RWE

Tween Bridge Solar Farm

Environmental Statement
Appendix 7.10: Outline Non-Breeding Bird Mitigation Strategy

Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

APFP Regulation 5(2)(a)

Document Reference: 6.3.7.10

June 2026

Revision 3

Non-Breeding Bird Mitigation

Tween Bridge
May 2026

TG Report No. 16413_R03f_JD

Tyler Grange

Project No:	Report No.	Date	Revision
16413	R03	May 2026	f

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Section 1: Introduction

1.1. This report has been produced by Tyler Grange Group Ltd (TG) on behalf of RWE Renewables in relation to 'Tween Bridge' solar farm. It has been produced to summarise the proposed mitigation strategy for the project in relation to non-breeding birds. This is informed by the data obtained from the 'Year 1' of the non-breeding bird surveys, completed between 2022 – 2023 and Year 2' non-breeding bird surveys, completed between 2023-2024, presented within Technical Appendix 7.3 of the **Environmental Statement Volume 2 Chapter 7: Ecology and Nature Conservation [APP-044].**

1.2. Natural England (NE) was consulted on an earlier iteration of this strategy (DAS A010619 / 441464 and UDS-A017176) via their Discretionary Advice Service (DAS); the strategy has responded to NE's comments.

1.3. This report has been updated following the Applicant's notice of intention to submit a request for changes to the application **[PD-006]** and subsequent **Change Request Document [Document Reference 8.14 Revision 1]**. The updates comprise the removal of parcels **1/A, 1/B, 1/C, 1/D, 2/B[1], 3/C, 3/D and 3/E** from the extent of land subject to compulsory acquisition, temporary possession and works powers; the modification of Mitigation Parcel **M1(A)** to avoid registered common land/Countryside and Rights of Way Act 2000 access land parcels **1/E, 2/A, 3/A and 3/B**; and an amendment to a proposed permissive path route through Mitigation Parcel M1(A) so that it would avoid encroaching upon parcel **2/A**. However, the updates as a consequence of the Change Request are minor and do not result in any significant changes to the measures proposed.

1.4. The non-breeding bird survey data is provided in Environmental Statement Volume 3 Appendix 7.3: Non-Breeding Bird Surveys (Year 1 and Year 2) [APP-074]. This data comprise the locations of birds recorded within the survey area (Order Limits [OL] + 600m buffer around) which are listed as a qualifying feature under the Humber Estuary Special Protection Area (SPA). Table 1 and 2 below also summarise peak counts of each qualifying species recorded within the Order Limits and are a direct extract from Technical Appendix 7.3

[1] A small area of land previously forming part of parcel 2A is now identified as parcel 2B in the Land Plans [Document Reference 2.2 Revision 3]. That land is not subject to compulsory acquisition, temporary possession or works powers. In addition, no benefit is assigned to that land for the purposes of the assessment contained in this report as it has never formed part of Mitigation Parcel M1(A) and no other habitat enhancement is proposed in respect of the land.

of the **Environmental Statement Volume 2 Chapter 7: Ecology and Nature Conservation [APP-044].**

Table 1: SPA qualifying species recorded within and outside of the Draft Order Limits during 2022/23. Note that nocturnal and diurnal surveys were combined and peak count of the two is provided, alongside the percentage of the moving (2022/23) WeBS 5-year moving mean totals.

Species	2022				2023		
	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Within the Draft Order Limits							
Curlew Humber Estuary 5 year mean 2022/23 **2,473**	0	0	0	0	0	0	2 (0.08%)
Golden plover Humber Estuary 5 year mean 2022/23 **21,160**	53 (0.25%)	0	0	37 (0.17%)	21 (0.10%)	0	0
Green sandpiper Humber Estuary 5 year mean 2022/23 **14**	**1 (7.14%)**	**1 (7.14%)**	**1 (7.14%)**	0	**1 (7.14%)**	0	0
Greylag goose Humber Estuary 5 year mean 2022/23 **2,569**	375 (14.60%)	0	19 (0.74%)	0	0	0	8 (0.31%)
Lapwing Humber Estuary 5 year mean 2022/23 **15,951**	390 (2.44%)	25 (0.16%)	31 (0.19%)	127 (0.8%)	260 (1.63%)	32 (0.20%)	32 (0.20%)
Little egret Humber Estuary 5 year mean 2022/23 **215**	0	1 (0.47%)	1 (0.47%)	0	0	0	1 (0.47%)
Mallard Humber Estuary 5 year mean 2022/23	**92 (6.31%)**	**24 (1.64%)**	0	12 (0.82%)	**27 (1.85%)**	**64 (4.39%)**	6 (0.41%)

1,459							
Pink-footed goose Humber Estuary 5 year mean 2022/23 **23,330**	**330 (1.41%)**	**360 (1.54%)**	0	0	0	0	0
Shoveler Humber Estuary 5 year mean 2022/23 **317**	0	0	0	0	2 (0.63%)	0	0
Teal Humber Estuary 5 year mean 2022/23 **9,994**	0	2 (0.02%)	0	3 (0.03%)	6 (0.06%)	0	4 (0.04%)
Outside of the Draft Order Limits							
Golden plover	76	480	21	20	1	0	38
Green sandpiper	0	0	0	1	0	0	0
Greylag goose	150	0	0	0	0	155	34
Lapwing	260	136	1	71	14	6	13
Little egret	1	2	1	1	1	0	0
Mallard	60	2	5	42	21	17	10
Pink-footed goose	700	42	0	0	0	21	0
Shoveler	1	0	0	0	0	0	0
Teal	0	0	0	0	23	3	9
Common crane	3	0	0	0	0	0	2

Table 2. SPA qualifying species and species part of the wider waterbird assemblage recorded within and outside of the Draft Order Limits during the Winter Walkover and Nocturnal Bird Surveys combined during 2023/24.

Note that nocturnal and diurnal surveys were combined and the maximum peak count of the two is provided alongside the percentage of the most up to date (2023/24) WeBS 5-year mean totals.[2]

Species	**2023**				**2024**			
	Sep	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**

[2] Calbrade, N.A., Birtles, G.A., Woodward, I.D., Feather, A., Hiza, B., Caulfield, E., Balmer, D.E., Peck, K., Wotton, S.R., Shaw, J.M., and Frost, T.M. 2025.
Waterbirds in the UK 2023/24: The Wetland Bird Survey and Goose & Swan Monitoring Programme. BTO/RSPB/JNCC/NatureScot. Thetford.

Within the Draft Order Limits								
Curlew WeBS 5-year mean for the Humber Estuary **2,473**	0	0	0	0	0	0	2 (0.16%)	2 (0.16%)
Dunlin WeBS 5-year mean for the Humber Estuary **22,346**	0	6 (0.027%)	27 (0.121%)	0	0	0	0	0
Little egret WeBS 5-year mean for the Humber Estuary **226**	0	1 (0.442%)	0	0	0	0	1 (0.442%)	0
Green sandpiper WeBS 5-year mean for the Humber Estuary **19**	0	0	0	**1 (5.26%)**	0	0	0	0
Greylag goose WeBS 5-year average for the Humber Estuary **2285** [3] [4]	0	**210 (9.19%)**	**157 (6.87%)**	12 (0.52%)	0	**27 (1.18%)**	**76 (3.33%)**	9 (0.39%)
Golden plover (WeBS 5-year mean for the Humber Estuary **21,623)**	0	0	82 (0.38%)	2 (0.009%)	84 (0.389%)	0	6 (0.028%)	0
Lapwing WeBS 5-year mean for the Humber Estuary **11,859**	5 (0.042%)	**220 (1.855%)**	**371 (3.129%)**	53 (0.447%)	79 (0.666%)	**147 (1.24%)**	11 (0.093%)	4 (0.034%)
Mallard WeBS 5-year mean for the Humber Estuary 1,459	2 (0.14%)	**33 (2.26%)**	**78 (5.35%)**	**125 (8.567%)**	**49 (3.357%)**	**92 (6.305%)**	**16 (1.096%)**	10 (0.685%)

[3] Contains Wetland Bird Survey (WeBS) data from Waterbirds in the UK 2023/24 © copyright and database right 2025. WeBS is a partnership jointly funded by the BTO, RSPB and JNCC, with fieldwork conducted by volunteers.

[4] Contains Goose and Swan Monitoring Programme (GSMP) data from Waterbirds in the UK 2023/24 © copyright and database right 2025. GSMP is a partnership, run by and jointly funded by BTO, JNCC and NS, with fieldwork conducted by both volunteer and professional surveyors.

Oystercatcher WeBS 5-year mean for the Humber Estuary 7,218	0	0	0	0	0	0	2 (0.028%)	0
Pink-footed goose WeBS 5-year mean for the Humber Estuary **27,329**	0	**1600*** **(5.85%)**	**620** **(2.27%)**	194 (0.71%)	0	**1530** **(5.63%)**	0	0
Teal WeBS 5-year mean for the Humber Estuary **9,994**	0	0	0	2 (0.020%)	12 (0.120%)	2 (0.020%)	2 (0.020%)	1 (0.010%)
Wigeon WeBS 5-year average for the Humber Estuary **6,452**	0	6 (0.093%)	0	0	0	42 (0.651%)	0	0
Outside of the Draft Order Limits								
Little egret	2	2	6	4	0	0	0	0
Greenshank	1	0	1	0	0	0	0	0
Greylag goose	0	184	36	64	0	0	22	1
Golden plover	0	3	20	0	1	0	0	0
Lapwing	54	48	28	12	27	66	29	2
Mallard	49	57	28	30	8	63	47	2
Pink-footed goose	0	1120	0	668	14	0	0	0
Teal	3	4	5	18	8	9	6	2

1.5. Based on the Year 1 and Year 2 survey results, the non-breeding bird assemblage recorded within the Order Limits is typically representative of farmland habitats.

1.6. The Order Limits surround Tween Bridge Wind Farm, which is an operational wind farm with 22 turbines. It is therefore considered that this northern section of the Order Limits is already impacted for non-breeding birds due to displacement caused by the presence of the turbines.

1.7. An assessment of significance has been undertaken to determine if the Order Limits are considered to be 'functionally linked' to the Humber Estuary SPA/Ramsar, which is situated approximately 7.7km northeast. Functional

linkage is not defined in case law, but is generally considered to be relevant when over 1% of a given SPAs population of qualifying features are regularly present and the site is considered 'important' in the life cycle of the qualifying species.

1.8. Greylag goose, lapwing, mallard, and pink-footed goose exceeded the 1% threshold of their WeBS 5-year mean[5] from the Humber Estuary SPA within the Order Limits, indicating potential use of Functionally Linked Land (FLL).

1.9. Potential impacts on non-breeding birds associated with the Humber Estuary SPA/Ramsar therefore include loss of functionally linked land for lapwing, pink-footed goose, greylag goose and mallard and disturbance to these species. Consideration for golden plover in adjacent land has also been had due to the numbers recorded, with measures to be implemented during construction to minimise disturbance. The potential for adverse effects during the construction phase have been 'designed out' where practicable, and these will be controlled through standard good construction and environmental working practices as an integral part of the Scheme, detailed within the **Outline Ecological Construction Management Plan (eCMP) [Document Reference 7.5 Revision 2].**

1.10. In addition to the above, although greylag geese are not a qualifying feature of the SPA[6] as they occur at site levels of more than 1% of the national population according to the most recent Humber Estuary WeBS 5-year average count, impacts to loss of functionally linked land for this species is assessed within this strategy. This requirement was also confirmed by Natural England within their DAS response dated 04.04.25.

1.11. Mallard, lapwing, pink-footed goose and greylag goose have been noted as present in areas which would currently be subject to solar panel installations during the lifetime of the development. To this end, a mitigation response has been proposed tailored to these species. As detailed in **Environmental Statement Volume 3 Appendix 7.3: Non-Breeding Bird Surveys (Year 1 and Year 2) [APP-074]**, these species were recorded in the following habitats:

- Cereal;
- Oilseed rape;

[5] Contains Wetland Bird Survey (WeBS) data from Waterbirds in the UK 2023/24 © copyright and database right 2025. WeBS is a partnership jointly funded by the BTO, RSPB and JNCC, with fieldwork conducted by volunteers.

[6] JNNC. STANDARD DATA FORM for sites within the 'UK national site network of European sites' – Humber Estuary

- Stubble;
- Tilled;
- Rough grassland (only lapwing).

Section 2: Mitigation Strategy

2.1. Prior to any construction commencing at the Order Limits the measures detailed within the **Outline Ecological Construction Management Plan (eCMP) [Document Reference 7.5 Revision 2]** will be implemented to ensure no impacts occur to bird species and the habitats that they utilise.

2.2. The general approach to the mitigation response has been to target areas which are currently used by the qualifying species of note. The overall objective is to turn what is currently agricultural land, with no specific objectives of benefitting non-breeding birds, into land which is secured long-term for the lifetime of the development specifically for the benefit of lapwing, pink-footed goose and greylag goose. These measures will also benefit golden plover, although the Order Limits is not functionally linked for this species.

2.3. Each species detailed above forage on the following resources:

- Lapwing - Worms and insects[7].
- Pink-footed geese - Grain, winter cereals, potatoes and grass[8].
- Greylag geese- Grass, roots, cereal leaves and spilled grain.[9]
- Mallard - Seeds, acorns and berries, plants, insects and shellfish[10].

2.4. There is research, as detailed within REP7-011 of the Cleve Hill Solar Park Habitat Regulations Assessment, that there is no competition between these species as *'golden plover and lapwing feed on surface invertebrates, whereas brent goose feeds on vegetation, meaning there is no competition for foraging resources between these species'* (Paragraph 4.28 of the HRA). Whilst brent goose is not relevant here, pink-footed geese and greylag goose have similar requirements to brent geese, and therefore differing foraging/habitat requirements to lapwing and mallard, so the same principles are considered valid.

2.5. This was confirmed within Natural England's consultation response dated April 2024, in which they stated that acknowledge that 'both waders and

[7] Lapwing Bird Facts | Vanellus Vanellus
[8] Pink Footed Goose Facts | Anser Brachyrhynchus
[9] RSPB. Greylag Goose Facts | Anser Anser
[10] Mallard Duck Facts | Anas Platyrhynchos

geese can be accommodated as they do not compete with each other for food', although NE continued by stating that *'management to maximise the food for one group might impact the other.'* This has been factored into the design and approach on the non-breeding birds detailed below.

2.6. At present, the land is intensively farmed for crops, which will result in a high nutrient content and inhibit the biodiversity of the soil in terms of invertebrate populations for lapwing in particular. The approach of the mitigation response is, therefore, to turn existing areas of sub-optimal cropland into permanent pasture sensitively managed for lapwing, mallard, pink-footed goose and greylag goose in particular, but which will undoubtedly have benefits for other non-breeding bird species, such as golden plover, and biodiversity in general. **Table 1** below summarises the principles of the mitigation strategy proposed.

2.7. Scrapes are also proposed to provide additional optimal habitat for all species, including mallard and lapwing, as part of the mitigation design.

2.8. In addition, it is proposed to maintain and secure areas in arable production in order to provide the optimal habitat requirements for pink footed geese and greylag geese.

Habitat Intervention and Rationale	**Management and Rationale**
Reversion of existing agricultural land into a tussocky meadow grassland. An example grass mixture is Emorsgate EM1 or EM2. This will provide suitable breeding habitat for ground-nesting farmland birds and foraging/roosting/loafing habitat for non-breeding birds (primarily pink-footed geese, graylag geese and lapwing). Subject to topography, consideration will also be given to the creation of shallow scrapes (in consultation with engineering/attenuation requirements) in these areas which can be designed to function as either a permanently marshy grassland (Emorsgate EM8), or ephemeral pools. Both of these habitats will be suitable as mitigation for both breeding and non-breeding birds. It would also be preferable to work with the topography of the land and create ground	The management of the grassland can be achieved in a number of ways, set out below. <u>Traditional Hay Management</u> This would comprise bi-annual cuts, with the first cut to 15cm undertaken in late summer after the core breeding season for ground-nesting farmland birds. The arisings would need to be removed from the area following the cut to allow new growth. A second cut should then be taken to 5cm in Autumn (no later than September), at the time when non-breeding birds will be arriving on passage, and kept like this until the beginning of March. This can be achieved with low intensity grazing (see below), or infrequent cuts/topping, and arisings removed.

which is not completely flat. This will introduce a natural variation in the cutting height of the grass, leaving some areas longer and some areas possibly scalped, creating arounds of bare ground which will ultimately allow new grass growth to develop. These interventions would introduce more botanically diverse grassland and provide the wetland mosaics in strategic locations, particularly along the central canal corridor.	From March and during the breeding season, approximately 50% of the grassland should be less than 5cm in height to benefit early-season nesters such as skylark and lapwing, and approximately 25% of the grassland should be cut between 5cm and 15cm, and the remainder left long.
Providing arable land on rotation for the duration of the proposals, to ensure that foraging opportunities for pink footed geese is secured and provided, in addition to grassland areas.	The main principles to be implemented as part of the rotational arable management for the benefit of pink footed geese will include: o Use sugar beet where possible. o Use other appropriate crops on rotation when sugar beet is not being grown, such as winter cereal crops, oil seed rape, post-harvest cereal stubbles, potatoes[11]. o Post-harvest, the fields should be left until the spring before ploughing to maximise the foraging resource, with the geese foraging on roots chopped into fragments by the harvester, as well as unharvested roots. o Avoidance of deep ploughing. o Incorporation of a ley crop within the management rotation. o Inclusion of permanent grass margins to the fields measuring a minimum 2 metres.

Table 2 – Summary of mitigation measures and management strategy

[11] https://www.rspb.org.uk/birds-and-wildlife/pink-footed-goose

2.10. In Natural England's recent comments, they state that '*The addition of manure subject to a reasonable agricultural cycle*' would be beneficial. However, it is understood that this is not normal farming practice for this area, due to the area mainly comprising arable with no livestock that create manure. Therefore this is not currently proposed.

2.11. The Scheme layout also ensures that all ditches and pond are retained and enhanced, through improved management removing excessive scrub and vegetation as well as invasive species.

2.12. The cessation of agricultural farming in adjacent habitats will also improve water quality and reduce disturbance, ensuring that foraging opportunities within these features for mallards, and other species, will be improved.

2.13. The locations proposed for the mitigation response have, where possible, been chosen to broadly align with recorded locations of the relevant species and to also provide opportunities spread across the Order Limits. (**Appendix 1**). **Drawing 16413/P07a** attached to this report shows and numbers the parcels detailed for the mitigation responses outlined above.

2.14. Further detail on the design and management of the mitigation areas identified within the Order Limits is provided below and also included within the updated **Outline Landscape and Ecological Management Plan [Document Reference 7.6 Revision 4]** . This information is provided to support the delivery of suitable habitat for target species and to ensure that the mitigation areas function as intended over the lifetime of the Scheme.

2.15. The mitigation areas have been selected based on baseline survey data and are designed to provide a mosaic of habitats, including grassland, wet features and managed arable land, to support non-breeding bird species associated with the Humber Estuary SPA, nightjar associated with Thorne & Hatfield Moors SPA, and ground nesting birds, principally skylark.

2.16. The grassland areas detailed below are to be managed primarily for the benefit of the functionally linked species lapwing, mallard and pink-footed geese over winter, and foraging nightjar, foraging and nesting skylark and other ground nesting birds over spring and summer.

2.17. The mitigation parcel (M15) provided as arable is primarily to be managed for pink-footed geese over winter, and nesting and foraging skylark and other ground nesting birds over spring and summer, although will also provide benefits for waders.

2.18. The management of each parcel will be informed by ongoing monitoring and adapted as necessary with the relevant local authorities and Natural England, secured by the **Outline Landscape and Ecological Management Plan [Document Reference 7.6 Revision 4]**.

Delivery and Phasing of Mitigation Parcels

2.19. The Scheme will be constructed in phases across discrete parcels within the Order Limits. As such, while mitigation parcels will be created prior to the commencement of each relevant construction phase, the impacts associated with the Scheme will arise progressively as individual phases are brought forward. In addition, habitats within the Order Limits that are not affected by construction will continue to provide suitable opportunities for the target bird species until such time as they are required for construction.

2.20. The creation of mitigation parcels will be phased, ensuring that mitigation areas are created prior to the onset of each relevant construction phase. The grassland mitigation areas located beyond 600m of wind turbines will be created prior to those within 600m of turbines, therefore mitigation areas M4, M7, M8, M11, M12 and M13 will be created in a phased manner before mitigation areas M1, M2 M3 and M5, ensuring the most optimal mitigation areas are created first. In addition, mitigation area M15 already comprises arable farmland and is to remain in arable management, although will be subject to improved management as detailed, and therefore will provide mitigation land prior to construction commencing.

2.21. Considering that the location of bird activity across the Order Limits has been demonstrated to change, with no one particular area of importance, and that areas in the Order Limits not under construction will continue to provide opportunities for non-breeding birds until they become subject to construction, this approach will ensure continuity of suitable habitat for non-breeding bird species across the Order Limits throughout the construction period.

2.22. The timing of mitigation establishment will take account of seasonal constraints associated with habitat creation (such as appropriate seeding periods), to ensure successful establishment prior to construction commencing.

2.23. The enhanced management to the grassland along retained ditch and river corridors, hedgerow and woodland buffers will also be implemented at the same time as the creation of the mitigation areas, to ensure functioning green

corridors and enhanced habitats are established prior to impacts, for the benefit of nightjar, bats, invertebrates and other wildlife.

2.24. The grassland within the solar array areas, will be established once construction in those areas is complete.

2.25. The following subsections provide parcel-specific detail on the proposed design, management and function of each mitigation area.,

2.26. **Table 3** below summarises the current baseline/use of these parcels and their hectarage.

Mitigation Parcel	Total Area (ha)	Total Area (ha) with 150m buffer to PV panels, buildings, hedgerows and woodland	Current baseline	Parcel Suitability
M1(A)	6.87	0	Rough grassland set on edge of adjacent SPA, noted to be used by lapwing (peak counts of 45 and 8 birds) and graylag geese (2 birds). Lapwing also recorded in adjacent fields in larger numbers (112 and 32 birds).	Mitigation Parcel M1(A) is located in the north-east of the Order Limits at grid reference SE 72534 13629, directly adjacent to the Thorne and Hatfield Moors SPA and SAC. The parcel extends to approximately 6.87 hectares in total. A proposed permissive path route through this parcel comprising a mown grass path. This will be fenced to limit potential for users of the path to encroach on areas identified for the benefit of breeding and non-breeding birds. The parcel will be managed to provide a variable structured grassland habitat through the enhancement of existing grassland. This will comprise the establishment and maintenance of a diverse sward with varied structure to support both breeding and non-breeding bird species. Management will maintain a mosaic of sward heights across the parcel, providing suitable conditions for species including skylark, lapwing and wintering waterfowl. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early spring for skylark. Over summer the grassland will be allowed to develop to approximately 20-50 cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel, measuring 10m width, to provide foraging habitat for geese and other species.

M2	13.42	0	Arable land located in proximity to the canal	Mitigation Parcel M2 is located at grid reference SE 72230 12378 and extends to approximately 13.42 hectares. The parcel is situated within the centre of the Order Limits, adjacent to the canal corridor. The parcel will be managed through the reversion of arable land to species-rich grassland, creating a diverse sward structure. This will provide nesting and foraging habitat for ground-nesting birds such as skylark, alongside foraging and roosting opportunities for non-breeding species. Management will maintain a mosaic of sward heights across the parcel to support both breeding and non-breeding bird functions. Woodland planting will be established along the northern boundary of the parcel to provide shelter and structural diversity, while retaining open grassland to the south suitable for target bird species. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early spring for skylark. Over summer the grassland will be allowed to develop to approximately 20 -50cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel, measuring 10m width, to provide foraging habitat for geese and other species.
M3	6.73	1.90	Not noted to be used by target species during Year 1 of surveys, but adjacent to plots of similar habitat.	Mitigation Parcel M3 is located at grid reference SE 71522 12248 and extends to approximately 6.73 hectares. The parcel is situated just north of the canal corridor and to the west of Mitigation Parcel M2. The parcel will be managed to provide species-rich grassland, maintaining and enhancing the existing habitat to create a diverse sward structure suitable for a range of target species. This

				will provide nesting and foraging habitat for ground-nesting birds such as skylark, alongside foraging and roosting opportunities for non-breeding species. Management will maintain a mosaic of sward heights across the parcel to support both breeding and non-breeding functions. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early spring for skylark. Over summer the grassland will be allowed to develop to approximately 20 -50cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel, measuring 10m width, to provide foraging habitat for geese and other species.
M4	19.94	2.97	Directly adjacent to plots used by lapwing.	Mitigation Parcel M4 is located at grid reference SE 70389 12214 and extends to approximately 19.94 hectares. The parcel is situated to the south of the canal corridor within the Order Limits. The parcel will be managed through the reversion of arable land to species-rich grassland, creating a diverse sward structure suitable for a range of target species. This will provide nesting and foraging habitat for ground-nesting birds such as skylark, alongside foraging and roosting opportunities for non-breeding species. Management will maintain a mosaic of sward heights across the parcel to support both breeding and non-breeding functions. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early spring for skylark. Over summer the grassland will be allowed to develop to approximately 20 -50cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel, measuring 10m width, to provide foraging habitat for geese and other species.

M5	19.24	3.20	Peak count of 360 pink-footed geese recorded within plot, and directly adjacent to other fields where pink-footed geese and lapwing were recorded.	Mitigation Parcel M5 is located to the south of the canal corridor, adjacent to the eastern boundary of the Order Limits, and extends to approximately 19.24 hectares. The parcel will be managed through the reversion of arable land to species-rich grassland. This will comprise the establishment of a varied sward structure to provide suitable habitat for ground-nesting and non-breeding bird species, in line with the wider mitigation strategy for the Scheme. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early spring for skylark. Over summer the grassland will be allowed to develop to approximately 20 -50cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel, measuring 10m width, to provide foraging habitat for geese and other species.
M7	4.76	0.64	Forms one continuous parcel with parcel 8, albeit separated by a hedge and ditch. Had pink-footed geese recorded present.	Mitigation Parcel M7 is located in the eastern part of the Order Limits at grid reference SE 73475 11045 and extends to approximately 4.76 hectares. The parcel will be managed through the reversion of arable land to species-rich grassland, establishing a varied sward structure to provide suitable habitat for target species in line with the wider mitigation strategy for the Scheme. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early spring for skylark. Over summer the grassland will be allowed to develop to approximately 20-50 cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel, measuring 10m width, to provide foraging habitat for geese and other species.

M8	10.71	1.17	Forms a continuous parcel with parcel 7, albeit separated by a hedge and ditch.	Mitigation Parcel M8 comprises two parcels located at grid references SE 73388 10803 and SE 73213 10347, with a combined area of approximately 10.71 hectares. The parcels will be managed through the reversion of arable land to species-rich grassland, establishing a varied sward structure to provide suitable habitat for target species in line with the wider mitigation strategy for the Scheme. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early spring for skylark. Over summer the grassland will be allowed to develop to approximately 20-50 cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel, measuring 10m width, to provide foraging habitat for geese and other species.
M11	20.84	5.14	Arable land located in proximity to parcels M12 and M13, providing a large connected area over 77ha that would not be 'encompassed' by solar development, so would retain attractiveness to over-wintering birds in particular. The field compartments are relatively open, further increasing attractiveness as a mitigation area. The fact that they are prone to flooding is also attractive as it would naturally lend itself to the	Mitigation Parcel M11 is located at grid reference SE 70848 10725 and extends to approximately 20.84 hectares. The parcel is situated to the south of the A18. The parcel will be managed through the reversion of arable land to species-rich grassland. In addition, the parcel will incorporate scrapes, to increase habitat diversity and suitability for target species. The soil conditions in this area comprise clay, which will hold water within the scrapes during and post periods of heavy precipitation, as confirmed within **ES Appendix 15.1 Agriculture Land Classification [APP-120].** The scrapes will provide a wet grassland and damp area, attracting a range of invertebrates and benefitting foraging waders. These scrapes will be created where there are open visitas therefore maximising the opportunities for waders, with the exact location and design provided at the detailed design stage post consent. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early

			creation of scrapes suitable for the wading birds of target. Pink-footed geese recorded using fields in close proximity that comprise similar habitats.	spring for skylark. Over summer the grassland will be allowed to develop to approximately 20 -50cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel, measuring 20m width, to provide foraging habitat for geese and other species.
M12	34.83	12.83	Arable land located in proximity to parcels 12 and 13, providing a large connected area over 77ha that would not be 'encompassed' by solar development and are relatively open. These compartments are located in one connected area and would allow the birds to move around between seasons and within seasons, depending on the specific ground conditions. Pink-footed geese recorded using fields in close proximity that	Mitigation Parcel M12 is located at grid reference SE 69810 10630 and extends to approximately 34.83 hectares. The parcel is situated to the west of Mitigation Parcel M11. The parcel will be managed through the reversion of arable land to species-rich grassland. The design will include the incorporation of scrapes to provide additional habitat diversity and suitability for target species. The soil conditions in this area comprise clay, which will hold water within the scrapes during and post periods of heavy precipitation, as confirmed within the **ES Appendix 15.1 Agriculture Land Classification [APP-120]**. The scrapes will provide a wet grassland and damp area, attracting a range of invertebrates and benefitting foraging waders. These scrapes will be created where there are open visitas therefore maximising the opportunities for waders, with the exact location and design provided at the detailed design stage post consent. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early spring for skylark. Over summer the grassland will be allowed to develop to approximately 20 - 50 cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel, measuring 20m width, to provide foraging habitat for geese and other species.

			comprise similar habitats.	
M13	29.55	14.03	Arable land located in proximity to parcels 12 and 13, providing a large connected area over 77ha that would not be 'encompassed' by solar development and are relatively open. These compartments are located in one connected area and would allow the birds to move around between seasons and within seasons, depending on the specific ground conditions. Pink-footed geese recorded using fields in close proximity that comprise similar habitats.	Mitigation Parcel M13 is located at grid reference SE 70953 10610 and extends to approximately 29.55 hectares. The parcel is situated to the east of Mitigation Parcel M11. The parcel will be managed through the reversion of arable land to species-rich grassland. The design will include the incorporation of scrapes to provide additional habitat diversity and suitability for target species. The soil conditions in this area comprise clay, which will hold water within the scrapes during and post periods of heavy precipitation, as confirmed within the **ES Appendix 15.1 Agriculture Land Classification [APP-120].** The scrapes will provide a wet grassland and damp area, attracting a range of invertebrates and benefitting foraging waders. These scrapes will be created where there are open visitas therefore maximising the opportunities for waders, with the exact location and design provided at the detailed design stage post consent. Shorter sward areas approximately 5cm in height will provide accessible foraging habitat for wading species across the majority of the area over winter and nesting opportunities in early spring for skylark. Over summer the grassland will be allowed to develop to approximately 20 - 50cm to benefit skylark and other ground nesting birds. Taller areas of grassland will be allowed to develop on the margins of this parcel ,measuring 20m width, to provide foraging habitat for geese and other species.
M15	16.85	3.01	Arable land located to the east of the OL and located away from any solar arrays.	Mitigation Parcel M15 is located at grid reference SE 77825 09502 and extends to approximately 16.85 hectares. The parcel will be managed as arable land under a low intensity agricultural regime to provide suitable foraging habitat for non-breeding bird species. This will include the use of appropriate

				crop types, such as root crops and cereals, alongside the retention of post-harvest stubbles to maximise the availability of food resources during the winter period. The main principles that will need to be implemented as part of the rotational arable management for the benefit of pink footed geese in particular are provided below: • Use sugar beet where possible. • Use other appropriate crops on rotation when sugar beet is not being grown, such as winter cereal crops, oil seed rape, post-harvest cereal stubbles, potatoes . • Post-harvest, the fields should be left until the spring before ploughing to maximise the foraging resource, with the geese foraging on roots chopped into fragments by the harvester, as well as unharvested roots. • Avoidance of deep ploughing. • Incorporation of a ley crop within the management rotation. • Inclusion of permanent grass margins to the fields measuring a minimum 2 metres. Detail on monitoring of all the mitigation parcels is included within the updated **Outline Landscape and Ecological Management Plan [Document Reference 7.6 Revision 4]** .
Total	**c. 183.74ha**	**c. 44.88ha**		

Table 3 – Summary of baseline use of mitigation parcels by qualifying bird species, and hectarage.

2.78. Table 3 provides the total area of each potential mitigation parcel, as well as the area of land within the parcel that will be located beyond 150m from any solar arrays, in line with Natural England's comments. It can be seen from looking at the table that over 44.88ha of potential mitigation land can be provided that is located over 150m from any solar arrays.

2.79. In addition to the total mitigation area and area with a 150m open vista, an assessment has also been undertaken to identify the area of each mitigation parcel located beyond 600m of the existing operational turbines. This is relevant because the northern part of the Order Limits is already influenced by the existing Tween Bridge Wind Farm, and areas located further from existing turbines are likely to provide more suitable open conditions for non-breeding bird mitigation.

2.80. Table 4 below summarises the total mitigation area, the area with a 150m open vista, the area located beyond 600m of existing turbines, and the area which meets both criteria.

Table 4 – Summary of mitigation parcel areas with 150m open vista and separation from existing turbines

Mitigation Field Number	Total Area (ha)	Total Area with 150m open vista (ha)	Total Area beyond 600m of existing turbine (ha)	Total Area beyond 600m of existing turbine and with 150m open vista (ha)
M1(A)	6.87	0.00	0.00	0.00
M2	13.42	0.00	0.00	0.00
M3	6.73	1.90	6.17	1.90
M4	19.94	2.97	19.94	2.97
M5	19.24	3.20	8.86	1.98
M7	4.76	0.64	4.76	0.64
M8	10.71	1.17	10.71	1.17
M11	20.84	5.14	20.84	5.14
M12	34.83	12.83	34.83	12.83

M13	29.55	14.03	29.55	14.03
M15	16.85	3.01	16.85	3.01
Total	183.74	44.89	152.51	43.67

2.81. However, it must be noted that during the non-breeding bird surveys, some bird species, including pink-footed geese, were recorded utilising habitats that are located in close proximity to barriers, such as tree lines and hedgerows, which would affect open vistas, indicating that birds will utilise habitat to forage within 150m of existing barriers. This took place in a number of locations including in the southeast of the Order Limits within fields that have hedgerows and tree lines as boundaries creating vistas less than 150m in places (see Technical Appendix 7.3 of the **Environmental Statement Volume 2 Chapter 7: Ecology and Nature Conservation (APP-044)**.

2.82. In addition, research has demonstrated that pink-footed geese forage within habitat that is located within 50m of built structures[12].

2.83. Therefore, although over 44.89ha of core mitigation land can be provided beyond 150m of any barriers, there is an additional 142.44ha of land that will be available and managed for the benefit of non-breeding birds within 150m of solar arrays and which contributes to the overall mitigation strategy.

2.84. Bird Days calculations have been completed to inform the extent of mitigation land required and can be seen in Appendix 1. From these calculations, that the maximum extent of non-breeding bird mitigation land required for pink-footed geese and lapwing is:

- Pink-footed geese – 22.98
- Lapwing – 24.99
- **Total: 47.97 ha**

2.85. Although not an SPA species, the land required for greylag geese based on the above calculations is: 12.28 ha.

2.86. Based on the above figures and considering that geese forage on different resources to lapwing, as confirmed within Natural England's consultation

[12] Jesper Kyed Larsen∗ and Jesper Madsen. Effects of wind turbines and other physical elements on field utilization by pink-footed geese (*Anser brachyrhynchus):* A landscape perspective. Landscape Ecology 15: 755–764, 2000.

response dated April 2024, and so will utilise the same habitats without competing for the same resource, it can be seen that there is more than sufficient land within the Order Limits to provide the required non-breeding bird mitigation.

2.87. No sufficiently up to date and relevant data has been available to inform bird days calculations for mallard, but it is considered that the extent of mitigation land and the retention and enhancement of all the pond and ditches, ensure that sufficient habitat for this species.

2.88. In total an overall area of approximately 2.14ha of ponds will be available and enhanced and approximately 105.29km of ditches available and enhanced increasing foraging opportunities for mallard and other species.

2.89. This mitigation land will also be utilised as part of the breeding bird mitigation for species such as skylark and provide foraging habitat for nightjar.

2.90. Further to the above, in line with Natural England's recent comments (December 2024), additional management is proposed within Parcel 1 due to its proximity to Humber Estuary SPA/Ramsar/SSSI and Thorne & Hatfield Moors SPA/Thorne Moor SAC/SSSI **(see Figure 1).** A wet grassland scheme will be implemented with ditch raising and water level management in this location. Suitable removal of tree cover at the edge of the moors will be undertaken to improve suitability of this area for wading birds.

2.91. No management of habitats is proposed within the SPA or SAC, only within the land parcel located outside of designated site boundaries.

2.92. Appropriate management of the northern and southern margins of parcel 1 will also be undertaken to benefit the adjacent SAC, with management to be agreed with Natural England.

2.93. The management of the mitigation land can be secured through the implementation of the **Outline Landscape Ecological Management Plan [Document Reference 7.6 Revision 4].**

Figures

Figure 1: Non Breeding Bird Mitigation Plan

The mitigation land has been carefully designed and calculated to ensure clear sightlines for the intended bird species.

Measures will be implemented during construction to prevent impacts such as from accidental damage, run-off including mud and silt, airborne pollutants including dust and noise

The Scheme will turn what is currently agricultural land, with no specific objectives of benefitting non-breeding birds, into land which is secured long-term for the lifetime of the development specifically for the benefit of lapwing, golden plover, pink-footed goose and greylag goose.

The cessation of intensive agricultural management and agrichemical inputs will improve water quality in ditches and off-site waterbodies improving thier suitability for birds.

Higher value boundary habitats that are likely to support invertebrate species will be retained and protected during works. Species-rich grasslands will be introduced around field boundaries to enhance habitat for invertebrates and to strengthen dispersal corridors across the landscape.

Arable land will be provided on rotation for the duration of the proposals to ensure continued foraging opportunities for pink-footed geese, alongside grassland areas. The rotational arable management will include using sugar beet where possible, with other appropriate crops such as winter cereals, oilseed rape, post-harvest cereal stubbles, and potatoes included in rotation when sugar beet is not grown. Following harvest, fields will be left until spring before ploughing to maximise the foraging resource, allowing geese to feed on fragmented and unharvested roots.

Deep ploughing will be avoided, a ley crop will be incorporated within the rotation, and permanent grass margins measuring a minimum of 2 metres will be included around the fields to support foraging and shelter opportunities for the geese.

In addition to habitat reversion and scrape creation, management will include traditional hay cuts to provide a mosaic of sward heights suitable for lapwing and skylark, as well as geese. The inclusion of permanent grass margins, shallow scrapes will further diversify habitat, supporting a wider range of non-breeding birds.

Scrapes are proposed to provide additional optimal habitat for waders as part of the mitigation design.

Substantial areas of agricultural land offsite will remain unaffected by the proposals which will provide oppotunities for non-breeding birds.

The locations proposed for the mitigation response have, where possible, been chosen to broadly align with recorded locations of the relevant species and to also provide opportunities spread across the Order Limits.

Buffers of of 9m from all IDB watercourses, and a 5-8m from all other non-IDB ditches will comprise neutral grassland, providing further foraging and potentially nesting opportunities.

The Scheme will provide an increase in native habitats through the site in place of intesively managed arable.This will improve connectivity across the Order Limits for a range of bird species.

Timing of works in proximity to potential habitat for Schedule 1 species will be managed to avoid impacts. This will include the implementation of targeted non-breeding bird mitigation plans, including buffer zones where Schedule 1 species are found to be nesting in the vicinity of construction works.

Reversion of existing agricultural land into a tussocky meadow grassland will provide suitable breeding habitat for ground-nesting farmland birds and foraging/roosting/loafing habitat for non-breeding birds (primarily pink-footed geese, lapwing and golden plover). These habitats will be suitable as mitigation for both breeding and non-breeding birds.

- Order Limits
- Mitigation Land
- Mitigation Land with a 50m Buffer from Vertical Features
- Mitigation Land with a 100m Buffer from Vertical Features
- Mitigation Land with a 150m Buffer from Vertical Features
- Mitigation Land (Managed As Arable)
- Special Protection Area (SPA)
- Indicative Scrapes Location

N

0 0.75 km

Project	Tween Bridge
Drawing Title	Figure 1: Non Breeding Bird Mitigation Plan
Scale	As Shown (Approximate)
Drawing No.	16413/P14e
Date	June 2026
Checked	TLR/RR

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Appendix 1: Bird Days Calculations

Pink footed goose

Year 1 (2022/23)	
Sep 2022 Peak Count	330
Oct 2022 Peak Count	360
Nov 2022 Peak Count	0
Dec 2022 Peak Count	0
Jan 2023 Peak Count	0
Feb 2023 Peak Count	0
Mar 2023 Peak Count	0
Months surveyed (Sep 2022 to March 2023)	7
Winter Peak Mean=Sum of Monthly Peaks/Number of months	98.57143
Number of Days in Survey Period	195
Bird Days per Winter=Winter Peak Mean×Number of Days in Survey Period	19221.43
Bird Days per Hectare for Pink footed goose	4290
Required Area (hectares)= Bird Days Supported per Hectare / Bird Days per Winter	
Potential Mitigation Area	4.480519

Pink footed goose

Year 2 (2023/24)	
Sep 2023 Peak Count	0
Oct 2023 Peak Count	1600
Nov 2024 Peak Count	620
Dec 2023 Peak Count	194
Jan 2023 Peak Count	0
Feb 2024 Peak Count	1530
Mar 2024 Peak Count	0
Apr 2024 Peak Count	0
Months surveyed (Sep 2022 to March 2023)	8
Winter Peak Mean=Sum of Monthly Peaks/Number of months	493
Number of Days in Survey Period	200
Bird Days per Winter=Winter Peak Mean×Number of Days in Survey Period	98600
Bird Days per Hectare for Pink footed goose	4290
Required Area (hectares)= Bird Days Supported per Hectare / Bird Days per Winter	
Potential Mitigation Area	22.98368

Lapwing

Year 1 (2022/23)	
Sep 2022 Peak Count	390
Oct 2022 Peak Count	25
Nov 2022 Peak Count	31
Dec 2022 Peak Count	127
Jan 2023 Peak Count	260
Feb 2023 Peak Count	32
Mar 2023 Peak Count	32
Months surveyed (Sep 2022 to March 2023)	7
Winter Peak Mean=Sum of Monthly Peaks/Number of months	128.1429
Number of Days in Survey Period	195
Bird Days per Winter=Winter Peak Mean×Number of Days in Survey Period	24987.86
Bird Days per Hectare for Lapwing	1000
Required Area (hectares)= Bird Days Supported per Hectare / Bird Days per Winter	
Potential Mitigation Area	24.98786

Lapwing

Year 2 (2023/24)	
Sep 2023 Peak Count	5
Oct 2023 Peak Count	220
Nov 2024 Peak Count	371
Dec 2023 Peak Count	53
Jan 2023 Peak Count	79
Feb 2024 Peak Count	147
Mar 2024 Peak Count	11
Apr 2024 Peak Count	4
Months surveyed (Sep 2022 to March 2023)	8
Winter Peak Mean=Sum of Monthly Peaks/Number of months	111.25
Number of Days in Survey Period	200
Bird Days per Winter=Winter Peak Mean×Number of Days in Survey Period	22250
Bird Days per Hectare for Lapwing	1000
Required Area (hectares)= Bird Days Supported per Hectare / Bird Days per Winter	
Required Mitigation Area	22.25

Greylag Goose	
Year 1 (2022/23)	
Sep 2022 Peak Count	375
Oct 2022 Peak Count	0
Nov 2022 Peak Count	19
Dec 2022 Peak Count	0
Jan 2023 Peak Count	0
Feb 2023 Peak Count	0
Mar 2023 Peak Count	8
Months surveyed (Sep 2022 to March 2023)	7
Winter Peak Mean=Sum of Monthly Peaks/Number of months	57.42857
Number of Days in Survey Period	195
Bird Days per Winter=Winter Peak Mean×Number of Days in Survey Period	11198.57
Bird Days per Hectare for Greylag goose	1000
Required Area (hectares)= Bird Days Supported per Hectare / Bird Days per Winter	
Required Mitigation Area	11.19857

Greylag Goose	
Year 2 (2023/24)	
Sep 2023 Peak Count	0
Oct 2023 Peak Count	210
Nov 2024 Peak Count	157
Dec 2023 Peak Count	12
Jan 2023 Peak Count	0
Feb 2024 Peak Count	27
Mar 2024 Peak Count	76
Apr 2024 Peak Count	9
Months surveyed (Sep 2022 to March 2023)	8
Winter Peak Mean=Sum of Monthly Peaks/Number of months	61.375
Number of Days in Survey Period	200
Bird Days per Winter=Winter Peak Mean×Number of Days in Survey Period	12275
Bird Days per Hectare for Greylag goose	1000
Required Area (hectares)= Bird Days Supported per Hectare / Bird Days per Winter	
Potential Mitigation Area	12.275

Total Required Mitigation Area = largest potential mitigation area for each species	
Pink footed goose	22.98
Lapwing	24.99
Greylag Goose	12.28
Total Required Mitigation Area For Functionally Linked	60.25

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