Intended for

Jones Lang LaSalle Ltd

Beneficiary Client

Downing Renewable Developments LLP

Date

October 2022

Project no.

1620013921

MEERDYKE SOLAR FARM

HABITAT MANAGEMENT PLAN

RAMBOLL Bright ideas. Sustainable change.

TABLES

FIGURES

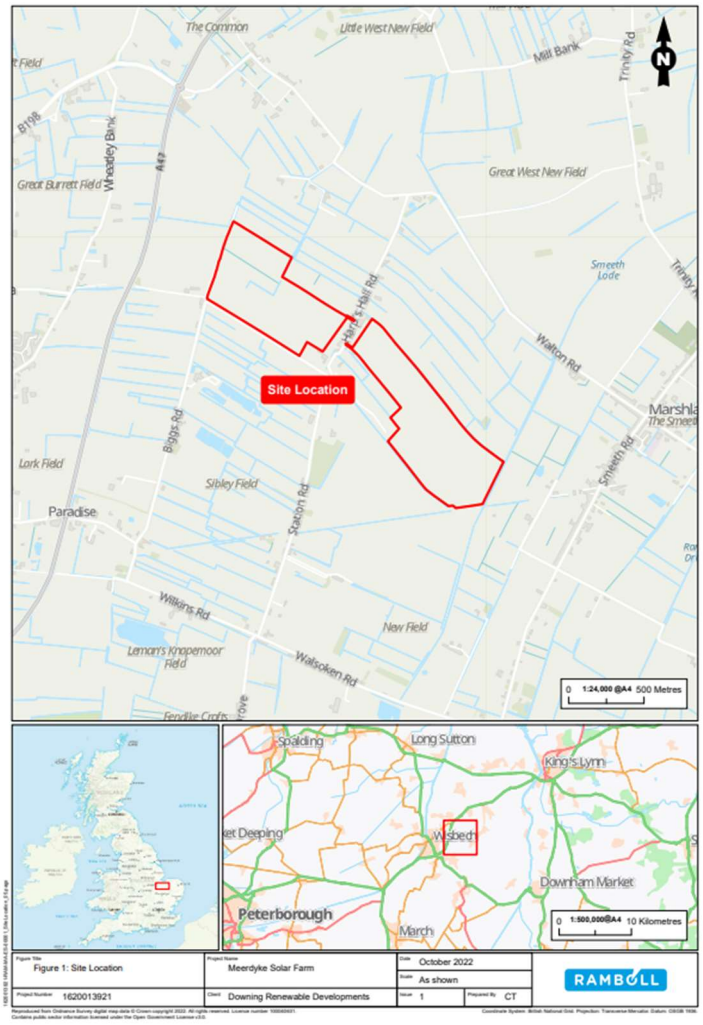
APPENDICES

1. INTRODUCTION

1.1 Background

This Habitat Management Plan (HMP) has been prepared by Ramboll UK Limited (Ramboll) in partnership with JLL, on behalf of the Downing Renewable Developments LLP (the Applicant) in support of an application for consent to construct and operate a solar photo voltaic (PV) farm with associated infrastructure, including battery storage (the Proposed Development). The Proposed Development would have a generation capacity up to 49.9 megawatts (MW) and would comprise solar panels and associated infrastructure on a Site located 1.3 km east of Wisbech and 500 m to the east of the A47 trunk road, on land at Blunts Drove, Walton Highway, Norfolk (the Site). The Site is located within the administrative boundary of King's Lynn and West Norfolk Borough Council. The HMP advises and reports on measures to enhance and protect the ecological value of the Proposed Development. The site location is shown in Figure 1 and shown in full in Appendix 1.

Figure 1: Site Location



1.2 Proposed Development

The Proposed Development would comprise approximately 125,000 solar panels with a maximum height of 3.1 m, along with associated infrastructure, including battery storage. The Proposed Development would include the following key components:

- ground mounted solar panels;
- a substation container;
- 10x battery energy storage containers;
- a transformer including housing;
- a switchgear including housing;
- perimeter fencing, security fencing and CCTV;
- lighting;
- access tracks 5m wide, and
- two temporary Site construction compounds.

1.3 Habitat Management Plan Scope and Objectives

This HMP has been informed by a preliminary ecological appraisal (PEA)[1] and habitat condition assessment (HCA)[2] undertaken by Mark Tarrant (MEECW) of Ramboll on May 6th 2022. Mark has a BSc in Biology and has worked professionally as a consultant ecologist since 2008. An ecological impact assessment (EcIA)[3] and biodiversity net gain assessment (BNG)[4] have been produced alongside this report.

This HMP covers both the Construction and Completed Development (for a period of up to 10 years beyond Practical Completion) stages of the Proposed Development.

In Section 2, key information is presented with regard to the site setting, existing ecological features and the proposed landscaping for the development.

The section of the HMP which addresses the Construction stage (Section 3) aims to minimise the impact of the Proposed Development on wildlife by specifying the programming of work, measures for protecting existing ecological features, responses to unexpected signs of or encounters with wildlife on site, and training of site maintenance staff. Other aspects include procedures for regular monitoring and reviewing of ecological issues during the works, and measures

[1] Ramboll, 2022. Meerdyke Solar Development. Preliminary Ecological Appraisal. R1620013921_D_Meerdykes PEA.

[2] Ramboll, 2022. Meerdyke Solar Development. Habitat Condition Assessment. R1620013921_1_Meerdykes HCA.

[3] Ramboll, 2022. Meerdyke Solar Development. Ecological Impact Assessment. R1620013921_B_Meerdykes EcIA.

[4] Ramboll, 2022. Meerdyke Solar Development. Biodiversity Net Gain Assessment. R1620013921_1_Meerdykes BNG.

to control Wildlife and Countryside Act (as amended) 1981 Schedule 9 (noxious or invasive) plants.

After completion, the Completed Development HMP proposes measures to ensure that the habitats retained, enhanced and created as a result of site development are maintained and enhanced as required. Management Objectives and Management Prescriptions are presented in Section 4.

The time period over which this plan should be implemented is expected to be five years, with recommendations for longer term evaluation and management over 10 years. After this it is recommended that the plan be fully evaluated (and revised where necessary) in order to take into account any relevant changes in the ecology of the Site.

1.4 Limitations

This report has been prepared by Ramboll exclusively for the intended use by the client in accordance with the agreement between Ramboll and the client defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended, or any other services provided by Ramboll.

This HMP has been produced without reference to detailed landscape plans and subsequently, any management prescriptions may need updating when detailed designs become available to reflect differences in species composition and extent.

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

Unless otherwise stated in this report, the scope of services, assessment and conclusions made assume that the site will continue to be used for its current purpose and end-use without significant changes either on-site or off-site.

2. SITE INFORMATION

2.1 General Information

Site Name: Meerdyke Solar Farm

Location: Blunts Drove, Walton Highway, Norfolk, PE14 7DL

National Grid Ref: TF 50368 10343

Site Area: 87 hectares (ha)

Site Owner: Downing Renewable Developments LLP

Site Manager: Downing Renewable Developments LLP

Local Planning Authority: King's Lynn and West Norfolk Borough Council

2.2 Existing Site Information

Statutory Sites

There are no statutory designated Sites within the Site boundary or within 2 km of the Site. The closest SSSI is Islington Heronry SSSI, 8.1 km from the Site boundary. Islington Heronry SSSI comprises a small, isolated oak woodland designated for its significant breeding grey heron *Ardea cinerea* population[5].

The Site falls within the Impact Risk Zone for Islington Heronry SSSI. SSSI Impact Risk Zones are defined zones around each SSSI which reflect the sensitivities of the features for which it is notified and indicate the types of development that could potentially have adverse impacts. In the case of Islington Heronry SSSI, this is limited to "*Infrastructure - Airports, helipads and other aviation proposals*".

There are no SACs designated for bats within 10 km of the Site. The closest SAC to the Site is Ouse Washes SAC, located 10.7 km from the Site boundary and not designated for bats[6].

Non-Statutory Sites

There are no non-statutory Sites located within the Site boundary or within a 2 km radius of the Site.

There are no parcels of ancient and semi-natural woodland located within 2 km of the Site. There is one ancient, veteran or notable tree within 2 km of the Site boundary. The nearest such tree is a notable beech *Fagus sylvatica* located 1.7 km to the west of the Site.

[5] Natural England (1984) Islington Heronry SSSI. Available at: https://designatedSites.naturalengland.org.uk/PDFsForWeb/Citation/1000618.pdf (Accessed: 28/04/22).

[6] JNCC (2015) Natura 2000 Standard Data Form – Ouse Washes. Available at: https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0013011.pdf (Accessed: 28/04/22).

The Site is located at central grid reference TF 50375 10396 to the east of Wisbech, in a mostly agricultural/horticultural area.

Arable fields surround much of the Site, however there are also two small unmanaged traditional orchards adjacent to the Site, one to the northwest and one to the south. Traditional orchards are listed on the Priority Habitat Inventory (England). There are also some small areas of grazed pasture. The Site is surrounded by a series of drainage ditches that connect to the wider drain network, these offer valuable riparian corridors. The watercourse 'Smeeth Lode' lies to the east of the Site, separated by an access track. Smeeth Lode is a large drain that drains the low lying fenland area from Emneth to Terrington St Clements.

The site is bound to:

- The north by arable farmland and St Paul's Road;
- The east by Smeeth Lode and a residential area;
- The south by arable farmland and Cow Lake Drove; and
- The west by Meer Dyke Lane and the A47.

2.3 Existing Ecological Information

2.3.1 Habitats

The habitat surveys carried out as part of the PEA for the Site confirmed that the site is of nature conservation importance at up to the Local Level, in accordance with the Chartered Institute of Ecology and Environmental Management guidelines (CIEEM, 2019)[7]. This is due to the hedgerows and lowland fens habitats identified as being present on Site. The Site has limited habitats present, mostly consisting of arable crops, with some small areas of bramble scrub and marginal/inundation vegetation including lowland fens and native hedgerow. The lowland fens have the potential to be described as a Habitat of Principle Importance (in accordance with NERC Act 2006 Section 41) and are further mentioned in the UK Biodiversity Action Plan (UK BAP). The existing site, including the on-site habitats following UKHab classifications, are shown in Figures 2.1 based on the UKHab condition survey undertaken in May 2022.

2.3.2 Species

The existing habitats present support an assemblage of insects, water voles, badgers, foraging bats and wild bird species.

In terms of invertebrate species, the site is considered to be of negligible importance for invertebrates with the habitats on-Site being common in the

[7] Chartered Institute of Ecology and Environmental Management (CIEEM), 2019. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal and Marine. Chartered Institute of Ecology and Environmental Management, London

surrounding areas, of limited use to invertebrates and, as such, are unlikely to support notable invertebrates. NBIS returned no records of invertebrates within 2 km of the Site boundary.

With respect to amphibians, given the lack of suitable terrestrial habitat on site, the nature of the water bodies within 500 m of the Site and the barriers to dispersal, it is considered unlikely that great crested newts (GCN) will be present on the Site. The site is consequently deemed to be of negligible importance for amphibians. NBIS returned 12 records of GCN *Triturus cristatus* within 2 km of the Site boundary, all of which were dated 2006 and found at the same Site approximately 1.5 km north of the Site at the closest point. NBIS returned no records of other amphibian species within 2 km of the Site. According to Multi Agency Geographic Information for the Countryside, no European Protected Species licenses have been obtained for GCN in a 2 km radius of the Site. No GCN were identified during the UKHab survey of May 2022.

The Site is deemed to be of negligible importance to reptiles, such as slow worm *Anguis fragilis*, grass snake *Natrix natrix* and common lizard *Zootoca vivipara*. NBIS returned no records of reptiles within 2 km of the Site boundary. There is only a small area of habitat present on Site that would be of potential use to foraging reptiles comprising scrub and the marginal/inundation vegetation. Moreover, there is a lack of suitable habitat in the within the site vicinity and therefore, this Site is of negligible importance to reptiles owing to the lack of connectivity. No reptiles were identified on Site during the UKHab survey of May 2022.

With reference to breeding and foraging birds, the Site is deemed to be of Site level importance. This is because there are small areas of habitat capable of supporting a small population of birds for both foraging and nesting present. However, due to the small size of these habitats, they are considered unlikely to be used by rarer species. NBIS returned several records of birds within 2 km of the Site boundary including green sandpiper *Tringa ochropus*, turtle dove *Streptopelia turtur*, fieldfare *Turdus pilaris*, song thrush *Turdus philomelos*, spotted flycatcher *Muscicapa striata* and house sparrow *Passer domesticus*. Furthermore, the Site is located in the impact risk zone for the Islington Heronry supporting the largest population of breeding grey heron *Ardea cinerea* in the county with approximately eighty nests occupied each year[8]*.* The ditches present on Site may be utilised as foraging habitat but these are likely to be unaffected by construction.

The Site is considered to be of Negligible importance for roosting and foraging bats as there is limited potential for bats to be present on site due to the lack of foraging and roosting habitat present. No surveys were recommended during the 2022 June PEA to reflect the lack suitable roost features identified within the

[8] https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1000618.pdf

Site, however surrounding habitats around the perimeter of the Site, including traditional orchards, possess suitable foraging and commuting habitat.

Four active badger setts were identified within the Site boundary, including a main sett. Due to the identification of badger activity on the Site, it is deemed to be of Local level importance.

Habitat suitable to support water voles has been identified on the boundary and adjacent areas of the Site with evidence of two potential burrows. However, no evidence of this species was found within the site boundary during the UKHab survey of May 2022. The ditches within the Site are unlikely to be suitable for water voles and no evidence to that effect was identified during the May 2022 UKHab survey. NBIS returned no records of water vole *Arvicola amphibius* from within a 2 km radius of the Site. It has been determined that water voles are of Site level ecological importance given the widespread occurrence of similar habitat in the vicinity that is also likely to be suitable.

WSBRC returned no records of otter *Lutra lutra* from within a 2 km radius of the Site. Moreover, there is no potential terrestrial or riparian habitat for otter within the Site however, there is potential for them to be using Smeeth Lode adjacent to the eastern end of the Site. Following this, otters are considered to be of negligible ecological importance because the Smeeth Lode would only form a small part of an otter's range.

2.4 Ecological Recommendations

The existing Site has limited habitats present with the previous land usage for farmland resulting in arable crops being the main habitat type. It is anticipated that all other habitats such as, bramble scrub and marginal/inundation vegetation are to be retained as part of the development process.

New landscape planting will be introduced for the benefit to biodiversity within the Proposed Development.

In view of the ecological importance of the Site, a number of mitigation measures were proposed in the June 2022 PEA to incorporate into the design. These can be summarised as follow:

- A Construction Environmental Management Plan (CEMP) should be prepared with input by a suitably experienced ecologist to ensure appropriate mitigation measures are in place during construction;
- Development taking place in close vicinity to any retained vegetation, should include protection measures, including the provision of appropriate protective fencing to prevent trampling of vegetation or inundation by construction and excavated materials. All development should be undertaken with a 5 m buffer from any retained hedgerows and new landscaping except for the wildflower mix that will require no buffer.

Furthermore, a 10 m development buffer should be employed for any watercourse present on site;

- No vegetation should be removed during the February to September nesting bird season, to avoid disturbance to nesting birds. Where this time period cannot be avoided, vegetation should be checked within 48 hours of planned clearance by an experienced ecologist and if any evidence of nesting birds is identified work should be delayed until chicks have fledged;
- Vegetation should be cleared carefully in stages, under the supervision of an ecologist. This should be timed to take place on a warm day at a time of year when reptiles are active e.g. April to early October. This would encourage reptiles (if present) to move of their own accord into adjacent areas, which are spread around the Site boundary and offer similar conditions;
- In the unlikely event that unanticipated protected species (such as reptiles) are found on Site during clearance works, works should stop and an ecologist should be consulted to advise on the most appropriate course of action;
- An appropriate Lighting Strategy should be developed with consideration of guidance provided in the BCT and Institution of Lighting Professionals (ILP) 'Guidance Note 08/18 – Bats and artificial lighting in the UK[9];
- Toolbox talks on all ecological constraints should be undertaken for contractors to help them understand the species identified as present on Site. This should be included in more detail in a CEMP;
- All open excavations should be dug to have sloped ends at no more than a 45 degrees angle at either end to provide a route of escape for any animal. If this is not possible, a plank or wooden beam should be placed at ends of the excavation;
- Any construction fencing should have badger gates installed to ensure continued connectivity to the site;
- A 10 m buffer from development should be enforced around water vole burrows to prevent disturbance to this species. This species should be included in the above mentioned toolbox talk. A water vole survey should be undertaken to identify any burrows bounding the site to ensure the habitat is undisturbed during construction; and
- A 30 m development and construction buffer should be employed at all identified badger setts on Site with the demarcation commencing from the closest active hole to the works.

[9] Bat Conservation Trust and Institute of Lighting Professionals. Guidance Note 08/18. Bats and artificial lighting in the UK. 2018. https://cdn.bats.org.uk/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?mtime=20181113114229

2.4.1 **Legal Requirements**

Under the Conservation of Habitats and Species Regulations 2017[10] as amended, it is an offence to carry out any activity which would kill or disturb any species listed under Schedule 2 of the Regulations or damage or destroy a breeding site or resting place of such a species. None of the species listed under schedule 2 are likely to be present on site.

Under the Wildlife and Countryside Act 1981[11], as amended, it is an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with exception to species listed under Schedule 2 of the Act); and
- Intentionally kill, injure or take any wild animal listed under Schedule 5 of the Act (these species include all bats and all native reptiles).

The Act also contains measures to prevent the establishment of non-native species by prohibiting the release or planting of animals and plants listed under Schedule 9. The Environmental Protection Act 1990[12] and associated regulations define Japanese knotweed and giant hogweed contaminated soil or plant material as controlled waste and make provisions for their treatment and disposal.

2.4.2 **Other Policy Requirements**

The Norfolk Biodiversity Partnership (NBP)[13] and the Post-2010 UK biodiversity framework[14] should be consulted to ensure that biodiversity benefits to the regional area and national area are considered and incorporated into the landscaping design.

Where hedgerows are planted, the NBP recommends that these should be rich in native, woody species such as hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa* and ash *Fraxinus excelsior*.

The soft landscape plan should be planted using at least 80% native plant species or species known to be valuable for wildlife in accordance with the Norfolk Biodiversity Action Plan (NBAP)[15].

[10] Secretary of State, 2017. The Conservation of Habitats and Species Regulations. Her Majesty's Stationery Office (HMSO)

[11] Her Majesty's Stationery Office (HMSO), 1981. The Wildlife and Countryside Act 1981 [as amended in Quinquennial Review and by the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006]. HMSO

[12] Her Majesty's Stationary Office, 1990. Environmental Protection Act 1990 [As amended]. HMSO

[13] Norfolk Biodiversity Partnership, 1996. NBP. Available from: https://www.norfolkbiodiversity.org/

[14] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. UK Post-2010 Biodiversity Framework. July 2012. Available from: http://jncc.defra.gov.uk/page-6189.

[15] Norfolk County Council, 2009. Norfolk Biodiversity Action Plan: Hedgerows. Available From: https://www.norfolkbiodiversity.org/assets/Uploads/Hedgerows-HAP2.pdf

3. CONSTRUCTION STAGE HABITAT MANAGEMENT PLAN

3.1 Appropriate Timing of Works

Breeding birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended). Any vegetation removal would wherever practicable take place between September and February, i.e. outside the bird breeding season). If any vegetation would be cleared between February and September inclusive, it would be inspected by an ecologist or other suitably qualified person for breeding birds immediately prior to its removal. If breeding birds are present then the nest and vegetation within a suitable buffer around it would not be disturbed until the birds have fledged. Site works would be programmed to minimise disturbance to wildlife.

3.2 Protection of Existing Ecological Features

Ecologically valuable habitats present on site including hedgerows, mixed scrub and lowland fens are to be retained as part of the Proposed Development. Therefore, measures are required to protect existing habitats or features on-site during the construction stage.

Retained hedgerows, scrub and trees should be fenced off to ensure these are not damaged by machinery during the works. This should be further extended to water vole burrows, badger setts and water bodies with consultation with the Environmental Site Co-ordinator and a suitable qualified ecologist (SQE) to ensure species can still access foraging habitat.

Measures should be implemented to control noise, dust, waste, construction lighting and contaminants that could be emitted during the construction works, to prevent these impacting adjacent habitats. These measures should be set out in detail in a CEMP.

Should any protected species, not previously identified, be found on-site, works should cease in that area and the Environmental Site Co-ordinator should be informed immediately. The Environmental Site Co-ordinator should then consult an ecologist and Natural England as appropriate, and should plan and manage the procedure for dealing with the protected species. The Lead Contractor should brief on-site workers on the appropriate procedures in the event that protected species are encountered during construction.

3.3 Training and Communication

All construction workers on Site should undertake a Site induction and routine tool-box talks to ensure they are aware of the potential impacts on sensitive species and necessary mitigation. Specifically, on site workers should be instructed to ensure that all deep trenches and pits are constructed with ramps at one end, to allow animals which might become trapped in a trench to escape. If Site workers are working near an excavation, they should be aware of the

possibility of wildlife, and inspect the excavation at the start of each day prior to commencing work.

3.4 Monitoring and Review of Ecological Issues

The Contractor is expected to appoint a nominated individual (e.g. Environmental Site Co-ordinator) to conduct and log inspections and to take and record any mitigation actions necessary, such as the necessary removal of bird nests.

The effectiveness of these actions would be monitored throughout the construction process. By ensuring that ecological features are protected, and the works are appropriately timed, the Environmental Site Co-ordinator would ensure that construction activities do not have a detrimental effect on the environment or on biodiversity at the Site.

3.5 Measures to Control Schedule 9 Plants

Whilst no signs of Schedule 9 plants, such as Japanese knotweed *Fallopia japonica* or giant hogweed *Heracleum mantegazzianum*, have been observed on the Site to date, if they are observed or are suspected to be present on-site during construction, or within materials imported to or exported from the Site, this would be reported to the Environmental Site Co-ordinator.

Occurrence of any such invasive plant species would be recorded, and a suitably qualified ecologist consulted for advice on its removal in the event it was identified on the site.

4. COMPLETED DEVELOPMENT STAGE HABITAT MANAGEMENT PLAN

4.1 Landscape Masterplan

The landscape masterplan for the Site as shown as Figure 2: Soft Landscape Plans in Appendix 1 would introduce the following as part of the Proposed Development:

- Areas of native tree planting to the Northwest boundary of the Site;
- Areas of native hedgerow planting around the perimeter of the Site;
- Areas of non-native hedgerow planting in the North-eastern corner of the Site;
- Areas of traditional orchards in the central areas of the Site; and
- Areas of wildflower seeding across the whole site landscaping.

4.2 Specific Ecological Features of Interest

The specific features of interest within the newly introduced landscaping are:

- Traditional orchard planting reflects the highlighted Local Biodiversity Action Plan requirements for regional biodiversity enhancements.
- Native hedgerow consisting of native, woody species such as hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa* and ash *Fraxinus excelsior*.
- 5 bird boxes spread evenly across the site such as the Schwegler 1B 32mm and the Schwegler 2HW.
- A minimum of 3 bat boxes such as the Schwegler 3FS bat box spread evenly across the site.
- A minimum of 80% native species planted across the landscaping plan.

4.3 Management Objectives

The Management Objectives (MO) for the habitats provided on-site by the Proposed Development are:

- MO1 Management and Maintenance of Habitats;
- MO2 Additional enhancements for ecological diversity; and
- MO3 Inspection of habitats and enhancement features to determine levels of biodiversity.

Each MO has a number of associated Management Prescriptions (MP), in order to achieve the objectives for the habitats at the Site. The MOs and associated MPs are detailed in the following sections.

Habitats and ecological enhancement features should be inspected by an SQE after five years and again after 10 years.

All of the maintenance activities can be undertaken by grounds maintenance staff or landscape gardeners unless stated otherwise.

4.4 MO1. Management and Maintenance of Habitats

Maintenance visits are to be carried out in accordance with BS 4428:1989[16] and BS 7370-4:1993[17] in relation to planted trees and shrubs, with general maintenance of all habitats to include watering to establishment, pruning, pest and disease control, weeding, adjusting tree guys, tree security checked, stakes, ties, topping up mulch and applying fertiliser locally to tree bases, and mowing grass / controlling weeds around tree bases.

It is important to ensure that the habitats and landscape planting at the Site thrives, in order to maintain levels of biodiversity once habitats are established.

The 'Solar Parks: maximising Environmental Benefits'[18] Guide has been utilised to inform the management of the created and retained habitats in reference to the specific land use.

4.4.1 **MP1.** Maintenance of Other Neutral Grassland

The ideal conditions for wildflower growth is poor nutrient quality soil, some soil treatment should be undertaken to ensure the conditions are supportive of wildflowers. 10-15 cm of low nutrient topsoil may be required if the soil is of the incorrect condition to support wildflowers.

The ideal time for sowing of wildflower mix is between April/May and early September. After sowing, the seed should be allowed to establish and for the first 12 months, the site should be visited regularly to ensure the wildflowers are not being 'choked' by arable weeds. This should be managed by cutting the margin or plot regularly to help the sown species to establish. In the 2nd and subsequent years, dependent on soil fertility, a summer 'hay' cut Should be undertaken, the cuttings left to dry in situ for at least 24 hours so that seeds can be shed and dried. The cuttings should be removed from site after this or raked up to provide habitat for insects on the boundaries of the site. Weeding should be undertaken as appropriate to remove undesirable species. Re-growth can be mown to 50 mm in Autumn and Spring if required. Watering should be undertaken as and when necessary, alongside annual inspections for habitat condition and non-native invasive species. The flowering meadows should be managed by allowing the flowers and grasses to grow tall, flower and seed from April through to September.

The areas under the solar panels should have a reduced growth due to shading. Careful monitoring in the first year by a SQE should inform advice on correct

[16] British Standards Institute, 1989. BS 4428:1989 Code of practice for general landscape operations (excluding hard surfaces)

[17] British Standards Institute, 1993. BS 7370-4:1993 Grounds maintenance. Recommendations for maintenance of soft landscape (other than amenity turf)

[18] Natural England, 2011. Natural England Technical Information Note TIN101, Solar parks: maximising environmental benefits.

management techniques for subsequent years and whether enhancement is required to ensure successful establishment.

4.4.2 **MP2.** Maintenance of Traditional Orchards

During planting, mulch should be applied around the base of the tree with tree guards and ties used where necessary to ensure establishment. Trees should be checked for protection against damage twice a year in the first five years, then annually. Trees should be checked in the first three years for tree guying and ties, these should be removed or adjusted if impeding growth. Additional checks should occur to ensure trees remain upright, firm and well secured after major weather events. Removal of basal and epicormic growth and dead wood should take place once a year. Mulching should be topped up in the first three years. Reforming should take place after frost or heavy wind six times a year in the first year and twice a year in the second year. Tree work to the crown should take place once a year every Autumn/Winter. Weed control should take place twice a year.

Watering should take place a minimum of once a week in the first growing season or with greater frequency as necessary to ensure successful establishment in the first and second years. In the third year trees should be watered as necessary to ensure successful establishment and then as necessary from the fourth year onwards. Any pruning should be in accordance with good horticultural and arboricultural practice[19]. All trees should be subject to a five-year tree condition survey to be undertaken by an arboriculturalist consultant. The Arboricultural Consultant shall be a member of the Arboricutural Association or Institute of Chartered Foresters

4.4.3 **MP3.** Maintenance of Bramble Scrub

Successional stages of the existing bramble scrub should help to support an assemblage of bird species, reptiles, and insects. A cyclical management regime cutting back a set length each year on a rotational basis of five yearly cuts should create and maintain a patchwork of scrub at different stages of maturity from freshly cut to closed canopy. This form of management should create a scalloped edge to the scrub providing a more diverse series of microclimates than should exist on a straight boundary. Every five years, scrub management should be reviewed by a SQE in order to assess the requirements for follow-up management. Any further management should be undertaken outside of the bird nesting season (February to September) and outside of periods where food sources should be prevalent in the scrub (Autumn and the first half of winter). Subsequently the optimum time for management is December to January.

[19] British Standards, 2010. BS 3998:2010 Tree work – Recommendations

4.4.4 **MP4.** Maintenance of Hedgerow

Newly planted hedgerows should be watered once per week in the first and second years during the growing season or with greater frequency as necessary to ensure successful establishment. Watering should take place in year three as necessary to ensure successful establishment. From year four onwards watering should take place as necessary. In the long-term, hedgerows should be trimmed twice a year by site maintenance workers to a target height of 3 m and 2 m wide, with weed control taking place annually and watering as necessary.

The retained mature hedgerow should be trimmed once a year alongside yearly weed control to a target height of 3 m and 2 m wide.

Management should be undertaken outside of the bird nesting season (April to July) and outside of periods where food sources should be prevalent in the hedgerow (Autumn and the first half of winter). Subsequently the optimum time for management is early December until late January.

4.4.5 **MP5.** Maintenance of Other Hedgerows - Evergreen

Management should follow MP4.

4.4.6 **MP6.** Maintenance of Other Rivers and Streams

In order to create habitat for water voles, dredging of the drainage ditches should be avoided but the channel width should be maintained.

The lowland fens on this Site are localised around drainage ditches and subsequently should be managed to ensure continued biodiversity without compromising site drainage. Furthermore, the drainage areas and boundary drains have provided a habitat for water voles in this area therefore, water voles must be considered in the management of this habitat. Moreover, the prevention of vegetation succession and improved structural diversity of the fen should be a management focus. Any scrub should be managed to 10-20% cover of the fen habitat to prevent the succession and subsequent loss of this habitat to scrub.

Subsequently the fen should be managed on a 3-yearly rotational basis with removal of vegetation occurring in small patches to retain suitable habitat adjacent to the working zone. In any year at least two thirds of the drainage ditch should be unmanaged. All floating debris should be removed from drainage ditches for safe disposal. Various types of mowing and cutting machinery are suitable for use on fens. The material cut should be raked into piles at least 10 m from the waters edge no larger than 1 m x 1 m in dimension to provide habitat for invertebrates on the Site substituting for the removal of habitat.

The correct time of year for fen management should be September to avoid the bird nesting period. Every five years, fen management should be reviewed by a

SQE in order to assess the requirements for follow-up management such as the removal of invasive species and a reduction/increase in management effort.

4.4.7 **MP7.** Maintenance of Native Hedgerow with Trees

Maintenance should be carried out in accordance with BS 8545:2014[20]. During establishment, tree guards should be maintained and removal of grass and weeds should be carried out by maintenance workers monthly to eliminate competition to hedgerows and trees. Inspection of existing trees, hedgerows and buffer zones should take place twice a year in the first, second fourth and fifth years by maintenance workers. In the third year and every three years a formal inspection should take place by maintenance workers and an ecologist. A regular walkover assessment should take place twice a year and after strong storms by maintenance workers. During maintenance it should be ensured that mechanical equipment does not damage the bark.

4.4.8 **MP8.** Maintenance of Lowland fens

This is to follow MP6.

4.5 MO2. Additional enhancements for ecological diversity

4.5.1 **MP9.** Bird boxes

Bird boxes should be provided on the solar infrastructure within the Site suitable for song thrush *Turdus philomelos*, spotted flycatcher *Muscicapa striata* and house sparrow *Passer domesticus*. Bird boxes should be erected during construction of the buildings or in the first available season during or following completion of the construction phase. The bird boxes should be faced between north and east avoiding strong sunlight. The exact type, number (expected to be a minimum of five) and location of bird boxes should be agreed following consultation with an ecologist prior to the build stage. The condition of bird boxes should be checked annually by an ecologist. If the boxes become deteriorated these should be replaced by Site maintenance workers.

4.5.2 **MP10.** Bat boxes

Bat boxes that provide potential roosting opportunities in summer for a range of bat species (e.g. Schwegler 1FQ boxes) should be installed at a minimum height of 3 m on suitable parts of the solar infrastructure so that they cannot easily be reached by predators. Where possible the bat boxes should be installed close to vegetation that acts as flightlines for bats such as the boundary hedgerows provisioned in the development landscape plans. A clear horizontal approach and drop zone from the box is required. Boxes should be placed on suitable infrastructure sections on a southerly aspect (southwest, south or southeast) to allow a range of temperature conditions for bats. This is likely to be on the

[20] British Standards Institute, 2018. BS 8545:2014. Trees: from nursery to independence in the landscape. Recommendations.

buildings on the north of the site. The exact type, number (expected to be a minimum of five) and location of bat boxes should be agreed following consultation with an ecologist prior to the build stage. Site managers and ground staff should be made aware of the conservation status and legal restrictions relating to bats and information should be provided to them on maintaining the bat boxes. The condition of bat boxes should be inspected annually in winter by licensed bat workers only, because bats are legally protected species. Bat boxes should be replaced by Site maintenance workers where necessary (as informed by a licensed bat worker should their condition have deteriorated such that replacement is necessary).

4.5.3 **MP11.** Badger gates

Badger gates are to be installed into any security fencing erected on the Site. This to allow connectivity between habitats within and outside of the Site boundary. The exact type, number and location of badger gates should be agreed following consultation with an ecologist prior to the build stage. The condition of the badger gates in the finalised development should be checked annually by an ecologist. If the gates become deteriorated or malfunction, these should be replaced by Site maintenance workers.

4.6 MO3. Inspection of habitats and enhancement features to determine levels of biodiversity

In the longer term it is possible that natural succession of plants would reduce the biodiversity of the habitats provided on-site. Monitoring of the ecological diversity of the landscape planting by an ecologist should help determine if the prescribed management strategies are having the desired effects. The monitoring results should inform the evaluation of this HMP and help to identify whether a review of this HMP is required.

4.6.1 **MP12.** SQE Inspection

Trees, shrubs and wildflower planting should be inspected by an SQE after five years and again after ten years to ascertain the continued suitability of the habitats for wildlife and to advise on any additional planting or management required.

4.6.2 **MP13.** Replacement Planting

Any replacement planting/seeding or other habitat works required should be undertaken as soon as possible after receiving advice from the SQE.

4.7 Summary of Management Prescriptions and Timeline

Appendix 3 lists the MPs required in order to achieve the objectives for the habitats at the Site and identifies the timeframe that the management activities need to be undertaken. The table in Appendix 3 should be read with reference

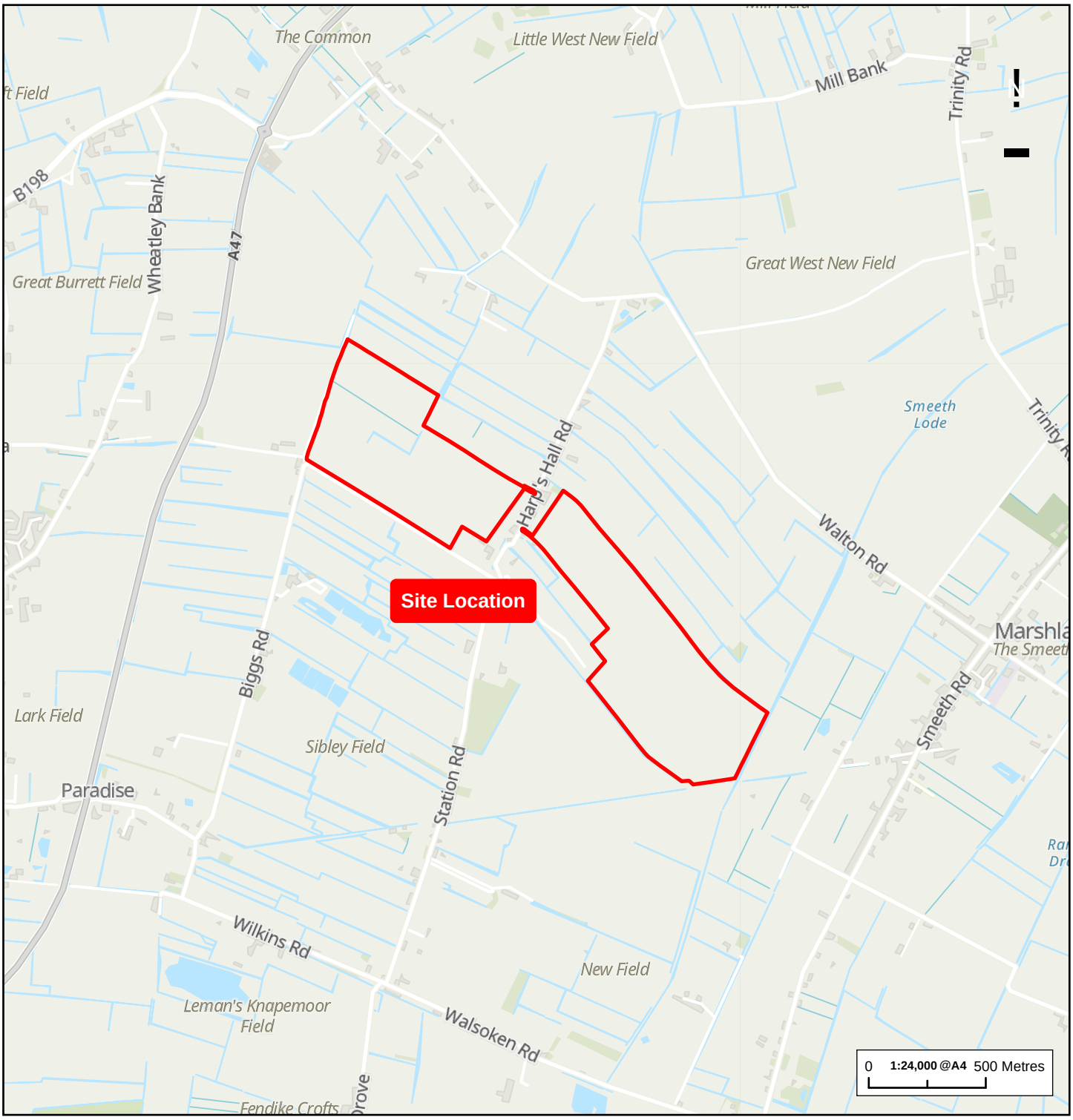
to the MP descriptions above because in certain instances whilst action is required at a particular frequency, there may be qualifications or restrictions to the actions (for instance, a particular proportion of the habitat to be managed at each management instance)

Table 4.1 illustrates how the MP relate to the management objectives (outlined above).

Table 4.1: Relationship between Management Objectives and Prescriptions

Management Objective	**Relevant Management Prescriptions**
MO1 Management and Maintenance of Habitats	MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8
MO2 Additional enhancements for ecological diversity	MP9, MP10, MP11
MO3 Inspection of habitats and enhancement features to determine levels of biodiversity	MP12, MP13

APPENDIX 1 FIGURES



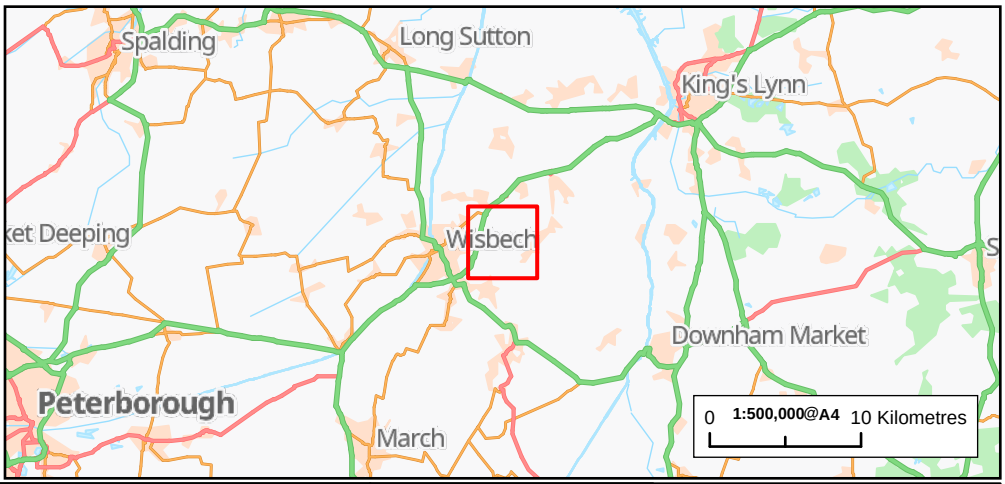


Figure Title: Figure 1: Site Location	Project Name: Meerdyke Solar Farm	Date: October 2022	
		Scale: As shown	
Project Number: 1620013921	Client: Downing Renewable Developments	Issue: 1	Prepared By: CT

1620013921-RAM-MA-ES-00001_SiteLocation_05.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Redline Boundary
- Tracks
- Solar Modules
- Solar Infrastructure
- Wildflower Mix
- Native Orchard Mix
- Existing Scrub
- Retained Habitat
- Evergreen Hedgerow
- Native Hedgerow
- Native Hedgerow With Trees
- Existing Field Drain
- Existing Hedgerow

Note: There will be a 5 m buffer between hedgerow and fenceline for maintenance purposes

Figure Title
Soft Landscape Plans

Project Name
Meerdyke Solar Farm

Project Number	Figure No.
1620013921	2
Date	
October 2022	CT
Scale	Issue
1:7,583 @A3	1

Client
Downing Renewable Developments

RAMBOLL

1620013921-RAM-MA-ES-00005_LandscapeMitigation_04.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

APPENDIX 2 POST CONSTRUCTION HABITATS

N

0 250 500 Metres

Legend

- Site Boundary
- h2 - Hedgerow
- c1c - Cereal Crops
- f2a - Lowland Fens
- g3 - Neutral Grassland

Figure Title
UKHab Pre-development Habitat Map

Project Name
Meerdyke Solar Farm

Project Number	Figure No.
1620013921	1a
Date	Prepared By
October 2022	CT
Scale	Issue
1:4,000 @A3	1

Client
Downing Renewable Developments

RAMBOLL

1620013921-RAM-MA-ES-00007_UKHabPreDevHabitatMap_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

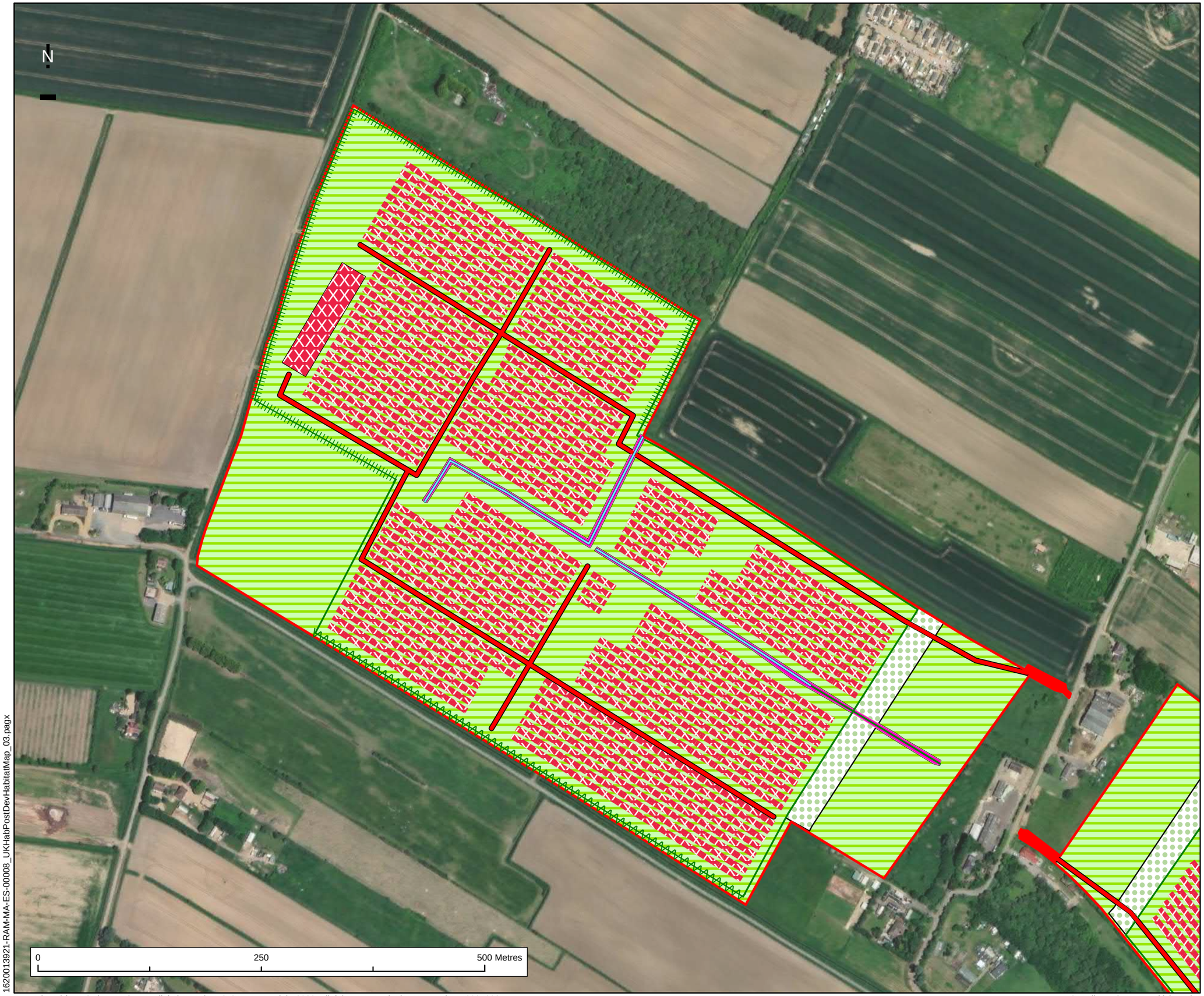
- Site Boundary
- h2 - Hedgerow
- c1c - Cereal Crops
- f2a - Lowland Fens
- h3d - Bramble Scrub
- h3h - Mixed Scrub

Figure Title	UKHab Pre-development Habitat Map
Project Name	Meerdyke Solar Farm
Project Number: 1620013921	Figure No.: 1b
Date: October 2022	Prepared By: CT
Scale: 1:5,000 @A3	Issue: 1
Client: **Downing Renewable Developments**	

RAMBOLL

1620013921-RAM-MA-ES-00007_UKHabPreDevHabitatMap_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Redline Boundary
- h2 - Hedgerow
- h2a - Retained Native Hedgerow with Trees
- h2b - Other Hedgerow
- r2b - Other Rivers and Streams
- 21 - Traditional Orchards
- f2a - Lowland Fens
- g3c - Other Neutral Grassland
- u1b6 - Other Developed Land
- u1e - Built Linear Features

Figure Title
UKHab Post-development Habitat Map

Project Name
Meerdyke Solar Farm

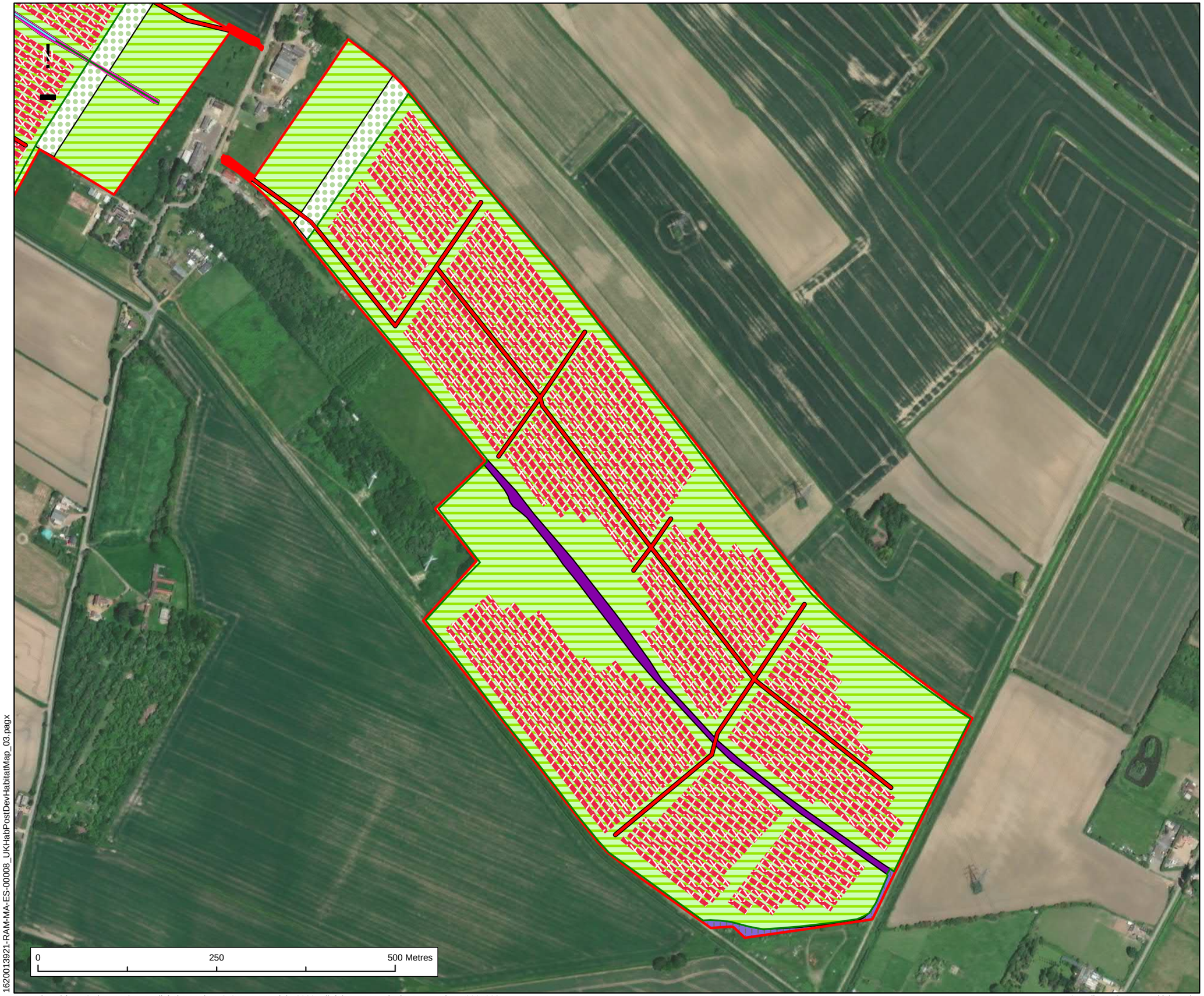
Project Number	Figure No.
1620013921	2a
Date	**Prepared By**
October 2022	CT
Scale	**Issue**
1:4,000 @A3	1

Client
Downing Renewable Developments

RAMBOLL

1620013921-RAM-MA-ES-00008_UKHabPostDevHabitatMap_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Redline Boundary
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- r2b - Other Rivers and Streams
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- f2a - Lowland Fens
- g3c - Other Neutral Grassland
- h3h - Mixed Scrub
- h3d - Bramble Scrub
- u1b6 - Other Developed Land
- u1e - Built Linear Features

Figure Title
UKHab Post-development Habitat Map

Project Name
Meerdyke Solar Farm

Project Number	Figure No.
1620013921	2b
Date	**Prepared By**
October 2022	CT
Scale	**Issue**
1:5,000 @A3	1

Client
Downing Renewable Developments

RAMBOLL

1620013921-RAM-MA-ES-00008_UKHabPostDevHabitatMap_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

APPENDIX 3 MANGEMENT PRESCRIPTIONS

Table 1. The Frequency and Timing of Individual Management Prescriptions

Management Prescription		MP1	MP2	MP3	MP4	MP5	MP6	MP7	MP8	MP9	MP10	MP11
Activity		Maintenance of Other Neutral Grassland	Maintenance of Traditional Orchards	Maintenance of Bramble Scrub	Maintenance of Hedgerow	Maintenance of Other Hedgerows	Maintenance of Other Rivers and Streams	Maintenance of Other Hedgerows with Trees	Maintenance of Lowland Fens	Maintenance of Bird Boxes	Maintenance of bat boxes	Maintenance of Badger Gates
Frequency		Annually	As Required	Annually	Annually	Annually	As Required	Annually	As Required	As Required	As Required	As Required
Month	J											
	F											
	M											
	A											
	M											
	J											
	J											
	A											
	S											
	O											
	N											
	D											
Year 0	2022											
1	2023											
2	2024											
3	2025											
4	2026											
5	2027											
10	2032											

Legend:	
	The yellow colouration reflects the correct timing each management prescription should follow and the frequency it should occur per month and year. No colour reflects times when no management should occur.