Land off Mill Lane, Whitburn

Wader Compensation Strategy

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Client	Story Homes
Project	Land off Mill Lane, Whitburn
Version	FINAL
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	Name	**Position**	**Date**
Originated	Alexander Permain	Senior Ecologist	18 December 2025
Reviewed	Ian Heard	Principal Ecologist	19 December 2025
Approved for issue to client	Claire Dewson	Associate Director	05 January 2026
Issued to client	Alexander Permain	Senior Ecologist	12 January 2026

Contents

1 Introduction

Background to commission

1.1 BSG Ecology Ltd. was commissioned by Story Homes (the 'Client') in October 2024 to undertake ecological surveys in support of an Ecological Impact Assessment (EcIA) that will be used to inform a planning application for a proposed residential development at Land off Mill Lane, Whitburn ('the Site'). The EcIA (see BSG Ecology, 2026a) is supported by a suite of bird surveys which was collected between November 2024 – October 2025. The full results are presented in the Ornithological report (see BSG Ecology, 2026b).

1.2 The Site is considered to be of district level importance for non-breeding curlew *Numenius arquata* (see BSG Ecology, 2026a). Therefore an offsite compensation strategy suitable to remediate impacts to curlew is proposed for in perpetuity will also indirectly compensate for other waders that were recorded on Site including golden plover *Pluvialis apricaria* and lapwing *Vanellus vanellus*.

1.3 A consultation with the ecologist at the local planning authority (LPA), South Tyneside, on 06 October 2025 was undertaken in relation to the offsite compensation strategy. As a result from the meeting, in order to collect further information on the foraging suitability of the fields for compensation, an earthworm survey was undertaken and communicated with the LPA on 07 November 2025.

Description of project

1.4 The client intends to submit a full planning application for a residential development of 205 units with associated sustainable urban drainage features and public open space. The ecology surveys were undertaken in accordance with industry standard guidance (CIEEM, 2024) and has been used to inform the final development design taking the mitigation hierarchy into account.

Site description

1.5 The Site boundary is approximately 10.7 hectares (ha) in size, and it is located adjacent to the east of Lizard Lane, Whitburn, South Tyneside. To the east of the Site is the A183 and to the north of the Site is Kitchener Road. The Site is centred on an Ordnance Survey grid reference (OSGR) of NZ 40564 63396. The Site is shown in **Figure 1**.

1.6 The Site comprises of a single arable field, managed for haylage. There are no significant field margins, and the boundaries are delineated by dry stone wall or post and wire fencing. Scattered scrub is present along the western boundary.

Purpose of the report

1.7 The purpose of this report is to detail the proposed compensation strategy for non-breeding curlew. The design requirements are set out in order to provide long-term foraging and roosting habitat for the birds which will be displaced by the proposed development during its construction and operational phase.

2 Wader compensation site – design requirements

2.1 In appraising the design requirements for a compensation site, the potential management solutions were informed by baseline data collected during the non-breeding wader surveys (see BSG Ecology, 2026a and 2026b), relevant peer-reviewed literature (see **Table A-1, Appendix 1**) and details in relation to the current land management and visual sight lines for waders.

2.2 Land to the west of the Site has been identified as suitable for non-breeding wader compensation (the 'Compensation Site'). The Compensation Site is made up of a combination of two fields (field 1 and field 2; a description of each field is outlined below. The Compensation Site totals approximately 8.8 ha in size.

2.3 The location of the Compensation Site and the current baseline habitats are shown on **Figure 1.** The post intervention habitats proposed including additional fencing is shown on **Figure 2**.

Field 1

2.4 Field 1 is approximately 3.51 ha in size and is currently used for livestock (horse) grazing (see **Figure 1**). It is located to the west of the Site on the opposite side of Lizard Lane. Field 1 is centred on an Ordnance Survey grid reference (OSGR) of NZ 40370 63423. The sward height averages between 5 – 10 cm and evidence suggest that occasional poaching has occurred from livestock; however, this accounts for less than 5% of the habitat area and the vast majority of the grassland shows no physical damage. Grass species include: dominant perennial ryegrass *Lolium perenne*, with occasional cocksfoot grass *Dactylis glomerata* and Yorkshire fog *Holcus lanatus*. The eastern and south-west boundaries are marked by post and wire fencing. Alongside the fencing to the south is a newly planted hedgerow. To the west of field 1 there is an earth mound which is fenced off an all aspects.

2.5 The results of the non-breeding wader surveys (see BSG Ecology, 2026b) indicate that curlew were using field 1 in the presence of grazing livestock. It is considered that optimum grazing management prescriptions (as detailed in **Section 2**) including a reduction from intensive grazing to a more moderate grazing practice (see literature cited in **Table A-1, Appendix 1**) will increase the carrying capacity of field 1 though more diverse vegetation structure, increased invertebrate diversity and reduction in human disturbance during the core over-wintering period (October – February).

2.6 Clear lines of sight are available within field 1 particularly on the north and the southern aspects. This will enable waders to transition between open fields unobstructed for foraging and roosting purposes.

2.7 Compared with the Site boundary, lines of sight to the south and east are restricted already by housing and road infrastructure. Therefore, the open land to the north and south of field 1 offers greater sight lines overall.

Field 2

2.8 Field 2 is approximately 5.29 ha in size made up wholly of a winter-sown arable crop (see **Figure 1)**. Around the margins is a narrow (0.5 m) strip of modified grassland dominated by grasses such as perennial ryegrass, cock's foot grass and Yorkshire fog. Along the northern boundary of the field is a newly planted hedgerow. The hedgerow measures approximately 0.75 m long and is entirely contained within tree tubes. The southern and south-west margins of the field are marked by an old stone wall which has become vegetated over, giving the appearance of a mound.

2.9 The results from the non-breeding wader surveys (BSG Ecology, 2026b) indicate that curlew, lapwing and golden plover were using field 2. A winter cereal crop is considered to be suboptimal for foraging curlew due to the tilling and ploughing events which typically take place on an annual basis (see literature cited in **Table A-1, Appendix 1**). This management destroys intact earthworm burrow systems which ultimately increases foraging difficulty and energy expenditure (see Berg, 1993 and Bertoncelj, 2025) in **Table A-1, Appendix 1**).

2.10 Field 2 offers clear lines of sight to the south and to the south-west where arable fields are widespread in the locality. To the north is a farm track which divides field 1 and field 2. It is considered that this is still open enough for waders to transition between both fields.

3 Earthworm survey

3.1 Earthworms are considered an important food resource during the pre-breeding period for waders, including curlew (Berg, A. 1993). Therefore, earthworm surveys were undertaken to determined densities at the Compensation Site and ensure the suitability of the land to support foraging non-breeding waders.

Methodology

3.2 The Site and proposed wader mitigation fields (as shown in **Figure 1 and 2)** were subject to an earthworm survey on 21 November 2025. The surveys were conducted by Harry Glass and Jennifer Peacock, Ecologists at BSG Ecology. Both have worked as ecological consultants since 2024 and have experience undertaking a variety of protected species surveys across the UK.

3.3 Survey conditions were dry, full sunshine and 4°C. Survey methods followed guidance set out by the Agricultural and Horticultural Development Board (AHDB) (2024). Ten soil pits 20 x 20 x 20 cm were dug at roughly evenly spaced locations throughout each of the three fields, as shown in **Figure 3.** Surveyors hand-sorted the soil from the pit, tallying the worms that were dug up. Results were used to draw comparative conclusions regarding the density of earthworms between each field (and thus the relative availability of foraging resource for waders).

Results

Site

3.4 The earthworm survey recorded poor numbers of earthworms on Site, averaging 1.4 earthworms per pit and with a peak count of 4 worms. It is considered likely that the recent tilling and sowing of the field in the weeks prior to the survey is likely to have impacted the number of worms recorded, however this is considered to reflect the typical baseline of the Site under its current management.

Compensation Site – field 1

3.5 The earthworm survey recorded the highest number of worms in the livery field west of Site with an average of 8.4 worms per pit and a peak count of 20 worms, likely due to the livery use providing biological inputs to the soil and increasing its suitability for worms.

Compensation Site – field 2

3.6 Lower numbers were recorded in the off-site agricultural field, averaging 3.4 worms per pit and a peak count of 7 worms, likely because of its agricultural management.

Evaluation

3.7 The results showed that the Compensation Site had more earthworms per pit than the Site and noticeably higher earthworm densities overall.

4 Compensation proposals

Field 1

4.1 It is proposed that 'field 1' (see **Figure 2**) will be managed and function in the following ways, in perpetuity:

- Field 1 will continue as livestock grazed pasture (g4 Modified Grassland); however, the grazing regime will change through management modifications. All livestock within field 1 will be removed between 01 October and 29 February.
- Livestock grazing between March to September will produce a varied sward height and inputs of dung which will provide favourable conditions for invertebrates and foraging waders (see Berg, 1993., Vickery *et al,* 2001, Atkinson, 2004, Lovasz, 2004 and Barzan, 2021 in **Table A-1, Appendix 1**). The removal of livestock between October and February will reduce animal disturbance throughout the core wintering season (October – February). The proposed livestock management regime should make the field more attractive to foraging waders and increase its overall carrying capacity;
- Access to the land will be strictly controlled by the installation of appropriate fencing of which is considered necessary to reduce disturbance (see Cutts *et al,* 2024 in **Table A-1, Appendix 1**); and
- Signage indicating restricted access will be installed in appropriate locations around the perimeter fence. It is recommended that signage (such as interpretation boards) are installed for the purpose of maintaining authorised access only and deterring access from new residents associated with the proposed development. The signage should include descriptions and advisory notes on the waders present for educational awareness purposes. In reference to Appendix C of BSG Ecology (2026d) the landscape masterplan shows that key recreational footpaths are focused on the north and east aspects of the Site with public footpaths directed away from the Compensation Site.

Field 2

4.2 It is proposed that 'field 2' (see **Figure 2**) will be managed and function in the following ways and secured for in perpetuity:

- Field 2 will be changed from its current use from winter-sown arable wheat crop (c1 Arable and horticulture) to a permanent grass ley (g4 Modified Grassland), analogous to the habitat present within the Site;
- Access to the land will be strictly controlled by the installation of appropriate fencing of which is considered necessary to reduce disturbance (see Cutts *et al,* 2024 in **Table A-1, Appendix 1**);
- Providing permanent grassland will deliver long-term optimum foraging habitat for over-wintering waders through a decrease in ploughing/tilling events which will maintain earthworm densities and reduce damage to earthworm burrows, which has been found to increase wader foraging efficiencies (see Berg, 1993, Onrust, 1989 and Vickery, 2001 in **Table A-1, Appendix 1**). Re-seeding events will likely only need to be undertaken approximately every 5-years in order to replenish the seed mix. It is proposed for flexibility as to the seed mix sown in field 2 in order to maintain soil health; and
- Access to field 2 will be restricted after the final hay cut each October until the following year. This practice is considered to be part of the normal agricultural regime. Two hay cuts are typical of this grassland (one early summer and one in late summer/early autumn). Whilst curlew is able to forage in a short and a long grass sward, it is recommended that a third hay cut (late October) is undertaken to maintain a short sward (approximately 5 cm) over the winter to increase the appeal for foraging golden plover and lapwing, both species of which prefer feeding within a short sward (see Woodward, 2022, Vickery, 2001 and Milsom *et al,* 1996 in **Table A-1, Appendix 1**). The short-term disturbance events required for the hay cuts is not likely to be detrimental to the birds using the field following the completion of these agricultural activities.

5 Delivery of compensation

5.1 It is anticipated that the wader compensation land and its associated management will be secured through a Section 106 (S106) agreement.

5.2 The details of key management tasks associated with the delivery of the wader compensation are outlined within this report. It is anticipated that a S106 agreement will require a management plan which will detail compensation delivery measures as well as the responsible parties and monitoring activities for the duration of the agreement.

6 References

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Cutts, V *et al.* (2024). Guidance on reducing disturbance of shorebirds. Conservation Guidance Series No. 14, v10.

Lovasz, L. *et al.* (2024). Natural grazing by horses and cattle promotes bird diversity in a restored European alluvial grassland. PeerJ.

Milsom, T.P e*t al.* (1996). Design of grassland feeding areas for waders during the winter: the relative importance of award, landscape factors and human disturbance.

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Onrust, J. (1989). Earth, worms & birds. Groningen Institute for Evolutionary Sciences (GELIFES), University of Groningen, The Netherlands. Chapter 1.

Vickery, A.J *et al.* (2001). The management of lowland neutral grasslands in Britain: effects of agricultural practices on birds and their food resources. Journal of Applied Ecology, pp 647 – 664.

Woodward, D.I. (2022). Assessing drivers of winter abundance change in Eurasian Curlews *Numenius arquata* in England and Wales. Bird Study, Volume 68, pp 289 – 301.

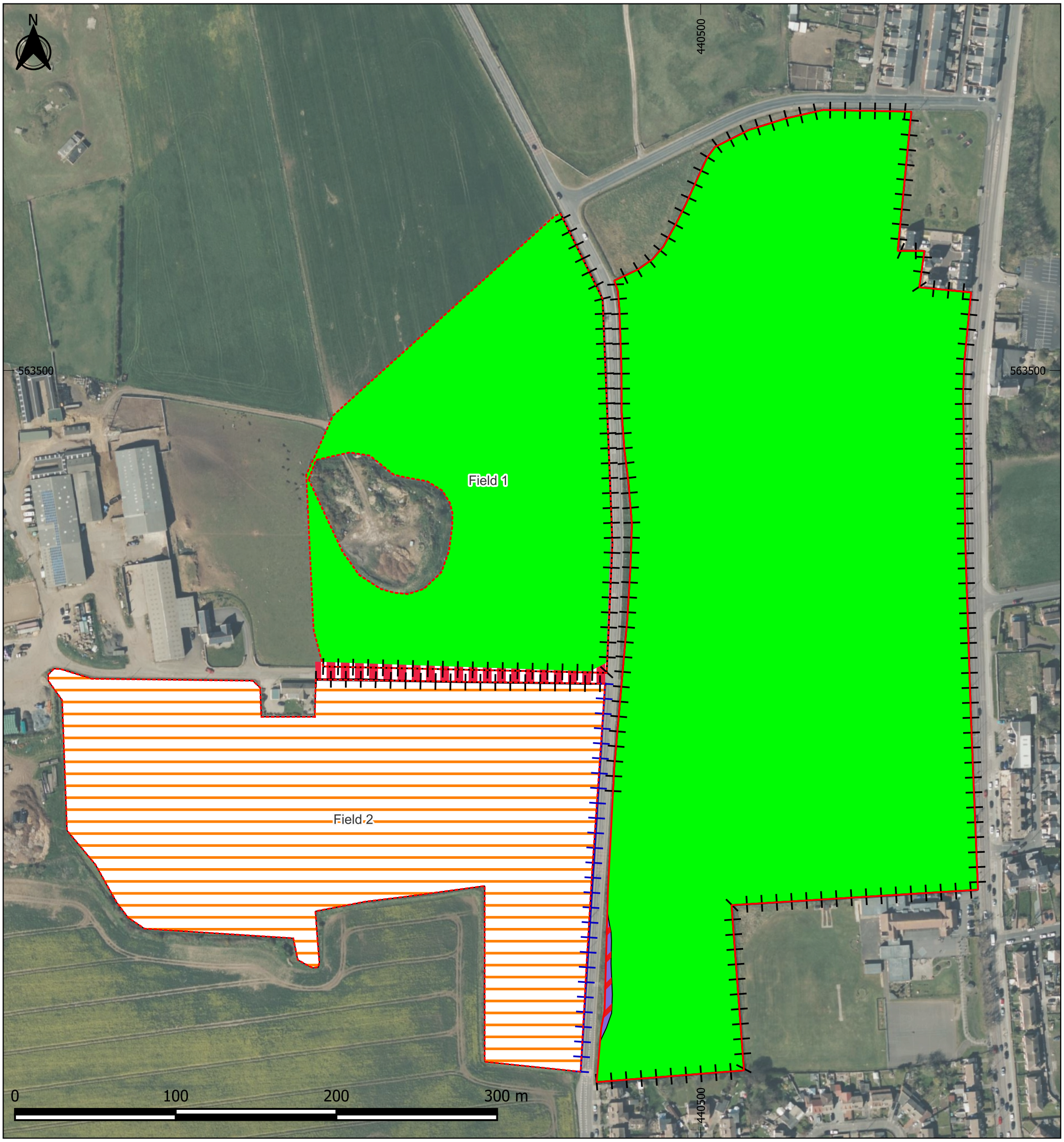
7 Figures

(Overleaf)

Figure 1: Baseline UKhab map (Site and off-Site baseline habitat plan)

Figure 2: Wader compensation strategy – post intervention UKhab map

Figure 3: Earthworm survey – sampling pit locations



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PROJECT TITLE

LAND OFF MILL LANE, WHITBURN

DRAWING TITLE

Figure 1: Baseline UKhab map (Site and off-Site baseline habitats plan)

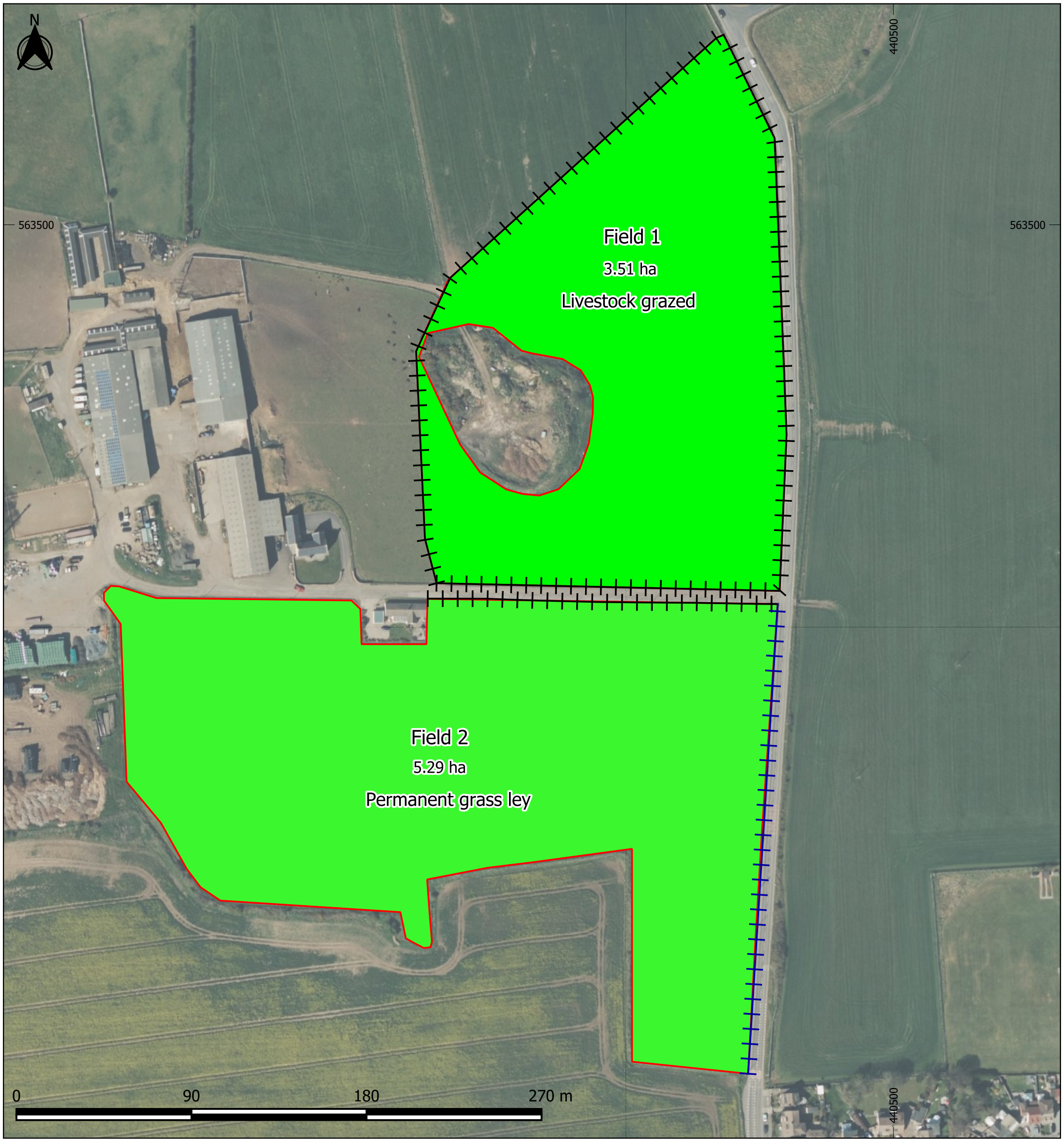
DATE: 24/11/2025	CHECKED: AP	SCALE: 1:2,325
DRAWN: SP	APPROVED: IH	VERSION:1.0

Legend

- Fence
- Wall
- Cereal crops
- Developed land; sealed surface
- Mixed scrub
- Modified grassland
- Off-site boundary
- Site boundary

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data



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MILL LANE, WHITBURN

DRAWING TITLE

Figure 2: Wader compensation strategy
post intervention UKhab map

DATE: 18/12/2025	CHECKED: AP	SCALE: 1:1,921
DRAWN: SP	APPROVED: IH	VERSION:1.1

Legend

- Fence
- Wall
- Modified grassland
- Site boundary

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 13025

Legend

- Sampling pit
- Survey boundary

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PROJECT TITLE

LAND OFF MILL LANE, WHITBURN

DRAWING TITLE

Figure 3: Earthworm survey - sampling pit locations

DATE: 02/12/2025 CHECKED: AP SCALE: 1:1,921

DRAWN: SP APPROVED: IH VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 13132

8 Appendix 1: Supporting evidence for the wader compensation strategy

8.1 A review of published evidence from research in the UK and Europe suggests that grass ley during the over-wintering period provides foraging opportunities for waders (particularly curlew) due to reduced ploughing/tilling events, resulting in more intact earthworm burrow systems and increased prey availability and increasing foraging efficiencies for waders (compared to annual ploughing or tilling of cereal crop fields).

8.2 Within the literature review, we have also considered potential indirect impacts, including disturbance, and methods of reducing such disturbance events, including a reduction in livestock grazing during the core over wintering period.

8.3 A summary of the evidence for the effectiveness of grass leys and methods of reducing disturbance impacts to waders are presented below, some methods of which have been adopted within our strategy (see **Section 3**).

8.4 **Table A-1** (overleaf) provides a literature review.

Table A-1: *Literature review*

Earthworms, grass leys and their benefits for foraging waders	
Author(s)	**Summary of key findings**
Berg, A. (1993). Food resources and foraging success of Curlews *Numenius arquata* in different habitats. The Swedish University of Agricultural Sciences.	Earthworms were found to be the most important food organisms for curlew during the pre-breeding period with the number of earthworms caught per minute by curlew is higher in sown grassland than tillage. It was suggested that the biomass of earthworms did not differ between these habitats, so the greater availability of earthworms in sown grass was probably due to their intact burrow systems, making earthworms easier to catch than in tillage, whereas tillage destroys burrow systems after each ploughing event. Foraging success of curlew was also greater in sown grassland than in tillage; the number of earthworms caught in the pre-breeding period was significantly higher than the breeding period and was favoured more than any other prey, reflecting the importance of this foraging resource during the pre-breeding period. The research acknowledged that the most important habitat for curlew in modern farmland was sown grassland, with curlew density positively correlated to the proportion of grassland in farmland.
Key findings	Sown grassland provides more productive foraging habitat for curlew than arable tillage, due to the retention of burrow systems which increases rate at which earth worms are caught by foraging curlew
Bertoncelj, I *et al.* (2025). Positive Effects of Reduced Tillage Practices on Earthworm Population Detected in the Early Transition Period.	Less intensive tilling practices are increasingly adopted globally and have shown to have positive effects on earthworm populations over time. Reduced tillage events were shown to increase both earthworm biomass and abundance. No till practices showed the lowest variability in earthworm populations. Though it is recognised in this study that climatic factors may influence these results.

Key findings	Low intensity conservation tillage or no tillage practices help to maintain earthworm biomass and abundance.
Woodward, D.I. (2022). Assessing drivers of winter abundance change in Eurasian Curlews *Numenius arquata* in England and Wales. Bird Study, Volume 68, pp 289 – 301.	Grassland cover represents an important winter habitat for curlew and its availability may potentially benefit buffering against depletion of intertidal food resources through the winter period.
Key findings	Grassland cover in the winter is an important foraging habitat for over-wintering curlew.
Onrust, J. (1989). Earth, worms & birds. Groningen Institute for Evolutionary Sciences (GELIFES), University of Groningen, The Netherlands. Chapter 1.	Most organisms cannot cope with agricultural intensification; however, it does not appear to harm earthworm densities. The research cited that some of the most earthworm-rich grasslands in Europe are in areas of intensive grassland management. It is suggested here that foraging dynamics for birds is not about how many earthworms (total abundance) are found in the soil, but indeed how many they can catch. The ability for a bird to forage on earthworms depends on their bill strength, ability to probe, earthworm depth and overall soil resistance.
Key findings	Grassland intensification has not limited earthworm densities, and in some studies earthworms in intensive grassland, earthworm density is found to be higher than in natural grassland.
Vickery, A.J *et al.* (2001). The management of lowland neutral grasslands in Britain: effects of agricultural practices on birds and their food resources. Journal of Applied Ecology, pp 647 – 664.	In coastal areas, during winter, curlew (in coastal areas only), golden plover and lapwing all show preferences for grassland with short swords. Lapwing's often favour a short sward of less than 5 cm during the over-wintering period. Whilst cutting events do lead to insect mortality, this is often short-lived before a recovery.
Key findings	A short grass sward is beneficial for over-wintering waders.
Milsom, T.P e*t al.* (1996). Design of grassland feeding areas for waders during the winter: the relative importance of award, landscape factors and human disturbance.	Grassland management options may benefit waders which exploit permanent grassland as a feeding habitat during winter. The strongest correlations in the use of a field by waders was the sward height (shorter being preferred) and the degree of field enclosure more than any other factor (such as disturbance). A mowing operation during mid-October was considered to create an attractive sward for waders.
Key findings	Sward height and sight lines were the strongest factors as to the attractiveness of wader foraging grounds over winter.
Grassland grazing management	
Vickery, A.J *et al.* (2001). The management of lowland neutral grasslands in Britain: effects of agricultural practices on birds and their food resources. Journal of Applied Ecology, pp 647 – 664.	It was found that selective moderate and seasonal grazing (rather than continuous) can result in structurally heterogenous swards and a greater insect diversity. Soil dwelling invertebrates will be negatively affected by soil compaction through grazing and the extent to which compaction occurs will depend on the stocking density of livestock within the field.
Key findings	Seasonal grazing can increase insect diversity.

Atkinson, P.W. (2004). What factors determine where invertebrate feeding birds forage in dry agricultural grassland? Ibis, Volume 146, pp 1 – 258.	Common waders of grassland in winter (curlew, golden plover and lapwing) typically prefer pasture with short swards. There is a suggestion of a positive relationship between bare earth and accessibility to the soil which is important for waders as a result of the greater ability to detect prey. Dung from livestock also increases prey availability and is easily accessible to birds.
Key findings	Grass sward structure and dung is important for foraging waders, with short swards allowing greater foraging success.
Lovasz, L. *et al.* (2024). Natural grazing by horses and cattle promotes bird diversity in a restored European alluvial grassland. PeerJ.	Foraging birds in grassland/pasture showed the strongest positive relationship with low intensity grazing by cattle and horses. It was acknowledged that high intensity grazing and the maintenance of a short sward increased food availability, prey visibility and predator detectability for birds. However, overall invertebrate species richness was optimised with low and moderate grazing densities.
Key findings	Low to moderate grazing densities result in greater invertebrate species richness and therefore improved foraging opportunities for birds.
Barzan, R.F., *et al.* (2021). Livestock grazing constrains bird abundance and species richness: A global meta-analysis.	Intermediate grazing intensity seems appropriate to maintain bird abundance and richness, The study found that high grazing intensity reduced bird species richness. Additionally, reducing livestock and grazing intensity could reduce the negative effect on bird abundance and richness. Moderate grazing intensities appear to have only a minor impact on abundance and richness.
Key findings	Moderate grazing management can lead to greater species richness and abundance of birds.
Disturbance events and their impact on waders and possible solutions	
Author(s)	**Summary of reports key findings**
Collop, C. *et al.* (2016), Quantifying wintering waders' responses to disturbance. British Ornithologists Union.	Intertidal areas of the Wash in East Anglia were subject to a study in 2022/2023 on disturbance impacts to over-wintering waders. The study acknowledged that disturbance could impact birds' energy budgets by reducing the amount of time feeding but suggested that survival would only be affected if birds are unable to compensate by moving elsewhere or by increasing their foraging efficiency. Data collected showed that energetic costs as a result of responding to a disturbance event were low relative to the estimates on wader daily energy requirements (less than 0.1%) and the lost feeding opportunity costs were also similarly low. It was considered that birds on the Wash can cope with a 5% reduction in available time for feeding in which the research calculated this to be between 38 – 162 separate disturbance events per day depending on species and tidal stage.
Key findings	Low costs of individual responses to disturbance suggest no significant impact on foraging waders providing that other areas of foraging habitat are available.
Cutts, V *et al.* (2024). Guidance on reducing disturbance of shorebirds. Conservation Guidance Series No. 14, v10.	Methods to reduce disturbance to waders, included appropriate signage and interpretation boards as well as restrictive access in order to deter human entry during critical breeding and wintering periods.
Key findings	Methods to restrict access can help reduce disturbance events.

Van der Kolk, H *et al.* (2019). Cumulative energetic costs of military aircraft, recreational disturbance and natural disturbance in roosting shorebirds. Animal Conservation. Volume 23, Issue 4.	This research studied the impacts of larger disturbance-related factors at high tidal cycle such as military and civil aircraft-related noise and disturbance on shorebirds (including curlew). The research indicated that predictability of disturbance could be an important factor in determining individual responses in birds. For example, birds may anticipate a certain level of danger from an object, but when this is different from the norm, the perception of danger may increase, and they will respond accordingly. The research concluded that the energetic responses from disturbance events were low for curlew and other larger waders, except for bar-tailed godwit.
Key findings	The level of disturbance is often associated with predictability for birds. Overall, energetic costs to curlew through disturbance was considered to be low.