



SUNNICA ENERGY FARM

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Volume 6

6.6 Offsetting Habitat Provision for Stone-Curlew Specification

APFP Regulation 5(2)(a)

Planning Act 2008

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



Planning Act 2008

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

Sunnica Energy Farm

6.6 Offsetting Habitat Provision for Stone-Curlew Specification

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1 Introduction

1.1 Overview

- 1.1.1 This specification document provides details of the offsetting measures for Stone-curlew.

1.2 The Scheme

- 1.2.1 Sunnica Energy Farm (the Scheme) is a new solar energy farm proposal that will deliver electricity to the national electricity transmission network. Sunnica Limited is proposing to install ground mounted solar photovoltaic (PV) panel arrays to generate electrical energy from the sun and combine these with a Battery Energy Storage System (BESS) which will connect to Burwell National Grid Substation in Cambridgeshire.
- 1.2.2 Electricity will be generated at Sunnica East Site A, near Isleham in Cambridgeshire; Sunnica East Site B, near Worlington and Freckenham in Suffolk; Sunnica West Site A near Chippenham and Kennett in Cambridgeshire. All locations will comprise ground mounted solar PV panel arrays, supporting electrical infrastructure and a BESS.
- 1.2.3 Supporting electrical infrastructure will include on-site substations on Sunnica East Site A and Sunnica East Site B and Sunnica West Site A, and on-site cabling between the different electrical elements across the Scheme. The generating equipment of the Scheme will be fenced and protected via security measures such as Closed Circuit Television. Inside the fenced areas, in addition to the generating equipment will be, internal access tracks, and drainage. It is not proposed for any area to be continuously lit.
- 1.2.4 Visual, ecological and archaeological mitigation is proposed which includes proposed grassland planting and new woodland; retention of existing woodland, wetlands and other vegetation; provision of replacement habitat; and offsetting areas, where there will be no development. The BESS will consist of a compound and battery array to allow for the importation, storage and exportation of energy to the National Grid. There will also be areas at Sunnica East Site A and Sunnica East Site B for office and storage facilities for use during the Scheme's operation.
- 1.2.5 The Scheme will be connected to the existing Burwell National Grid Substation, using 400 kilovolt (kV) cables buried underground. The cables will run between Sunnica East Site A, Sunnica East Site B and Sunnica West Site A (Grid Connection Route A), and then from Sunnica West Site A to the existing Burwell National Grid Substation (Grid Connection Route B). This will connect the Scheme to the existing Burwell National Grid Substation to allow distribution to the national transmission network.
- 1.2.6 The Scheme will have two main access points, one north of Elms Road at Sunnica East Site B and one south of La Hogue Road at Sunnica West Site A. The main access route to Sunnica West Site A will be via the Chippenham junction of the A11, to the north of junction 38 of the A14. Sunnica East Site B will be accessed via the A11 and B1085. A number of secondary access points are proposed to access the individual land parcels through construction, operation, and decommissioning phases.

- 1.2.7 The Scheme is defined as a Nationally Significant Infrastructure Project (NSIP) and will require a Development Consent Order (DCO) from the Secretary of State for Business, Energy and Industrial Strategy (Secretary of State), due to its generating capacity exceeding 50 megawatts (MW).
- 1.2.8 The need for the Scheme to include the offsetting habitat provision for Stone-curlews is secured in a requirement of the draft DCO, which provides that certain works that form part of the Scheme may not commence until the offsetting habitat provision has been provided, in accordance with an updated version of this specification to be approved by the local planning authorities, which must be substantially in accordance with this document. The requirement also states that the Applicant must maintain the offsetting habitat provision for Stone-curlews in accordance with the approved specification throughout the construction and operation of the Scheme and during the carrying out of decommissioning works.

2 Legislative Context

- 2.1.1 As part of the assessment of a development, it is necessary to consider whether the Scheme is likely to have a significant effect on areas that have been internationally designated for nature conservation purposes (i.e. European Sites). European sites are protected under the Conservation of Habitats and Species Regulations 2017 (as amended; relevant to England and Wales) (Ref 1). The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 (“the Withdrawal Act”). However, the most recent amendments to the Habitats Regulations – the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Ref 2) – make it clear that the need for Habitats Regulations Assessment (HRA) continues to apply. Whilst those 2019 Regulations make changes to the Habitats regime and terminology; much of the impact of those changes does not yet have a practical effect, particularly the introduction of the term ‘national site network’, given the short passage of time since the end of the transition period. As such, this document continues to use the term ‘European sites’ to refer to all Natura 2000 sites potentially affected by the Scheme.

3 Baseline

- 3.1.1 Information pertaining to Stone-curlew usage of the Order limits and a 500m buffer from the Order limits (collectively referred to as the ‘Study Area’) are detailed the Appendix 8I of the Environmental Statement [EN010106/APP/6.2]. This is summarised below and in Table 3-1. Field references are provided to aid interpretation and follow those shown on the Environmental Masterplan [REP3-022]. Details of the methodology used in the field surveys is also provided in Appendix 8I of the Environmental Statement [EN010106/APP/6.2], but is summarised below, along with further clarification of the area surveyed and arable habitats present within the Order limits and 500m buffer.

Survey Methodology

- 3.1.2 To determine the presence, or absence, of breeding and post-breeding Stone-curlew within the Order limits, all suitable habitats within the Order limits, were surveyed every two weeks between April and September 2019. Further to this, all suitable habitat (such as beet fields or short grassland), within 500m of the Order

limits and accessible or visible from public rights of way, was surveyed for breeding Stone-curlew. Additionally, nocturnal surveys (using taping methods, under a licence issued by Natural England), were also undertaken around the Order limits and within 500m. The Stone-curlew survey method was based on the RSPB Stone-curlew monitoring protocol. In summary, this involved a walkover, where access allowed, following pre-determined survey routes (see Figure 3 of Appendix 8I of the Environmental Statement [EN010106/APP/6.2]) and regular stopping points to locate Stone-curlew.

- 3.1.3 Early on in the surveys it became apparent that a small breeding population of Stone-curlew was present on the farmland in and immediately adjacent to the Order limits. Even though surveys quickly identified the locations of nesting Stone-curlew, any potentially suitable habitat was still subject to continued survey in 2019. No additional Stone-curlew nesting locations were identified in 2019, beyond those areas located early on during surveys. The findings of the extensive surveys undertaken in 2019, along with the surveyor's visual assessments of suitable nesting habitat within the wider 500m, provided the focus for the extent of surveys undertaken in 2020 and 2021, *i.e.*, predominantly within the Order limits and any adjacent areas that could be viewed from the Order limits. So, whilst the surveys in 2020 and 2021 focussed on the Order limits and fields surrounding the Order limits, *e.g.*, as evidenced by the presence of Pairs J and K in Table 3-1, the availability of the extent of suitable habitat identified in 2019 (Appendix A, Figure 1) (and shown in Appendix A, Figures 2 and 3 for 2020 and 2021, respectively), demonstrate that the population is centred around the Order limits and immediately surrounding fields, and that limited opportunities for nesting are available within the wider 500m buffer and beyond.
- 3.1.4 Figures 1, 2 and 3 in Appendix A show the crop types present in 2019, 2020 and 2021, respectively. These have been derived from information collected from the ornithological surveyors and interpretation of the data available from Defra's 'Crop Map of England (CROME)' dataset. Therefore, this should not be taken as a thorough survey of crop types (given, that crop types have been mapped by non-experts), however, it does provide a broad representation of the availability of potentially suitable crop types for nesting Stone-curlew. Within the 500m buffer larger arable fields are present to the north of E05, north and west of ECO1 and ECO2 and north of ECO3 (between Sunnica East Site A and Sunnica East Site B) and in most years these are dominated by cereal crops. Many of these large fields are viewable from the Order limits and Stone-curlew were noted in adjacent fields in 2021.
- 3.1.5 Further to this, in 2020 and 2021, extended visits later into the summer and additional nocturnal surveys using playback techniques to elicit a response were deemed unnecessary and likely to cause undue disturbance to a relatively small and isolated population, especially as the presence of the species had already been established. Surveys were also undertaken against the background of Covid restrictions and constraints posed by access as the Scheme evolved.
- 3.1.6 The number of pairs recorded during surveys between 2019 and 2021 (irrespective of any variation in survey effort and extent) is remarkably consistent and supports a conclusion that the Stone-curlew population relevant to the Scheme, *i.e.*, within the Order limits and 500m buffer where impacts may occur,

is up to 5 nesting pairs. It is also considered that the Stone-curlew population is centred around the Order limits, particularly ECO1, ECO2 and ECO3 and that much of the suitable arable farmland is present here and immediately adjacent the Order limits. As such, the surveys undertaken are considered to have accurately recorded the population present.

Stone-curlew Population

- 3.1.7 In 2019, up to three pairs or territories of Stone-curlew were recorded within the Order limits:
- a. [REDACTED]
 - b. [REDACTED]
- 3.1.8 Another pair (Pair D) were recorded outside of the Order limits, [REDACTED]
- 3.1.9 No other Stone-curlew territories were recorded within 500m of the Order limits in 2019.
- 3.1.10 In 2020, up to five pairs of Stone-curlew were recorded within the Order limits during the course of the surveys:
- a. [REDACTED]
 - b. [REDACTED]
- 3.1.11 No other Stone-curlew territories were recorded within 500m of the Order limits in 2020.
- 3.1.12 In 2021, up to three pairs of Stone-curlew were recorded within the Order limits:
- a. [REDACTED]
- 3.1.13 A further two pairs (Pairs J and K) were recorded within 500m of the Order limits in 2021.
- 3.1.14 It was concluded that in 2019 the breeding population of Stone-curlew present within the Order limits was between 2-3 pairs, with a further pair breeding within 500m of the Order limits. In 2020, the breeding population of Stone-curlew was between 1-4 pairs, with a further pair either non-breeding or breeding away from the Order limits, as described in Table 3-1 below. In 2021, the breeding population of Stone-curlew was 2-3 pairs, with a further two pairs within 500m of the Order limits.

Table 3-1: Stone-curlew Survey Information

Survey Year	Pair Reference	Location within the Order limits	Breeding Status	Nesting Site and/or breeding territory characteristics
2019	Pair A (1)			
2019	Pair B (2)			
2019	Pair C (3)			
2019	Pair D (4)			
2020	Pair E (1)			

Survey Year	Pair Reference	Location within the Order limits	Breeding Status	Nesting Site and/or breeding territory characteristics
2020	Pair F (2)			
2020	Pair G (3)			
2020	Pair H (4)			
2020	Pair I (5)			
2021	Pair J (1)			
2021	Pair K (2)			

Survey Year	Pair Reference	Location within the Order limits	Breeding Status	Nesting Site and/or breeding territory characteristics
2021	Pair L (3)			
2021	Pair M (4)			
2021	Pair N (5)			

- 3.1.15 Stone-curlew is a ground nesting bird which breeds on downland, heathland and arable farmland in the south and east of England. Within the Brecks area, the birds prefer areas of short, sparse vegetation on light, stony soils, ideally associated with dry, sandy, semi-natural 'breck' heaths, but this may also include fallow land or spring-sown crops on arable farmland. Within and around the Breckland SPA this has been achieved by the establishment of Stone-curlew plots, which are generally 2ha areas of cultivated land within arable crops, or in some cases within pastures, which are kept free of crops and other vegetation before the arrival of the Stone-curlew in March.
- 3.1.16 The population occurring in and around the Order limits use a combination of fallow, spring-sown crops, such as beet and onions, bare ground associated with poultry farming and fields margins. Where possible, the RSPB works with a number of landowners in and round the Order limits to create Stone-curlew plots. From AECOM's observations and discussions with the RSPB, this is usually a maximum of one plot annually. Stone-curlew is, therefore, reliant on the cropping regime in any given year and the availability of suitable areas of fallow and spring-sown crops to be able to nest. This is reflected in the observations of Stone-curlew occurrence and distribution noted in surveys undertaken by the Applicant in 2019, 2020 and 2021 and detailed in the Table 3-1.
- 3.1.17 In their response to the HRA screening opinion, Natural England stated that land to be used for offsetting impacts on Stone Curlew should not be:
- a. within 1.5km from any residential settlements, infrastructure or major roads;
 - b. within 500m of any buildings or smaller roads, *i.e.* access roads; and
 - c. within 400m of any Public Right of Way (PRoW), other permissive path or area used for recreation.
- 3.1.18 With reference to Table 3-1 and RSPB data, it is clear that Stone-curlew within the Order limits and surrounding area do not conform to the general guidance for territory occupancy and nesting sites. The areas embedded within the Scheme design for offsetting impacts on Stone-curlew utilise the species' current and historical distribution across the Order limits, irrespective of whether these meet the above criteria. Since this replicates the conditions the birds are already utilising (see Table 3-1), it is considered a suitably robust approach informed by empirical information on the nesting behaviour of the specific Stone-curlew pairs in question in this landscape.

4 Mitigation

- 4.1.1 Discussions with Natural England and RSPB have identified that the mitigation objective should be to ensure no net loss of breeding pairs in Breckland SPA by embedding sufficient areas within the Scheme design to offset the loss of potentially suitable arable farmland through erection of solar arrays. Since the arable farmland used by nesting Stone-curlew to be lost is outside the SPA boundary itself, the provision of replacement habitat does not class as 'compensation' in the sense of the Habitats Directive. In other words, the replacement Stone-curlew habitat does not constitute 'compensation' for adverse effects on the Stone-curlew population of Breckland SPA but is intended to avoid an adverse effect on the SPA population by ensuring that there is no decline in nesting and foraging opportunities for the overall Brecks population, which might otherwise result in increased competition for resources with the SPA birds. There

is precedent for this approach in the case of the A303 (Amesbury to Berwick Down) DCO1 in which replacement Stone-curlew plots were not deemed compensation for adverse effects on the integrity of Salisbury Plain SPA because they were to accommodate the linked broader Wessex population rather than to the SPA itself. The Scheme design has embedded sufficient land to offset any potential reduction in arable farmland, that may, in any given year, be used by Stone-curlew.

4.1.2 As the provision of offsetting habitat is based on the species' fluid distribution within a farming landscape, the figure of a minimum of 16ha per pair has been applied. This acknowledges the requirement for not only suitable nesting sites, but also the requirement for foraging habitat.

4.1.3 The offsetting provision embedded within the Scheme design consists of the following:

Nesting Plots

4.1.4 A maximum of ten 2ha plots will be created across Sunnica East Sites A and B, in fields where Stone-curlew have been recorded during surveys. To maximise the potential for take up two plots have been allocated per pair. Plots unoccupied for nesting will contribute an important resource for foraging pairs. Three are proposed in ECO1, three in ECO2, and four across ECO3. Details of plot creation and management in the Brecks are provided by the RSPB information Note 'Managing nest plots for stone-curlews' (Ref 19), with further requirements set out in the Countryside Stewardship Higher Tier 'AB4: Nesting plots for Stone-curlew' guidance note (Ref 20) and the work undertaken by Hawkes et al. (2021) (Ref 21). Plots will be a minimum of 100m apart. Various cultivation techniques will be used to create a rough tilth and/or areas of bare ground, depending on ground conditions and other environmental factors or constraints. The new plots will be provided in advance of the loss of any existing habitat. This will mean that the new plots will be to be available in the breeding season prior to construction commencing.

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010025/TR010025-001685-Highways%20England%20-%208.63%20Applicant%E2%80%99s%20Response%20to%20Rule%2017%20Letter.pdf>



Plate 4-1 Stone-curlew plot in a Brecks arable field (RSPB Information note – Managing nest plots for Stone-curlews)

Foraging habitat

- 4.1.5 Recent research has shown that the creation of bare ground provides an important foraging resource for breeding Stone-curlew, particularly if this is located near to the nesting site; most foraging by Stone-curlew occurs within 1km of the nest (Ref 22). As well as providing suitable nesting opportunities, the plots, delivered in advance of the loss of any existing habitat and located within areas shown by surveys to be used by Stone-curlew, will also deliver important foraging areas in close proximity to the nest site (approximately 100m).
- 4.1.6 As well as the bare ground plots, approximately 108ha of predominantly arable farmland have been embedded within the Scheme for reversion to grassland, specifically managed to create a close-cropped sward, suitable for Stone-curlew. Small areas of existing acid grassland have also been retained within the Scheme design in Sunnica East Site B and these will form the basis of reverting adjacent areas in Sunnica East Site B to semi-natural grassland, characteristic of the Breckland heaths. In time this will provide a high quality habitat, offering both nesting and foraging opportunities for Stone-curlew. The disturbed plots will be retained within these established grassland areas for the lifespan of the project and remain undeveloped. The areas containing these plots are shown on the Environmental Masterplans [REP3-022].
- 4.1.7 Within Sunnica East Site A the offsetting area will be sown with a chalk grassland mix and managed specifically for Stone-curlew, i.e. maintaining a close-cropped sward. The plots will be retained within these established grassland areas for the lifespan of the project.
- 4.1.8 There is a high degree of confidence that the Stone-curlew plots and foraging habitat will be utilised as it is to be provided in suitable areas regularly used by Stone-curlew, and the habitat, including nesting plots, is being designed and delivered following what has been successful with the other similar habitat and nesting plots around the Breckland area (Ref 19, Ref 21). The provision of this habitat will ensure no net loss of breeding territories within the Order limits.

Therefore, it is considered that the Scheme will result in no adverse effect on the integrity of the SPA through this pathway.

Establishment and Management of Plots and Grassland in ECO1

- 4.1.9 Tables 4-1 and 4-2 provide a summary of the nesting plot and grassland creation and management within ECO1. In total ECO1 amounts to 40.1 ha of land allocated for Stone-curlew (see Appendix A, Figure 4). This consists of 6 ha of disturbed and bare ground/short sward (i.e., nesting plots) and 34.1 ha of grassland (sward height <5cm).

Table 4-1: Summary of Nesting Plot Management in ECO1

Number of Nesting Plots	Management Objective	Creation Technique	Management Technique
3	Bare ground 2 ha plot with sward height not exceeding 2cm between March and September.	Retention of bare ground/short sward through annual removal of ruderal plants.	Non-selective herbicide spray in May. Retention of fallow through autumn and winter.

Table 4-2: Summary of Grassland Management in ECO1

Grassland Type ² and Size (ha)	Management Objective	Creation Technique	Management Technique
Other Neutral Grassland (with calcareous influence) (34.1ha)	Sward height <5cm	Arable reversion. Ploughed by landowner prior to handover, then lightly harrowed and sown with appropriate seed mix.	Years 0-5. Mown 2-4 times during growing season, with a single autumn cut (mowing to be determined by presence of Stone-curlew and other ground-nesting bird species). Targeted weeding where necessary. Years 5+. Low intensity grazing by sheep.

- 4.1.10 Within ECO 1 the Scheme would replicate ploughed field conditions within the plots to constitute 'bare-earth'. This would be managed through visual inspection and manual removal of aggressive weeds, to keep the plots bare on an annual basis.
- 4.1.11 To create the grassland outside the plots, the surface would receive a light harrowing followed by sowing of the seeds across the existing surface. It is anticipated that commercially available seed will be required and this will be sourced well ahead of construction. A typical seed mix appropriate for the freely draining lime-rich loamy soils present in ECO1 would be Emorgate's EM5 - Meadow Mixture for Loamy Soils. This would have a slightly calcareous influence and the overall outcome of grassland for Stone-curlew would be more reminiscent of conditions present in the species' south and south-west range in the UK, i.e., Wessex.

² Grassland types follow the classification used in the UK Habitats definitions.

4.1.12 The short-term management (0-5 years) would involve the following:

- a. Visual inspections during the growing season.
- b. Looking for establishment rates and whether certain species are at risk of out-competing the grassland.
- c. Grassland mown between two and four times at even intervals throughout the growing season to control the more competitive species and allow the newly sown less competitive species to establish.
- d. Grassland cut in autumn (once grassland has set seed) with cut grass left in situ for 24hrs.
- e. Cut vegetation will be removed from the grassland area (in combination with a litter pick).
- f. Targeted weeding (including no residual herbicide) if invasive species.

4.1.13 The long-term management (5+ years) will involve low intensity conservation grazing once the grassland has established. The sheep grazing programme will be established pre-construction with an element of flexibility built in to accommodate differential rates of establishment and, where necessary, complement mowing. An example of a grazing regime would be through low intensity pulse grazing using sheep with a stocking density of between 0.5-1 livestock units per hectare:

- a. January-February: Light grazing on any new growth
- b. Early March: Remove grazing to allow plants to grow and create good habitat for ground nesting birds
- c. September - end of December: Main grazing period with light grazing down to a short sward height.

4.1.14 Water troughs for animals will be provided in locations away from sensitive archaeological remains.

Establishment and Management of Plots and Grassland in ECO2

4.1.15 Tables 4-3 and 4-4 provide a summary of the nesting plot and grassland creation and management within ECO2. In total ECO2 amounts to 34.2 ha of land allocated for Stone-curlew (see Appendix A, Figure 5). This consists of 6 ha of disturbed and bare ground/short sward (i.e., nesting plots) and 28.2 ha of grassland (sward height <5cm).

Table 4-3: Summary of Nesting Plot Management in ECO2

Number of Nesting Plots	Management Objective	Creation Technique	Management Technique
3	Bare ground 2 ha plot with sward height not exceeding 2cm between March and September.	Annual mechanical rotovation prior to 15 th March.	Non-selective herbicide spray in May. Retention of fallow through autumn and winter.

Table 4-4: Summary of Grassland Management in ECO2

Existing Habitat Type and Size (ha)	Grassland Type and Size (ha)	Management Objective	Creation Technique	Management Technique
Arable (28.2ha)	Other Neutral Grassland (with calcareous influence) (28.2ha)	Sward height <5cm	Arable reversion. Ploughed by landowner prior to handover, then lightly harrowed and sown with appropriate seed mix.	Years 0-5. Mown 2-4 times during growing season, with a single autumn cut (mowing to be determined by presence of Stone-curlew and other ground-nesting bird species). Targeted weeding where necessary. Years 5+. Low intensity grazing by sheep.

- 4.1.16 Within ECO 2 the creation of plots will follow the details of plot creation and management provided by the RSPB information Note 'Managing nest plots for stone-curlews', with further requirements set out in the Countryside Stewardship Higher Tier 'AB4: Nesting plots for Stone-curlew' guidance note.
- 4.1.17 Various cultivation techniques can be used to create a rough tilth. The best results for Stone-curlew are achieved by using a spring tine cultivator, discs, cultivator with a press (not a pack roller or flexi-coil) or a plough with press. Where plot locations are already bare, cultivation may not be necessary, but weeds should be controlled with herbicide so that the plot remains bare until April.
- 4.1.18 The following cultivation programme would be required:
- By 15th March (prior to construction), prepare the whole 2ha plot by disking/light cultivation, ideally in February. This creates a rough bare fallow that provides suitable conditions for the first Stone-curlew nesting attempt.
 - During May, spray the whole plot using a non-selective herbicide ideally when the vegetation is no more than a few centimetres tall. This will create bare ground rather than a mat of dead vegetation. Spraying reduces the risk associated with intrusive management (such as through mowing) to a level that will not impact the population of Stone-curlew. The only danger from spraying, to Stone-curlew nests/chicks, is from tractor wheels. If the nest location is known it may be possible to reduce this risk by avoiding the area around the nest and/or by spraying only half of the plot.
 - Retain the fallow through the autumn/winter (at least until 30th September). Stone-curlew can nest late into the year so the fallow must be left until the end of September. If left through winter, it will provide a vital source of seeds for farmland birds.
- 4.1.19 To create the grassland outside the plots, the surface would receive a light harrowing followed by sowing of the seeds across the existing surface. It is anticipated that commercially available seed will be required and this will be sourced well ahead of construction. A typical seed mix appropriate for the freely draining lime-rich loamy soils present in ECO1 would be Emorgate's EM5 - Meadow Mixture for Loamy Soils. This would have a slightly calcareous influence

and the overall outcome of grassland for Stone-curlew would be more reminiscent of conditions present in the species' south and south-west range in the UK, i.e., Wessex.

- 4.1.20 The short-term management (0-5 years) would involve the following:
- a. Visual inspections during the growing season.
 - b. Looking for establishment rates and whether certain species are at risk of out-competing the grassland.
 - c. Grassland mown between two and four times at even intervals throughout the growing season to control the more competitive species and allow the newly sown less competitive species to establish.
 - d. Grassland cut in autumn (once grassland has set seed) with cut grass left in situ for 24hrs.
 - e. Cut vegetation will be removed from the grassland area (in combination with a litter pick).
 - f. Targeted weeding (including no residual herbicide) if invasive species.
- 4.1.21 The long-term management (5+ years) will involve low intensity conservation grazing once the grassland has established. The sheep grazing programme will be established pre-construction with an element of flexibility built in to accommodate differential rates of establishment and, where necessary, complement mowing. An example of a grazing regime would be through low intensity pulse grazing using sheep with a stocking density of between 0.5-1 livestock units per hectare:
- g. January-February: Light grazing on any new growth
 - h. Early March: Remove grazing to allow plants to grow and create good habitat for ground nesting birds
 - i. September - end of December: Main grazing period with light grazing down to a short sward height.
- 4.1.22 Water troughs for animals will be provided in locations away from sensitive archaeological remains.

Establishment and Management of Plots and Grassland in ECO3

- 4.1.23 Tables 4-5 and 4-6 provide a summary of the nesting plot and grassland creation and management within ECO3. In total ECO3 amounts to 51.4 ha. This consists of a core Stone-curlew area of 32.7 ha and additional area of 18.7 ha (see Appendix A, Figure 6), which encompasses existing unimproved acid grassland within Worlington Heath County Wildlife Site (CWS) and immediately to the south of the CWS and semi-improved acid grassland and arable farmland to the east of the CWS. Within the core Stone-curlew area there will be 8 ha of disturbed and bare ground/short sward (i.e., nesting plots) and 24.7 ha of grassland (sward height <5cm).

Table 4-5: Summary of Nesting Plot Management in ECO3

Number of Nesting Plots	Management Objective	Creation Technique	Management Technique
4	Bare ground 2 ha plot with sward height not exceeding 2cm between March and September.	Annual mechanical rotovation of 50% of plot (1 ha) prior to 15 th March.	Non-selective herbicide spray in May. Retention of fallow through autumn and winter.

Table 4-6: Summary of Grassland Management in ECO3

Existing Habitat Type and Size (ha)	Target Grassland Type ³ and Size (ha)	Management Objective	Creation Technique	Management Technique
Arable/Bare ground (Core Stone-curlew Area) (20ha)	Lowland dry acid grassland (20ha)	Maintain a sward height not exceeding 5cm.	Arable reversion. Skim off the existing ploughed topsoil to reduce phosphate. Lightly harrow and sow with a combination of appropriate commercial seed mix, locally harvested seed and green hay.	Years 0-5. Mown 2-4 times during growing season, with a single autumn cut (mowing to be determined by presence of Stone-curlew and other ground-nesting bird species). Targeted weeding where necessary. Years 5+. Low intensity grazing by sheep.
Other lowland dry acid grassland (Semi-improved grassland and semi-improved acid grassland) (Core Stone-curlew Area) (12.7ha)	Lowland dry acid grassland (12.7ha)	Maintain a sward height not exceeding 5cm.	N/A	Years 0-5. Mown 2-4 times during growing season, with a single autumn cut (mowing to be determined by presence of Stone-curlew and other ground-nesting bird species). Targeted weeding where necessary. Years 5+. Low intensity grazing by sheep.
Additional areas in ECO3 (non-core areas), including, Lowland dry acid grassland (Unimproved acid grassland) (18.7ha)	Lowland dry acid grassland	Worlington Heath CWS – as per CWS prescriptions in the OLEMP. Existing habitats as per prescriptions in OLEMP.	N/A	Refer to prescriptions in OLEMP.

³ Grassland types follow the classification used in the UK Habitats definitions.

- 4.1.24 Within ECO 3 the creation of plots will follow the details of plot creation and management provided by the RSPB information Note 'Managing nest plots for stone-curlews', with further requirements set out in the Countryside Stewardship Higher Tier 'AB4: Nesting plots for Stone-curlew' guidance note.
- 4.1.25 The plot locations will remain fixed, as Stone-curlew have been shown to re-use plots when made available in consecutive years.
- 4.1.26 Various cultivation techniques can be used to create a rough tilth. The best results for Stone-curlew are achieved by using a spring tine cultivator, discs, cultivator with a press (not a pack roller or flexi-coil) or a plough with press. Where plot locations are already bare, cultivation may not be necessary, but weeds should be controlled with herbicide so that the plot remains bare until April.
- 4.1.27 The following cultivation programme will be used:
- a. By 15th March (prior to construction), prepare the whole 2ha plot by discing/light cultivation, ideally in February. This creates a rough bare fallow that provides suitable conditions for the first Stone-curlew nesting attempt.
 - b. During May, spray one half (1 ha) of the plot using a non-selective herbicide ideally when the vegetation is no more than a few centimetres tall. This will create bare ground rather than a mat of dead vegetation. Spraying reduces the risk associated with intrusive management (such as through mowing) to a level that will not impact the population of Stone-curlew. The only danger from spraying, to Stone-curlew nests/chicks, is from tractor wheels. By only spraying half the plot this risk is further reduced, providing cover for chicks, as well as allowing important flora, e.g., arable plants to grow.
 - c. Retain the fallow through the autumn/winter (at least until 30th September). Stone-curlew can nest late into the year so the fallow must be left until the end of September. If left through winter, it will provide a vital source of seeds for farmland birds.
- 4.1.28 Where arable farmland is to be reverted to semi-natural grasslands, this will be achieved by skimming off the existing ploughed topsoil which effectively reduces phosphate availability. The soil will be subject to light harrowing to prepare for the sowing of the seeds. Whilst, natural regeneration and colonisation of the existing seedbank may be desirable, this may take many years to establish. To achieve quicker ground coverage and establishment of the desired grassland, seeding is likely to be the most appropriate approach. Seed will come from three main sources:
- a. commercially available seed sources, identified well ahead of construction;
 - b. seed harvested from either external sites in East Anglia, for some species preferably from Breckland and, or the Breckland edge, but also incorporating seed harvested from existing grasslands in ECO3; and
 - c. green hay, again, either from external sites in East Anglia, for some species preferably from Breckland and, or the Breckland edge, but also incorporating arisings from existing grasslands in ECO3.
- 4.1.29 The short-term management (0-5 years) would involve the following:

- d. Visual inspections during the growing season.
 - e. Looking for establishment rates and whether certain species are at risk of out-competing the grassland.
 - f. Grassland mown between two and four times at even intervals throughout the growing season to control the more competitive species and allow the newly sown less competitive species to establish.
 - g. Grassland cut in autumn (once grassland has set seed) with cut grass left in situ for 24hrs.
 - h. Cut vegetation will be removed from the grassland area (in combination with a litter pick).
 - i. Targeted weeding (including no residual herbicide) if invasive species.
- 4.1.30 The long-term management (5+ years) will involve low intensity conservation grazing once the grassland has established. The sheep grazing programme will be established pre-construction with an element of flexibility built in to accommodate differential rates of establishment and, where necessary, complement mowing. An example of a grazing regime would be through low intensity pulse grazing using sheep with a stocking density of between 0.5-1 livestock units per hectare:
- j. January-February: Light grazing on any new growth
 - k. Early March: Remove grazing to allow plants to grow and create good habitat for ground nesting birds
 - l. September - end of December: Main grazing period with light grazing down to a short sward height.

Anti-predator Fencing

- 4.1.31 To further enhance the potential for breeding success of Stone-curlew within ECO1, ECO2 and ECO3 (core Stone-curlew area) anti-predator fencing will be placed annually around the perimeter of the three areas during the breeding season. This will be removed once the breeding season has finished.
- 4.1.32 This will be compatible with Countryside Stewardship Higher Tier FG7 and will be in place between March and August, with installation occurring in February, prior to Stone-curlew returning to site and will be uninstalled in September (or later depending on final fledging) following completion of nesting.
- 4.1.33 The fence specification (which will be confirmed in the updated specification submitted for approval to the LPAs) will need to:
- a. Be buried about 25 cm deep into the ground
 - b. Extend at least 1 m above ground
 - c. Have electric wires set at around 65cm, 1155cm, 130cm and 150cm above ground level, offset 5cm to 10cm out from the post.

Managing Disturbance

- 4.1.34 The creation of a circular route around E05 will focus recreational use of the Scheme away from areas used by nesting Stone-curlew. In addition, anti-predator fencing will prevent ingress onto ECO1, ECO2 and ECO3 (core Stone-curlew area) by people or dogs.
- 4.1.35 The re-enforcement of boundary hedgerow planting in the south-east corner of ECO2 will reduce visibility of users of the public right of way. Equally, planting along U6006 will help reduce visibility of users on this public right of way. These features are shown on the Environmental Masterplan and secured in the OLEMP. It should be noted that Stone-curlew have been recorded nesting within ECO1, ECO2 and ECO3 (core Stone-curlew area), even with the existing presence of these rights of way. By encouraging recreational use around E05, there is no reason to suggest that there will be increased usage of other public rights of way. Further information relating to visitor management and recreational use will be submitted at Deadline 6, with further information added to the Environmental Masterplans and secured through the OLEMP.

Monitoring

- 4.1.36 The objective of the Stone-curlew offsetting areas is to ensure that there is no net loss in breeding population by ensuring there is no reduction in nesting opportunities for the Stone-curlew population. The success of this will be measured as follows:
- 4.1.37 An average of 50% of the Stone-curlew plots to be in use in the first 5 years post construction and then in the 5 year periods following, until decommissioning.
- 4.1.38 The following monitoring will be undertaken during construction and operation to establish the baseline populations of Stone-curlew present within the Order limits and 500m buffer. This population will also be consisted in the context of the wider Breckland population and the species national trend.
- 4.1.39 Construction related monitoring is detailed and secured in the Framework CEMP. This will consist of pre-commencement surveys being undertaken in advance of works commencing, and will cover the Order limits and 500m buffer. The survey methods will follow those recommended by the RSPB. Construction will be phased so that areas within 500m of the new habitat provisions are developed outside the Stone-curlew breeding season of March to October and that the replacement nesting plot provisions are ready for use by Stone-curlew by the breeding season at the start of construction. Monitoring during construction will be undertaken of the Stone Curlew offsetting areas, including the condition of these habitats, in the context of providing optimal nesting and foraging habitat. The monitoring will additionally include those areas within 500m of construction where there is suitable nesting habitat during the breeding season.
- 4.1.40 Operational monitoring is detailed and secured in the Framework OEMP. The use of the Stone-curlew offsetting areas will be monitored annually for the lifetime of the Scheme, along with the population present within 500m of the Scheme. Monitoring will include both the occupancy of the offsetting habitats by Stone-curlew and the condition of these habitats, in the context of providing optimal nesting and foraging habitat. Annual monitoring reports will be submitted for review and consultation with the Ecology Advisory Group, to allow any remedial

actions to be identified and agreed. Any remedial actions agreed with the Ecology Advisory Group will be implemented as a commitment by the Scheme.

5 References

- Ref 1 Anon. 2018. Conservation of Habitats and Species Regulations 2017 (as amended). HMSO, London.
- Ref 2 HMSO (2019) The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. HMSO, London
- Ref 3 National Planning Policy Framework. Department for Communities and Local Government.
- Ref 4 European Commission (2001): Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive.
- Ref 5 Ministry of Housing, Communities & Local Government (2019).
- Ref 6 The Planning Inspectorate (2017). Habitats Regulations Assessment.
- Ref 7 Holohan ruling (C-461/17)
- Ref 8 People Over Wind and Sweetman v Coillte Teoranta (C-323/17)
- Ref 9 European Court of Justice in the 'Coöperatie Mobilisatie for the Environment and Vereniging Leefmilieu (Dutch Nitrogen)' ruling.
- Ref 10 Environment Agency (2016). Air emissions risk assessment for your environmental permit.
- Ref 11 Department for Business, Energy and Industrial Strategy (2021) Guidelines on the assessment of transboundary impacts of energy developments on Natura 2000 sites outside the UK
- Ref 12 Environment Agency Ecology Data Explorer
- Ref 13 Wolseley, P. A.; James, P. W.; Theobald, M. R.; Sutton, M. A. (2006). Detecting changes in epiphytic lichen communities at sites affected by atmospheric ammonia from agricultural sources. *Lichenologist* 38: 161-176
- Ref 14 Dijk, N. (2011) Dry deposition of ammonia gas drives species change faster than wet deposition of ammonium ions: evidence from a long-term field manipulation. *Global Change Biology* 17: 3589-3607
- Ref 15 UK Centre for Ecology and Hydrology (CEH) (2016c). Sulphur Dioxide.
- Ref 16 IAQM (2014). Guidance on the assessment of dust from demolition and construction. Institute of Air Quality Management.
- Ref 17 Department for Transport (DfT) (2016). Standards for Highways online resources.
- Ref 18 Guderian, R. (1986). Terrestrial ecosystems: particulate deposition. In: *Air Pollutants and Their Effects on the Terrestrial Ecosystem* (Legge AH, Krupa SV,

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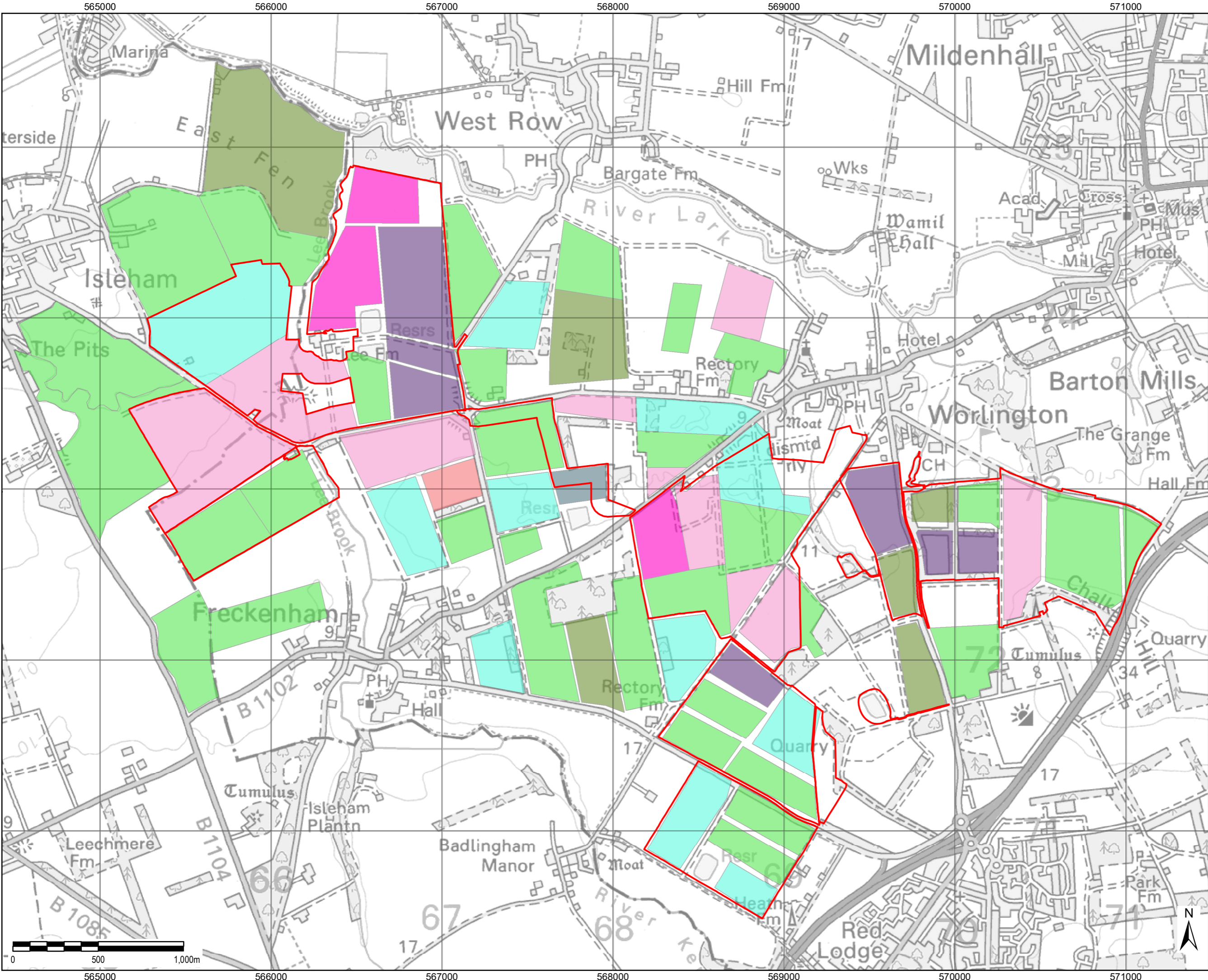
- Ref 19 RSPB information Note. 'Managing nest plots for stone-curlews', Version 2 – Eastern England
- Ref 20 Natural England (2018) Countryside Stewardship grants Higher Tier 'AB4: Nesting plots for Stone-curlew' guidance note.
- Ref 21 Hawkes, R.W., Smart, J., Brown, A., Green, R.E., Jones, H. & Dolman, P.M. (2021) Effects of experimental land management on habitat use by Eurasian Stone-curlews. Animal Conservation – open access article.
- Ref 22 Taylor, E.C., Green, R.E., Perrins, J., 2007. Stone-curlews *Burhinus oediacnemus* and recreational disturbance: developing a management tool for access. RSPB. Ibis (2007), 149 (Suppl. 1), 37–44.

Appendix A

Figure 1: Cropping Regime in 2019

Figure 2: Cropping Regime in 2020

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LEGEND

Site Boundary

Habitat within Field Boundary

- Beet
- Carrot
- Cereal
- Fallow
- Maize
- Onion
- Pigs
- Pot

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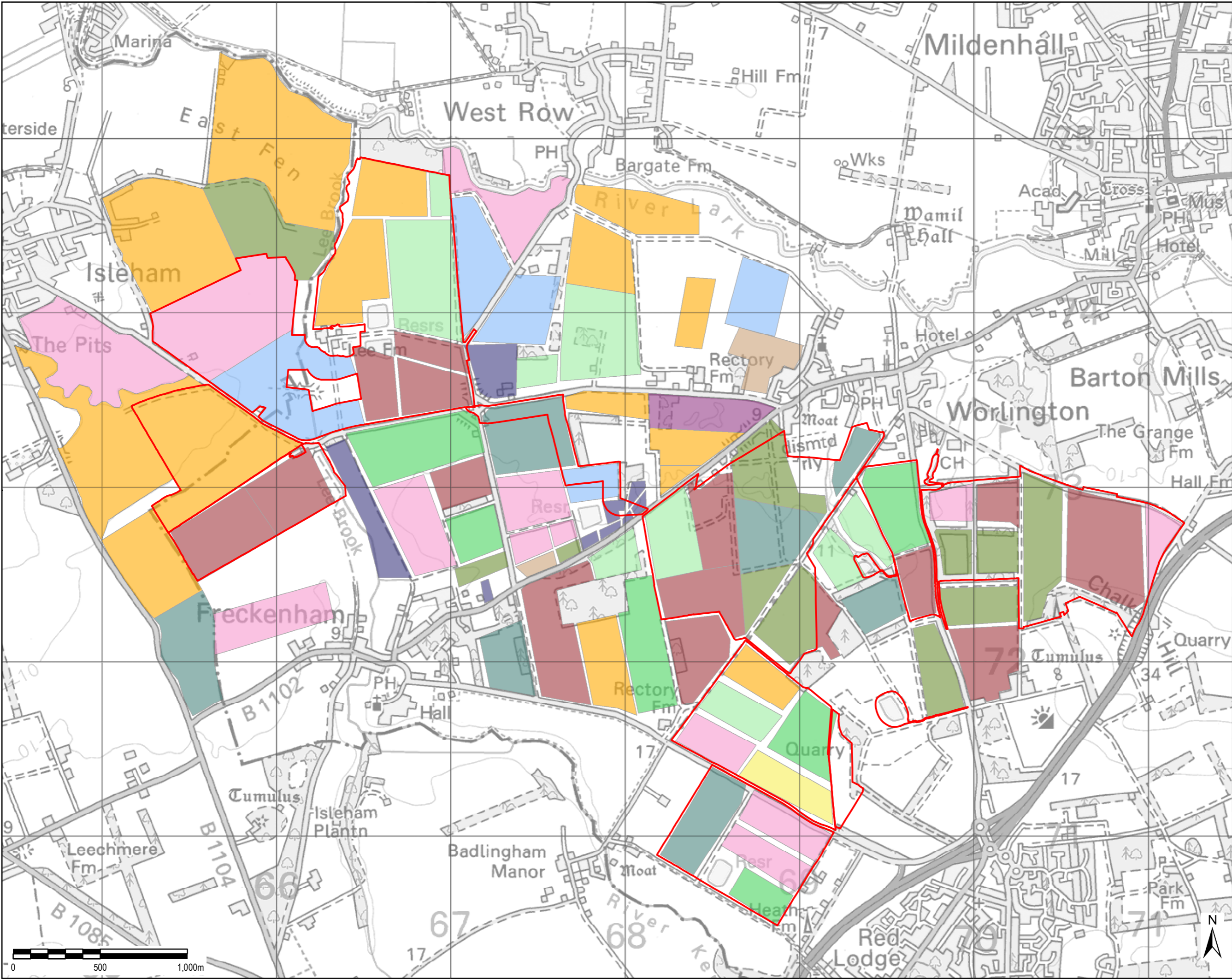
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Figure 3: Cropping Regime in 2021

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LEGEND

Site Boundary

Habitat within Field Boundary

- Beet
- Fallow Land
- Grass
- Maize
- Potato
- Spring Barley
- Spring Field beans
- Spring Peas
- Winter Barley
- Winter Field bean
- Winter Rye
- Winter Wheat

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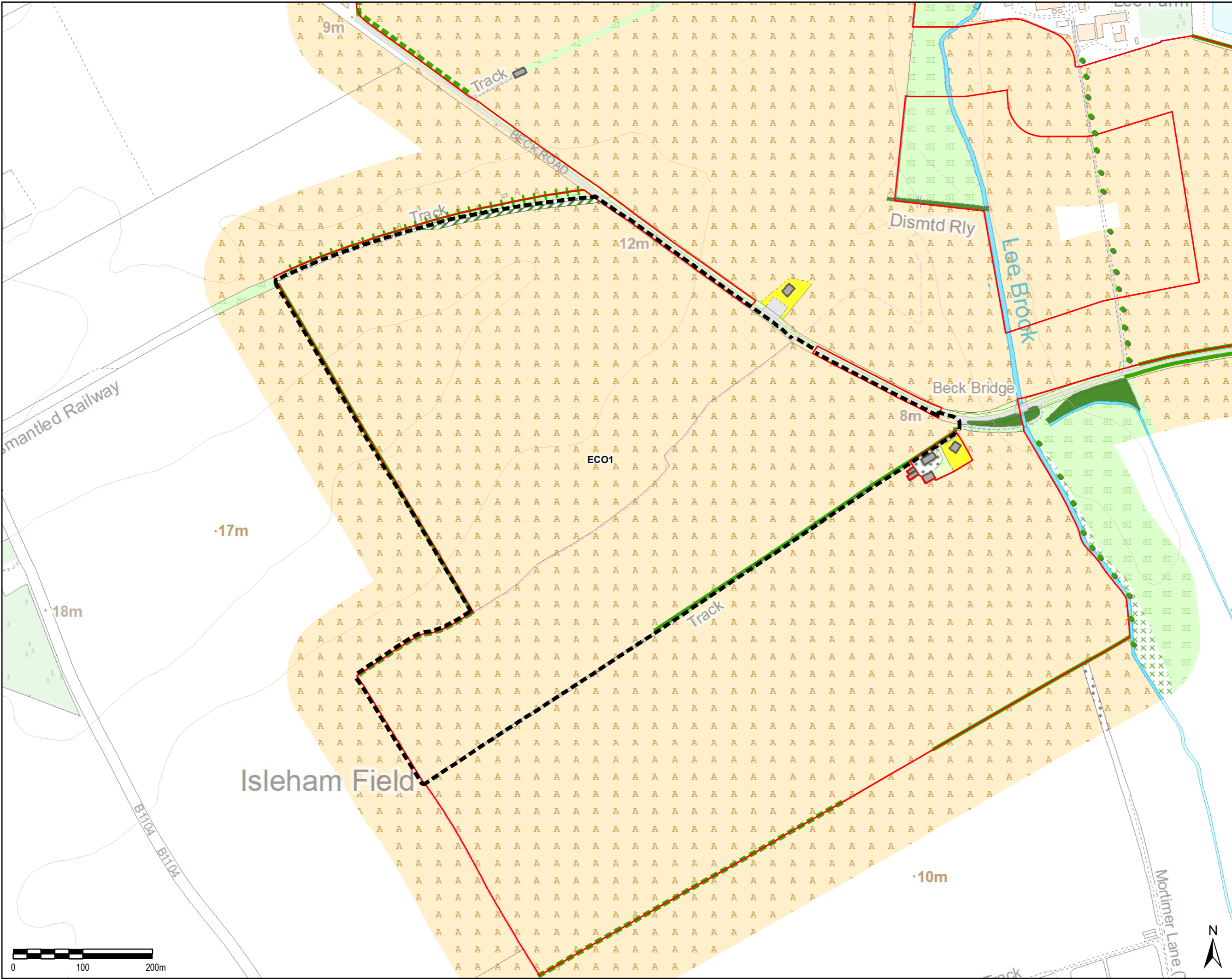
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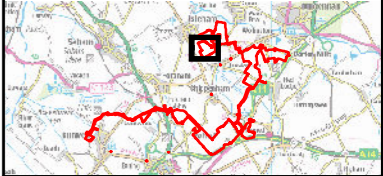
Figures 4-6: Location of ECO1, ECO2 and ECO3

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- LEGEND**
- The Order Limits
 - Stone-Curlew Area
 - Broad leaved semi-natural woodland
 - Broad leaved plantation woodland
 - Coniferous plantation woodland
 - Scattered scrub
 - Improved grassland
 - Poor semi improved grassland
 - Running water
 - Arable
 - Bare ground
 - Private/Garden
 - Building
 - Hard surface
 - Intact hedge
 - Defunct hedge
 - Hedge and trees
 - Tree



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**STONE CURLEW
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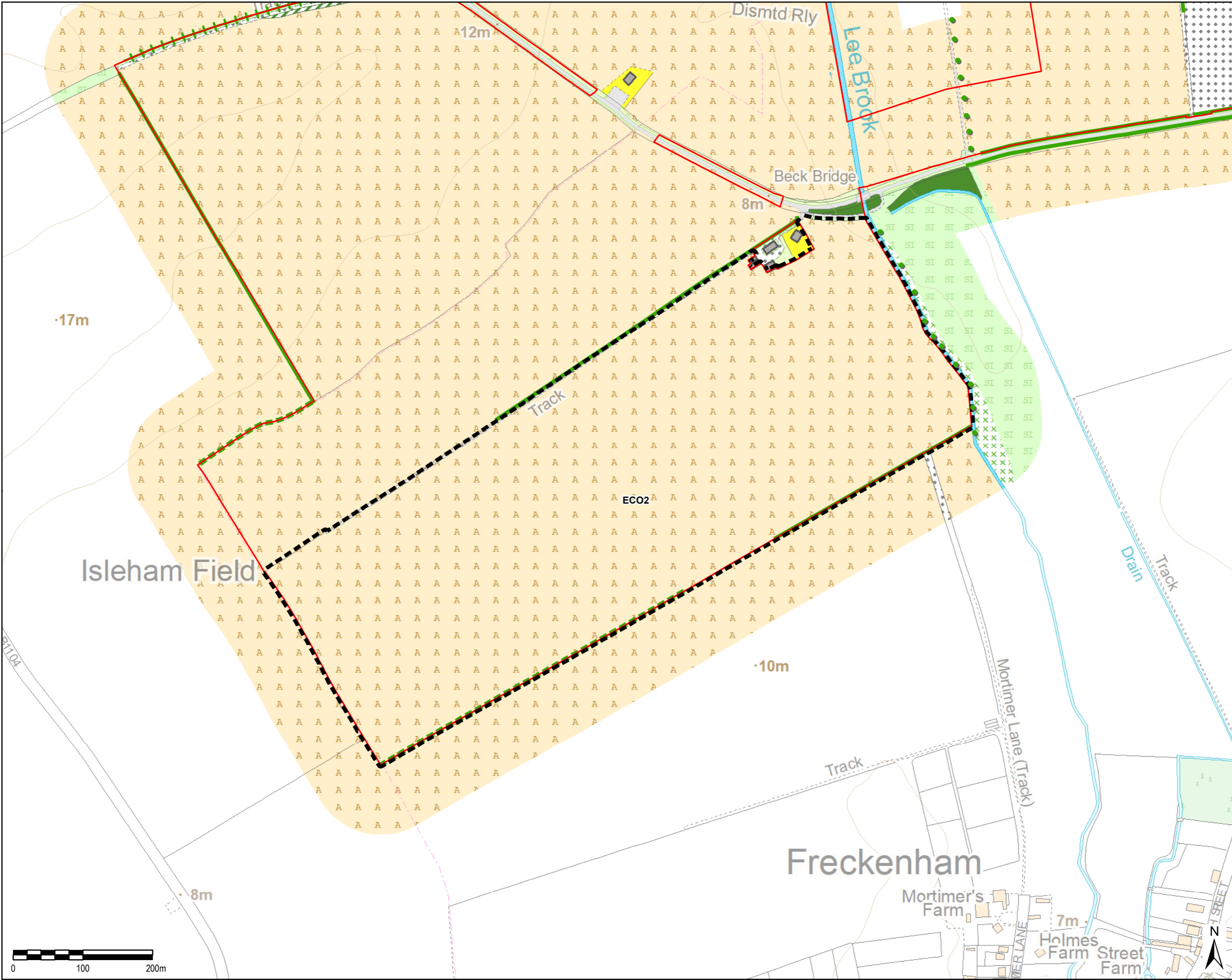
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LEGEND

- The Order Limits
- Stone-Curlew Area
- Broad leaved semi-natural woodland
- Broad leaved plantation woodland
- Coniferous plantation woodland
- Scattered scrub
- Improved grassland
- Poor semi improved grassland
- Running water
- Arable
- Bare ground
- Private/Garden
- Building
- Hard surface
- Intact hedge
- Defunct hedge
- Hedge and trees
- Tree

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**STONE CURLEW
EXISTING HABITAT (ECO2)**

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