MKA
ECOLOGY

Reach, Cambridgeshire

A Biodiversity Assessment

to support the Neighbourhood Plan

March 2021

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1 INTRODUCTION

1.1 Aims and objectives

In November 2020 MKA Ecology Ltd was commissioned to undertake a biodiversity assessment of Reach Parish to support the forthcoming Reach Neighbourhood Plan. This reports presents the findings of that assessment which were gathered through a process of field studies, consultations and a desktop study. The key aims of the assessment were as follows;

- Identify and record important habitats within the Neighbourhood Plan Area;
- Recommend appropriate measures to protect these habitats, and
- Define initiatives and measures for improving habitats and the ecological network.

The overall aim of the Biodiversity Assessment is to support the Reach Neighbourhood Plan, the purpose of which will be to help the community shape and influence change in the coming years.

This assessment specifically concerns biodiversity and ecology where areas are identified for opportunities, be they enhancement or development led, there may be other matters which make these unsuitable, for example ownership or other identified constraints such as landscape.

1.2 Site description and context

Reach is situated in East Cambridgeshire District and is approximately 10km north-east of Cambridge and 7km north-west of Newmarket. The village of Reach is centred on OS Grid Reference TL566662 but the parish boundary extends significantly to the north-west and south-east. The extent is approximately 4.7km². The parish boundary, which is also taken as the boundary of the Neighbourhood Plan, is shown on Figure 1. The village of Reach has a population of approximately 335.

Reach is situated on a low chalk promontory which extends into the low fenland of Cambridgeshire, much of which is below sea level. This juxtaposition of high and low ground creates a fascinating range of geological and ecological influences which ensure that Reach is rich in biodiversity feature of note. The low fenlands support important populations of birds and the waterways provide biodiverse corridors with thriving invertebrate communities and notable aquatic plants. The higher chalklands contain ancient grasslands of national importance, and a network of hedgerows that connect developing patches of woodlands. This variety of habitats make Reach a biodiverse hotspot with tremendous opportunities for further enhancement. However, consequently this does mean that any potentially damaging activities, such as development, must be carefully planned and considered.

Reach has a strong cultural heritage which is intricately linked with the biodiversity features of the Parish. There is widespread evidence of Roman settlement which is still clear in the landscape with the Reach Lode with was constructed at this time as a navigable connection between the River Cam and the higher grounds. Where the lode ends in Reach, at a location known as The Hythe, a port developed with some of the slipways still present and visible today. The Anglo-Saxons created the Devil's Dyke, a linear earthworks of approximately 11km running from Woodditton and terminating at The Hythe and lode in Reach. The Devil's Dyke is now home to internationally important orchid habitats and a wealth of other chalk specialist species. Drainage of the fens started in the 17th century which had a dramatic effect on local biodiversity as the fens and swamps were claimed for agriculture. This drainage has continued almost to the present day, the consequence of which is drying and degradation of the peat and a significant lowering of ground levels, to the extent that the lode is up to 3m above the surrounding peat. Coprolite extraction in the 19th century resulted in the open ponds and pools that can still be seen in the fen area. Throughout these periods significant quarrying of clunch took place on Chapel Hill which have created exposed chalk and grasslands which are, over time, succeeding to woodland and scrub.

The fen edge parishes tend to run in strips, from fen, to chalky loam, to sandy boulder clay on higher ground. In more modern times this would ensure that however wet or dry the season the parish could count on crops from at least two of these three zones. In earlier times only the central skirt land would have fields laid out around the village and its springs. The higher ground

would have been forest providing wood and panage for pigs. The lower ground would have been fen, providing marshy grazing in summer but in winter the waters may have risen considerably with no drainage. The fen would have also provided fish and wildflowl as well as other materials such as reed for thatching, and willows for wattles, fishtraps and baskets. Each of the three zones would have been vital for the local community (Ennion, 1949).

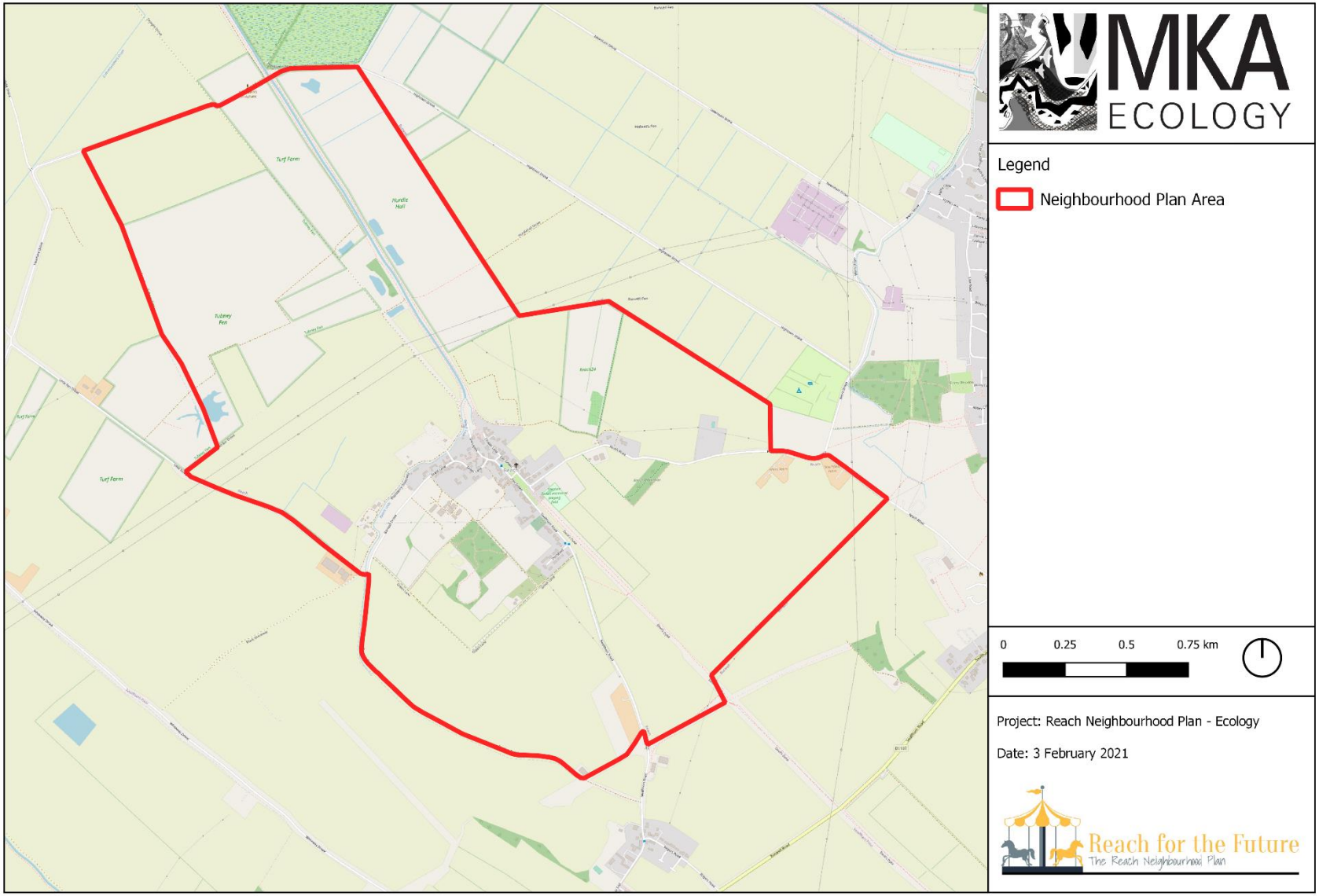
In January 2019 it was agreed that Reach would develop its own Neighbourhood Plan. The plan will help the community shape and influence planning strategy in the neighbourhood. It will encompass a suite of topics including development, recreation, traffic management, landscape, as well as biodiversity and nature conservation. The Neighbourhood Plan will have the same legal force as the East Cambridgeshire District Council Local Plan and will carry statutory weight. East Cambridgeshire District Council will need to consider the Neighbourhood Plan when determining planning applications.

A landscape appraisal has been produced by Alison Farmer to support the Neighbourhood Plan (AFA, 2020). Where relevant the landscape appraisal report is referred to within this assessment. AECOM (2020) have also produced a design code for potential development.

As part of the Neighbourhood Planning process a residents' survey was conducted in early 2020. The survey demonstrated that the natural features of the parish are of significant value to the community. High quality greenspaces, good access and footpaths, abundant and varied wildlife, proximity to wild places and areas of little light pollution were all highlighted as features which make Reach an attractive place to live. The survey also raised concerns about the environmental impacts of further housing. A small amount of new housing was thought necessary but the great majority of villagers responding to the questionnaire were keen to ensure that any such development protected and enhanced local wildlife and habitats. Finally it was clear that the community would like to see some level of protection for greenspace that does not currently receive any protection. These areas included The Hythe, Reach Lode, the fen-edge, the woodlands, hedges, footpaths, bridleways and droveways, and finally the geological features of interest. The results reveal that the residents of Reach place a high value on their biodiversity, and are keen to both protect and enhance it.

Since the mid-20th century development within Reach has been small scale, and typically infill, replacement dwellings or conversions. The 2015 Local Plan proposes only infill for Reach with no new allocations within the Strategic Land Availability Assessment (SLAA, 2014). Opportunities for commercial or industrial development are limited although there is potential for further solar applications beyond the community solar farm. There is some limited accommodation for small business. With the rich natural environment and features of historical interest in the locality there is potential for tourism led development.

Figure 1: Map showing the Neighbourhood Plan (and Reach Parish) boundary



2 LEGISLATION, POLICY AND INITIATIVES

2.1 Legislation and policy

National legislation and planning policy

This assessment has been made with reference to relevant wildlife legislation and planning policy. Relevant legislation considered within the scope of this document includes the following:

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;
- Natural Environment and Rural Communities Act 2006;
- The Countryside and Rights of Way Act 2000;
- Wild Mammals (Protection) Act 1996.

In addition to obligations under wildlife legislation, the revised National Planning Policy Framework (NPPF) updated on 19 February 2019 requires planning decisions to contribute to conserving and enhancing the local environment. Further details on this legislation and policy is provided in Appendix 1. Where relevant they are referred to in the text.

Local planning policy

East Cambridgeshire District Council has withdrawn the 2019 local plan and therefore the adopted 2015 Local Plan is referred to this in this assessment (East Cambridgeshire District Council, 2015). With regard to biodiversity the Strategic Land Availability Assessment (SLAA, 2014) does not contain any sites within Reach.

Policy ENV 7 relates specifically to biodiversity and geology and is as follows.

'*All development proposals will be required to:*

- *Protect the biodiversity and geological value of land and buildings and minimise harm to or loss of environmental features, such as trees, hedgerows, woodland, wetland and ponds.*
- *Provide appropriate mitigation measures, reinstatement or replacement of features and/or compensatory work that will enhance or recreate habitats on or off site where harm to environmental features and habitat is unavoidable; and*
- *Maximise opportunities for creation, restoration, enhancement and connection of natural habitats as an integral part of development proposals.*

Development proposals where the main aim is to conserve biodiversity will be permitted; and opportunities to incorporate biodiversity into new development will be supported.

All applications for development that may affect biodiversity and geology interests must be accompanied by sufficient information to be determined by the Local Planning Authority, including an ecological report, to allow potential impacts and possible mitigation measures to be assessed fully. Where there is reason to suspect the presence of protected species, trees and woodland, applications must be accompanied by a survey carried out by a qualified individual assessing their presence and, if present, the proposal must be sensitive to, and make provision for, their needs, in accordance with the relevant protecting legislation. Where appropriate, there will be a requirement for the effective management of designated sites and other features, controlled through the imposition of conditions or Section 106 agreements.

- *Proposals which have an adverse impact on a site of international importance will not normally be permitted unless there are exceptional overriding reasons of public interest (human health, public safety or environmental benefit).*
- *Proposals which have an adverse impact on a site of national importance will not normally be permitted unless the benefits of the development at the site significantly outweigh the impacts.*

Proposals which would cause harm to County Wildlife Sites, Ancient Woodland, aged and veteran trees, Local Nature Reserves, Protected Roadside Verges, and any other irreplaceable habitats, and green corridors or important species will not be permitted unless the need for, and benefits of development in that location outweigh the potential harm to nature conservation interests.'

East Cambridgeshire District Council have recently produced a Supplementary Planning Document (SPD) for biodiversity (East Cambridgeshire District Council, 2020). This establishes the following policies;

- Policy SPD.NE1: Conserving and Enhancing Biodiversity – Internationally Designated Sites. Strengthened protection for internationally designated sites.
- Policy SPD.NE2: Proposals within the Swan ad Goose Impact Risk Zone. Greenfield major development within the IRZ must undertake a project-level Habitat Regulation Assessment.
- Policy SPD.NE3: Development resulting in the loss of deterioration of a County Wildlife Site (CWS), Local Nature Reserve (LNR) or Protected Roadside Verge (PRV). Development resulting in the loss of CWS, LNR or PRV which are irreplaceable habitats will be refused unless there are wholly exceptional reasons and suitable compensation strategies.
- Policy SPD.NE4: Soham Commons. The wildlife, landscape and recreational quality of the Soham Commons should be protected and enhanced.
- Policy SPD.NE5: Reviewing planning applications for Protected Species. Appropriate survey effort should be conducted and it should be feasible to acquire correct licences, and to ensure appropriate mitigation, compensation and monitoring.
- Policy SPD.NE6: Biodiversity Net Gain. In the absence of a nationally mandated mechanism to secure biodiversity net gains (forthcoming in the Environment Bill) proposals must significantly exceed pre-development values (demonstrated with the Defra metric) or be refused.
- Policy SPD.NE7: Contributing to the strategic target of doubling land for nature. Strategic scale development proposal could contribute to the Local Nature Partnership's 'doubling land for nature' vision by providing 20% of the application site as wildlife rich habitat, or create off-site contributions to the vision via provision of habitat or financial contributions.
- Policy SPD.NE8: Trees and Woodland. Existing tree and woodland cover should be maintained, improved and expanded and opportunities for expanding woodland should be actively considered and implemented where practicable to do so. Guidance on the number of compensatory trees is provided.
- Policy SPD.NE9: Landscaping and Biodiversity. New planting should be integral to design providing corridors, native species and sufficient appropriate habitats for biodiversity.
- Policy SPD.NE10: Taking the most appropriate natural environment opportunities. Provision of new natural environment infrastructure must be appropriate and the make the most of site specific opportunities.
- Policy SPD.NE11: Provision of sufficient, suitable and robust information. Development proposals must be accompanied by sufficient, suitable and robust information to enable the effects on biodiversity to be assessed.

Neighbourhood planning policy

Neighbourhood planning was introduced in the Localism Act (2011) and is a tool which gives communities statutory powers to shape the way their communities develop. The Neighbourhood Plan is;

- A document that sets out planning policies for the neighbourhood area which are used whether to approve planning applications;
- Written by the local community rather than the Local Planning Authority; and
- A powerful tool to ensure the community gets the right types of development in the right place.

Neighbourhood Plans should be prepared positively in a way that is aspirational *and* deliverable. Neighbourhood Plans can contain policies on the contributions expected from development, but these and other requirements placed on development should accord with the relevant strategic policies and national planning policy.

NPPF (2019) Section 8 (paragraph 100) allows local communities to identify green areas for special protection within Neighbourhood Plans. These Local Green Spaces (LGS) must provide special benefits to the community and the criteria in the NPPF paragraph 100 are as follows;

- In reasonably close proximity to the community it serves;
- Demonstrably special to the local community and holds a particular local significance, for example because of its beauty, historic significance, recreational value (including as a playing field), tranquillity or richness of its wildlife; and
- Local in character and is not an extensive tract of land.

2.2 Local projects and initiatives

Natural Cambridgeshire (Local Nature Partnership)

A partnership of local authorities, wildlife and countryside charities, non-departmental government bodies and developers. Creating an action plan for the Cambridgeshire natural environment through key themes and projects. This includes living landscapes which aims for landscape scale restoration. A key project is Doubling Nature with the aim of doubling the amount of land that is managed for nature conservation from 8% to 16% which is the national average. Other themes include local food and farming, sustainable jobs and healthy communities.

Cambridgeshire Green Infrastructure Strategy

The Cambridgeshire Green Infrastructure Strategy (Cambridgeshire County Council, 2011) is designed to assist in shaping and coordinating the delivery of green infrastructure in the county with the aim of 1) reversing the decline in biodiversity, 2) mitigate and adapt to climate change, 3) promote sustainable growth and economic development, and 4) support healthy living and well-being. Reach lies within the Wicken Fen and Anglesey Abbey target area with objective to open up areas for wildlife and people, create habitats particularly for fenland species, protecting resources such as water and peat, provide opportunities for residents and visitors to access nature, and provide economic opportunities.

Wicken Fen Vision

A 100 year plan, driven by the National Trust, to create a diverse landscape for people and wildlife, stretching from the existing Wicken Fen reserve to the edge of Cambridge in the south. Wicken Fen vision land covers more than half of the Reach Neighbourhood Plan Area and is consequently likely to have a significant impact on the biodiversity of Reach in the coming years. The area covered by the Wicken Vision are shown in Figure 2.

Fen Biosphere

A project to create a UNESCO biosphere across the fenland landscape, becoming the first of such area in East Anglia. The key threads linking activities within a biosphere are 1) Biospheres will meet the needs of their current and future residents and work towards providing secure and happy futures for all, 2) Biospheres will improve the natural environment, and 3) Biospheres will use new ideas, science and technology to explore new ways of living everyday that solve global challenges. Reach is located within the buffer zone of the proposed biosphere.

Buglife B-lines

A project to provide connectivity for invertebrates across the UK by linking existing habitats with new areas of habitat creation (Buglife, 2021). Reach lies directly within a key B-line linking the chalk to the fens.

Figure 3: Buglife B-lines over Reach

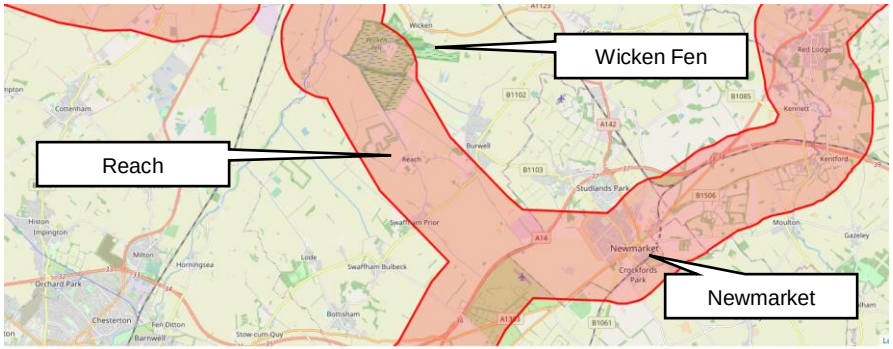
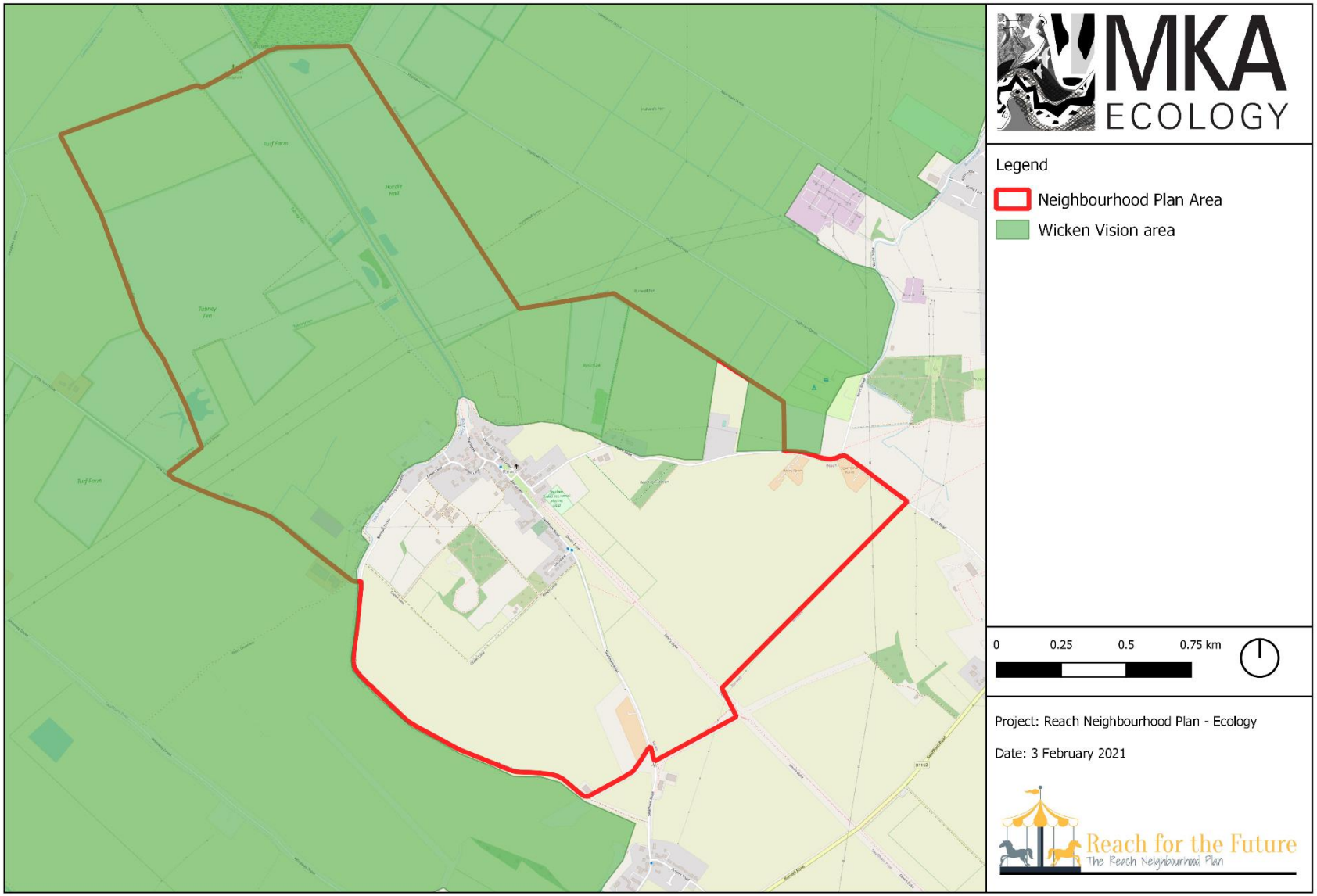


Figure 2: Showing the Wicken Vision area in relation to Reach



3 REACH

3.1 The geological setting

The village of Reach lies on the West Melbury Marly Chalk Formation reaching to around 15m above sea level. The lower grounds of the fens to the north and west, at sea level or below, comprise peat over Gault Formation clay. Where the intersections of gault and chalk meet springs rise around the village skirt lands.

3.2 The ecological setting

National Character Areas

Reach straddles two national character areas which are 46 The Fens and 87 East Anglian Chalk. The intersection of the two is formed by the fen edge habitats just to the west of Reach.

46 The Fens: Characterised as an expansive low-lying wetland landscape. Woodland cover is sparse and the open fields are bounded by drains and river systems which provide an important ecological network. An important area for biodiversity with several internationally recognised areas of nature conservation value.

87 East Anglian Chalk: Characterised by smooth rolling chalkland hills with large irregular field enclosed by low-lying hedgerows. Much of the area is under cereal production but important semi-natural habitats include lowland calcareous grassland and the chalk streams which are under significant threat from modification and abstraction.

Statutory designated site of nature conservation interest

Reach is connected to a number of statutory sites of nature conservation interest, some of which are of international importance. These sites provide an insight into the habitat and species which are of significance in this setting. They also allow us to consider what target habitat might be appropriate for biodiversity interventions in the area, and what habitats should be protected. Table 1 provides a summary of the sites and they are shown on Figure 4.

These areas include Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR) which are designated at a national level and Special Areas of Conservation (SAC) which were designated at an international level within the European Union. Following the UK's withdrawal from the EU they are now recognised as part of a new 'national site network' but it would be appropriate to continue to consider them of international importance. One of these areas, the Devil's Dyke, is situated within the Reach Neighbourhood Plan Area.

Table 1: Statutory designated sites within 5km of Reach Neighbourhood Plan Area

Site	Direction and distance	Reasons for citation
Wicken Fen NNR, Ramsar, SSSI, SAC (Fenland)	1.3km north	The best surviving remnant of East Anglian Fen in the context of Cambridgeshire with a diverse flora and fauna (notably the invertebrate fauna and relic fenland flora). To the north of Wicken Lode is original peat fen with communities of carr and sedge. To the south of the lode are open rough pasture, reedbeds and pools. The assorted waterbodies contain many aquatic plants including rarer species such as greater spearwort *Ranunculus flammula* and lesser water-plantain *Baldellia ranunculoides*. The Fenland SAC is designated for the presence of several important habitat types including Molinia meadows and calcareous fens. These sites also support important species included the spined loach *Cobitis taenia* and great crested newt *Triturus cristatus*.
Cam Washes SSSI	2.4km north-west	Low-lying pastures subject to seasonal flooding which are important for breeding and wintering birds. In

Site	Direction and distance	Reasons for citation
		additional the agriculturally unimproved areas of the pasture hold important botanical communities.
Upware Bridge Pit North SSSI	5km north	Cited for its geological interest with a particularly rich ammonite fauna.
Upware South Pit SSSI	3.5km north	Cited for its geological interest showing a section through the Oxfordian 'Upware reef'.
Stow-com-Quy Fen SSSI	5km south-west	Contains areas of floristically rich calcareous loam pasture and a number of pools formed on Chalk Marl which contain rare aquatic species.
Devil's Dyke SSSI, SAC	SSSI within Reach, SAC section 3.5km south-east	Holds one of the best and most extensive areas of species-rich chalk grassland in the county with good areas of chalk scrub grading to woodland in the east. These are habitats which are severely restricted in their UK range. Supports a number of rare species including bastard toadflax *Thesium humifusum* and pasque flower *Pulsatilla vulgaris*. This botanical and structural diversity supports important populations of invertebrates. Devil's Dyke is listed as an SAC because of the dry grassland on calcareous substrate which has important orchid sites (particularly lizard orchid *Himantoglossum hirinum*).
Newmarket Heath SSSI	3.5km south-east	The largest expanse of unimproved chalk grassland in Cambridgeshire, and particularly notable for areas of chalk heath which is very rare in the UK and comprises an intimate complex of both acidic and chalk loving species. As well as scarce botanical species an important invertebrate assemblage is also present.

Non-statutory sites of nature conservation interest

A number of non-statutory sites also fall within close proximity of the Neighbourhood Plan Area, although none are in the parish itself. These are described in Table 2 and include County Wildlife Sites (CWS). They are shown on Figure 4.

Table 2: Non-statutory sites within close proximity of Reach Neighbourhood Plan Area

Site	Direction and distance	Reasons for citation
Burwell Disused Railway CWS	Adjacent to south-east boundary	The banks of this disused railway support extensive areas of unimproved calcareous grassland with many strong indicators of this habitat type. Kidney vetch *Anthyllis vulneraria* and horseshoe vetch *Hippocrepis comosa* are abundant and provide larval food plants for small blue *Cupido minimus* and chalk-hill blue *Polyommatus coridon* butterflies respectively. This site is contains the few remaining colonies of these species in Cambridgeshire. Spanish catchfly *Silene otites*, a nationally rare plant, is also present.
Driest Droveway CWS	250m south-west	A dry droveway with species-rich grassland bound by lines of trees and hedgerows. The grassland contains a number of strong calcareous and neutral grassland indicators.
Swaffham Prior Meadows CWS	350m south	A wet meadow (previously more so) with areas of marshy grassland and swamp. The grasslands contain a number of neutral indicator species and the hedgerows around the perimeter are of value for biodiversity.
Pauline's Swamp CWS	250m south-east	A meadow with areas of marshy grassland and swamp. Several ponds and hedgerows also offer biodiversity value.

Site	Direction and distance	Reasons for citation
Spring Close CWS	350m east	An area of slightly calcareous grassland on the earthworks of Burwell Castle, particularly on the steeper embankments which are not mown as regularly. Areas of spring-fed marsh are also present.
Burwell Brick Pit CWS	2km north-east	Disused brick pit with a mosaic of habitats including a lake fringed with swamp habitats. There are also areas of calcareous grassland and scrub.

Undesignated green spaces

Within 2km are several areas identified by Natural England Priority Habitats Inventory. These priority habitats are listed as important on Section 41 of the Natural Environment and Rural Communities Act (2006) and here they include:

Floodplain grazing marsh: Particularly in areas around Wicken Fen and the Wicken Vision areas. Some of these habitat parcels lie within the Neighbourhood Plan Area.

Lowland calcareous grassland: Along the Devil's Dyke running right into the Neighbourhood Plan Area and Reach village.

Lowland fens: This habitat occurs at Wicken Fen to the north of the Neighbourhood Plan Area. Small areas are also present close to Burwell and Swaffham Prior.

Traditional orchards: Occurring within the Neighbourhood Plan Area on the fringes of the village at 24 Acres and on the fen edge. Scattered throughout the wider area but typically associated with the villages.

Deciduous woodland: Scattered throughout the Neighbourhood Plan Area and the surrounding landscape. More common on the higher ground but still sparse. Much of this is located on the fringes of the village at Reach Wood, the 24 Acres and the Plantation. Small areas are also present in the Wicken Vision area in the form of woods fringing ponds and fishing lakes.

Within the Reach Neighbourhood Plan Area are a number of open greenspaces with nature conservation value that are not designated. These have been established as part of local initiatives, or are pre-existing greenspaces in the village. They are summarised as follows;

Reach wood: An area of woodland (4.59ha) which was planted on arable land by the village in 1994. It comprises plantation woodland with rides and a large expanse of meadow which had been seeded with a calcareous grassland mix. Reach Wood is managed by The Woodland Trust and a management plan has been produced (The Woodland Trust, 2012). Dominated by beech *Fagus sylvatica* it also contains ash *Fraxinus excelsior*, cherry *Prunus sp.*, field maple *Acer campestre*, crab apple *Malus sylvestris* and yew *Taxus baccata* with a shrub layer of hazel *Corylus avellana*, dog rose *Rosa canina*, wayfaring tree *Viburnum lantana* and spindle *Euonymus europaeus*. The wood is known to support bee orchid *Ophrys apifera* and common spotted orchid *Dactylorhiza fuchsii*. The management plan has undergone changes to accommodate concerns regarding the impact of mowing on site fauna. However, the solution of cutting the grass at a higher level is likely to result in a deterioration of grassland quality over time.

Reach plantation: Part of the County Farms Estate this wood was planted as a joint venture with the Forestry Commission in 1998. Species include beech, field maple and hazel. A woodland ride runs through the centre of the wood which provides public access via this permissive bridleway.

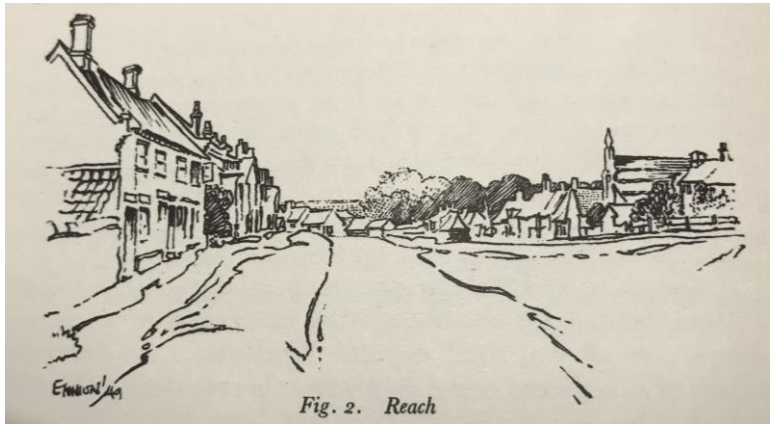
Reach Pocket Park: Situated alongside Reach Lode this park comprises grassland, ponds and concomitant hedgerows. The grassland is thought to be unimproved and potentially of significant value. The areas is managed traditionally with grazing through the winter. A pond with planted willows is situated to the north which is likely an old coprolite pit.

24 Acres: An area of public access delivered as part of the Wicken Vision. Owned by the National Trust a range of features are being developed including woodland, a traditional

orchard, a cricket pitch, a manege and areas of grassland. The orchard has a range of varieties, many local, including apples, pears, cherry and mulberry. The woodland is just over 2ha in extent and was planted as a natural woodland in 2013. A total of 25 tree and shrub species were planted. Oak, beech and lime will be the dominant species. This wood will evolve into a significantly different habitat to Reach Wood by virtue of the planting mix and the underlying soils and hydrology.

The Hythe: The Hythe forms a promontory stretching into the fen from Reach Village. It forms a connection in the linear route that leads from the Devil's Dyke through Fair Green and then along the Reach Lode through the fen. It is dominated by the now largely defunct sewage treatment works but contains areas of scrub, grassland and mature trees. Artificial channels run either side which join the load. It is believed to have significant cultural and archaeological interest as it would have formed the centre of the mediaeval port. It is not a natural feature but entirely manmade with chalk rammed down onto the peat.

Fair Green: A linear village green that runs through Reach which is largely dominated by amenity grassland. This would have been on the original course of the Devil's Dyke but this was levelled in the 1700s, with the chalk used to create The Hythe.



Fair Green, sketch by Eric Ennion

Drying Green: An area of open space with silver birch and cherry trees situated in the heart of Reach village. Thought to have some archaeological significance.

Recreation ground: An amenity area with open grassland for sports, and other play and sports facilities. This is situated directly adjacent to the Devil's Dyke. A number of mature elms *Ulmus sp.* are present in this location which are of ecological value.

Cemetery: A small cemetery is present in the heart of the village just off Fair Green. The cemetery comprises grassland which is currently of unknown ecological value. Rows of lime *Tillia sp.* provide further habitat features.

Wicken Vision: Wicken Vision significantly shapes how the landscape around and within the Neighbourhood Plan Area is formed, and will likely be one of the most significant influences on the area in the years to come. The vision is to create a diverse landscape for people and wildlife which will cover 53km² and reach all the way from the original fen reserve to the edge of Cambridge.

The vision offers an opportunity for landscape restoration that will allow natural processes to take their course with careful interventions through grazing and water management. The target will be a mosaic of wildlife rich habitats which incorporate access for people to enjoy. The measures will also ensure that the peat, and its carbon storage potential, is conserved. These aims will be achieved through land purchase and collaboration. Some areas of land around Reach have already been purchased and rewilding is currently underway.

Barston Drove: This is a public right of way along the southern perimeter of the neighbourhood plan area. It comprises rough grassland and hedgerows. The quality of the grassland habitats is unknown and area of higher quality grassland could be present depending on the extent of agricultural influences from the neighbouring farmland, and the use by the track of off-road vehicles. There is also scrub encroachment from the adjacent hedgerows with suckering blackthorn which is likely to further reduce the condition of any grassland habitats over time. Barston Drove does provide an important wildlife corridor, particularly when taking into account its connectivity to the Catchwater Drain. Furthermore the droveway provides a corridor for wildlife through an area which is otherwise dominated by intensive farming activities.

Church of St Ethelreda and the Holy Trinity Churchyard: A small area of grassland and ornamental planting around the church off Fair Green. To the rear of the churchyard stands the remaining east wall and window of the chancel of the former chapel that stood at this location.

Notable species within the wider area

Natural England have identified some of the habitats in the Neighbourhood Plan Area, and the surrounding countryside, as suitable for target bird species within countryside stewardship scheme. The target bird species which have been identified are;

- Corn bunting *Emberiza clanadra*;
- Lapwing *Vanellus vanellus*;
- Redshank *Tringa totanus*; and
- Snipe *Gallinago gallinago*.

RSPB's Bird Conservation Targeting Project also identified habitats in this location for a number of farmland bird targets including;

- Corn bunting;
- Lapwing;
- Redshank;
- Snipe;
- Grey partridge *Perdix perdix*;
- Tree sparrow *Passer montanus*;
- Turtle dove *Streptopelia turtur*; and
- Yellow wagtail *Motacilla flava*.

Wicken Fen is a Plantlife Important Plant Area (Plantlife, 2021). These are locations which have been identified as botanically the most important areas in the UK. Wicken is noted for the species growing on the peat, such as Cambridge milk parsley *Selinum carvifolia* and also the aquatic species in the lode, such as the stonewort *Nitella tenuissima* which only grows in this one location in England.

Figure 3: Statutory and non-statutory designated sites around Reach

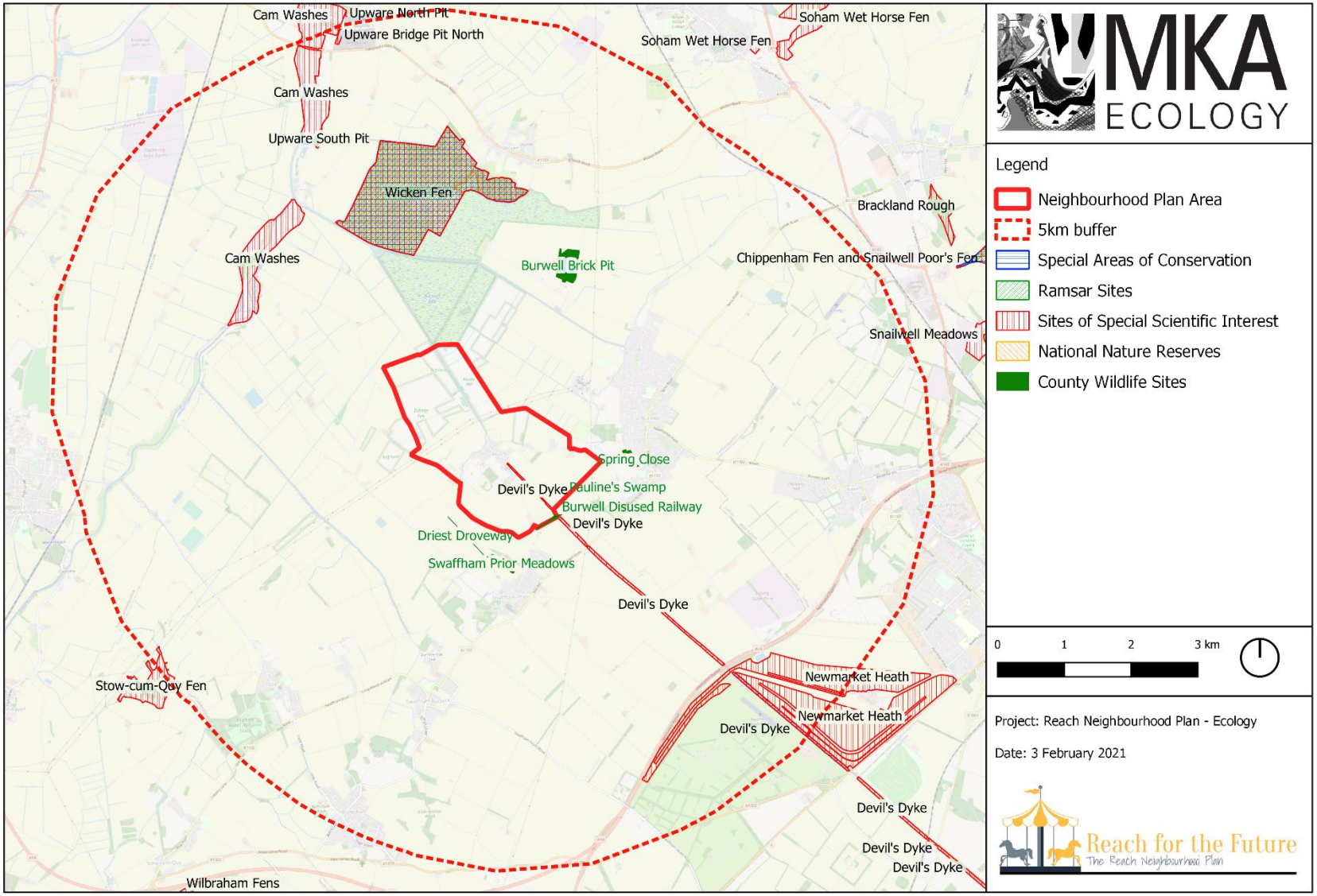
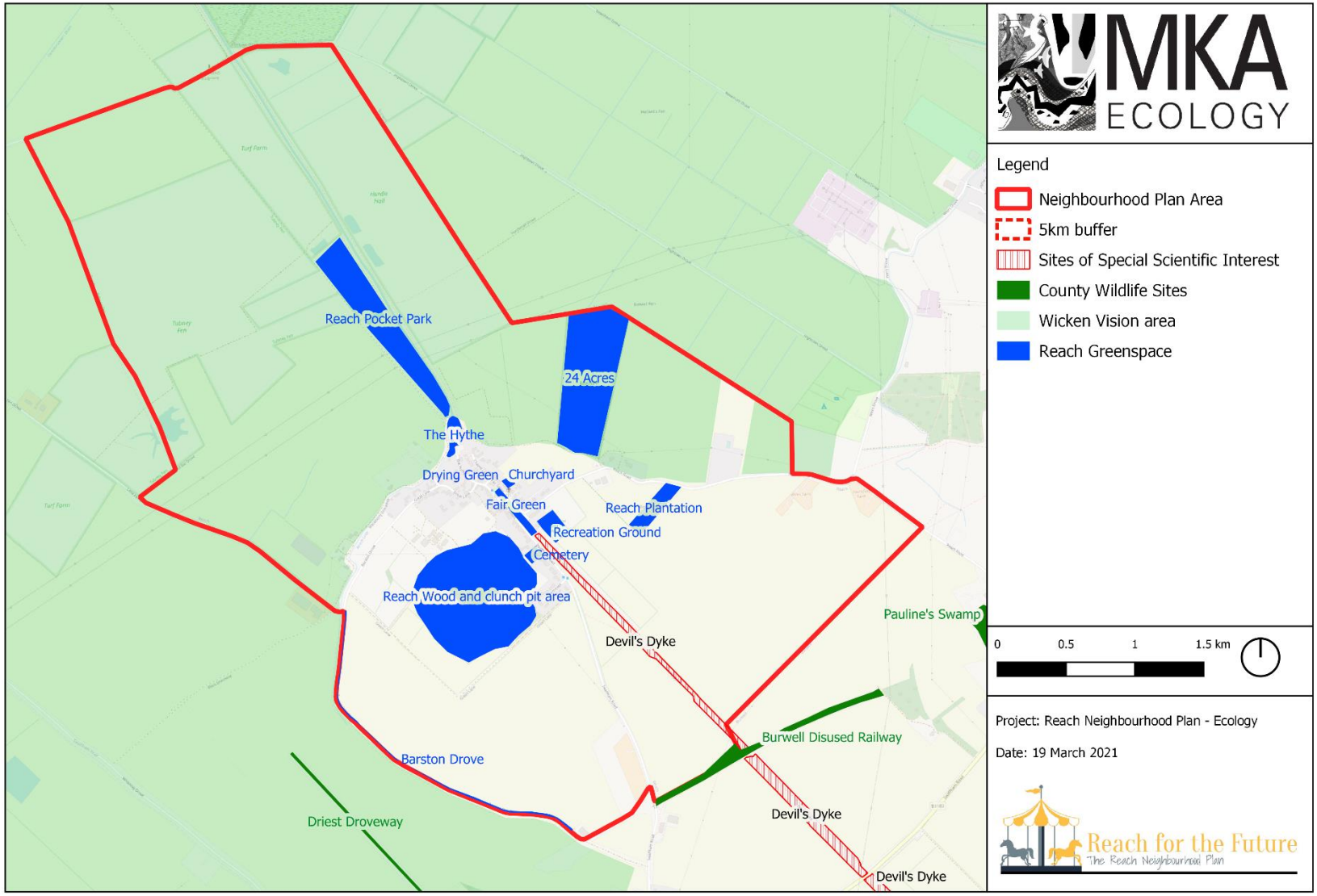


Figure 4: Open greenspaces within Reach Neighbourhood Plan Area



Summary of the key ecological features present around Reach

The habitats and species listed above go some way to demonstrate the diversity that is present in this landscape, largely driven by the contrasting geological conditions in the higher and lower ground. Key ecological features around Reach are;

Fenlands: Important for the aquatic habitats that they support, particularly grazing marsh, swamps, open water and lodes. Species of note include a huge number of plant species associated with these habitat types, but also breeding and wintering bird assemblages, invertebrates and fish such as spined loach. Mammals will also utilise these habitats with notable species including otter *Lutra lutra*, water vole *Arvicola amphibius* and numerous bat species.

Calcareous grasslands: The areas surrounding Reach, and within the parish, contain some of the most important calcareous grassland habitats in the UK. This habitat comprises species-rich grassland with a number of rarities recorded in the locality, such as Spanish catchfly.

These are by no means the only ecologically valuable habitats which are present, within this network are situated other features of high biodiversity value such as the traditional orchards on the fringes of the villages and the scattered woodlands and hedgerows on the higher ground. These features all combine to create a network of biodiversity across the area.

3.3 Habitat survey

The Reach Neighbourhood Plan Area was surveyed using the UK Habitat Classification and Mapping methodology (UK Habitat Classification Working Group, 2018) through winter 2020 – 2021 over several visits. The habitats recorded were assigned a pre-defined category according to this methodology. A full description of this methodology is provided in Appendix 2. The Reach Habitat Map is shown in Figure 6.

Due to time and seasonal constraints it was not possible to collect a full inventory of species in the Neighbourhood Plan Area. However, in the sections below an indication of the species with potential to occur in these habitats is provided. These assumptions are guided by species records provided by Cambridge and Peterborough Environmental Records Centre (CPERC).

Within the UK the Natural Environment and Rural Communities Act (2006) lists species and habitats which are of value. These are defined as Species and Habitats of Principal Importance. Where relevant Habitats of Principal Importance are identified in the sections below.

Grasslands

Calcareous grassland (g2). This habitat type occurs south and east of the village within the paddocks and pastures on higher ground. This grassland is not necessarily species rich but it lies over the chalky soils that are present in these locations. Some are degraded through intense grazing or alteration.

Lowland calcareous grassland (g2a). This valuable habitat type occurs along the Devil's Dyke and adjacent areas along its length. Further areas of calcareous grassland are present in Reach Wood and are also likely to be present in neighbouring pasture where there appears to be less intensive grazing. Lowland calcareous grassland is a Habitat of Principal Importance.

Other neutral grassland (g3c). This habitat type is present through the north of the survey area and is dominated by the grazing marshes across the Wicken Vision area. This grazing marsh grassland can be further classified as Holcus-Juncus neutral grassland (g3c8) which is typical of poorly drained permanent pastures on lowlands with rough grasslands and rushes. Lowland floodplain grazing marsh is a Habitat of Principal Importance. The broader category of other neutral grassland has been applied for grazing on the lower ground which remains drier, such as the horse grazing close to The Hythe.

Modified grassland (g4). This habitat type falls into two categories. The first is the clearly modified amenity grasslands that are present at Fair Green or the recreation ground. Secondly the intensively grazed pastures in the southern part of the survey area were included in this habitat type. These areas appeared to have a very low floristic diversity and some, such as the horse paddocks on Chapel Hill have been reseeded with a grass mix. The sheep grazing to the south of the Devil's Dyke has been placed in this category although this area should be

treated with caution. Due to the time of year it was not possible to accurately identify the quality of the habitat type and there is some risk that it could contain calcareous species of interest and would therefore be reclassified as lowland calcareous grassland.

Traditional orchards. These are included within the grassland type for this methodology. They comprise fruit trees over modified grassland at Reach and occur at two locations. The main area of habitat is located at 24 Acres where the orchard was planted in 2013. Traditional orchards are a Habitat of Principal Importance.

The old calcareous grasslands are of great significance for plants and fungi with a number of rare species recorded in this habitat type, such as Spanish Catchfly. There are several records along the Devil's Dyke, close to the survey area, of lizard orchid *Himantoglossum hiricinum* which is an exceptionally scarce species. The botanical diversity of this habitat type also gives rise to important assemblages of invertebrates, particularly butterflies with small and chalk-hill blue butterflies recorded in the area.

The Devil's Dyke has clearly been identifiable as a feature of botanical interest for some time. It was visited by John Ray (1627-1704). In his flora of 1660 he records '*mouse-eare with a large white flower… upon the hill of the heath, on Newmarket heath among the bushes, and in the devills ditch plentifully*', '*bloody cranes-bill… found on the Newmarket heath and in the Devil's Ditch*' and '*flie orchies… On the banks of the Devils ditch'*. These being field chickweed, blood crane's-bill and fly orchid (Ewen and Prime, Trans. and Eds., 1975). Ennion (1949) describes the chalk grassland on the Devil's Dyke at Reach in 1948 as such; '*The grey-green groundwork of the leaves and grasses, enlivened by a myriad points of colour has a quality of Jacobian needle-work. Purple of knapweed and bellflower, pink sainfoin, blue of scabious and harebell, lemon rockrose, golden lady's fingers, white of meadowrue and milfoil…'*. Whilst some of this diversity is still apparent it appears likely there has been a decline, with scrubbing up of the feature.

Recent studies have suggested that where conditions are appropriate there is some evidence that key botanical species have moved from the Devil's Dyke and colonised the adjacent habitats (Leslie, 2020). This provides promise for habitat restoration on the dyke, and also for habitat creation projects within adjacent areas.

The combination of a linear feature with good connectivity and suitable, well-established habitats means that the Devil's Dyke is highly likely to support populations of reptiles. There are records of common lizard *Zootoca vivpara* through the area. This species may also be present on the grazing marsh habitat within the rough grassland that is present there. There is a good population of common lizard at Wicken Fen which may aid colonisation of the grazing marsh as they succeeded from arable. The mosaic of wetland habitats right up to the edge of Reach Village offer good opportunities for grass snake *Natrix helvetica* also.

Grass snake

The grazing marshes provide significant opportunities for birds all year around. The wet grasslands provide breeding habitat for a range of notable species such as redshank and yellow wagtail. The combination of habitats provide opportunities for cuckoo in spring as it parasitizes the nests of reed warbler *Acrocephalus scirpaceus* and meadow pipits *Anthus*

pratensis. In winter these areas would provide foraging grounds for species such as snipe and owls including barn owl *Tyto alba* and short-eared owl *Asio flammeus.* The grasslands on the chalk habitats, in combination with arable crops, will provide important habitat for farmland birds including corn bunting, grey partridge and yellowhammer *Emberiza citronella.*

The combination of open grassland habitats and grazing produce a rich source of aerial prey for bat species. Common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and noctule *Nyctalus noctula*, all previously recorded in the area, are likely to make use of this resource. The linear nature of the Devil's Dyke may also provide a key feature for bats in the area. Bat species require strong features in the landscape to enable them to navigate using their echolocation. The dyke may provide such commuting opportunities for these and other species which have been recorded in the area, including one of the rarest species in the UK, the barbastelle bat *Barbastella barbastellus.* This feature might provide a key commuting route from the higher ground down to the fens which have a high concentration of prey for the bats.

Other mammals are likely to use the grassland habitats, notably harvest mouse *Micromys minutus* which has been recorded in the area. This species will build nests in areas of longer grass, such as those on the Devil's Dyke and along the droveways.

The peat habitats, which are largely found in the Wicken Vision area, provide value to us beyond biodiversity which are worthy of consideration. Peat is one of the best carbon store habitats in the UK and therefore their conservation should be considered to help address climate change issues.

Woodlands

Other woodland; mixed; mainly broadleaf (w1h5). Virtually all of the woodland within the Neighbourhood Plan Area comprises plantation woodland. This is typically mixed woodland with some yew although it is dominated by broadleaf species, notably beech. Ages of the woodlands vary with the larger areas of Reach Wood created in 1994, Reach Plantation in 1998 and the woodland at 24 Acres was planted most recently in 2013. Within the clunch pits on Chapel Hill are several other smaller areas of woodland which have also been planted. Whilst the date of their planting is unclear it is likely to have been in the 1990s. A wide variety of woodland are categorised as Habitats of Principal Importance however due to these young age of these woodland types they have not been classified as such here.

The plantation woodlands are typically developing well although the growth is slow at Reach Wood owing to the very poor soil conditions at this location. Due the relatively young ages of these woodlands they have not have the opportunity to develop significant woodland ground flora. Although some interest in the form of orchids have been recorded at Reach Wood these are not typical woodland species and are more likely associated with the ride habitats and grasslands.

Wet woodland (w1d). The areas around the ponds in the Wicken Vision have been classified as wet woodlands (w1d) as these are likely to be seasonally flooded and are dominated by willow *Salix sp* and alder *Alnus glutinosa*. Wet woodland is a Habitat of Principal Importance.

The new woodlands on higher ground are likely to provide cover for reptile species. Particularly with the combination of open ground for basking with nearby cover created in the woodland, rides and grassland at Reach Wood. The woodlands on the Wicken Vision will also provide terrestrial habitat for amphibians. Amphibian species recorded in the area include common toad *Bufo bufo* and common frog *Rana temporaria*.
The woodland which are situated in the arable farmland on higher ground are likely to be of significance for a number of bird species, providing shelter and foraging in an otherwise quite sparse landscape. Their value for bird species will increase over time. This is also likely to be the case for mammals and as the woodland develops they will be utilised more frequently by some specialist species such as brown long-eared bat *Plecotus auritus.*

These woodlands will be providing other important functions such as carbon storage, thereby helping alleviate some of the ongoing climate change issues that face us. There is some concern however, that woodlands planted on the peat will have a negative effect in this sense. These woodlands will degrade the peat which is such a good carbon store that the overall effect will be detrimental. Therefore the location of future woodland planting should be carefully considered.

Hedgerows and scrub

Hedgerow (h2a): Hedgerows are present throughout the Neighbourhood Plan Area. These are typically dominated by hawthorn *Crataegus monogyna* and blackthorn *Prunus spinose* with other species present such as dogwood *Cornus sanguinea*. Hedgerows which are dominated by woody native species qualify as a Habitat of Principal Importance.

Dense scrub (h3): Patches of dense scrub were present throughout the Neighbourhood Plan Area and these wrre typically dominated by bramble *Rubus fruticosus agg.*.

These provide important resources for wildlife in terms of food and shelter but they also provide opportunities for species to move through the landscape which otherwise might be inhospitable. This is likely to be the case for amphibian and reptiles, as well as bats. The hedgerows and the understory below them provide important habitat in combination with arable crops for the farmland bird assemblage and also small mammals.

Wetlands, rivers and lakes

Aquatic and marginal vegetation (f2d): Marginal vegetation is present along the waterways and open water. Due to seasonal constraints it was difficult to identify species but common reed *Phragmites autralis* was frequent along the lode margins and other species such as purple loosestrife *Lythrum salicaria*, reedmace *Typha latifolia* and willowherbs *Epilobium sp.* are likely to be present. Due to the length of the waterways the marginal common reed stands are likely to provide a significant resource for wildlife.

Reedbeds (f2e). These are present in some of the ponds but they are not extensive. Reedbeds are a Habitat of Principal Importance and are typically dominated by common reed.

Eutrophic standing waters (r1a): Several ponds are present in the Wicken Vision area. Many of the ponds are well-established and are former coprolite pits, or borrow pits where clay has been extracted to build and repair the banks of Reach Lode. New scrapes have been created in the Wicken Vison area to the west and to the north to provide open water and marginal habitats for wildlife. These waterbodies are surrounded by marginal vegetation. The coprolite pits are surrounding by wet woodland and the scrapes are surrounding by lower vegetation such as reeds and rushes. Ponds are Habitats of Principal Importance.

Other rivers and streams (r2b): The Reach Lode is a key waterway and is fringed by marginal vegetation forming an important wildlife resource. A second waterway of significance, which does not quite qualify as river or stream is the Catchwater Drain which runs alongside the boundary between the chalk and the fen. Other smaller streams and ditches are present throughout the survey area, some of which are fed by springs welling up where the chalk meets the underlying clay.

The lode and ponds on the Wicken Vision area have considerable potential to support important assemblages of aquatic flora. This is because of their age and connectivity to other high quality aquatic habitats at Wicken Fen. Notable species which have been recorded in the area in the past include hairlike pondweed *Potamogeton trichoides*, marsh dock *Rumex palustis* and narrow-leaved plantain.

The rich and dense flora associated with the wetland habitats in the Wicken Vision area will also provide shelter, foraging and larval food plants for a host of notable invertebrate species. These include scarce beetles, such as *Stenolophus teutonus* which lives on banks of waterbodies. These habitats are also home to notable dragonflies and damselflies such as the scarce chaser *Libellula fulva* and the variable damselfly *Coenagrion pulchellum*.

The aquatic pond habitats are likely to support amphibians and the waterways may support notable fish species such as the European eel *Anguilla Anguilla*. Predators of these species have also been recorded and will include otter, grass snake and kingfisher *Alcedo atthis*. The ponds, drains and lode may support populations of water vole.

The rivers and drains will be important corridors for wildlife through the landscape. They will also perform other functions that are of value to us such as flood alleviation and drainage services.

Water vole

Cropland

Arable field margins (c1a): Field margins are present throughout the arable landscape including that on the fen habitats and the higher chalk habitats. However, these margins are typically very narrow and the associated drift of farming applications is likely to have resulted in poor quality plant communities in these locations.

Cereal crops (c1c): Arable farmland is one of the dominant habitat types through the survey area and particularly to the south where the drier ground is present. Cereal cropping is likely to be most common through the Neighbourhood Plan Area and certainly in the higher chalk areas. Some areas of arable have been left fallow, particularly on the lower fen areas, and this has resulted in a flush of arable weeds which are likely to provide an important temporary food resource for wildlife.

Intensive farmland habitats are typically poor for biodiversity however this does not mean that they will not support species and features of note. The croplands around Reach will be critical for the farmland bird populations which will include corn bunting, grey partridge, and skylark *Alauda arvensis.* These crops and their edge habitats will be of significance for some notable mammal species such as brown hare *Lepus europaeus* and harvest mouse. There are some records of rare arable weeds such as dwarf spurge *Euphorbia exigua* which could occur on the margins of the arable fields.

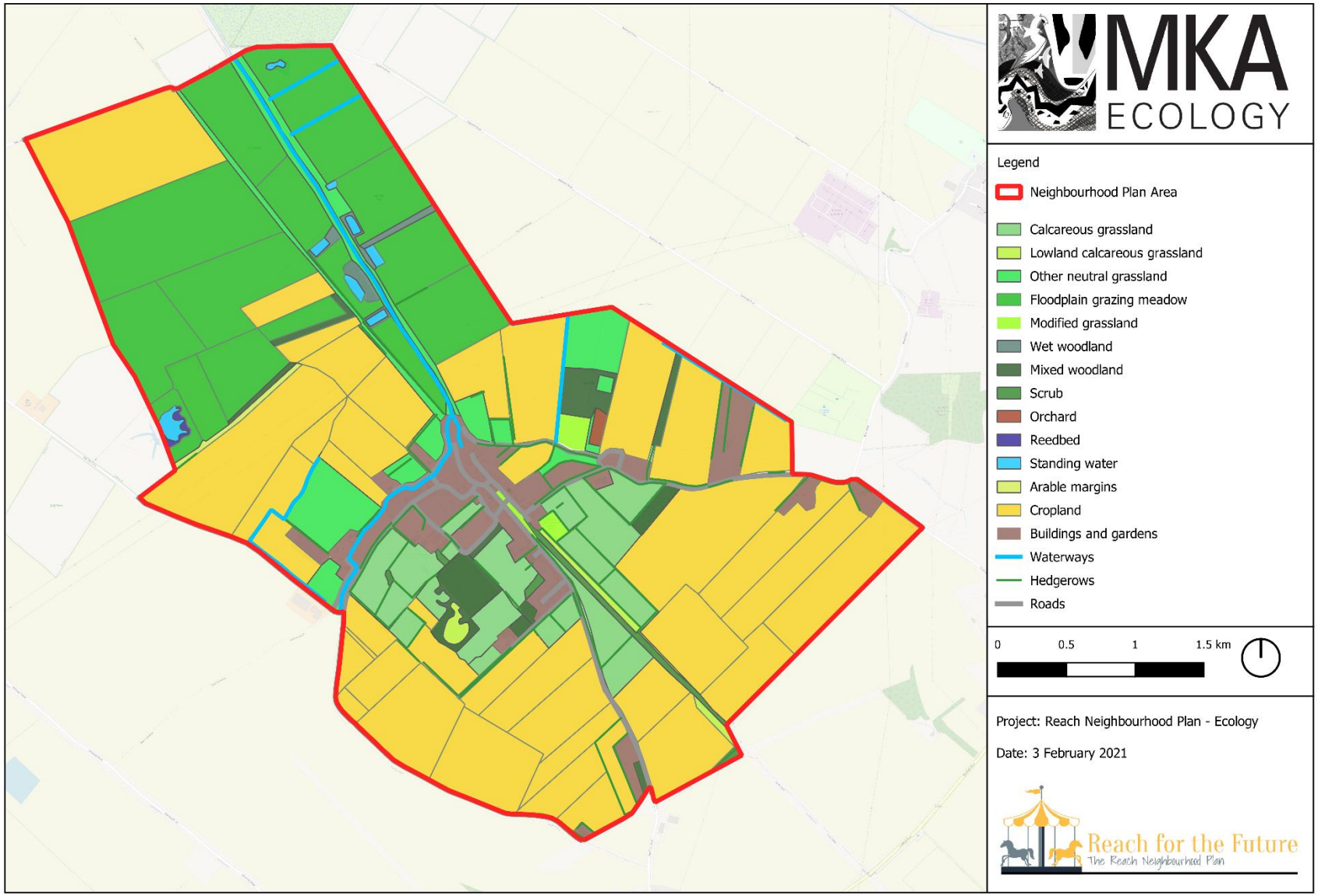
Urban

Developed land/sealed surface (u1b): This habitat type includes the roads and tracks that run through the survey area.

Suburban/mosaic of developed/natural surface (u1d): This habitat type has been used to classify the complex matrix of habitats that form the village and the residential properties there. Being a rural location the gardens tend to be larger and they are likely to hold significant value for wildlife.

As with the intensive farmland the built environment is less suitable for wildlife. However there are a range of notable species which live in close proximity to us on a regular basis. At Reach bird species such as house sparrow *Passer domesticus* and swift *Apus apus* will rely on the nesting opportunities in dwellings and outbuildings. The increasingly scare hedgehog *Erinaceus europaeus* will be using the garden habitats for foraging and wintering. The garden habitats, with their variety of flowering plants, will also be an important pollen and nectar resource for many invertebrate species.

Figure 5: Reach Habitat Map



4 SENSITIVITIES AND OPPORTUNITIES

In order to provide an overview of the sensitivities and opportunities that are apparent within the Reach Neighbourhood Plan the area has been zoned to allow for appropriate measures in each location. This is necessary due to the starkly different habitats types presented in the parish. Each of the zones has differing sensitives and opportunities depending on the habitats and features therein.

Some sensitivities and opportunities are relevant to all parts of the Neighbourhood Plan Area. The assessment has identified a range of greenspaces through the survey area. These range from nationally important SSSI, through landscape scale habitat creation initiatives with the Wicken Vision, to smaller areas of habitat which are not designated and do not contain priority habitats types, but nevertheless are important features for the ecological network at Reach. These areas all make up the green infrastructure of Reach and should be assessed for suitability as Local Green Spaces using the criteria of the National Planning Policy Framework. These areas are summarised as follows;

- The Devil's Dyke
- Reach Wood
- Reach Plantation
- 24 Aces
- The Hythe
- Fair Green
- Drying Green
- Cemetery
- Barnston Drove
- Church of St Ethelreda and the Holy Trinity Churchyard

Connecting these areas are other features which are of value such as Barston Drove and hedgerows. These provide functional connectivity that improves the quality of the other greenspaces. These features are all shown on Figure 7 and it is proposed that these are protected in the Reach Neighbourhood Plan.

There are opportunities to explore new areas of habitat creation and connectivity. These are detailed in the tables below for each zone however Figure 8 provides potential areas for enhancing connectivity. This includes connectivity to neighbouring parishes such as Swaffham Prior and Burwell.

Connectivity to Burwell can be achieved through planting and enhancements along Burwell Road. During consultation it was suggested biodiversity connectivity could be combined with public access to improve walking and cycling safety between Reach and Burwell. Feasibility for new access routes with biodiverse margins such as hedgerows and wildflower verges would provide a way to achieve better access and ecological connectivity.

Connectivity to Swaffham Prior to the south could be achieved through enhancement planting and management of Swaffham Road and Barston Drove. Improved management of verge habitats would help to promote grassland diversity at both locations. Recent guidance has been published for such measures by Plantlife (2019). Further hedgerow planting would also help to improve ecological connectivity.

With the advent of the Biodiversity Emergency there are a several initiatives and projects to help reverse long-terms declines. Some of these initiatives are locally based and it is recommended that the community explore these to encourage wider awareness of the issues. Of note is Natural Cambridgeshire which is the Local Nature Partnership. Doubling Nature is a current project and the community of Reach could help by making a pledge to double nature as part of the Neighbourhood Plan. The opportunities for biodiversity interventions set out within this document will help to achieve that aim.

Some development within Reach is inevitable. The sensitivities and issues concerning development in each of the zones are set out in the tables below. However, there are some

principles that should be applied to all development activities and these should be included in the neighbourhood plan. These are as follows;

- Ensure the mitigation hierarchy is followed. 1) Ecological impacts should be avoided, this may require development in alternative locations. 2) Where ecological impacts are impossible to avoid these should be mitigated, and measures will be required to minimise the scale of impact. 3) As a last resort when impacts cannot be avoided or mitigated then compensation must be provided.
- Ensure no detrimental impacts on Local Green Spaces (as set out above).
- Any development must adequately assess the potential impacts on ecological features and demonstrate how the mitigation hierarchy has been followed.
- Development should deliver a measurable net gain in biodiversity and this should be calculated with an appropriate metric. In anticipation of a mandatory 10% biodiversity net gain within the forthcoming Environment Bill a Biodiversity Metric has been created by Defra (Crosher et al., 2019). This metric uses habitats as a proxy for biodiversity value and enables a quantifiable comparison of biodiversity value before and after development. Where it is not possible to deliver a biodiversity net gain within the site then off-site measures should be explore. Forthcoming development in Reach must deliver a measurable biodiversity net gain with a target of 20%. This should be calculated using the most up to date metric recognised by Defra.
- Biodiversity measures should be an integral part of development design. Each proposal must be supported by a Landscape and Ecology Management Plan which details how existing ecological features are to be protected, how new features will be created, and how these will be managed in the long-term.
- As standard all development should incorporate features integrated into the fabric of the buildings to provide habitat for nesting birds and roosting bats. Each dwelling or structure should have a minimum of two integrated bird boxes and two integrated bat boxes. Target bird species are swift and house sparrow, for open cart lodge type structures swallow should be the target species. Crevice roosting bats, such as pipistrelles should be target bat species.

The following tables identify the sensitivities and opportunities for the zones within Reach. Three zones have been created to facilitate this and these are shown in Figure 9. These zones are as follows;

Fen: Situated to the north and comprising the lower ground, falling largely within the Wicken Vision area.

Chalk: Situated to the south and east this area comprises the upper ground with chalky substrate. It includes the arable farmland and also the area of clunch pits on Chapel Hill.

Village: This is the built environment comprising dwellings and gardens. This zone also includes the open greenspaces of Fair Green, Drying Green, The Hythe and the recreation ground.

For each zone the following are considered;

- Characteristics
- Key habitats (including priority habitats)
- Key species
- Nature conservation designations
- Sensitivity to development
- Mitigation options for development
- Opportunities for positive biodiversity interventions

Swift, a local priority species which can provided for through the installation of boxes at Reach

Figure 6: Key green infrastructure in the Reach Neighbourhood Plan Area

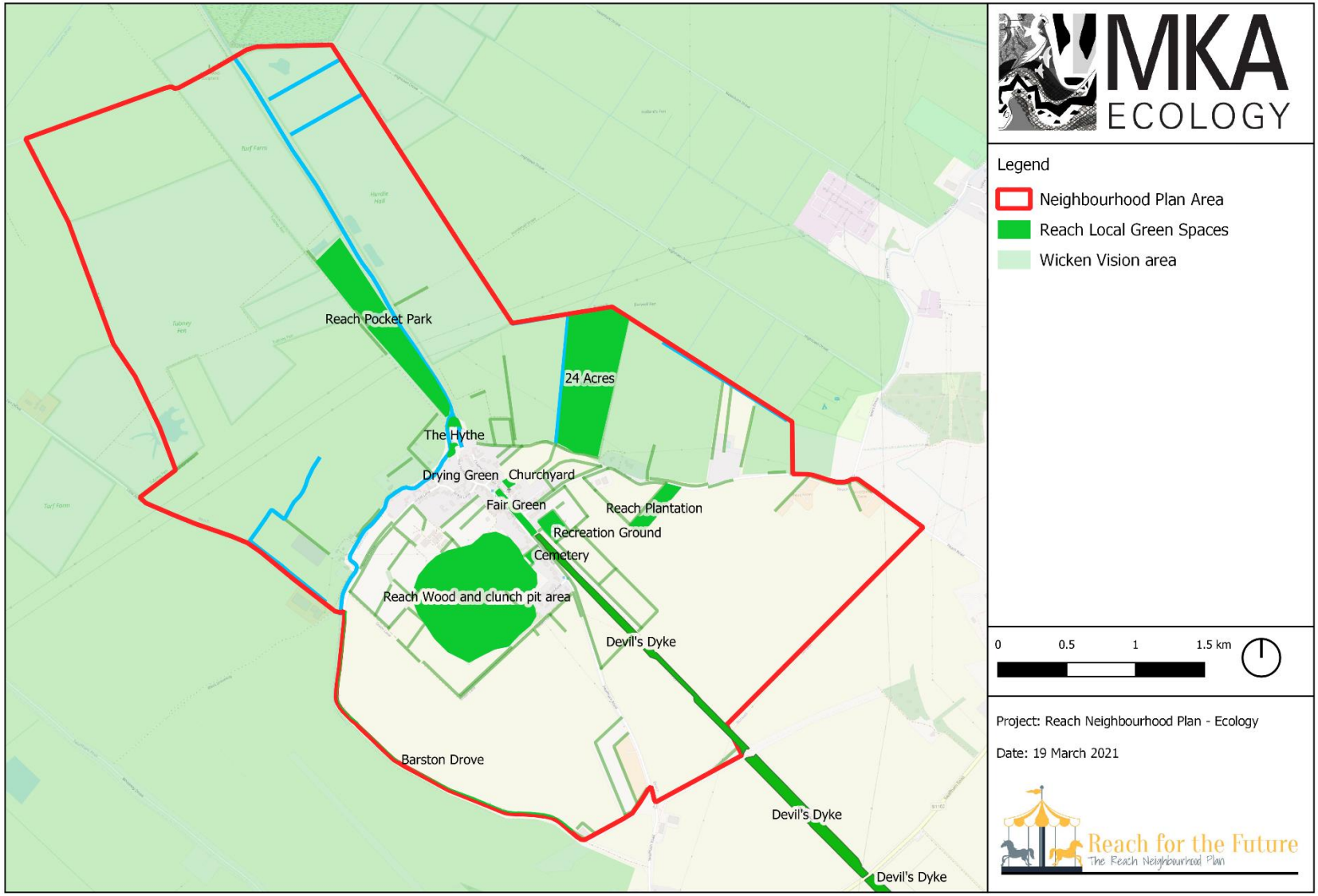


Figure 7: Opportunities for connectivity within the Reach Neighbourhood Plan Area

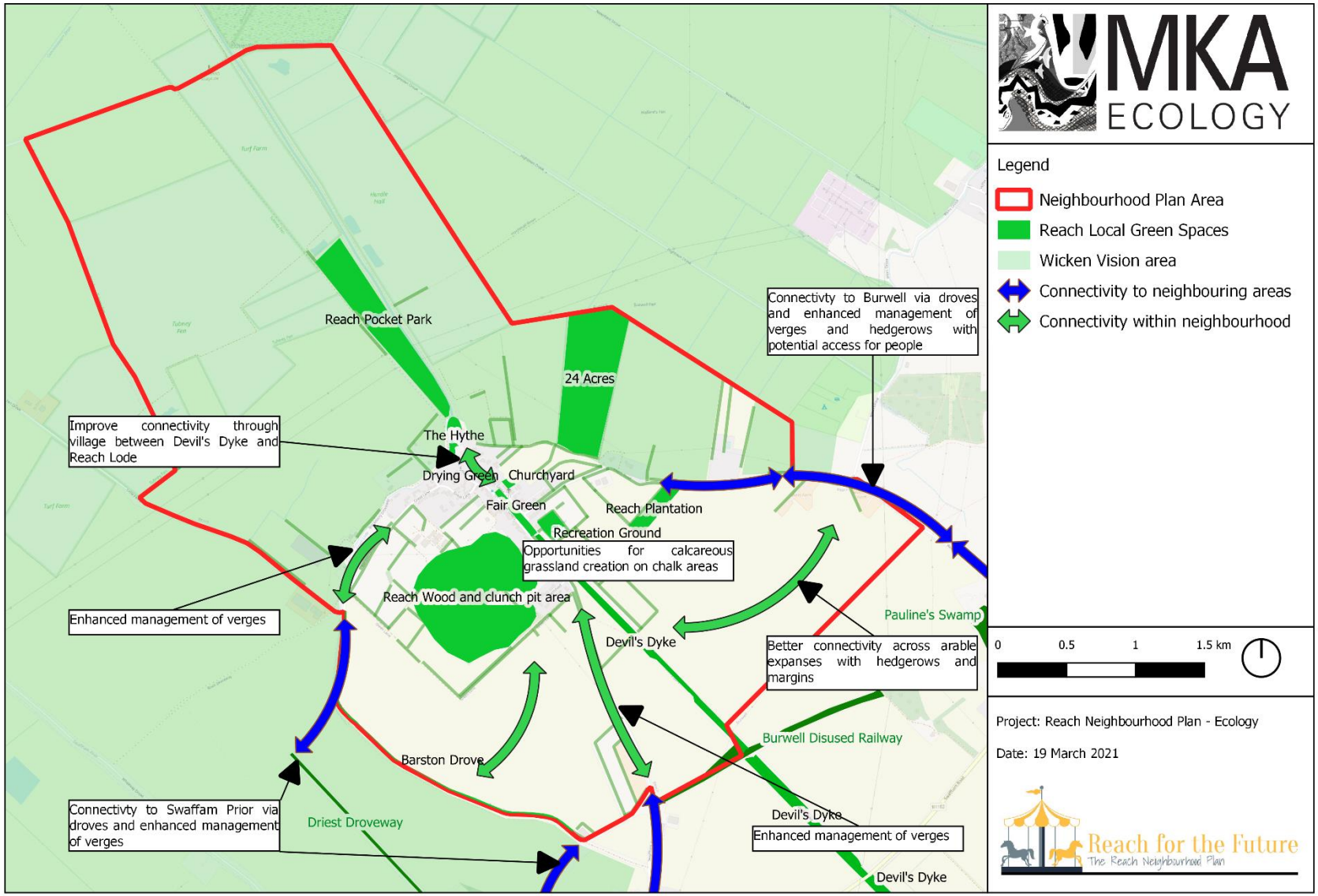


Figure 8: Reach zones

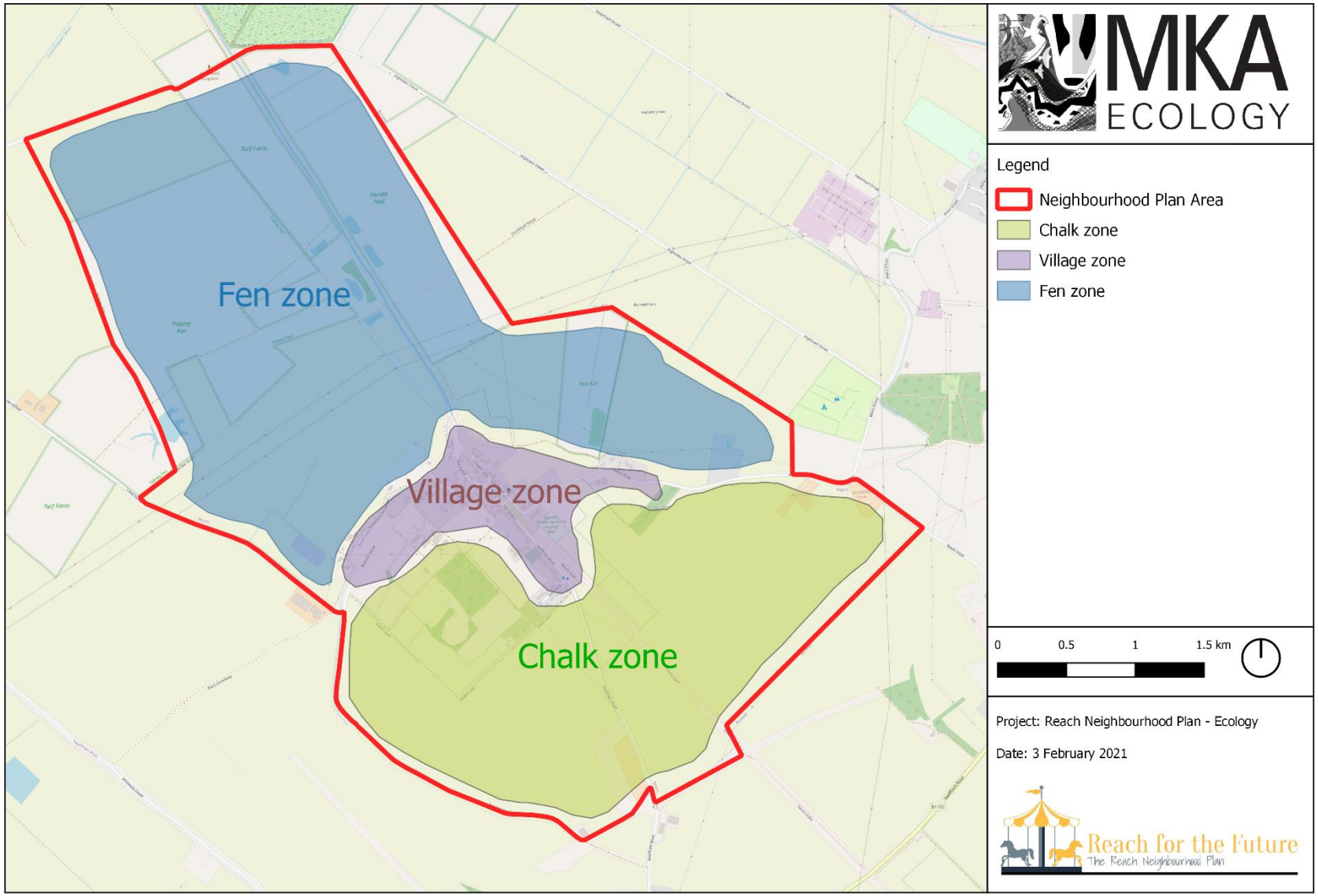


Table 3: Sensitivities and opportunities for the fen zone

Zone characteristics	Low-lying ground to the north of the Neighbourhood Plan Area comprising peat over gault clay. Much of the area is seasonally wet and it is dominated by grazing pasture, with some arable farmland. Water features are common and include the Reach Lode, coprolite pits, drains and man-made scrapes created specifically for nature conservation. All of this zone lies within the Wicken Vision which is likely to be the key driver for habitat change in this location in the future.
Key habitats	• Lowland floodplain grazing pasture (Habitat of Principal Importance) • Wet woodland (Habitat of Principal Importance) • Traditional orchard (Habitat of Principal Importance) • Hedgerows (Habitat of Principal Importance) • Reedbed (Habitat of Principal Importance) • Ponds (Habitat of Principal Importance) • Reach Lode does not qualify as a Habitat of Principal Importance as, strictly speaking, it is a canal. However, in this assessment it is assigned equal value due to the high quality habitat it provides
Key species	• Aquatic plants • Invertebrates (typically associated with the aquatic habitats) • Amphibians • Reptiles • Birds associated with the seasonally wet grassland areas during the breeding season (redshank, lapwing, yellow wagtail) and those associated with the aquatic habitats (kingfisher, reed warbler and cuckoo). Also of significance for wintering assemblages including waders, wildfowl and raptors such as owls and harriers. • Mammal species including otter, water vole, harvest mouse and foraging bats.
Nature conservation designations	No statutory or non-statutory designations although the entire zone lies within the Wicken Vision area
Sensitivity to development	• Highly sensitive to development • Potential direct loss of key habitats • Potential direct impacts on key species • Potential indirect impacts on key habitats and species through aquatic pollution pathways, changes in the water table, disturbance • Potential loss of peat and associated carbon storage • Development would potentially be detrimental to Wicken Vision
Mitigation options for development	• No impacts on key green infrastructure features • Ensure adequate assessment of impacts on key habitats and species and apply mitigation hierarchy • Measures in place to avoid indirect impacts such as pollution, disturbance and changes to the water table

	• Deliver a measurable biodiversity net gain
Opportunities for positive biodiversity interventions	It is anticipated that the positive biodiversity interventions that will take place with the fen zone will largely be driven by the aim of the Wicken Vision and this is endorsed here. Other measures which should be considered include; • Botanical assessment of Reach Pocket Park and consideration against County Wildlife Site criteria • Creation of new wildlife scrapes • Exploring opportunities for greater control of water levels through stakeholder engagement • Opening out scrub from watercourses and managing bank profiles for wildlife, particularly springs lead from higher ground • Creation of an artificial otter holt close to Reach Lode • Barn owl boxes on the fen edge

Table 4: Sensitivities and opportunities for the chalk zone

Zone characteristics	Situated on the higher ground to the south and east of the Reach Neighbourhood Plan Area with the habitats strongly influenced by the chalk substrates. Much of the area is set down to arable farmland but remnant areas of species-rich calcareous grassland survive, notably the Devil's Dyke which is of great ecological significance. Small plantation woodlands provide further features and the mosaic of habitats around the clunch pits on Chapel Hill are of note.
Key habitats	• Lowland calcareous grassland (Habitat of Principal Importance) • Hedgerows (Habitat of Principal Importance) • The woodlands do not qualify as a Habitat of Principal Importance due their young age. However, in this assessment they are assigned equal value due to the general paucity of this habitat in the area • Barston Drove contains grassland habitats which could be of botanical value but no data available • The mosaic of habitats around the clunch pits on Chapel Hill provides value
Key species	• Calcareous grassland flora • Invertebrate fauna associated with the chalk habitats • Reptiles, particularly common lizard in the grassland and scrub habitats • Farmland bird assemblage (corn buntings, yellowhammer, skylark, grey partridge, turtle dove) • Foraging habitat for bats over grazing pasture and potentially a key commuting route along the linear Devil's Dyke • Harvest mouse in areas of grassland and brown hare in the arable fields
Nature conservation designations	• Devil's Dyke SSSI • Burwell Disused Railway CWS (directly adjacent)
Sensitivity to development	• Devil's Dyke is highly sensitive to development • Potential for indirect impacts from residential development resulting in excessive recreational pressure on Devil's Dyke (trampling, erosion, nutrient deposition through dog fouling) • The farmland is ecologically poor and therefore less sensitive to development. • The grazing pastures are currently of unknown value. The presence of the underlying chalk and nearby sites of significant value increases the risk of high value calcareous grassland habitats in these locations. • Potential direct loss of key habitats • Potential direct impacts on key species
Mitigation options for development	• No impacts on key green infrastructure features or designated site • Ensure adequate assessment of impacts on key habitats and species and apply mitigation hierarchy • Measures in place to avoid indirect impacts from recreational pressure (suitable alternative natural greenspace for dog walking) • Deliver a measurable biodiversity net gain

Opportunities for positive biodiversity interventions	• Botanical assessment of the clunch pit area on Chapel Hill and consideration against County Wildlife Site criteria • Explore opportunities to open up new areas of woodland in the clunch pit area on Chapel Hill for public access and management for biodiversity, opening up chalk faces for geological interest and creating invertebrate habitats • Botanical assessment of Barston Drove and consideration against County Wildlife Site criteria • Collaborative projects with landowners for habitat creation (calcareous grassland, hedgerows) particularly adjacent to the Devil's Dyke • Explore opportunities for habitat connectivity to help bridge gaps over areas of expansive farmland • Review of management of Devil's Dyke to consider long terms impacts of scrubbing up • Review of management of the grassland at Reach Wood to promote greater diversity in the sward

Table 5: Sensitivities and opportunities for the village zone

Zone characteristics	Situated in the centre of the Neighbourhood Plan Area and strongly influenced by the built environment. This zone contains some of the key open greenspaces including The Hythe, Fair Green, Drying Green, recreation ground and cemetery
Key habitats	No Habitats of Principal Importance but the key open greenspaces are all of value
Key species	• Reptiles within garden habitats and other green spaces • Birds species associated with the built environment (house sparrow, swift, swallow) • Bats with potential for roosts within buildings • Hedgehogs in garden habitats
Nature conservation designations	No statutory or non-statutory designations
Sensitivity to development	• Low sensitivity to development • Potential direct impacts on key species (development works affecting roosting bats or reptile populations, loss of nesting bird habitat) • Potential indirect impacts on key species (artificial lighting affecting nocturnal species, reduction in connectivity)
Mitigation options for development	• No impacts on key green infrastructure features • Ensure adequate assessment of impacts on key habitats and species and apply mitigation hierarchy • Measures in place to avoid indirect impacts such as pollution (particularly into the Catchwater Drain), disturbance and changes to the water table in low-lying land, impacts from artificial lighting. Lighting design should follow best-practice guidance from the Bat Conservation Trust (2018). • Deliver a measurable biodiversity net gain
Opportunities for positive biodiversity interventions	• Explore opportunities to remove the defunct sewage treatment works on The Hythe and create an ecological, cultural and archaeological hub for Reach • Botanical assessment of Cemetery and consideration against County Wildlife Site criteria • Explore opportunities for habitat creation in open greenspaces such Fair Green, Drying Green and recreation ground, this could include creation of areas of species-rich grassland • Encourage wildlife friendly gardening for residents (see Appendix 3 for potential opportunities for garden enhancement) • Explore opportunities for sensitive management of roadside verges following Plantlife guidance (Plantlife, 2019)

5 SUMMARY OF POLICY PROPOSALS AND OPPORTUNITIES FOR THE COMMUNITY

The following section provides a summary of potential policies for inclusion within the Reach Neighbourhood Plan. These are divided between policies intended to guide development, and policies intended to guide positive biodiversity interventions.

Policies intended to guide development within the Reach Neighbourhood Plan should include;

1) Protection of key green infrastructure, as set out in Figure 7.
2) Development must demonstrate that the mitigation hierarchy has been followed and that impacts on biodiversity features have been adequately addressed.
3) Development must deliver a measurable biodiversity net gain and demonstrate this with the most recent version of the Biodiversity Metric. Development should aim for a 20% gain.
4) Biodiversity features must be integral to design and new proposals must be accompanied by a Landscape and Ecology Management Plan.
5) Development proposals must include integrated features for birds with a minimum of two boxes for birds (target species house sparrow, swift, and swallow depending on design) and two boxes for bats (target species crevice dwelling species such as pipistrelles).
6) Development proposals must consider impacts of run-off pollution and changes in the water table in the fen zone.
7) Residential and tourism development proposals must consider impacts of increased recreational pressure on sensitive ecological features, particularly the Devil's Dyke and disturbance within the Wicken Vision areas.
8) Any lighting associated with development must be managed appropriately for wildlife following the best-practice guidelines developed by the Bat Conservation Trust (2018).

Policies intended to guide positive biodiversity interventions within the Reach Neighbourhood Plan should include;

1) Explore opportunities to create new habitat connectivity within Reach and also to neighbouring areas, as set out in Figure 8.
2) Make a parish pledge to the Natural Cambridgeshire Doubling Nature Project.
3) Botanical assessment of Reach Pocket Park, the Cemetery, the clunch pits and Barston Drove for consideration against County Wildlife Site criteria.
4) Exploring opportunities for greater control of water levels in the fen zone through stakeholder engagement.
5) Enhancing waterways in the fen zone through bankside habitat management.
6) Provision of an artificial otter holt close to Reach Lode.
7) Provision of barn owl boxes on the fen edge.
8) Explore opportunities to open up new areas of woodland in the clunch pit area on Chapel Hill for public access and management for biodiversity.
9) Collaborative projects with landowners for habitat creation (calcareous grassland, hedgerows) particularly adjacent to the Devil's Dyke
10) Review of management of Devil's Dyke to consider long terms impacts of scrubbing up
11) Review of management of the grassland at Reach Wood to promote greater diversity in the sward
12) Explore opportunities to remove the defunct sewage treatment works on The Hythe and create an ecological, cultural and archaeological hub for Reach
13) Explore opportunities for habitat creation in open greenspaces such Fair Green, Drying Green and recreation ground, this could include creation of areas of species-rich grassland
14) Encourage wildlife friendly gardening for residents (see Appendix 3 for potential opportunities for garden enhancements)

15) Explore opportunities for sensitive management of roadside verges following Plantlife guidance (Plantlife, 2019)

6 CONCLUSION

The parish of Reach contains a striking contrast of habitats types, moulded by the underlying geological conditions, which result in an area rich in biodiversity features. These chalk and fen habitats have shaped the cultural history of Reach and also its biodiversity. The diversity of habitats presents numerous exciting opportunities for the promotion of biodiversity, some of which are already being realised in the form of the Wicken Vision.

The fenland to the north and west of Reach are dominated by the Wicken Vision area. Here can be found lowland floodplain grazing marsh, ponds, wet woodland and the Reach Lode. These habitats contain a rich aquatic flora and support important assemblages of birds all year round. Other important species such as otter and water vole will inhabit these waterways too. The Wicken Vision has aims to restore much of the natural processes in this landscape and these will heavily influence this part of the Reach Neighbourhood Plan Area for the long-term future. This restoration work has already proved successful with increased sightings of species such as common crane, little egret and short-eared owl on Tubney Fen. Increasing sightings of kingfisher and otter within Reach Lode suggest an improving water quality.

The chalk areas and higher ground to the south and east are no less impressive with the biodiversity features they contain. The Devil's Dyke is one of the most important areas of calcareous grassland habitats within the UK, with some parts of international significance. This biodiversity feature of enormous value runs right into the heart of Reach village. The Devil's Dyke and the Reach Lode create a major linear wildlife corridor running through the landscape with Reach village situated right in the centre. Within the higher areas are other features of value including the developing woodland, of which there are very few in the landscape. Historical quarrying activities have resulted in the creation of a complex mosaic of habitats around the clunch pits on Chapel Hill. This mosaic offers a range of habitats and niches for biodiversity to thrive.

Otter

The village itself offer further habitats and features to add to the network. Gardens and small open spaces provide value for wildlife with the diversity of pollen and nectar resources they offer. Buildings themselves will also provide habitat for key species such as roosting bats and nesting house sparrow and swift.

These biodiversity features add great value to the community of Reach however they do increase sensitivity to potential development activities. It is inevitable that development will occur within the Reach, and indeed the residents' survey suggest that some small scale development is welcomed. A range of potential policies are proposed within this assessment to ensure that future development does not have a detrimental effect on the biodiversity of the area, and they offer an opportunity for development to make a positive contribution to it. Of

primary importance is the network of green spaces which should be designed as Local Green Space and protected in the Neighbourhood Plan.

The assessment shows that the fen and chalk zones are more sensitive to development and, if development were to take place this would best be situated within the existing village zone. However, development within this zone is not without risk of impacts, including on protected species such as bats and reptiles. Furthermore any residential development with Reach will need to carefully consider the potential impacts of greater recreational pressure of key ecological features, and particularly the Devil's Dyke. Other development, particularly that encouraging tourism will also need to carefully consider how it may change the level of recreational pressure on key habitats. Even small increases in recreational pressure could have significant impacts on the Devil's Dyke which is a narrow linear feature with few optional available for managing pressures The Wicken Vision is likely more robust in this sense given the scale of the area and active management of visitors by the National Trust.

Due to the rich network of ecological features there are number opportunities for the community to develop and further promote biodiversity. Much has already been achieved through community projects at Reach and these include habitat creation projects at Reach Wood, 24 Acres and Reach Plantation. Within this assessment a suite of biodiversity interventions are proposed. These measures, combined with appropriate and sustainable development, could help to ensure that Reach develops as a biodiversity hotspot offering a fantastic gateway to the Wicken Vision, whilst upholding the principles and aims of the Fen Biosphere.

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8 APPENDICES

8.1 Appendix 1: Legislation and Policy

Please note that the following is not an exhaustive list, and is solely intended to cover the most relevant legislation pertaining to species commonly encountered.

Subject	Legislation (England)	Relevant prohibited actions
Amphibians		
Great crested newt *Triturus cristatus* Natterjack toad *Epidalea calamita*	Schedule 2 of Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	• Deliberately capture or kill, or intentionally injure; • Deliberately disturb or recklessly disturb them in a place used for shelter or protection; • Damage or destroy a breeding site or resting place; • Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection; and • Possess an individual, or any part of it, unless acquired lawfully.
Reptiles		
Common lizard *Zootoca vivipara* Adder *Vipera berus* Slow-worm *Anguis fragilis* Grass snake *Natrix helvetica*	Part of Sub-section 9(1) of Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill or injure individuals of these species (Section 9(1)).
Sand lizard *Lacerta agilis* Smooth snake *Coronella austriaca*	Full protection under Section 9 of Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	• Deliberately or intentionally kill, capture (take) or intentionally injure; • Deliberately disturb; • Deliberately take or destroy eggs; • Damage or destroy a breeding site or resting place or intentionally damage a place used for shelter; or • Intentionally obstruct access to a place used for shelter.
Birds		
All wild birds	Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill, injure, or take any wild bird or their eggs or nests.

Subject	Legislation (England)	Relevant prohibited actions
'Schedule 1' birds	Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)	• Disturb any wild bird listed on Schedule 1 whilst it is building a nest or is in, on, or near a nest containing eggs or young; or • Disturb the dependent young of any wild bird listed on Schedule 1.
Mammals		
Bats (all UK species)	Schedule 2 of Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019	• Deliberately capture, injure or kill a bat; • Deliberately disturb a bat (disturbance is defined as an action which is likely to: (i) Impair their ability to survive, to breed or reproduce, or to rear or nurture their young; (ii) Impair their ability to hibernate or migrate; or (iii) Affect significantly the local

Subject	Legislation (England)	Relevant prohibited actions
	Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	distribution or abundance of the species); • Damage or destroy a bat roost; • Intentionally or recklessly disturb a bat at a roost; or • Intentionally or recklessly obstruct access to a roost. In this interpretation, a bat roost is "*any structure or place which any wild [bat]...uses for shelter or protection*". Legal opinion is that the roost is protected whether or not the bats are present at the time.
Badger *Meles meles*	Protection of Badgers Act 1992	Under Section 3 of the Act: • Damage a sett or any part of it; • Destroy a sett; • Obstruct access to, or any entrance of, a sett; or • Disturb a badger when it is occupying a sett. A sett is defined legally as any structure or place which displays signs indicating current use by a badger (Natural England 2007).

Subject	Legislation (England)	Relevant prohibited actions
Otter *Lutra lutra*	Schedule 2 of Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 Section 9(4)(b) and (c) of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Deliberately capture, injure or kill an otter; • Deliberately disturb an otter in such a way as to be likely to significantly affect the local distribution or abundance of otters or the ability of any significant group of otters to survive, breed, rear or nurture their young; • Intentionally or recklessly disturb any otter whilst it is occupying a holt; • Damage or destroy or intentionally or recklessly obstruct access to an otter holt.
Water vole *Arvicola amphibious*	Section 9 of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill, injure or take water voles; • Possess or control live or dead water voles or derivatives; • Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection; or • Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose.
Crustaceans		
White-clawed crayfish *Austropotamobius pallipes*	Section 9(1) of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill, injure or take white-clawed crayfish by any method.

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019

Full legislation text available at: https://www.legislation.gov.uk/ukdsi/2019/9780111176573

The Wildlife and Countryside Act 1981 (as amended)

Full legislation text available at: http://www.legislation.gov.uk/ukpga/1981/69/contents.

Countryside and Rights of Way Act 2000

Full legislation text available at: http://www.legislation.gov.uk/ukpga/2000/37/contents

Section 41 of Natural Environments and Rural Communities (NERC) Act 2006

Full legislation text available at: http://www.legislation.gov.uk/ukpga/2006/16/section/41

Many of the species above, along with a host of others not afforded additional protection, are listed on Section 41 of the NERC Act 2006.

Section 41 (S41) of the Natural Environment and Rural Communities (NERC Act 2006) requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England. The list (including 56 habitats and 943 species) has been drawn up in consultation with Natural England and draws upon the UK Biodiversity Action Plan (BAP) List of Priority Species and Habitats.

The S41 list should be used to guide decision-makers such as local and regional authorities to have regard to the conservation of biodiversity in the exercise of their normal functions – as

required under Section 40 of the NERC Act 2006. The duty applies to all local authorities and extends beyond just conserving what is already there, to carrying out, supporting and requiring actions that may also restore or enhance biodiversity.

Schedule 9 of Wildlife and Countryside Act 1981 (as amended)

In addition to affording protection to some species, The Wildlife and Countryside Act 1981 (as amended) also names species which are considered invasive and require control. Section 14 of the Act prohibits the introduction into the wild of any animal of a kind which is not ordinarily resident in, and is not a regular visitor to, Great Britain in a wild state, or any species of animal or plant listed in Schedule 9 to the Act. In the main, Schedule 9 lists non-native species that are already established in the wild, but which continue to pose a conservation threat to native biodiversity and habitats, such that further releases should be regulated.

Wild Mammals (Protection) Act 1996

Full legislation text is available at: http://www.legislation.gov.uk/ukpga/1996/3/contents

Under this legislation it is an offence to cause unnecessary suffering to wild mammals, including by crushing and asphyxiation. It largely deals with issues of animal welfare, and covers all non-domestic mammals including commonly encountered mammals on development sites such as rabbits, foxes and field voles.

Birds of Conservation Concern (BoCC)

This is a quantitative assessment of the status of populations of bird species which regularly occur in the UK, undertaken by the UK's leading bird conservation organisations. It assesses a total of 246 species against a set of objective criteria to place each on one of three lists – Green, Amber and Red – indicating an increasing level of conservation concern. There are currently 52 species on the Red list, 126 on the Amber list and 68 on the Green list. The classifications described have no statutory implications, and are used merely as a tool for assessing scarcity and conservation value of a given species.

National Planning Policy Framework (NPPF)

Full text is available at: https://www.gov.uk/government/collections/revised-national-planning-policy-framework

The revised NPPF was updated on 19 February 2019 setting out the Government's planning policies for England and the process by which these should be applied. The policies within the NPPF are a material consideration in the planning process. The key principle of the NPPF is a presumption in favour of sustainable development, with sustainable development defined as a balance between economic, social and environmental needs.

Policies 170 to 183 of the NPPF address conserving and enhancing the natural environment, stating that the planning system should:

- Contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes;
- Recognise the wider benefits of ecosystem services; and
- Minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.

Furthermore, there is a focus on re-use of existing brownfield sites or sites of low environmental value as a priority, and discouraging development in National Parks, Sites of Specific Scientific Interest, the Broads or Areas of Outstanding Natural Beauty other than in exceptional circumstances.

Where possible, planning policies should also;

"Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity".

8.2 Appendix 2: UK Habitat Classification Methodology

Methodology

The Reach Neighbourhood Plan Area was surveyed using the UK Habitat Classification and Mapping methodology (UK Habitat Classification Working Group, 2018). This is a comprehensive habitat classification system for the UK to ensure consistent mapping for ecological purposes.

UK Habitat Classification is a rapid hierarchical system for recording and classifying habitats with five levels. Greater definition of habitat type is achieved by moving through the levels starting with ecosystems and moving through broad habitats, priority habitats and Annex 1 habitats. Secondary Codes are applied to provide additional detail on the habitat type.

For the purposes of this assessment habitats were initially mapping using aerial imagery and was then ground tested and checked during field visits. Data were gathered electronically with a tablet and QField software.

Surveyors

The survey was conducted by Will O'Connor CEcol MCIEEM and Ellen Miller Qualifying Member CIEEM. Will has over fifteen years' experience working in the environmental sector, Ellen has one year's experience as an ecologist.

Constraints

The purpose of the habitat survey was to provide broad mapping information for the Neighbourhood Plan Area and it was not designed to micro-map all habitat features within the survey areas. Therefore it is highly likely that smaller habitat features are no present on the map. This is not considered to be a significant constraint for the purposes of this Biodiversity Assessment.

The survey was conducted during the winter months which are not ideal for enabling detailed analysis of habitat types. This is particularly true for grassland habitats when many of the forb species are not apparent throughout the winter months. This presents a constraint on the methodology as it means that there is potential for important habitats to be overlooked. Where relevant this is discussed in the assessment.

Due to the scale and complicated ownership structure of the survey area it was not possible to access all habitats for survey. Where access was not possible the habitats were mapped remotely using aerial photography or remoted from a vantage point in the field. In these instances it was sometimes necessary to assign a higher level classification to the habitat type. This is not considered to present a significant constraint on the survey methodology as in most instances the higher level of habitat classification is adequate for this assessment.

Dates and weather conditions

The dates and weather conditions for the surveys are showing in the table below.

Date	Time	Weather conditions
30 November 2020	10:30	Wind: W Beaufort 4 Cloud: 8/8 Temperature: 7ºC Rain: Frequent
18 January 2021	10:30	Wind: W Beaufort 4 Cloud: 8/8 Temperature: 5ºC Rain: None

8.3 Appendix 3: Measures for Reach residents to consider for enhancing the biodiversity in their gardens

Simple measures can be taken to provide high quality habitat for a diverse range of species in your garden. Outlined below are some practical ideas about how to manage your garden with wildlife in mind.

Plant native species

Planting native species in your garden will help increase native plant species diversity, provide more ecologically valuable habitats, and attract local wildlife into your garden. You should aim to plant different types of vegetation, such as trees, hedgerows, climbing plants, lawns and flower beds. This will create a variety of microhabitats to support species with different habitat preferences. An example of a garden with good structural diversity is shown in **Error! Reference source not found.**.

Lawns

An overly-manicured lawn leaves little room for wildlife. By mowing less frequently, reducing mow height or leaving a patch uncut, you can create additional foraging and breeding habitat for insects, which in turn benefits other species including small mammals, birds and reptiles. Lawns could also be re-sown with species-rich mixes, such as the calcareous grassland seed mix 'Emorsgate EM6 mix' (available here: https://wildseed.co.uk/mixtures/view/7). This will provide species-rich calcareous grasslands in keeping with those found in the wider landscape surrounding Reach parish. In order for this type of species rich grassland to thrive it is important to ensure the area is low in nutrients to avoid the excessive growth of vigorous grasses. This can be done by repeated mowing over time and always removing the arisings. Sometimes you can scrape away the topsoil to reveal a nutrient poor substrate below. Alternatively you can enhance the species diversity of an existing lawn. In order for wildflowers to be successful in an existing lawn it will be necessary to create bare patches where the seeds can set and establish. With any wildflower area the key to success is cutting at the right time, ideally after the wildflowers have flowered and set seed later in summer. A further cut in early spring can help to keep the grasses down. Always remove the arisings and this will help to keep nutrient levels down.

Trees

Planting native trees will provide additional foraging, roosting and breeding habitat for species such as insects, birds and bats. In a larger garden, plant species such as silver birch or wild cherry would provide benefits for a variety of species. If space is limited, smaller trees such as dogwood or dogrose could be planted. Dogrose provides nectar for pollinators and berries for birds including our winter visitors, such as redwing and fieldfare.

Hedgerows

Planting hedgerows in place of fencing, or enhancing existing hedgerows with native planting, will provide corridors for wildlife through the urban environment. Native shrubs like hawthorn, field maple, beech and holly are recommended as they provide foraging and nesting habitat for a range of species. A native hedgerow planted with hawthorn is shown in **Error! Reference source not found.**. Avoid trimming hedges until late winter or early spring so that wildlife can take advantage of the insects and fruits they provide during the winter months. Hedges should be trimmed outside of the bird breeding season (March to August inclusive) to avoid harming or disturbing nesting birds.

Photograph 1: Aim to create structural diversity in your garden by planting different types of vegetation including trees, hedgerows and flower borders (Wildlife Gardening Forum, 2021)

Climbers

Planting climbers and wall shrubs is a great way of providing additional vegetation in your garden, especially where space is limited. Species such as honeysuckle, dog rose and ivy provide foraging and nesting opportunities for species such as birds, bees and butterflies. Ivy provides particularly good nesting habitat for birds and flowers in autumn, providing a nectar source for insects when few others are available.

Photograph 2: Plant hedgerows with native species, such as hawthorn (Discover Wildlife, 2021)

Planting for pollinators

Plating flower beds or herbaceous borders will provide a valuable resource for pollinating insects, including bees, hoverflies, butterflies, moths and beetles. Aim to plant different shaped flowers to suit different insects and grow plants with different flowering times to ensure a year-round food source for pollinators. **Error! Reference source not found.** shows an attractive garden border plants with a variety of pollinator-friendly flower. Avoid planting 'double' or multi-petalled flowers like the ones shown in **Error! Reference source not found.**. These varieties have been bred so that most of the reproductive parts of the flower are converted into extra petals, rendering them useless for pollinators.

Photograph 3: Plant pollinator-friendly flowers with different shaped flowers along garden borders (Rye Free Reading Room, 2021)

Photograph 4: Avoid planting highly-bred flowers like this hybrid tea rose (left) and pompon dahlia (right) (Wildlife Gardening Forum, 2021)

Create a wildlife pond

Creating a wildlife pond is one of the best ways to attract wildlife into a garden. New ponds should be dug in a sunny spot and ideally filled with rainwater. Ponds can be created at any time of year but will establish much more quickly when dug in autumn. Ponds can even be created in small gardens using an old washing up bowl or ceramic sink, like the one shown in **Error! Reference source not found.**. Your newly created pond should be planted with native aquatic species, including floating species, emergent species and submerged species, which can all be found in a local garden centre. This will provide food, shelter, nutrient removal services and oxygen so that aquatic animals can thrive. While amphibians require aquatic vegetation for shelter and to lay their eggs, they tend to avoid ponds with more than 75% vegetative cover. Ideally, aquatic ponds should cover 50-75% of the water surface. **Error! Reference source not found.** shows a pond with a good cover of aquatic vegetation, which has provided effective breeding habitat for frogs.

Ponds require regular management to keep aquatic vegetation in check and ensure the pond doesn't become filled with coarse debris. Tips on managing ponds, including a breakdown of seasonal activities, is available here: Managing ponds (wlgf.org)

Install bird boxes

Bird boxes can be mounted onto mature trees, fences or buildings to provide nesting opportunities for birds in the local area. Installing generalist bird boxes will provision for a range of species. Boxes for priority species, such as house sparrow, swift and barn owl, could also be provided to support local populations. Some examples of bird boxes suitable for garden habitats are shown in Photograph 8. You can buy ready-made bird boxes from suppliers such as NHBS (https://www.nhbs.com/), or try your hand at constructing your own. The RSPB has

produced a guide on how to build your own bird box here: https://www.rspb.org.uk/fun-and-learning/for-families/family-wild-challenge/activities/build-a-birdbox/

Photograph 5: A garden pond supporting a healthy stock of frog spawn

House sparrow

House sparrow numbers have declined considerably in the UK and a lack of suitable nesting sites is thought to be a driving factor. Providing a house sparrow box is a great way to encourage the species to breed. As house sparrows typically nest in colonies, several boxes should be installed close together. Placing boxes near deciduous shrubs and trees, which provide foraging habitat for the species, will encourage house sparrow to use the boxes.

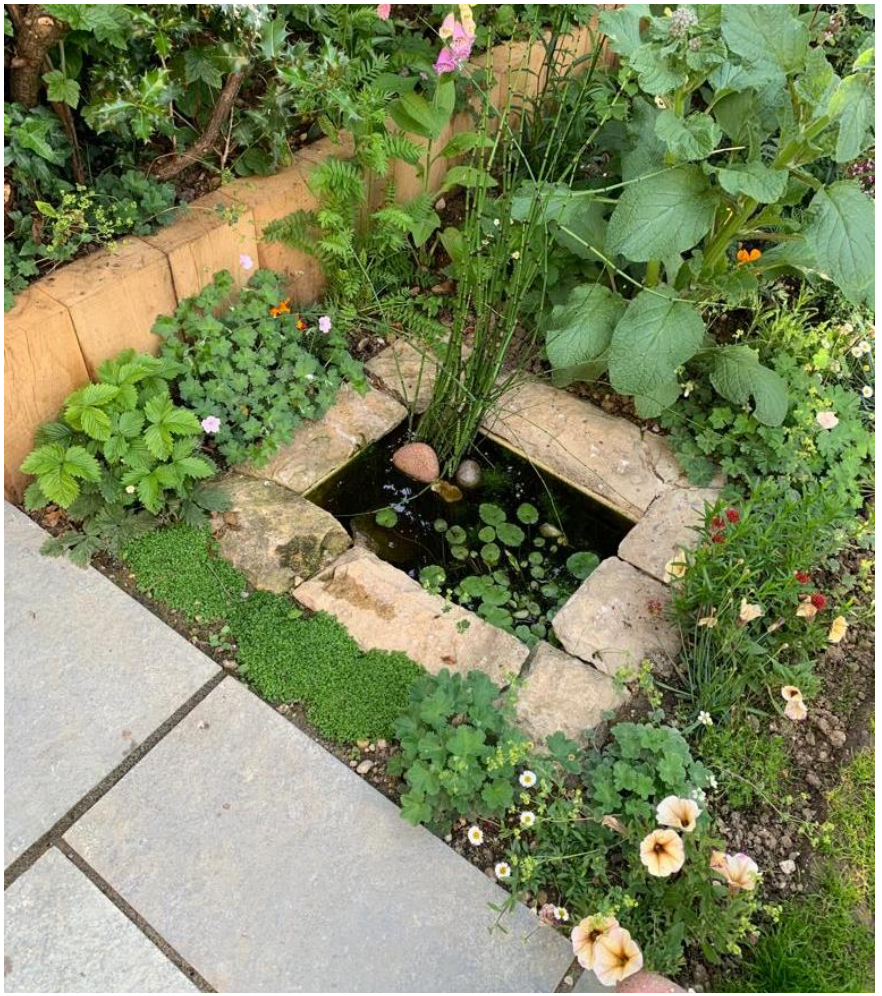
Swift boxes

Swifts are summer visitors to the UK and providing a swift box will ensure the species have places to breed year after year. Swifts prefer to nest in high places and boxes should be mounted on to buildings, ideally under overhanging eaves. You can attract swifts to a nest box by playing recordings of swift calls during the breeding season (May-July).

Barn owl

Barn owl boxes are best installed in gardens near to open countryside, such as grasslands or farmlands, in which the species hunts. Barn owl boxes can be installed on mature trees, or onto poles, with the access hole facing open countryside. It is highly beneficial to position barn owl boxes inside outbuildings if the building has an opening at least 3 metres above ground level, enabling constant access to the nest box.

Photograph 6: A small garden pond made using an old ceramic sink



Install bat boxes

Bat boxes can be mounted onto trees or buildings to provide additional roosting habitat for bats in the local area. Bat boxes are more likely to be inhabited if they are located close to foraging habitats or navigation features, such as hedgerows or lines of trees. Bat boxes should be sheltered from strong winds and exposed to the sun for part of the day. They are best placed facing south or east. You can buy bat boxes from suppliers like NHBS (https://www.nhbs.com/), or try your hand at constructing your own. The Wildlife Trust has produced a guide on how to build your own bat box here: https://www.wildlifetrusts.org/actions/how-build-bat-box

Create hedgehog highways and hedgehog domes

Boundary fences between gardens can negatively impact hedgehogs through loss of habitat connectivity. Installing a hole of at least 13cm x 13cm at the bottom of fences (with a focus on those separating residential gardens and excluding fences adjacent to roads) can help maintain habitat connectivity for hedgehogs. These holes are termed 'hedgehog highways' and an example is shown in Photograph 9. You could also put a hedgehog dome in your garden to provide a safe place for hedgehogs to hibernate. Hedgehogs line their nests with materials from the surrounding environment, so make sure there are plenty of leaves near to the box they can use. Hedgehog domes should be positioned in a dry, sheltered spot out of direct sunlight. Suppliers such as NHBS (https://www.nhbs.com/) stock hedgehog domes.

Provide deadwood features

Leaving felled wood, rotting wood or tree stumps in your garden provides valuable habitat for invertebrates, which in turn benefits other species such as small mammals, birds and reptiles. An example is shown in Photograph 10. Drilling holes or cutting notches into deadwood features provides even more places for insects to burrow and shelter. Creating undisturbed log piles can also provide basking habitat for reptiles in the summer months.

Insect boxes and hoverfly lagoons

Mounting an insect box or bee hotel onto trees or fences is a great way of attracting insects. Insect boxes should be positioned in a warm and dry place where they will catch the morning sun, ideally near wood piles, ponds and vegetation. Some insects, including hoverflies, require stagnant water to breed. You can create a hoverfly lagoon by filing an old container with grass cuttings, nettles, wood chips and then topping it up with water. A layer of leaf litter should be placed on top of the lagoon to provide a landing platform for female hoverflies to lay their eggs. Examples of a suitable insect box and a home-made hoverfly lagoon are shown in Photograph 7.

Provide bird feeders and bird baths

Bird baths provide a place for birds to bathe and drink, as well as providing an important resource for invertebrates. The positioning of a bird bath is important, as bird will only use it if they feel safe. Make sure birds have clear visibility as they bathe, with vegetation nearby to provide cover if alarmed, and perches to use when preening.

Creating a feeding station for birds provides a vital food resource, particularly in the winter months when there is less food available in the countryside. Providing a variety of food types, such as seeds, fat balls, peanuts and cereals, will attract a greater range of species into your garden. It is important to clean your feeders regularly to prevent the spread of disease in local bird populations. Feeders can be cleaned using a mild detergent and hot water.

Useful resources

The Wildlife Gardening Forum provides lots of helpful advice on how to make your garden wildlife friendly. Available here: Wildlife Gardening Home (wlgf.org)

The Wildlife Trust have lots of tips on how to create features for wildlife in your garden. Available here: https://www.wildlifetrusts.org/gardening

The RSPB provide helpful information on wildlife gardening here: https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/

Photograph 7: Mount insect boxes onto fences or trees (left – NHBS, 2021) and create hoverfly lagoons out of old pots to provide breeding habitat for invertebrates (right – Gardeners World, 2021)

Photograph 8: Install bird boxes onto trees and exterior walls in your garden, such as this Vivara Pro Seville WoodStone Nest Box (left) and this House Sparrow Terrace FSC Nest Box (right) (NHBS, 2021)

Photograph 9: Create 'hedgehog highways' in boundary fences to maintain habitat connectivity for hedgehogs (Hedgehog Street, 2021)

Photograph 10: Stacks of logs make great habitat for invertebrates, as well as other species such as amphibians and hedgehogs (RHS, 2021)