

### **AQUIND Limited**

### **AQUIND INTERCONNECTOR**

Environmental Statement – Volume 3 – Appendix 16.11 Hazel Dormouse Survey Report

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### **EXECUTIVE SUMMARY**

This report has been prepared on behalf of AQUIND Limited (the 'Applicant') to support an application (the 'Application') for a Development Consent Order ('DCO'). AQUIND Interconnector is a proposed electricity Interconnector between France and the UK. The Application for the DCO is made in respect of the UK elements of AQUIND Interconnector (referred to as the 'Proposed Development').

WSP has been commissioned by AQUIND Ltd. to undertake a Hazel Dormouse Survey.

A desk study returned records of hazel dormice within 2km of the Order Limits. Suitable dormouse habitat within the Order Limits is present around the Converter Station Area and north section of the Onshore Cable Route, and as such these areas were the focus of dormouse surveys. The surveys comprised two elements:

- Nest tube surveys to determine presence of hazel dormice or their nests; and
- Hazel nut searches to identify nuts with characteristic feeding marks indication the presence of hazel dormice in the habitats on Survey Area.

Field surveys returned no evidence of hazel dormice. It is therefore concluded that hazel dormice are absent from the habitats within the Survey Area and are not an ecological constraint to the Proposed Development.



## **APPENDIX 16.11 HAZEL DORMOUSE** SURVEY REPORT

#### 1.1. INTRODUCTION

#### 1.1.1. PROJECT BACKGROUND

- 1.1.1.1. This report has been prepared on behalf of AQUIND Limited (the 'Applicant') to support an application (the 'Application') for a Development Consent Order ('DCO'). AQUIND Interconnector is a proposed electricity Interconnector between France and the UK. The Application for the DCO is made in respect of the UK elements of AQUIND Interconnector (referred to as the 'Proposed Development').
- 1.1.1.2. The Proposed Development is described in detail in Chapter 3 (Description of the Proposed Development) of the Environmental Statement ('ES') Volume 1 (document reference 6.1.3).
- 1.1.1.3. WSP has been commissioned by the Applicant to undertake a hazel dormouse Muscardinus avellanarius survey.

#### 1.1.2. **ECOLOGICAL BACKGROUND**

- 1.1.2.1. A Phase 1 habitat survey and subsequent Preliminary Ecological Appraisal ('PEA') (Appendix 16.2 (PEA/Phase 1 Habitat Survey) of the ES Volume 3 (document reference 6.3.16.2)) of the Proposed Development was commissioned by AQUIND Ltd. in August 2017 (WSP, 2017) and updated in June 2019. The PEA identified suitable habitat for hazel dormouse within the Converter Station Area and north section of the Onshore Cable Route, further surveys were therefore recommended.
- 1.1.2.2. These surveys have been undertaken to inform the baseline of the Proposed Development and the Ecological Impact Assessment.
- 1.1.2.3. Hazel dormice have been recorded across much of Hampshire, with particular concentrations of records to the east of Andover, including along the A303 corridor, to the east and west of Basingstoke, along the M3 corridor north of Winchester and across parts of the South Downs National Park and near Park Gate Fareham (HDG. 2018).

#### **BRIEF AND OBJECTIVES** 1.1.3.

- 1.1.3.1. WSP was commissioned to complete a survey to inform the assessment of ecological impacts on hazel dormice.
- 1.1.3.2. To achieve this, the following objectives were set:

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- Undertake a desk study to identify any records of hazel dormice within 2 km of the Survey Area from the last ten years;
- Undertake surveys to confirm presence/absence of hazel dormice within suitable habitat in the Survey Area through identification of hazel dormice or hazel dormice nests and identification of hazel nuts with characteristic feeding marks;
- Highlight and map areas of key importance to hazel dormice within the Survey Area; and,
- Recommendations as to how proposals should account for hazel dormice in relation to legislation, planning and biodiversity policy.
- 1.1.3.3. The desk study conducted as part of the PEA (Appendix 16.2 (PEA/Phase 1 Habitat Survey)) and field surveys provide information to identify likely adverse effects of the Proposed Development upon hazel dormice. Where appropriate, recommendations have been made for measures to protect hazel dormice during and following construction of the Proposed Development.



### METHODS

#### 2.1. SURVEY AREA

- 2.1.1.1. The PEA (Appendix 16.2) identified suitable habitat for hazel dormouse within the Converter Station Area and north section of the Onshore Cable Route. These sections of the Proposed Development were subject to field surveys, and are the 'Survey Area' for this study. The locations of field surveys is shown in Figure 2, 3 and 4 in Appendix 1.
- 2.1.1.2. The Survey Area included ancient and broadleaved semi-natural woodland adjacent to the Lovedean Substation at Stoneacre Copse, Crabdens Row and Crabdens Copse, and surrounding hedgerows. These habitats are suitable for supporting foraging and sheltering habitat for hazel dormice.
- 2.1.1.3. The majority of the arable and grazing fields are lined with intact species-poor or species-rich hedgerows. Those that are species-rich are less managed, often with mature or semi-mature trees. These habitats provide good foraging and nesting habitats for hazel dormice.
- 2.1.1.4. Habitats which could be directly impacted by Proposed Development and directly connected habitats (hereby referred to as the 'Survey Area') were assessed for their potential to support hazel dormice and surveyed accordingly.

#### 2.2. DESK STUDY

- 2.2.1.1. As summarised in the PEA, a desk study was conducted which included a review of desk study records. The following sources were consulted to obtain ecological records of hazel dormice within the Survey Area and up to 2 km distance from this:
  - The MAGIC website list of European Protected Species license applications;
  - Hampshire Biological Information Centre ('HBIC'); and,
  - AECOM. (2013.) Lovedean Substation Extension. Volume 1: Environmental Report. AECOM, London.

#### 2.3. FIELD SURVEYS – NEST TUBE SURVEYS

2.3.1.1. Hazel dormouse presence/absence surveys were undertaken in accordance with the best practice guidance methods recommended in The Dormouse Conservation Handbook (Bright *et al.*, 2006) and in accordance with standard guidance provided by Natural England (2011). To ensure adequate survey effort, Natural England recommends using an index of probability of finding hazel dormice (see Table 1). When no hazel dormice are found, absence can only be assumed if the survey effort scores more than 20.

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Table 1 – Index of Probability of Finding Hazel Dormice Present in Nest Tubes in any One Month (Bright *et al.*, 2006)

Month	Index of Probability
April	1
Мау	4
June	2
July	2
August	5
September	7
October	2
November	2

- 2.3.1.2. Nest tubes resemble hollow branches which hazel dormice would naturally use to create a summer nest, therefore providing the hazel dormice with more nesting opportunities in the habitat. The occupation of a nest tube by a hazel dormouse, be it a nest or an individual animal, would confirm presence of the species in the Survey Area.
- 2.3.1.3. To establish whether hazel dormice were present or likely absent, hazel dormouse nest tubes were installed within suitable habitat within the Order Limits in May 2017 and checked once a month from June 2017 to November 2017. Additional areas including the Survey Area directly around Lovedean Substation were surveyed in 2018, with tubes checked from September to November 2018.
- 2.3.1.4. The surveys conducted in 2017 score a survey effort of 20, and the surveys conducted in 2018 score a survey effort of 11, which is less than the target 20 score. As a result, the areas subjected to surveys in 2018 were also subject to additional hazel nut searches (see Section 2.4 below).
- 2.3.1.5. Tubes were deployed in habitats identified as having high or moderate suitability to support hazel dormice. These were habitats which had good connectivity to other suitable habitats and which were large enough to support hazel dormice.
- 2.3.1.6. The nest tubes were deployed in hedgerows, dense scrub and woodland areas at approximately 10 m intervals.



2.3.1.7. Every month, for six months for the 2017 survey and three months for the 2018 surveys, each tube was inspected for the presence of hazel dormice or recently constructed hazel dormice nests. During these visits, the surveyors also recorded other evidence of hazel dormice presence such as hazel nut shells with characteristic signs of having been eaten by hazel dormice.

#### 2.4. FIELD SURVEYS – HAZEL NUT SEARCHES

- 2.4.1.1. The hazel nut searches followed guidance from Natural England's *The Dormouse Conservation Handbook* (Bright *et al.*, 2006) and People's Trust for Endangered Species (PTES, 2019). Hazel (*Corylus avellana*) trees were identified within the Survey Area and fallen hazelnuts within a 10 m<sup>2</sup> area around these were collected over a 20-minute period for later inspection. Survey locations were identified where a mature hazel tree, or group of mature hazel trees were present (for example along hedgerows) and the ground directly underneath these could be accessed.
- 2.4.1.2. All hazel nuts were then inspected using a magnifying hand lens, for characteristic feeding marks from hazel dormice. This includes a hole with smooth inner rim with tooth marks around this in a circular direction, and tooth marks on the outer surface around the hole in a "Catherine wheel" shape. Identifying these marks can enable a hazel nut eaten by a hazel dormouse to be differentiated from that eaten by birds or insects and other small mammals such as mice, voles or squirrels.
- 2.4.1.3. Where five squares yield no hazel dormouse eaten nuts, and/or from one hundred collected nuts opened by voles and mice and none from hazel dormice, this indicates that hazel dormice are unlikely to be present within a survey area.
- 2.4.1.4. There is an 80% probability that, if hazel dormice are present, the hazel nuts with characteristic feeding marks will be found by the time three 10m² squares have been searched. (Bright *et al.*,1994). If five squares fail to yield hazel dormouse eaten hazel nuts, it is about 90% certain that hazel dormice are not present, although this is not proof of absence from the Survey Area.
- 2.4.1.5. Heavy nut consumption by squirrels can result in 'false negatives', so where relatively few nuts (less than 100) are found that have been opened by species other than squirrels, and none have yet been found opened by hazel dormice, it is appropriate to increase survey effort by searching up to a further five survey points.
- 2.4.1.6. An alternative way of achieving an adequate sampling intensity, is to collect 100 hazel nuts that have been opened by small rodents (voles and mice, but avoiding caches made by these species and ignoring nuts opened by squirrels). If this sample contains no nuts that have been opened by hazel dormice it is highly probably that hazel dormice are not present.

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2.4.1.7. Fresh hazel nuts show tooth marks much more clearly than older ones. It is thus best to carry out hazel nut searches from about mid-August, when the nuts first accumulate on the ground. Hazel nuts will persist on the ground for over a year, but gradually decay so that tooth marks become progressively less distinct and it is harder to decide which species gnawed them.

#### 2.5. DATES OF SURVEY AND PERSONNEL

- 2.5.1.1. Visits were completed by competent surveyors with 8 years' experience of ecological survey holding a hazel dormouse class licence from Natural England (Licence number 2016-22846-CLS-CLS).
- 2.5.1.2. Dates of survey and weather conditions are given in Table 2Table 2 below.

Table 2 – Dates of Survey & Weather Conditions

Survey Visit	Date	Temperature (∘C)	Cloud Cover (Oktas)	Wind (Beaufort Scale)	General Weather Description
June 2017 Nest Tube Survey	29/06/2017	20	3/8	1	Dry and sunny
July 2017 Nest Tube Survey	24/07/2017	20	3/8	1	Dry and sunny
August 2017 Nest Tube Survey	21/08/2017	17	3/8	2	Dry and sunny
September 2017 Nest Tube Survey	27/09/2017	17	4/8	1	Dry and sunny
October 2017 Nest Tube Survey	23/10/2017	13	3/8	2	Dry and overcast
November 2017 Nest Tube Survey	24/11/2017	6	2/8	0	Dry and sunny
September 2018 Nest Tube Survey	25/09/2018	14	2/8	2	Dry and sunny
October 2018 Nest Tube Survey	24/10/2018	12	3/8	2	Dry and sunny
November 2018 Nest Tube Survey	27/11/2018	7	8/8	3	Foggy and cold
2019 Hazel Nut Search	05/02/2019	5	8/8	2	Foggy and cold
2019 Hazel Nut Search	13/02/2019	11	4/8	2	Dry and sunny

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#### 2.6. NOTES AND LIMITATIONS

- 2.6.1.1. The 2018 hazel dormouse survey was not extended throughout the whole active season of April to November. Despite this, the survey effort is considered sufficiently robust for the purposes of this study, as hazel nut surveys were also conducted in conjunction with these surveys in accordance with The Dormouse Conservation Handbook (Bright *et al.*, 2006).
- 2.6.1.2. The hazel nut searches were not conducted in the optimum survey period of mid-August to the end of December. Despite this, the hazel nuts still showed clear tooth marks from small mammals allowing these to be identified to species. This is likely to be due to the relatively dry winter reducing the decay of the hazel nuts. The timings of the survey are therefore not considered a limitation in the effectiveness of the survey method.



### 3. RESULTS

#### 3.1. DESK STUDY

- 3.1.1.1. The desk study identified nine granted European Protected Species (EPS) licences for hazel dormouse within 2km of the Order Limits of the Proposed Development, dating from 2011 to 2017. All licences are located south of Waterlooville, and fall outside the areas targeted for fields surveys.
- 3.1.1.2. HBIC returned 14 records of dormouse within 2km of the Order Limits. The records are from 2007 onwards, records prior to this have been discounted as they are unlikely to represent the current distribution of dormice in the area. The majority of records are located south of Waterlooville, and overlap with areas where dormouse EPS licences are located. One dormouse record from 2011 is located within the Converter Station Area. Dormouse records returned from the desk study are presented in Figure 1 in Appendix 1.
- 3.1.1.3. A hazel dormouse survey was carried out at Lovedean Substation in 2012, which did not find any hazel dormice present within the area surveyed (AECOM, 2013).

#### 3.2. FIELD SURVEYS – NEST TUBE SURVEYS

3.2.1.1. No hazel dormice or evidence of them was recorded at any of the survey locations during the 2017 and 2018 nest tube surveys. The results of the nest tube surveys are detailed in Table 3 below. The locations of dormouse nest tube areas are shown in Figure 2 and 3 in Appendix 1.

Table 3 - Nest Tube Survey Results

Dormouse Tube Area	Survey Year	Number of nest tubes deployed	Evidence of dormouse recorded
2017_DM_003	2017	5	None
2017_DM_009	2017	9	None
2017_DM_010	2017	6	None
2017_DM_011	2017	15	None
2017_DM_032	2017	19	None
2017_DM_034	2017	86	None
2017_DM_035	2017	36	None
2017_DM_036	2017	17	None
2017_DM_037	2017	15	None
2017_DM_038	2017	12	None

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Dormouse Tube Area	Survey Year	Number of nest tubes deployed	Evidence of dormouse recorded
2017_DM_039	2017	10	None
2018_DM_040	2018	10	None
2018_DM_042	2018	6	None
2018_DM_043	2018	15	None
2018_DM_044	2018	20	None
2018_DM_045	2018	2	None
2018_DM_046	2018	31	None
2018_DM_048	2018	15	None
2018_DM_049	2018	2	None
2018_DM_050	2018	15	None
2018_DM_051	2018	13	None
2018_DM_052	2018	6	None
2018_DM_053	2018	33	None
2018_DM_054	2018	2	None
2018_DM_055	2018	6	None

#### 3.3. FIELD SURVEYS – HAZEL NUT SEARCHES

3.3.1.1. Over the two survey days, hazel nut surveys were conducted at seventeen different squares within the Survey Area (see Figure 4 in Appendix 1). During these surveys, 1,426 hazel nuts were collected, 108 of which were eaten by either vole or mouse species, and none of which were eaten by hazel dormouse. The results of the surveys are shown in Table 4 below.

Table 4 - Hazel Nut Search Results

Survey Point	Hazel Dormouse Eaten Nuts	Vole/ Mouse Eaten Nuts	Squirrel Eaten Nuts	Bird/ Insect Eaten Nuts	Un-eaten Nuts	Total Nuts Collected
05/02/2019						
1	-	-	1	-	3	4
2	-	-	1	-	2	3

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Survey Point	Hazel Dormouse Eaten Nuts	Vole/ Mouse Eaten Nuts	Squirrel Eaten Nuts	Bird/ Insect Eaten Nuts	Un-eaten Nuts	Total Nuts Collected
3	-	-	3	-	-	3
4	-	-	16	-	7	23
5	-	3	37	1	-	41
6	-	16	12	-	11	39
7	-	2	5	-	-	7
8	-	1	35	-	6	42
9	-	2	8	-	4	14
10	-	12	65	2	10	89
			13/02/2019			
1	-	9	67	-	13	89
2	-	3	18	-	3	24
3	-	8	62	2	116	188
4	-	8	223	5	47	283
5	-	8	22	1	11	42
6	-	36	333	9	104	482
7	-	-	47	2	4	53
Total Nuts (Small Mammals Only)					108	



### 4. EVALUATION

4.1.1.1. The desk study identified nine granted EPS licences for dormouse and 14 biological records within 2km of the Order Limits. Field surveys undertaken in 2017, 2018 and 2019 did not record any evidence of hazel dormice within the Survey Area. It is concluded that hazel dormice are absent from the habitats within the Survey Area, although they are present in the wider area.



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# Appendix 1 – Figures











