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Biodiversity Audit

Cadborough Marsh, Rye

Cadborough Marsh, Rye

1.1. Introduction

In March 2023, MKA Ecology Ltd was commissioned by Rother District Council to undertake Biodiversity Audits of 23 sites owned and managed by the district council. The aims of the biodiversity audits were to provide baseline information on the type and quality or condition of these areas with a view to identifying measurable opportunities for positive biodiversity interventions using the Biodiversity Metric. This report refers specifically to Cadborough Marsh, Rye (referred to in this report as Cadborough Marsh).

1.2. Methodology

The audits were performed using standard methodologies; habitats were defined according to the UK Habitat Classification and habitat conditions were assessed assist the 'Biodiversity Net Gain' metric schema (Natural England, 2023). By assigning values to habitats by their 'distinctiveness' or rarity, and their condition, the overall measurable biodiversity contained within the surveyed sites was calculated using the Defra Biodiversity Metric (v4.0). In principle, larger/longer, more valuable and better condition habitats score more highly. A detailed methodology is provided at the end of this document.

1.3. Site status

Cadborough Marsh is located within the High Weald National Landscape (formerly known as Area of Outstanding Natural Beauty (AONB). It is on the border between the High Weald and Romney Marshes National Character Areas (NCAs).

Cadborough Marsh is also located within The Brede Valley Local Wildlife Site (LWS). This designated site extends for 1130ha along the Brede Valley, covering an extensive ditch system supporting a diverse aquatic floral community, including notable species tubular water-dropwort *Oenanthe fistulosa* and frogbit *Hydrocharis morsus-ranae*. The latest survey of the LWS, conducted in 2021, recorded 18 butterfly species and 21 species of dragonflies and damselflies (SxBRC, 2023). Cadborough Marsh is located at the far east extent of the LWS.

Cadborough Marsh is located within Romney Marsh Biodiversity Opportunity Area (BOA; Sussex Biodiversity Partnership, 2024). The main habitat features of this area include coastal and intertidal habitats, including floodplain and coastal grazing marsh Habitat of Principal Importance (HPI). These features have made the area extremely important for birds (breeding and non-breeding).

Cadborough Marsh is identified as Coastal Floodplain Grazing Marsh Habitat of Principal Importance (HPI) in Natural England's Priority Habitats Inventory (Natural England, 2023c).

1.4. Site description

Cadborough Marsh is located on the southern edge of Rye (central grid reference: TQ 91314 20054), and is 1.28ha in size. It consists of a field, currently used for livestock grazing (predominantly horses), which is bordered to the north by a public footpath running between two lines of trees. Ditches line the south boundary of the field, and run adjacent to the public footpath and lines of trees.

Cadborough Marsh is bordered to the north and west by the suburban development of the outskirts of Rye; residential properties are situated on a steep escarpment rising from the north-west boundary. To the south and east, the site is bordered by a network of arable and pastoral fields, separated by ditches, which form The Brede Valley LWS (see Section 1.3). A railway line runs adjacent to the south-east boundary.

The table below shows the habitats which are present at Cadborough Marsh. Detailed descriptions of each habitat type are given in Section 1.16.

Habitat type	Description
Other neutral grassland	A widespread grassland type, distinguished by an absence of strong calcareous or acidic indicator species, and low occurrence of palatable grasses typical of modified grassland.
Coastal floodplain grazing marsh	Grassland that is periodically inundated or associated with ditches which maintain water levels, containing standing brackish or fresh water. Defined by proximity to water, topography, hydrological regime and management, rather than underlying soils or vegetation communities present. Can cover a range of terrestrial habitat types, as well as aquatic habitats (ditches and ponds).
Aquatic marginal vegetation	Often narrow (<0.5m wide) stands of vegetation fringing open water, characterised by wetland specialist plant species.
Building	Built structure.
Developed surface	Areas of road, car park and paths.
Lines of trees	Native and non-native trees planted in distinct lines.
Ditch	A man-made channel created for drainage.

1.5. Maps

The maps presented below show the existing habitats at Cadborough Marsh, and their conditions. Quadrats ($1m^2$) were used to determine the average number of species per square metre in the grasslands, which informs the condition assessments for Biodiversity Net Gain.

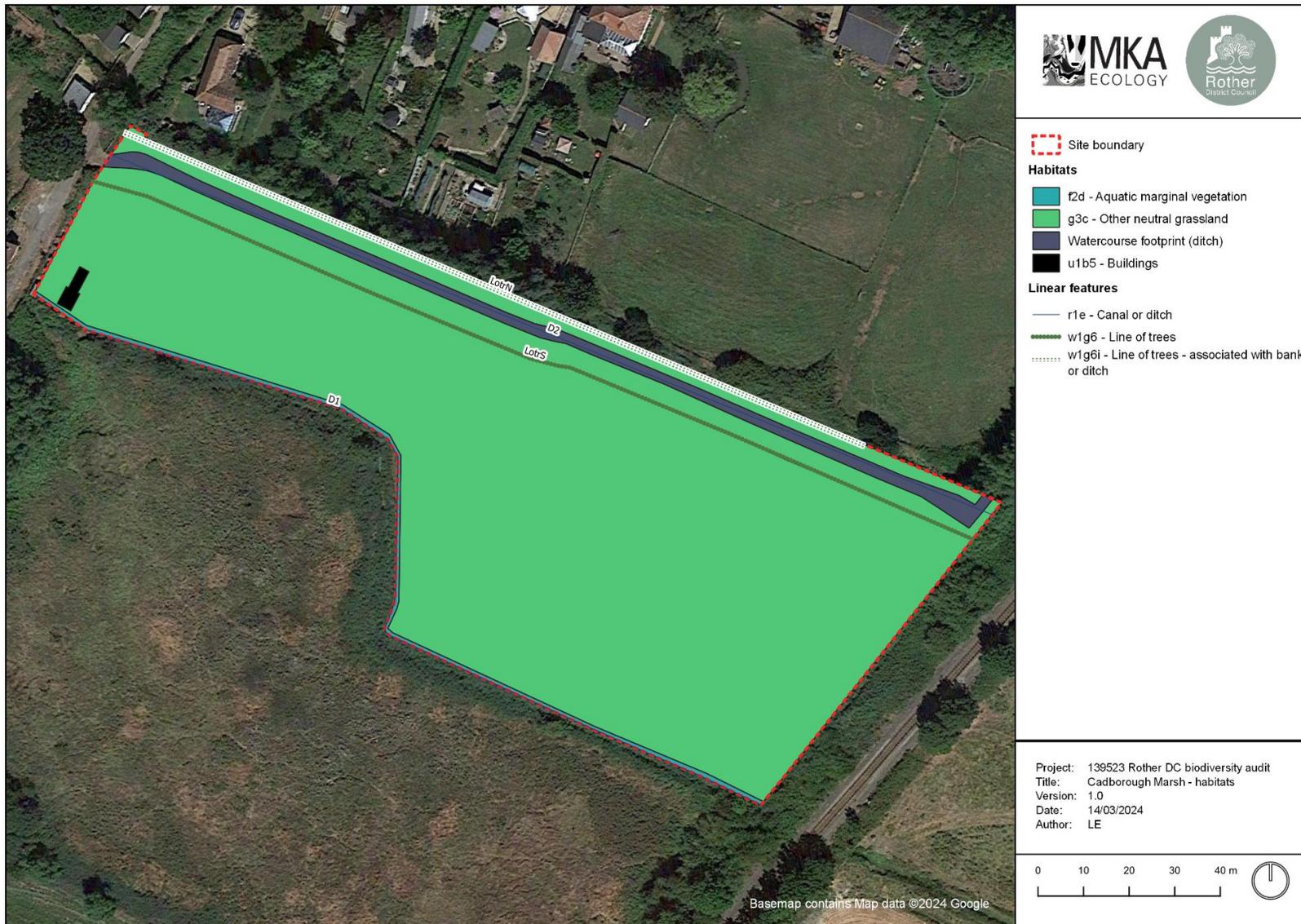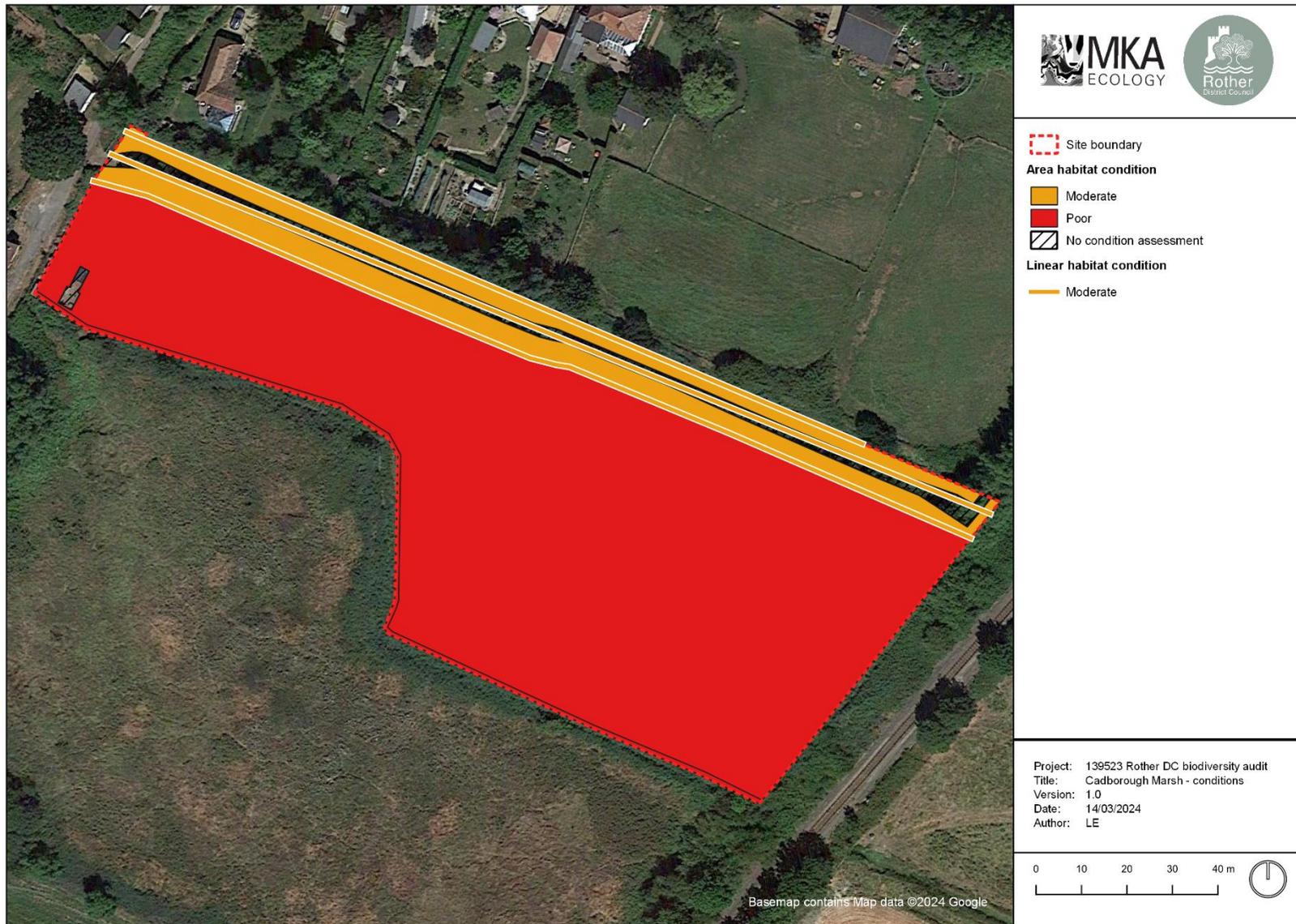**Figure 1: UK Habitats Classifications map**

Figure 2: Condition assessments

1.6. Photographs

Photograph 1: Other neutral grassland (coastal and floodplain grazing marsh): west end of site

Photograph 2: Other neutral grassland (coastal and floodplain grazing marsh): east end of site

Photograph 3: Other neutral grassland adjacent to sealed surface (public footpath)

Photograph 4: Building (livestock shed)

Photograph 5: Ditch (D1) and aquatic marginal vegetation

Photograph 6: Ditch (D2)

Photograph 7: Line of trees associated with ditch (LotrN)

Photograph 8:Line of trees (LotrS)

1.7. Priority habitats

The following Priority Habitats are present at this location:

- Coastal and Floodplain Grazing Marsh.

Habitats of Principal Importance are recognised as the most important habitats in the UK and are listed within the Natural Environment and Rural Communities Act (2006). Coastal and Floodplain Grazing Marsh is grassland that is periodically inundated, or associated with ditches which maintain water levels. This habitat type is defined by its proximity to water, topography, hydrological regime and management, and can cover a range of terrestrial habitat types, as well as aquatic habitats (ditches and ponds).

At Cadborough Marsh, the field currently used for grazing and the ditch along the southern boundary (D1) is classified as Coastal and Floodplain Grazing Marsh. The neutral grassland adjacent to the public footpath is not included within this priority habitat. This is based on the absence of grazing (it is separated from the field by a fence). As Ditch D2 is not directly adjacent to the field, it is also not included within this priority habitat.

1.8. Biodiversity units

The biodiversity units at Cadborough Marsh, based on broad habitat types, are shown in the table below. The units for coastal floodplain grazing marsh include those of the neutral grassland in the main field, Ditch D1, and the aquatic marginal vegetation.

Habitat type	Total biodiversity units
Other neutral grassland (grassland adjacent to public footpath)	1.52
Coastal floodplain grazing marsh (including Ditch D1)	6.98
Building	0.00
Developed land; sealed surface	0.00
Total habitat units	**8.50**
Linear features type	Total biodiversity units
Line of trees (ecologically valuable)	1.85
Line of trees associated with ditch	1.58
Total hedgerow units	**3.43**
Linear features type	
Ditches (D2 only)	1.89
Total watercourse units	**1.89**

1.9. Invasive non-native species

No invasive non-native species were recorded at Cadborough Marsh.

1.10. Constraints

Below are detailed some constraints relating to protected and notable species, which should be considered as part of habitat enhancement or creation programmes. It should be noted that most risks associated with protected species constraints can be easily avoided with appropriate planning.

- Potential presence of nesting birds within the grassland, aquatic marginal vegetation and trees.
- Potential presence of reptiles in grassland and aquatic marginal vegetation habitats.
- Potential presence of amphibians (such as great crested newt *Triturus cristatus*) in thick vegetation during their terrestrial phase, due to the presence of ditches.
- Potential use of the habitats onsite by foraging and commuting bats.
- Potential use of trees onsite by roosting bats.
- Potential presence of hedgehogs *Erinaceus europaeus*.
- Potential presence of badger *Meles meles* setts (no setts recorded during the site visit).
- Potential presence of water vole *Arvicola amphibius* in ditches and aquatic marginal vegetation.
- Potential presence of otter *Lutra lutra* in ditches.

1.11. Opportunities

The following sections detail the potential opportunities for creating new habitats or enhancing existing habitats at Cadborough Marsh, and also measures to provide further opportunities for priority species. Priorities identified within the Romney Marsh BOA (see Section 1.3) centre around wetland habitat management, restoration and creation.

Opportunities – Habitats

Habitat type	Opportunities
Coastal floodplain grazing marsh	This habitat type is given high distinctiveness by the Biodiversity Metric, and is a national and local priority habitat. This habitat is also the principal reason for inclusion of Cadborough Marsh within The Brede Valley LWS (see Section 1.3). Especially given its current poor condition and levels of degradation, restoration of this habitat should be a priority for this site. Efforts should focus on the following:

Habitat type	Opportunities
	• Removal of ruderal species and re-establishment of grassland habitats. Grazing pressure should be removed at first, but reinstated following successful establishment, and will be key to maintaining this habitat in the long-term. Grassland creation should be informed by soil sampling. • Extend the current ditch network by excavating new ditches in the site, and include larger areas of open water and scrapes (shallow depressions) to increase habitat diversity.
Neutral grassland	This habitat is given medium distinctiveness in the Biodiversity Metric. It is not included within the coastal and floodplain grazing marsh condition assessment, as it is not currently grazed like the adjacent field. Reconfiguration of the site and removal of fences would bring these grassland parcels under grazing management, and could therefore qualify as grazing marsh. Appropriate grazing would also increase the botanical diversity of these grassland parcels, which is the main factor limiting its current condition.
Ditches	Both ditches meet nearly all the criteria for good condition; diversity of marginal and aquatic plant species is the main limiting factor on both watercourses, along with heavy shading on Ditch D2. Pollarding and veteranisation works recommended for line of trees LotrS (see below) will help to reduce shading on Ditch D2; this ditch already has eight marginal or aquatic plant species present, concentrated towards the east end. Reduction of shading will encourage these plant species (and others) to colonise further along the ditch and reach the densities required to meet good condition (>10 species within 20m). For Ditch D1 shading is not an issue and the banks are dominated by a single species (common reed). Introducing regular, rotational management of the reeds and supplementary planting will increase botanical diversity here.
Lines of trees	The factor limiting condition for both these habitats is the presence of a tarmac footpath within 6m. There could be scope within re-configuration of the site to remove this footpath and replace with a boardwalk; this would ensure this criterion was passed. Some pollarding and veteranisation of the willow trees on LotrS (all immature willow) would increase

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Habitat type	Opportunities
	the number of ecological niches available in this habitat feature, and also reduce shading on Ditch D2 (see above). The following are options for veteranisation, from the Woodland Trust (2014): e.g. (Woodland Trust, 2014): ○ *Ring-barking* ○ *Branch breaks* ○ *'Horse – damage'* ○ *Pollarding* ○ *'Monolith stumps': Soft/selective felling of limbs where necessary (i.e., for safety) to leave tall trunks in situ.*

Opportunities – Species

Species	Opportunities
Invertebrates (saproxylic)	*Standing deadwood piles:* The creation of 'stumperies' with large volume wood (as generated by management works) dug into the soil (eg: PTES, 2016). *Artificial rot-holes:* Cavities cut into stumps to mimic rot holes. These often fill with water and provide habitat for the larvae of a range of specialist invertebrates.
Invertebrates (pollinators)	Increasing the proportion of wildflowers within the grassland will create additional foraging habitat for pollinators.
Invertebrates (generalist)	'Bug hotels,' 'bee banks' and log piles could be installed around the Site.
Birds	Installation of generalist bird boxes where possible, for instance on the lines of trees. Bird boxes with varying entrance hole sizes should be used to provide for a range of species.
Amphibians	Creation of a wildlife pond within one of the grassland parcels would add a high value habitat to the existing habitat mosaic, particularly of value to local amphibian populations.
Reptiles	Reptiles could be supported through creation of bespoke reptile refugia and hibernacula, providing additional areas for basking and foraging.
Bats	Installation of bat boxes where possible.
Water vole	Sensitive ditch vegetation management, leaving a buffer zone of 2m of unmown vegetation during the breeding season of this species (March-October). Ditch and wetland creation will provide further habitat for these species to colonise.
Otter	Installation of an artificial otter holt.

1.12. Key targets for the short and long term

Short-term targets

Some key targets for upcoming 5 to 10 years:

- Restore floodplain grazing marsh
    - Temporarily remove grazing and re-establish neutral grassland on the main field;
    - Introduce rotational management of marginal vegetation on Ditch D1; and
    - Extend ditch network, incorporating areas of open water and scrapes.
- Pollard and veteranize willow trees in LotrS.

Long-term targets

- Investigate re-configuration of site to include all habitats within coastal and floodplain grazing marsh.

1.13. Further monitoring work/other activities

Specific surveys for protected and priority species could be undertaken for bats, birds, invertebrates, water vole, otter and reptiles, to understand if and/or how these species groups use the site. There are survey methods for all these species which can be undertaken by volunteers; groups could be supported by a licensed ecologist or local specialist if needed.

These targeted surveys could be supplemented by regular Bioblitz surveys at the site, carried out by volunteer groups, to monitor general species diversity.

Soil sampling is recommended to inform management activities to enhance the coastal and floodplain grazing marsh.

1.14. Future risks to condition

- Potentially increased levels of recreational pressure;
- Changes in management and land use;
- Tree disease;
- Impacts of climate change on the habitats present, such as increased drought, fire and flood risk; and
- Introduction and spread of invasive, non-native species.

1.15. Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets)
g3c – Other neutral grassland (19 coastal and floodplain grazing marsh, 10 scattered scrub, 81 ruderal/ephemeral) **g3c – Other neutral grassland**

Description
g3c – Other neutral grassland (19 coastal and floodplain grazing marsh, 10 scattered scrub, 81 ruderal/ephemeral): Most of the site comprises a field currently used for livestock grazing. It is showing signs of recent large-scale disturbance, with widespread bare ground across the field, especially in the west. The east side of the field is more vegetated, but dominated by ruderal species, including fat hen *Chenopodium album,* creeping thistle *Cirsium arvense*, bristly oxtongue *Helminthotheca echioides* and common cudweed *Filago vulgaris*. Grasses are only occasional, and include bent *Agrostis sp.* and meadow barley *Hordeum secalinum*. A row of heavily grazed hawthorn *Crataegus monogyna* shrubs is present at the far east end of the field. **g3c – Other neutral grassland** The public footpath in the north of the site is lined on either side by a strip of grassland. Dominant species are false oat-grass *Arrhenatherum elatius*, cock's-foot *Dactylis glomerata*, barren brome *Bromus sterilis*, great willowherb *Epilobium hirsutum*, cleavers *Galium aparine* and common nettle *Urtica dioica*. The grassland does not appear to be regularly mown – the sward was long at the time of survey. This habitat is not included within the coastal and floodplain grazing marsh, as it is not currently grazed like the adjacent field.

Condition
g3c – Other neutral grassland (19 Coastal and floodplain grazing marsh, 10 scattered scrub, 81 ruderal/ephemeral): Poor condition. This habitat fails the wetland condition assessment for coastal and floodplain grazing marsh on the following criteria: it is a poor example of other neutral grassland, the main habitat type (ruderal species are dominant, with grasses occasional only); bare ground occupies more than 5% of total area; and undesirable species (in this case, ruderal) occupy more than 5% of total area. The condition of Ditch D1 is also assessed as part of this habitat; as it does not meet good condition, this criterion is also failed. The grazing marsh does pass criterion relating to water quality (adjacent ditches show no signs of pollution); a high water table (again, evidenced by adjacent ditches) and appropriate levels of scrub (less than 10%).

Grassland
G3c – Other neutral grassland: Moderate condition. The grassland adjacent to the public footpath has appropriate variation in sward height, cover of bare ground and scrub, and low occurrence of undesirable species (e.g. common nettle). However, due to low species diversity (fewer than 10 species per m^2), it does not meet requirements for good condition.

Wetland
UKHabs habitat types present (secondary codes in brackets) **f2d – Aquatic marginal vegetation**
Description **f2d – Aquatic marginal vegetation** A fringe of wetland vegetation lines both banks of Ditch D1 (see below). This is dominated by common reed *Phragmites australis.*
Condition **f2d – Aquatic marginal vegetation: Poor condition.** Included within condition assessment for floodplain coastal grazing marsh (see grassland section above).

Urban
UKHabs habitat types present (secondary codes in brackets) **u1b5 – Developed land; buildings** **u1b – Developed land; sealed surface**
Description **u1b5 – Developed land; buildings** A wooden shed is located at the west end of the field, currently used to house livestock. **U1b – Developed land; sealed surface** A public footpath, reinforced with concrete, runs along the north site boundary, between the two lines of trees and adjacent to Ditch D2.
Condition **u1b5 – Developed land; buildings:** N/A – Other. **U1b – Developed land; sealed surface:** N/A – Other.

Line of trees
UKHabs habitat types present (secondary codes in brackets) **w1g6i – Line of trees associated with bank or ditch** **w1g6 – Line of trees**
Description Both lines of trees are located parallel to one another running along the north of the site, either side of a public footpath. **w1g6i – Line of trees associated with bank or ditch (LotrN)** This line of trees runs along part of the north bank of Ditch D2. It consists of mature hawthorn *Crataegus monogyna*, and goat willow *Salix caprea,* together with pollarded crack willow *Salix fragilis.* **w1g6 – Line of trees (LotrS)** This line of trees marks the boundary between the field and the public footpath; it runs along a fenceline. It comprises all semi-mature willow *Salix sp.* trees. The trees are a similar age, and do not appear to have been recently pollarded or managed.
Condition **w1g6i – Line of trees associated with bank or ditch (LotrN): Moderate condition.** This habitat passes all but one criterion; it cannot reach good condition due to the presence of hardstanding (the public footpath) within 6m. However, it comprises native tree species, canopy cover is continuous, and the trees are healthy and contain features offering ecological niches for wildlife. **w1g6 – Line of trees (LotrS): Moderate condition.** This habitat also fails to reach good condition on the basis of hardstanding (the public footpath) within 6m. The trees in this line also lack ecological niches for wildlife, being all of the same semi-mature growth stage. Canopy cover is continuous, and the trees are native and in a healthy condition.

Ditches
UKHabs habitat types present (secondary codes in brackets) **r1e – Ditches**
Description **r1e – Ditches** D1: This ditch runs along the south site boundary. There are no trees present along its length, and both banks are lined with dense marginal vegetation, dominated by common reed. The banks are steep and the vegetation has encroached into the channel, with very little open water visible. This ditch does not appear to be regularly managed.

Ditches
D2: This ditch runs along the north site boundary, adjacent to the public footpath. It is lined with trees for approximately half of its length along its north bank, with neutral grassland lining the south bank (see habitat descriptions above). The channel supports diverse aquatic marginal vegetation, particularly towards the east end which is less shaded and where vegetation is growing across the whole channel. Species recorded include water-starwort *Callitriche sp.*, floating sweet-grass *Glyceria fluitans*, water dropwort *Oenanthe sp.,* celery-leaved buttercup *Ranunculus sceleratus*, fool's water-cress *Apium nodiflorum* and common reed.
Condition **r1e - Ditches** **D1: Moderate condition.** This ditch passes all but one criterion; it cannot reach good condition as there are fewer than 10 aquatic and marginal plant species within a 20m length (the banks are dominated by common reed). However, the ditch is of good water quality; no indications of eutrophication were observed; there is aquatic marginal vegetation present along over 75% of its length, with no shading; there is no evidence of physical damage to the ditch, despite degradation of the adjacent grassland; water levels appeared to be high at the time of survey; and no invasive non-native species were recorded. This ditch is included within the condition assessment for coastal floodplain grazing marsh (see above). **D2: Moderate condition.** This ditch fails two criteria. although more diverse than D1, there are still fewer than 10 aquatic and marginal plant species within a 20m length; the presence of the lines of trees to the north and south also means that the ditch is heavily shaded for over 10% of its length. However, this ditch passes all other criteria.

1.16. References

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1.17. Surveyors

The survey was undertaken by Lydia Ennis ACIEEM. Lydia has six years' experience undertaking habitat surveys and delivering management advice to landowners. The report was also written by Lydia, and reviewed by Will O'Connor CEcol MCIEEM. Will has over 15 years' experience working as an ecological consultant.

Detailed methodology

UK Habitat Classification

The habitat surveys followed the methodology of the UK Habitat Classification (professional) version 2.0 (hereafter UKHab; UK Habitat Classification Working Group, 2023). UKHab works at two levels: a hierarchical primary habitat classification and a list of secondary codes. The primary classification builds on existing habitat and botanical classifications (e.g., Phase 1, NVC). Habitats are described through an increasingly detailed hierarchy until a match is found. The secondary codes provide a list of environmental qualifiers that capture details for a range of other factors (e.g., hydrological regime, management etc). A given primary habitat area may have many secondary codes attached.

Some modifications to the UKHab were made as follows:

- Native hedgerows were categorised according to the more detailed Biodiversity Metric habitat label (see below). A level 5 hierarchy was created under the existing level 4 code 'h2a - Priority hedgerows' to reflect the differing features that hedgerows might contain in combination:

    - Association with a bank or ditch.
    - Species richness.
    - With/without trees.

Incidental plant species lists were gathered for each habitat and distributions of species estimated (using the DAFOR scale; **D**ominant, **A**bundant, **F**requent, **O**ccasional and **R**are). Full botanical inventories were not feasible within the scope of this work. Botanical lists are provided as a separate appendix to this Biodiversity Audit.

Biodiversity Metric

The Defra Biodiversity Metric 4.0 (Natural England, 2023) has been used for this Biodiversity Audit, with certain modifications as detailed in the Appendix. This method uses habitat as a proxy for biodiversity, whereby habitats are assigned the following 'multiplier' scores:

- Distinctiveness: A measure of the type and importance of a habitat. Habitats that are rare and/or support a wide range of species are more distinctive.
- Condition: A measure of the condition of a given habitat type. The condition is assessed according to a suite of criteria described within the methodology below. It should be stressed that condition in biodiversity terms is not to be confused with traditional perceptions of condition

or maintenance. A grassland that might be perceived to be well maintained (e.g. regularly mown) is very likely to be in poor condition. Distinctiveness and condition are also not wholly independent. Some of the factors that lead to poor condition grasslands (intensive mowing or grazing) can also lead to a definition as a lower distinctiveness grassland.

- Strategic significance: Any site that possesses a designation is considered High, those deemed ecologically valuable but without designation are considered Medium, and those with limited ecological value and no designation are classed as Low.

These factors are then multiplied to the area (for habitat parcels) or length (hedgerows, lines of trees) to produce an overall 'biodiversity unit.' Large parcels of habitat or long linear features will score better.

The total number of units is presented for the surveyed areas, each site and by habitat type. Indications of how many units are currently contained within habitats of different conditions are also presented; this will help to indicate the opportunities that might be made to increase measurable biodiversity by improving the condition of existing habitats.

Condition assessments

Each habitat type was assessed for condition using the methodology outlined in the Defra Biodiversity Metric 4.0 (Natural England, 2023). Habitat condition is defined as either good, moderate or poor by assessment against a suite of condition criteria. A habitat in good condition will meet more of the criteria for good condition and fewer of the criteria for poor condition. A habitat in poor condition will meet fewer of the criteria for good condition and more of the criteria for poor condition. For the purposes of this assessment the interim categories of 'fairly good' and 'fairly poor' were not used because they are not clearly defined within the methodology and may present inconsistencies with future audit assessments. The habitat condition sheets were modified for use in the field and are supplied as supplementary data.

Habitats were therefore divided into parcels based upon their condition and minimum mappable unit of habitat area.

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