble, elder, hawthorn, blackthorn, hazel, oak, and hornbeam *Carpinus betulus.*	Sub-optimal	55
F4	Woodland with limited understory but some connectivity around denser margins. Limited connectivity to wider habitat and food resources. Species included poplar, elder, willow, hawthorn, ash, and bramble.	Sub-optimal	47
G1	Plantation woodland and short section of hedgerow with limited understory but connected around the edges. Species included field maple, ash, oak, hazel, blackthorn, rose, bramble, and nettle.	Sub-optimal	35
G3	Mixed woodland and a dense hedgerow to its south. Woodland was open in parts and dense in others. Wide glades running through wood regularly. Connected hedgerow dense with a variety of species but with several large gaps. Species include blackthorn, elder, oak, elm, hazel, conifers, bramble, and beech.	Sub-optimal	45
G4	Transect that includes dense hedgerow and some open plantation woodland. Hedgerows and edge of woodland, dense with connected understory, and good feeding opportunities with plentiful berries. Species include blackthorn, bramble, elder, oak and field maple.	Optimal	33
G5	Short area of dense hedgerow alongside stream with a dense understory. Limited connectivity to wider habitat. Species include elder, blackthorn, willow, nettle, and bramble.	Sub-optimal	7
G6	Small area of woodland with limited understory, but some feeding opportunities and connectivity to wider habitat. Species include oak, hawthorn, elder, and ash.	Sub-optimal	17
H2	Strip of mature woodland surrounded by parkland habitat. Moderate connectivity within habitat but mainly dominated by mature trees. Species include hawthorn, blackthorn, field maple, ash, hazel, oak, elder, and horse chestnut.	Sub-optimal	87

2020 Transect reference	Habitat description	Habitat suitability	No. of tubes
H4	Dense hedgerow with some gaps. Limited species diversity but good understory connectivity and connectivity to the wider landscape. Species include field maple, hawthorn, blackthorn, and oak.	Sub-optimal	50
I1	Mature woodland with some dense understory and good connectivity to the wider landscape. Species include hazel, field maple, blackthorn, elm, and honeysuckle.	Optimal	30

Annex C: Dormouse nest tube survey visits 2017 and 2020

Table C.1 Dormouse nest tube survey visits 2017

Transect reference	Date Nest Tubes Deployed	Survey status					
		June	July	August	September	October	November
4	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
5	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
6	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
7	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
8	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
9	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
10	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
11	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
12	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
13	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
14	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
15	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
16	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
17	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
18	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
19	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
20	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
21	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
22	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
23	May 2017	Complete	Complete	Complete	Access Refused	Access Refused	Complete
24	May 2017	Complete	Complete	Access Refused	Access Refused	Access Refused	Complete
25	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
26	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
27	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
28	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
29	May 2017	Complete	Complete	Access Refused	Access Refused	Access Refused	Complete
30	May 2017	Complete	Complete	Complete	Complete	Complete	Complete

Transect reference	Date Nest Tubes Deployed	Survey status					
		June	July	August	September	October	November
31	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
32	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
33	May 2017	Complete	Complete	Access Refused	Access Refused	Access Refused	Complete
34	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
35	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
36	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
37	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
38	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
39	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
40	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
41	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
42	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
43	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
44	May 2017	Complete	Complete	Complete	Complete	Complete	Complete
45	September 2017	-	-	-	-	Complete	Complete
46	September 2017	-	-	-	-	Complete	Complete

Table C.2 Dormouse nest tube survey visits 2020

Transect reference	Date Nest Tubes Deployed	Survey status					
		June	July	August	September	October	November
A2	21/05/2020	Access refused	Complete	Access Refused	Access Refused	Access Refused	Access Refused
A3	27/05/2020	Access Refused	Complete	approx. 75% surveyed- restricted access	Complete	Complete	Complete
A4	21/05/2020	Access refused	Complete	Complete	Completed	Complete	Complete
B1	13/05/2020	Access refused	Complete	Complete	Complete	Complete	Complete

Transect reference	Date Nest Tubes Deployed	Survey status					
		June	July	August	September	October	November
B2	20/05/2020	Complete	Complete	Complete	Complete	approx. 50% surveyed - restricted access - game cover	approx. 50% surveyed - restricted access - game cover
B3	19/05/2020	Access refused	Complete	Complete	Complete	approx. 50% surveyed - restricted access - game cover	approx. 50% surveyed - restricted access - game cover
C1	20/05/2020	Complete	Complete	Complete	approx. 40% surveyed- restricted access- game cover	approx. 40% surveyed- restricted access- game cover	approx. 40% surveyed- restricted access- game cover
C6	29/05/2020	Complete	approx. 30% surveyed- restricted access	approx. 30% surveyed- restricted access	approx. 30% surveyed- restricted access	approx. 30% surveyed- restricted access	approx. 30% surveyed- restricted access
C8	21/05/2020	Access refused	Complete	Complete	Complete	Complete	Complete
C9	18/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
D1	12/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
D2	12/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
D3	13/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
E1	13/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
E2	14/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
E3	27/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
F1	15/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
F2	27/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
F3	19/06/2020	-	Complete	Complete	Complete	Complete	Complete
F4	18/06/2020	-	Complete	Complete	Complete	Complete	Complete
G1	29/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
G3	28/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
G4	28/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
G5	28/05/2020	Complete	Complete	Complete	Complete	Complete	Complete
G6	28/05/2020	Complete	Complete	Complete	Complete	Complete	Complete

Transect reference	Date Nest Tubes Deployed	Survey status					
		June	July	August	September	October	November
H2	16/06/2020	-	Complete	Complete	Complete	Complete	Complete
H4	17/06/2020	-	Complete	Complete	Complete	Complete	Complete
I1	26/05/2020	Complete - tubes collected	Access Refused	Access Refused	Access Refused	Access Refused	Access Refused

Figures

APPENDIX 9.6 - FIGURE 1

Legend

- 2020 Survey Areas (A-I)
- Provisional Order Limits
- Study Area

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	31/05/22	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
DORMOUSE SURVEY STUDY AREA

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:90000	DO NOT SCALE
Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0669

N
W
E
S

Braintree
Coggeshall
Witham
Chelmsford
Maldon

A
B
C
D
E
F
G
H
I

River Chelmer poses
a barrier to dormouse dispersal

Gap of approximately 90m in the roadside vegetation
on the wester carriage verge, and vegetation
on the eastern carriageway is suboptimal,
with gaps in woody vegetation of at least 25m.

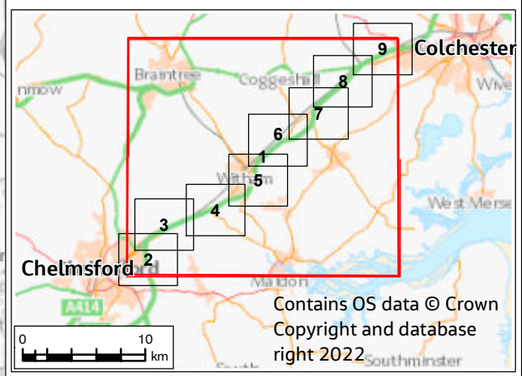
Essex and Suffolk Dormouse Group -
Dormouse Record

0
2500
m

APPENDIX 9.6 - FIGURE 2

Legend

- Provisional Order Limits
- Study Area
- 2020 Survey Area (A-I)
- Dormouse Transects 2017
- Dormouse Transects 2020



Contains OS data © Crown Copyright and database right 2022

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	31/05/22	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
DORMOUSE NEST TUBE TRANSECT LOCATIONS
SHEET 1 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:80000	DO NOT SCALE	
Jacobs No.	B36601D1	Rev	P01
Client No.	HE551497		

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0670

APPENDIX 9.6 - FIGURE 2

Legend

- Provisional Order Limits
- 2020 Survey Area (A-I)

Dormouse Transects 2017

- 33

Suitable dormouse habitat onsite

- J2.1.1 Intact hedge - native species-rich
- J2.1.2 Intact hedge - species-poor
- J2.2.1 Defunct hedge - native species-rich
- J2.2.2 Defunct hedge - species-poor
- J2.3.1 Hedge with trees - native species-rich
- J2.3.2 Hedge with trees - species-poor
- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A1.3.2 Mixed woodland - plantation
- A2.1 Scrub - dense/continuous

Contains OS data © Crown Copyright and database right 2022

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	31/05/22	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
DORMOUSE NEST TUBE TRANSECT LOCATIONS
SHEET 2 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:15000	DO NOT SCALE
Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0671

APPENDIX 9.6 - FIGURE 2

Legend

- Provisional Order Limits
- 2020 Survey Area (A-I)

Dormouse Transects 2017

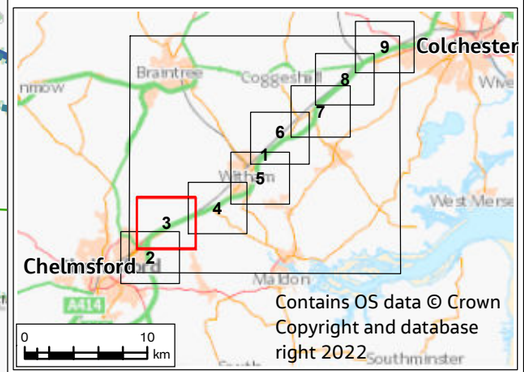
- 23
- 33
- 34
- 4
- 5
- 6

Dormouse Transects 2020

- G6
- H2
- H4
- I1

Suitable dormouse habitat onsite

- J2.1.1 Intact hedge - native species-rich
- J2.1.2 Intact hedge - species-poor
- J2.2.1 Defunct hedge - native species-rich
- J2.2.2 Defunct hedge - species-poor
- J2.3.1 Hedge with trees - native species-rich
- J2.3.2 Hedge with trees - species-poor
- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A1.3.1 Mixed woodland - semi-natural
- A1.3.2 Mixed woodland - plantation
- A2.1 Scrub - dense/continuous



Contains OS data © Crown Copyright and database right 2022

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	31/05/22	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
DORMOUSE NEST TUBE TRANSECT LOCATIONS
SHEET 3 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:15000	DO NOT SCALE
Jacobs No.	B36601D1	Rev P01
Client No.	HE551497	

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0672

APPENDIX 9.6 - FIGURE 2

Legend

- Provisional Order Limits
- 2020 Survey Area (A-I)

Dormouse Transects 2017

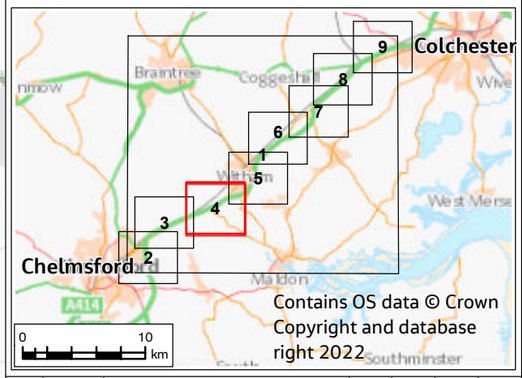
- 10
- 11
- 18
- 34
- 4
- 45
- 5
- 6
- 7
- 8
- 9

Dormouse Transects 2020

- F1
- F2
- F3
- F4
- G1
- G3
- G4
- G5
- G6
- H2
- H4

Suitable dormouse habitat onsite

- J2.1.1 Intact hedge - native species-rich
- J2.1.2 Intact hedge - species-poor
- J2.2.1 Defunct hedge - native species-rich
- J2.2.2 Defunct hedge - species-poor
- J2.3.1 Hedge with trees - native species-rich
- J2.3.2 Hedge with trees - species-poor
- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A1.2.2 Coniferous woodland - plantation
- A1.3.1 Mixed woodland - semi-natural
- A1.3.2 Mixed woodland - plantation
- A2.1 Scrub - dense/continuous



Contains OS data © Crown Copyright and database right 2022

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	31/05/22	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
DORMOUSE NEST TUBE TRANSECT LOCATIONS
SHEET 4 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:15000	DO NOT SCALE
Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0673

APPENDIX 9.6 - FIGURE 2

Legend

- Provisional Order Limits
- 2020 Survey Area (A-I)

Dormouse Transects 2017

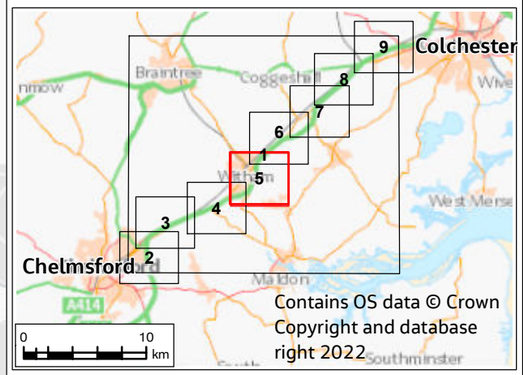
- 10
- 11
- 12
- 14
- 18
- 24
- 27
- 29
- 37
- 45
- 46
- 9

Dormouse Transects 2020

- E1
- E2
- E3
- F1

Suitable dormouse habitat onsite

- J2.1.1 Intact hedge - native species-rich
- J2.1.2 Intact hedge - species-poor
- J2.2.1 Defunct hedge - native species-rich
- J2.2.2 Defunct hedge - species-poor
- J2.3.1 Hedge with trees - native species-rich
- J2.3.2 Hedge with trees - species-poor
- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A1.2.2 Coniferous woodland - plantation
- A1.3.2 Mixed woodland - plantation
- A2.1 Scrub - dense/continuous



Contains OS data © Crown Copyright and database right 2022

P01	31/05/22	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
DORMOUSE NEST TUBE TRANSECT LOCATIONS
SHEET 5 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:15000	DO NOT SCALE
Jacobs No.	B36601D1	Rev P01
Client No.	HE551497	

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0674

APPENDIX 9.6 - FIGURE 2

Legend

- Provisional Order Limits
- 2020 Survey Area (A-I)

Dormouse Transects 2017

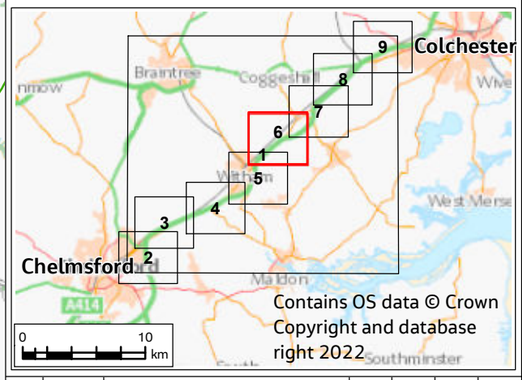
- 13
- 14
- 15
- 16
- 19
- 20
- 24
- 27
- 28
- 37
- 39

Dormouse Transects 2020

- C8
- C9
- D1
- D2
- D3

Suitable dormouse habitat onsite

- J2.1.1 Intact hedge - native species-rich
- J2.1.2 Intact hedge - species-poor
- J2.2.1 Defunct hedge - native species-rich
- J2.2.2 Defunct hedge - species-poor
- J2.3.1 Hedge with trees - native species-rich
- J2.3.2 Hedge with trees - species-poor
- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A1.2.2 Coniferous woodland - plantation
- A1.3.2 Mixed woodland - plantation
- A2.1 Scrub - dense/continuous



Contains OS data © Crown Copyright and database right 2022

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	31/05/22	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
DORMOUSE NEST TUBE TRANSECT LOCATIONS
SHEET 6 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:15000	DO NOT SCALE
Jacobs No.	B36601D1	Rev P01
Client No.	HE551497	

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0675

APPENDIX 9.6 - FIGURE 2

Legend

- Provisional Order Limits
- 2020 Survey Area (A-I)

Dormouse Transects 2017

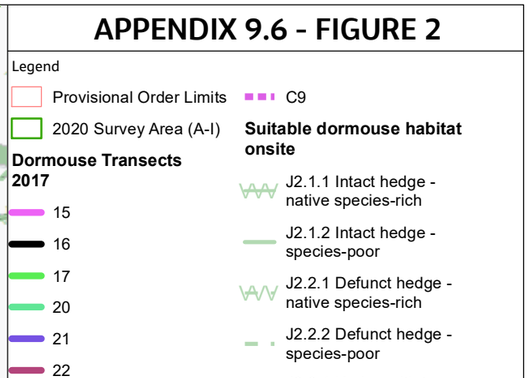
- 15
- 16
- 17
- 20
- 21
- 22
- 25
- 28
- 30
- 32
- 35
- 38
- 40
- 41
- 42

Dormouse Transects 2020

- C1
- C6
- C8
- C9

Suitable dormouse habitat onsite

- J2.1.1 Intact hedge - native species-rich
- J2.1.2 Intact hedge - species-poor
- J2.2.1 Defunct hedge - native species-rich
- J2.2.2 Defunct hedge - species-poor
- J2.3.1 Hedge with trees - native species-rich
- J2.3.2 Hedge with trees - species-poor
- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A1.2.2 Coniferous woodland - plantation
- A1.3.1 Mixed woodland - semi-natural
- A1.3.2 Mixed woodland - plantation
- A2.1 Scrub - dense/continuous



Contains OS data © Crown Copyright and database right 2022

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	31/05/22	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
DORMOUSE NEST TUBE TRANSECT LOCATIONS
SHEET 7 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:15000	DO NOT SCALE
Jacobs No.	B36601D1	Rev P01
Client No.	HE551497	

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0676

APPENDIX 9.6 - FIGURE 2

Legend

- Provisional Order Limits
- 2020 Survey Area (A-I)
- B3
- C1

Dormouse Transects 2017

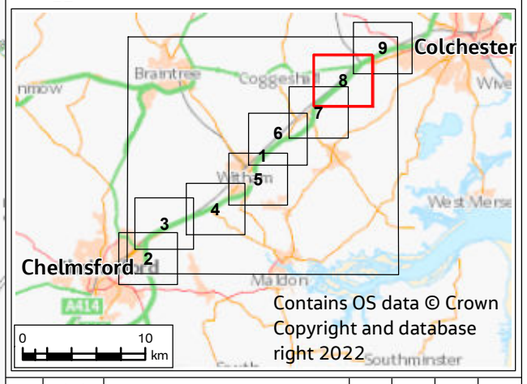
- 22
- 25
- 26
- 28
- 30
- 31
- 32
- 36
- 38
- 40
- 41
- 42
- 43

Dormouse Transects 2020

- A2
- A4
- B1
- B2

Suitable dormouse habitat onsite

- J2.1.1 Intact hedge - native species-rich
- J2.1.2 Intact hedge - species-poor
- J2.2.1 Defunct hedge - native species-rich
- J2.2.2 Defunct hedge - species-poor
- J2.3.1 Hedge with trees - native species-rich
- J2.3.2 Hedge with trees - species-poor
- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A1.2.2 Coniferous woodland - plantation
- A1.3.2 Mixed woodland - plantation
- A2.1 Scrub - dense/continuous



Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	31/05/22	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
DORMOUSE NEST TUBE TRANSECT LOCATIONS
SHEET 8 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:15000	DO NOT SCALE
Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0677

APPENDIX 9.6 - FIGURE 2

Legend

- Provisional Order Limits
- 2020 Survey Area (A-I)

Dormouse Transects 2017

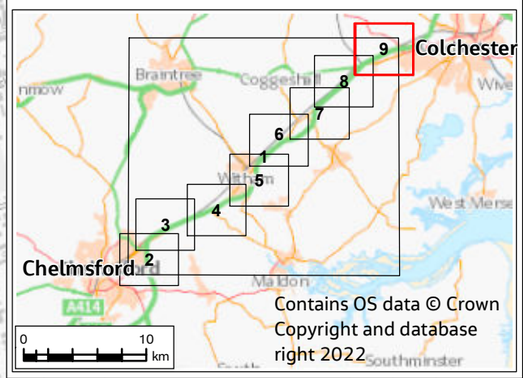
- 26
- 36

Dormouse Transects 2020

- A2
- A3
- A4

Suitable dormouse habitat onsite

- J2.1.1 Intact hedge - native species-rich
- J2.1.2 Intact hedge - species-poor
- J2.2.1 Defunct hedge - native species-rich
- J2.2.2 Defunct hedge - species-poor
- J2.3.1 Hedge with trees - native species-rich
- J2.3.2 Hedge with trees - species-poor
- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A1.2.2 Coniferous woodland - plantation
- A1.3.1 Mixed woodland - semi-natural
- A1.3.2 Mixed woodland - plantation
- A2.1 Scrub - dense/continuous



Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	31/05/22	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
DORMOUSE NEST TUBE TRANSECT LOCATIONS
SHEET 9 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:15000	DO NOT SCALE	
Jacobs No.	B36601D1	Rev	P01
Client No.	HE551497		

Drawing Number: HE551497-JAC-LDC-SCHW-SK-GI-0678