

Nature Network Priorities in relation to Sunnica Solar Farm

For Sunnica Local Impact Report

Prepared by

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**Wildlife Trust for
Beds, Cambs
& Northants**

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1. INTRODUCTION

1.1 Background

The Environment Act introduces a requirement for the preparation and implementation of Local Nature Recovery Strategies. Locally, Natural Cambridgeshire¹ has set out a vision to double nature:

“Our Vision is that by doubling the area of rich wildlife habitats and natural greenspace, Cambridgeshire and Peterborough will become a world-class environment where nature and people thrive, and businesses prosper.”

Natural Cambridgeshire has identified six priority landscapes across Cambridgeshire & Peterborough where action for nature can have the most immediate benefit. One of these is the “Connected Fens”, which includes Chippenham Fen, along with the other internationally important nature conservation sites in the Cambridgeshire Fens. In preparation for the forthcoming Local Nature Recovery Strategy, the Wildlife Trust has been undertaking further work to identify and assess priority areas where nature recovery would have the most benefit in a number of locations including East Cambridgeshire.

Within East Cambridgeshire we have identified nine such priority areas, including two which are directly impacted by the Sunnica Solar Farm proposals. These are the Chippenham Fen & River Snail Priority Area and the Breckland Edge Priority Area. The value and importance of these areas is described in section 3 below in more detail, showing the critical components of a nature network in each area according to the ¹Lawton principles of More, Bigger, Better, and More Joined Up.

1.2 Methods

The Wildlife Trust has identified **Priority Areas** for large-scale, strategic biodiversity and landscape enhancement based on a mixture of desk study, using available natural environment datasets, and field work to assess and refine the boundaries.

During fieldwork, detailed analysis of the priority landscape areas was undertaken, including targeted site surveys to update habitat information where this was out of date (most of the phase 1 habitat data dates from the 1990s). These site visits helped us gain a better understanding of local opportunities and constraints that may not be evident from desk-based studies. Analysis of the updated habitat information was used to refine the boundaries of the **Priority Areas** and to identify core habitat and buffer areas, and key linkages and stepping-stones within the study area, in line with the Lawton principles. Connections to the wider Nature Recovery Network across Cambridgeshire and beyond were also considered.

The identification of robust ecological networks can be undertaken using a variety of methods, see ²Natural England Research Report NERR081 *Nature Networks Evidence Handbook* (2020). Many of these methods are modelling approaches that rely on large amounts of habitat and other spatial data and require significant inputs of time and money to produce robust outputs.

For the short timescale and level of detail required for our study we therefore decided to use a simpler approach based on use of up-to-date high-quality information on habitats, soils, and discussion with landowners regarding better and poorer quality agricultural land. **This in effect is a more local and refined version of the approach Natural England have taken to their National Habitat Network Framework and Maps and their Habitat Potential data layers.** By incorporating a component of site visits and habitat mapping within the Priority Areas, this simplified approach will produce at least as good results as any ecological modelling result for a similar level of effort.

¹ Natural Cambridgeshire is the Local Nature Partnership covering Cambridgeshire and Peterborough. See <https://naturalcambridgeshire.org.uk/>

2. PRIORITY AREA NATURE NETWORK COMPONENTS

2.1 Nature Network Rules of Thumb

There are different approaches that can be adopted to develop a nature network, based on local conditions. However, there are some broad principles that influence the design of functional and robust ecological networks (²Natural England Research Report NERR081). The following represents a hierarchical approach based on the ¹Lawton principles (Lawton et al, 2010), listing the most important elements in order. The key elements are then each considered in turn.

Better site quality > Bigger sites > More sites > Stepping stones & permeable matrix (nature friendly farming) > Corridors

Better site quality: Maintaining the quality of core sites within a network is the starting point, as these will represent the best quality areas of habitat supporting the largest range and number of key species. To achieve the best site quality, there needs to be sufficiently large habitat patches to allow for a complex mosaic of different habitats and micro-habitats, along with dynamic processes to allow the fullest range of species to flourish.

Core sites with long-term continuity of habitats, whether ancient woodland, or long-standing grassland and wetland habitats need to have strong protection as they will support more species and have more complete and carbon-rich soil structures than more recent examples of these habitats.

These core habitat patches should be buffered from adverse adjacent land uses by at least 50m, and ideally 100m of less intensive land uses. In some cases, e.g. where predation from urban cats would affect important species, a larger distance of up to 500m may be required.

The final critical element to achieving better quality core habitat patches is to ensure suitable management that allows key ecological processes such as grazing or natural regeneration to occur. Where this is not possible, for example on small sites, management interventions can attempt to replicate these processes, but this tends to be more costly with less natural results.

Bigger sites: Bigger sites with significant buffer zones have reduced edge effects, and provide larger core habitat patches that can support wider ranging species. They are also likely to have more habitat variation and better support those species with specialist habitat requirements. In the context of climate change, bigger sites are likely to provide more micro-climates and therefore be more resilient than smaller sites.

The aim should be to have core habitat patches of at least 100 Ha with a minimum habitat patch size of 40 Ha. If there are choices to be made, when expanding the size of sites, it will usually be better to choose the smallest core site to increase first (for example increase a site of 30 Ha to 40 Ha before increasing a site of 70 Ha to 100 Ha).

In the context of recreational pressure, bigger sites are usually able to cope with larger numbers of people because of the greater scope to provide areas with no / low disturbance to act as refuges for sensitive species.

More sites: When selecting locations for creating new sites, it will often be better to choose areas with greater variation of topography and aspect. Larger sites are better than smaller sites, but if the former is not possible, larger numbers of smaller sites can work so long as they are well connected to the core sites and each other.

Stepping stones & permeable matrix: Across a defined habitat network the aim should be for there to be at least 30% semi-natural habitat. For specialist species, habitat patches should be less than 200m apart, but for more generalist species less than 1 Km apart is acceptable.

Landscape-scale habitat mosaics help improve the stability of populations and may be important for wide-ranging species. In agricultural landscapes a more heterogeneous landscape can help counter the impacts of intensive farming practices. A landscape with a good variety of different types of habitats can often support a greater variety of species than would be predicted by just considering the number and type of habitats present (i.e. a Nature Network as a whole is potentially more valuable than each individual Priority Area).

Nature-friendly farming, with a variety of farm habitat features and some high quality habitat stepping stones will support a habitat network by providing a more permeable matrix through which some species can move. Work at RSPB Hope Farm and the work of the Nature Friendly Farming Network (Georgina Bray & Martin Lines, *pers. comm.*) has shown that giving 10% of farms over to wildlife features is the level required to allow nature to recover. This is also achievable through using the least productive / unproductive parts of fields along with retaining existing farm wildlife features. This approach increases the area of breeding, foraging or sheltering habitats for some species. It is also likely that different landowners will take different approaches based on their own interests, so will increase the variety of the landscape in between habitat patches, and support a wider diversity of species.

Habitat corridors: For most habitat specialist species, corridors are of little value unless they are a minimum 100m wide, due to edge effects reducing the habitat quality along a linear corridor. Natural corridors, such as rivers function better than man-made corridors. Most species will “see” corridors differently to humans. For example, hedgerow corridors are a landscape feature that are of little value to wildlife unless they are dense and tall (i.e. they act as good scrub edge habitat) and they form part of a permeable landscape or part of a woodland habitat network.

Extent of nature-rich habitats: As well as the individual site size, the other critical aspect for the development of a coherent and functioning ecological network is the extent of nature-rich habitats. A minimum land cover of 30% is ideally required to allow species to thrive and respond to naturally fluctuating conditions across a landscape. While in some instances a lower % cover might suffice, this will inevitably require a significantly larger proportion of wildlife-friendly farmland habitats or extensive nature-friendly farming practices.

The following section considers each of the Priority Areas in terms of these principles and identifies the components of the habitat network and opportunities for enhancing it. The opportunities identified have been discussed with key stakeholders, but detailed discussions have not taken place with most landowners. This would be a valuable subsequent task once work to prepare a Local Nature Recovery Strategy commences. Land use and land management opportunities will evolve over time, so the Nature Recovery Network priorities shown should be seen as identifying the best opportunities and indicative of what could be achieved.

2.2 Chippenham Fen & River Snail Priority Area

2.2.1 Summary

The historic remnant fenland site of Chippenham Fen SSSI forms the main focus of this area. The Chippenham Fen sub-area comprises the historic fen, area of peat soils adjacent to it, the surrounding farmland and the River Snail chalk stream, which connects the River Snail to Snailwell Meadows SSSI and Fordham Woods (Brackland Rough SSSI). This area is relatively well defined geographically. The conservation priorities are provision of wetland mosaics, lowland fen and grassland habitats to buffer, extend and connect the core sites. Restoration of the River Snail could entail a range of in-channel habitat enhancements for this chalk stream priority habitat as well as ensuring natural flows from the chalk springs.

South of Chippenham Fen, the area includes part of Chippenham Park and the farmland which forms the catchment of Chippenham Fen. The farmland includes a mixture of free draining chalky soils and wetter soils typical of the Fen edge. Conservation priorities for the farmed areas include the provision of grassland habitats of various types and small wetland areas which could also be created around the ditch networks.

To the south and east, this area adjoins the Breckland Edge Priority Area, which has sandier soils overlying the Cretaceous Chalk; the boundary between the two areas is predominantly based on this difference in soil type.

2.2.2 Key Facts

Total area: 949 Ha

Area of core habitats: 294.71 Ha (31.05% of total area)

Core sites: Chippenham Fen SSSI / SAC, Brackland Rough (Fordham Woods) SSSI, Snailwell Meadows SSSI, Snailwell Grasslands & Woods CWS, Chippenham Park CWS, and Old Rectory Meadows CWS.

Important habitats: Lowland fen, wet woodland, lowland meadow, chalk stream.

Important species:

Fauna: Fen invertebrates, including many nationally scarce and rare species, particularly flies, but also moth and spider species. Breeding woodcock & snipe and a range of scrub nesting birds such as warblers (Chippenham Fen).

Flora: Cambridge milk-parsley, black bog rush, bogbean, bog pimpernel, saw-wort, and marsh helleborine, southern marsh and fragrant orchids.

2.2.3 Network Approach:

Better Management

Chippenham Fen has formed within a topographical depression on the Cretaceous West Melbury Marly Chalk which is fed from a series of chalk spring arising from the base of the overlying Totternhoe Stone and Zig Zag Chalk. This allows calcareous fen conditions to be created with frequent ditches, pools and wet depressions making this a highly diverse wetland. The lack of drainage has allowed peat soils to develop on the site which vary from centimetres to 2m thick.

The top priority in this area is maintaining the quality of Chippenham Fen, which is nationally and internationally important. This relies of management to maintain open fen areas and prevent succession to woodland, and maintenance of sufficient quantities of clear calcareous water.

Similarly, Snailwell Meadows SSSI are spring-fed from the underlying Cretaceous chalk though the soils comprise patchy sand and gravel deposits from the former river bed, creating a variety of soil conditions. Some areas are dry calcareous pasture, and others are wet neutral and marshy acidic grassland. Like Chippenham Fen they rely on management to maintain open grassland and fen areas and sufficient

supplies of clean water. The adjacent Snailwell Grasslands & Woodlands CWS forms an extension and complementary habitats to Snailwell Meadows.

Brackland Rough SSSI known locally as Fordham Woods is a wet woodland with alder and willows lying adjacent to the River Snail. The River Snail is a chalk stream emanating from the springs at Chippenham Park and Snailwell Meadows. However, for much of its length it flows within a modified (over-deepened and straightened) channel created to drain the adjacent farmland. It eventually joins the Soham Lode.

Maintaining sufficient water requires action to limit water abstraction and ensure the natural spring flows. Ensuring the sites are fed by clean water is best achieved by moving to more extensive farming methods within the catchment, or through the creation of buffering habitats. This has been partially done to the south of Chippenham Fen, where former arable land has been reverted to grassland and is currently grazed extensively by cattle.

The fen and grassland areas of Chippenham Fen and Snailwell Meadows are kept open through grazing, with a mixture of cattle, sheep and at Chippenham Fen, water buffalo. Chippenham Park also supports cattle grazing, with some former arable areas also reverted back to grassland within the Park. Continuation of grazing is critical for achieving favourable ecological condition at these sites.

Buffering & Extending Core Areas

The nature network priorities in this area are the buffering and extending of the four core nature sites to create a larger contiguous area of high quality habitats. The current core areas cover approximately 365 Ha and there is potential to create a single, large, connected core habitat area of over 550 Ha.

This has already been done to the south of Chippenham Fen, where a 38 Ha grassland buffer / extension to the SSSI has been created and added to the original SSSI.

Many of the new habitats would be grasslands, though in wetter areas or where there are remnant peat soils, there may be potential to create wetland mosaics. Areas of scrub and woodland would complement the open habitats. The larger area of extensive grazing could help support more sustainable grazing regimes, to bring about better ecological condition of the core sites. It could also support the creation of high quality open grassland and fen habitats in the extensions to the core areas.

Stepping Stones

The creation of a single large core area by buffering and extending Chippenham Fen, Brackland Rough and Snailwell Meadows SSSIs means there is no need to create stepping stone habitats within the Priority Area.

Nature Friendly Farming

Beyond an expanded core area, nature-friendly farming would provide complementary habitats for farmland birds, as well as help support improved water quality in the catchment. Nature-friendly farming will also play a role on land within the proposed extensions to the core areas, in the intervening period ahead of habitat creation. Measures to buffer water courses and drains, as well as provision of field edge habitats such as hedgerows and a variety of field margins for pollinators and farmland birds would be the priorities.

2.2.4 Objectives:

Short-term

- To enhance the buffer habitats around Chippenham Fen to create a mosaic of species-rich grassland and other habitats complementary to the historic fen.
- To restore species-rich grasslands to parts of Chippenham Park and Snailwell Grasslands & Woodlands CWS.
- To create a wider buffer of non-cropped land along the full length of the River Snail.

Long-term

- To create a single, large (over 500 Ha) core habitat area, connecting Chippenham Fen, Snailwell Meadows and Brackland Rough SSSIs. The area will comprise a mosaic of species-rich habitats including wildflower meadows, wetland mosaics, scrub and woodland.
- To restore a more natural channel and flow to the River Snail, particularly between Snailwell and Fordham, but also potentially downstream of Fordham.
- To adopt nature-friendly farming across the majority of the area.

2.2.5 Priority Area Vision:

A single, large, core habitat area incorporating Chippenham Fen, Snailwell Meadows and Brackland Rough SSSIs, and other adjacent sites will be created with a mosaic of species-rich habitats including priority lowland fen and grassland habitats, wetland mosaics, scrub and woodland. The chalk springs will flow naturally feeding the Chippenham Fen and Snailwell Meadows with clean water. Likewise, the River Snail will support natural flows and will be restored along at least part of its length. The whole catchment of Chippenham Fen will be farmed in a nature-friendly way further increasing the extent of breeding, foraging and sheltering habitats and supporting increased populations for invertebrates and farmland birds.

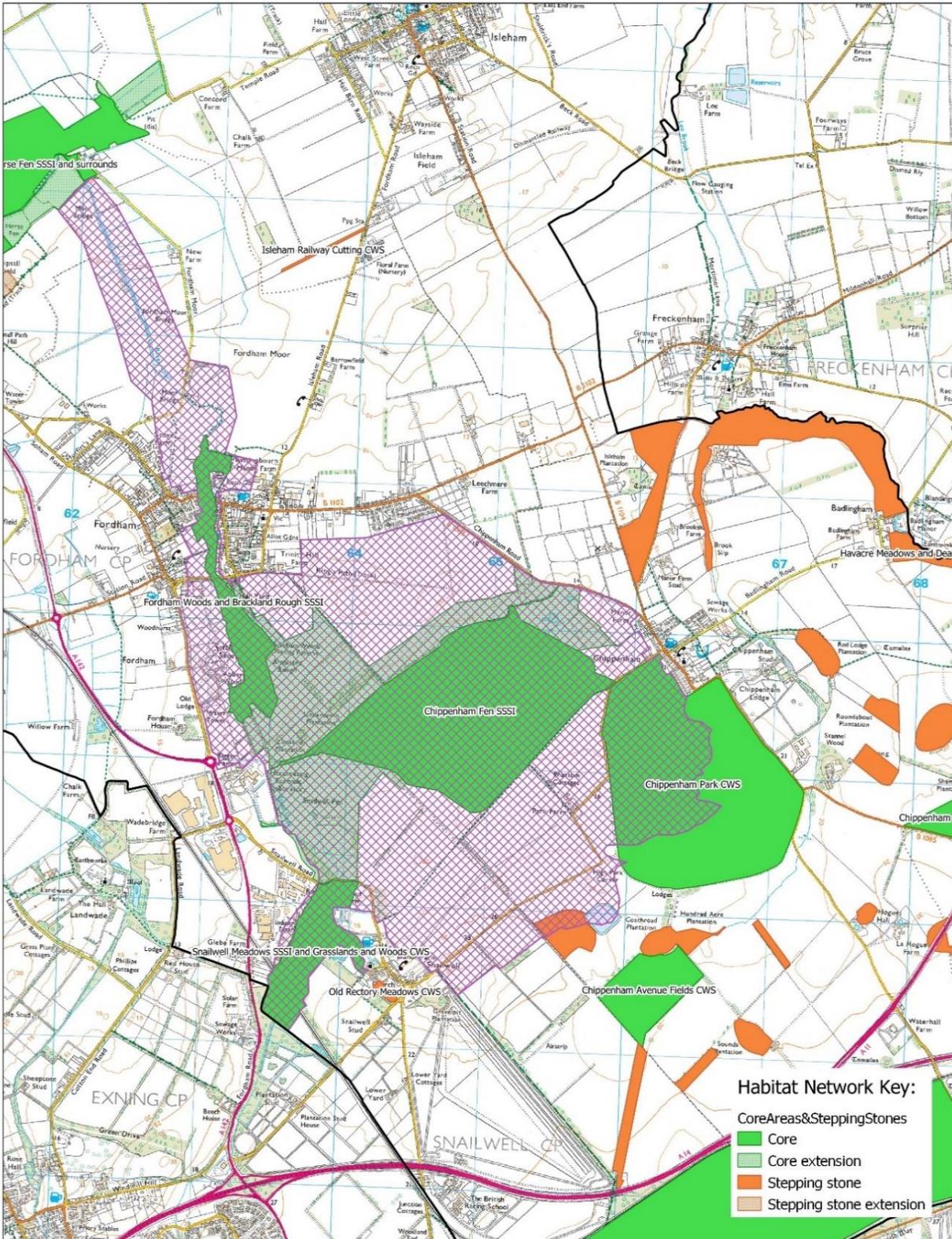
2.2.6 Delivery Mechanisms:

The significant habitat creation proposed around Chippenham Fen could be funded in a number of ways. While the use of agri-environment schemes is one, there is potential to fund habitat creation through the establishment of a habitat bank to provide biodiversity credits for development. Elsewhere in the Priority Area the main delivery mechanism particularly for nature-friendly farming will be the use of agri-environment schemes. Restoration of the River Snail may be funded through Environment Agency or water Company grants whether related to biodiversity, flood risk management or water supply.

Map 1: Chippenham Fen & River Snail Habitat Network

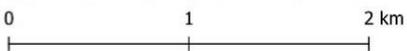


Chippenham Fen & River Snail
Habitat Network July 2022



Habitat Network Key:

- Core Areas & Stepping Stones
- Core
- Core extension
- Stepping stone
- Stepping stone extension



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2.3 Breckland Edge Priority Area

2.3.1 Summary

This Priority Area forms an extension to the main area of Breckland in Suffolk and Norfolk. It comprises areas with Quaternary sand and gravel deposits overlying the Cretaceous Chalk and includes former sand pits that support a range of Breckland specialist flora and invertebrates. The Priority Area also includes the River Kennett and adjacent land within the river corridor, in places forming the border with Suffolk. River gravel terrace deposits form the main component of the surface geology, but the area also includes some shallower soils over the chalk along the River Kennett. The main conservation sites are Red Lodge SSSI (in Suffolk) and Chippenham Gravel Pit, Halfmoon Plantation Pit and Kennett Restored Gravel Pit County Wildlife Sites.

The western part of this area is farmland adjoining the Chippenham Fen Priority Area. The area includes the sandy soils in the eastern part of the Breckland Edge area as well as the calcareous soils in the west, forming a direct connection to the Newmarket chalk grasslands Priority Area. The farmland includes a mixture of free draining sandy or chalky soils, often with damp hollows, and wetter soils typical of the Breckland Edge and contains areas known to support rare arable flora, including Chippenham Avenue Fields County Wildlife Site.

Conservation priorities in this area include the provision of habitats suitable for Breckland flora and invertebrates, whether grasslands of various types or arable areas suitable for assemblages of rare arable flora. Small wetland areas could also be restored and created around watercourses including the River Kennett along with in-channel enhancements and seasonally damp hollows. Other habitats such as tree belts and hedgerows would provide complementary habitats.

2.3.2 Key Facts

Total area: 1,325 Ha

Area of core habitats: 247.69 Ha (18.7% of total area)

Area of core & stepping stone habitats: 368.26 Ha (27.8% of total area)

Core sites: Red Lodge SSSI, Halfmoon Plantation Pit CWS, Chippenham Gravel Pit CWS, Chippenham Park CWS (part), Chippenham Avenue Fields CWS.

Important habitats: Acid grassland and heath, arable margins and other disturbed ground, woodland and scrub.

Important species:

Fauna: Breck invertebrates, particularly bees, wasps, ants and beetles, stone curlew.

Flora: Breck acid grassland flora (e.g. smooth rupturewort, dense silky-bent, bearded fescue, Spanish catch-fly, smooth cat's-ear, long-stalked crane's-bill, sickle medick, bur medick).

Rare arable plants (e.g. corn chamomile, corn marigold, fine-leaved fumitory, wild pansy, common cudweed, sharp-leaved fluellen, round-leaved fluellen, grass-poly).

2.3.3 Network Approach:

Better Management

The extent of Breckland acid grassland and heath type vegetation is limited to Red Lodge SSSI and to a number of former minerals sites dug for sand and gravel. The conservation of the typical Breckland flora and invertebrates present at these sites depends on continued management and disturbance, sometimes by rabbits, but at present often through anthropogenic activities such as arable farming, mining and even off-road driving and motocross (Chippenham Gravel Pit CWS is currently an outdoor activity centre). In the future, if the amount of disturbance decreases due to changing management, alternative, mechanical forms of disturbance may be required to maintain the open, sandy conditions on which many of the scarce

species depend. Managing the core sites well is critical to maintaining the presence of many of the scarce species in Cambridgeshire at this western edge of the Brecks as there is limited scope in the wider landscape to re-create such habitats and future minerals working to create suitable conditions is also unlikely to occur.

Buffering & Extending Core Areas

There are limited opportunities for buffering and extending the core areas, but some creation of additional areas of grassland, ideally managed by grazing, on suitable sandy soils would be beneficial if it could support better management of the core sites. Alternatively, agri-environment schemes may provide funding for areas of uncropped, cultivated (disturbed) soil along arable field margins which encourage the scarce flora which depends on more transient conditions. Specifically, buffers of habitat around Chippenham Gravel Pit and Halfmoon Plantation Pit CWSs would help to preserve the core habitat, and the latter site will need a sustainable long-term management approach on completion of the current minerals and restoration scheme. It is critical that these habitats are not threatened by the nearby development of Kennet Garden Village.

Stepping Stones

Many of the stepping stone habitats are broadleaved or mixed broadleaved and conifer plantations, with few areas of acid grassland or wetlands. Other habitats in the landscape include various arable field margins, and the priorities for these must be to provide suitable conditions for the rare arable flora and associated invertebrates, which will act as stepping stones for the more permanent areas of sandy grassland and heath.

Nature Friendly Farming

Current cropping patterns have maintained suitable conditions for the rare arable flora over a long period, but there has been a reduction in the distribution and abundance of species, and some are likely to have been lost locally. There is therefore scope to provide more by way of suitable conditions through a range of nature-friendly arable field margins and headlands, and several areas of cultivated but uncropped soils have already been created within the Chippenham Park Estate. This will be critical to the conservation and recovery of the special flora and fauna of this Priority Area going forward. The wide-scale adoption of suitable arable cropping patterns and arable field margin / headland / fallow options through agri-environment schemes should be promoted.

2.3.4 Objectives:

Short and long-term

- Implement suitable management regimes at the core Breck acid grassland sites to support the distinctive flora and fauna.
- Adopt nature-friendly farming practices, based on suitable cropping patterns and provision of cultivated, unsprayed areas to support the rare arable flora and invertebrates.
- Increase the extent of high quality (non-arable) habitats to over 30% of the Priority Area through limited buffering of the core sites and enhancement and restoration of stepping stone sites.

2.3.5 Priority Area Vision:

The vision for this Priority Area is to restore and maintain the range and abundance of key Breckland species, at the western edge of the Brecks. This will involve the adoption of suitable management regimes at the core Breck acid grassland sites, with sufficient grazing and disturbance to maintain open, sandy conditions. Much of the area will remain arable, but with cropping patterns and arable margin and headland options selected to favour the rare arable flora and invertebrates.

2.3.6 Delivery Mechanisms:

The predominant delivery mechanism will be the use of agri-environment schemes whether to promote arable options favourable to the rare flora and invertebrates or to support management of acid grassland sites.

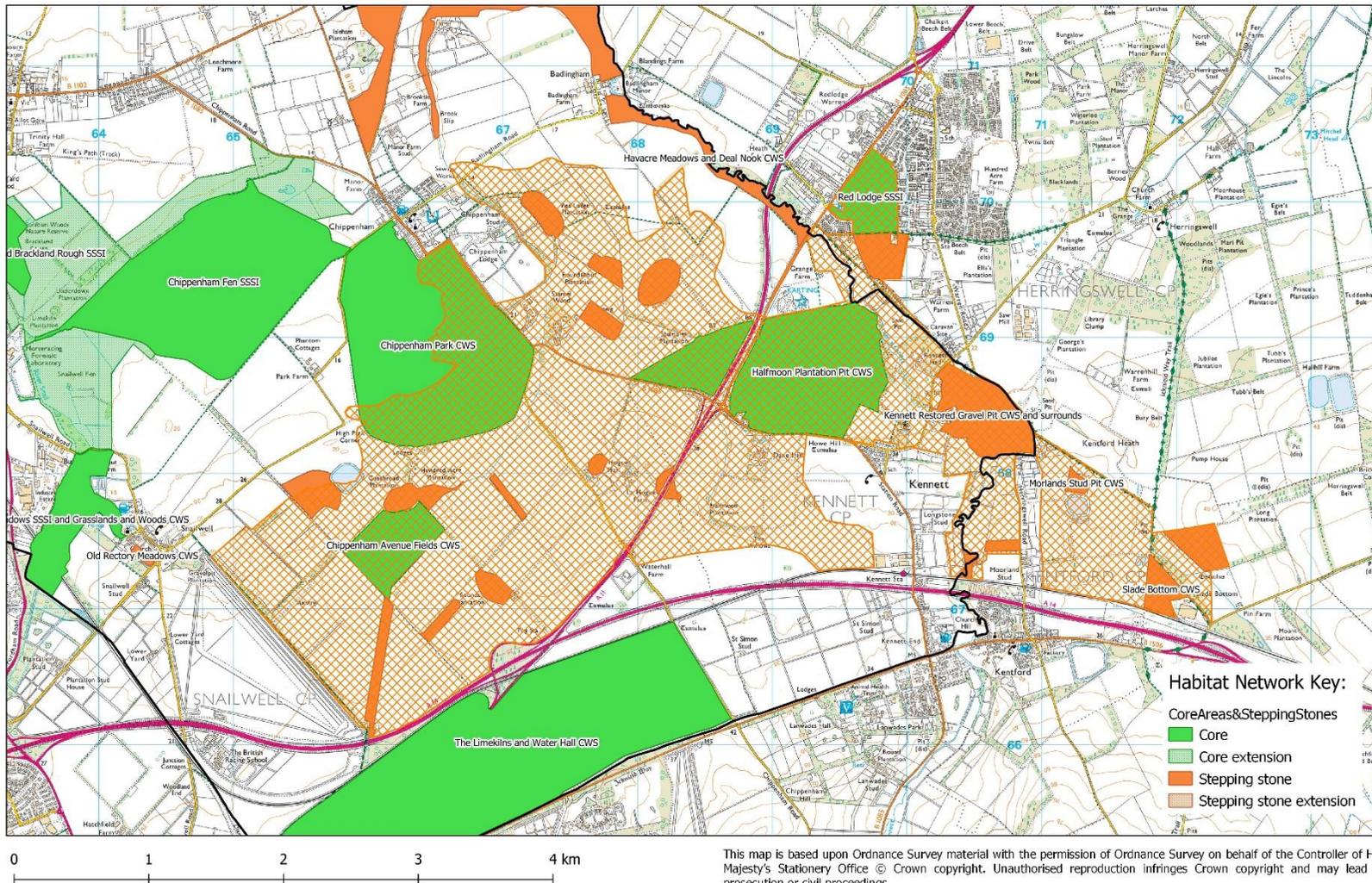
Development S106 contributions may play a role in supporting the management of some of the core sites, whether that be through mitigation measures that might be required to protect Red Lodge SSSI, associated with the motor sports business operating within Chippenham Gravel Pit CWS, or the minerals restoration scheme at Halfmoon Plantation Pit. The development of Kennett Garden Village is close to this latter site, and there may be opportunities to support its conservation.

Elsewhere, there is currently an application for a major solar park across much of this Priority Area. This may bring opportunities to create a range of Breck type grasslands associated with the solar panels, however, there is also a severe risk that the loss of arable farming and regular disturbance will result in further declines in the distribution and abundance of the specialist arable flora and invertebrates.

Map 2: Breckland Edge Habitat Network



Breckland Edge
Habitat Network July 2022



3. References

¹Lawton, J. et al (2010). Making Space for Nature: A review of England's Wildlife Sites and Ecological Network. *Report to Defra*.

²Natural England Research Report NERR 081 - Nature Networks Evidence Handbook (2020). *Humphrey Crick, Ian Crosher, Chris Mainstone, Sarah Taylor, Andy Wharton, Pippa Langford, Jonathan Larwood, Jane Lusardi, David Appleton, Peter Brotherton, Simon Duffield & Nicholas Macgregor. Natural England*.