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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Converting an area of grassland pasture to a cultivated area

On Behalf of [redacted]

July 2022

Dr [redacted] [redacted] [redacted]

Contents

1. Non-Technical Summary (NTS)

This Environmental Impact Assessment Report (E.I.A.R.) has been prepared by [redacted], in July 2022. on behalf of [redacted]. The proposed development is to convert a 4.4ha area of pasture grassland to a cultivated area for winter crops. The development site sits to the south of [redacted] and is within the Moorfoot Hills protected area (SSSI and SAC).

Preliminary scoping identified factors likely to be significantly impacted by the proposed development. These considered biodiversity (both flora and fauna), hydrology/water, and soil. Following this, a targeted survey of flora and fauna was undertaken, with general observation of how both the hydrology and soil could be affected by the proposed changes.

The surveys area was found to be acid grassland which had a broad range of plant species but did not contain any rare or protected species. Bracken was also present in the area. This had previously been controlled using Asulox. No evidence of protected animal species was found (badgers, reptiles, newts, etc.) and as such any impact is deemed negligible. The only potential risks identified were the presence of breeding curlews and lapwings. Mitigation for this includes avoiding the use of machinery on site during the breeding season (March to July). With the correct mitigation measures in place the works are unlikely to have an immediate effect on these species as chicks will have fledged prior to works taking place. In the longer term, these species are likely to be displaced into the suitable habitat which surrounds the development site. The long term impact on the local population is unlikely to be significant. In addition to nesting birds, there is a small risk of soil erosion due to the gradient of the slope. Following best practice, cultivation should take place across the slope to promote stable crop establishment and to reduce the risk of soil erosion and runoff. Further mitigation would include controlled use of pesticides, manure and chemical fertilizers. No signs of water voles or otters were recorded in the area and the proposed works would be unlikely to have any effect on the riparian habitat to the north of the site. Likewise, no badgers' setts were recorded.

Two alternative locations were also studied, one further upslope in moorland and another closer to riverside banks, but both were deemed to result in more significant impact in local biodiversity and more damage to existing habitats. Taking all information available into account, the current proposed site is considered the best location for the proposed development.

2. Description of Project

The proposed development consists of converting a small area of acid grassland, currently used and grazed by sheep, into a cultivated parcel. Crops such as kale, cover crops and livestock fodder crops are likely to be grown on site. The project site measures 4.4 ha.

The proposed development is located in the Scottish Borders, approximately 15km northwest of Galashiels. It is 600 meters south of [redacted], across the southern bank of Lugate water, on the northeast slopes of Calfhope Hill (Figure 1). The site is located within Moorfoot Hills SSSI (Site of Special Scientific Interest) (https://sitelink.nature.scot/site/1186) and just within the boundary of Moorfoot Hills SAC (Special Area of Conservation) (https://sitelink.nature.scot/site/8326). The Moorfoot Hills SSSI is a protected area for Blanket Bog, Breeding Bird Assemblage, Golden Plover breeding, and Upland Assemblage (subjected to negative pressures of overgrazing by sheep and bracken expansion). The Moorfoot Hills SAC is a protected area for Blanket Bog and Dry Heath (subjected to negative pressures of bracken expansion). The SSSI is known to be under pressure from sheep grazing pressure in places and bracken encroachment.

All developments listed in Schedule 2 from Regulation 2(1) of Town and Country Planning Regulations (2017) which are to be located in protected areas must be screened for the need for Environmental Impact Assessment, whether or not they meet the criteria or exceed the thresholds in Schedule 2. These include projects for use of uncultivated land in semi-natural areas for agricultural purposes.

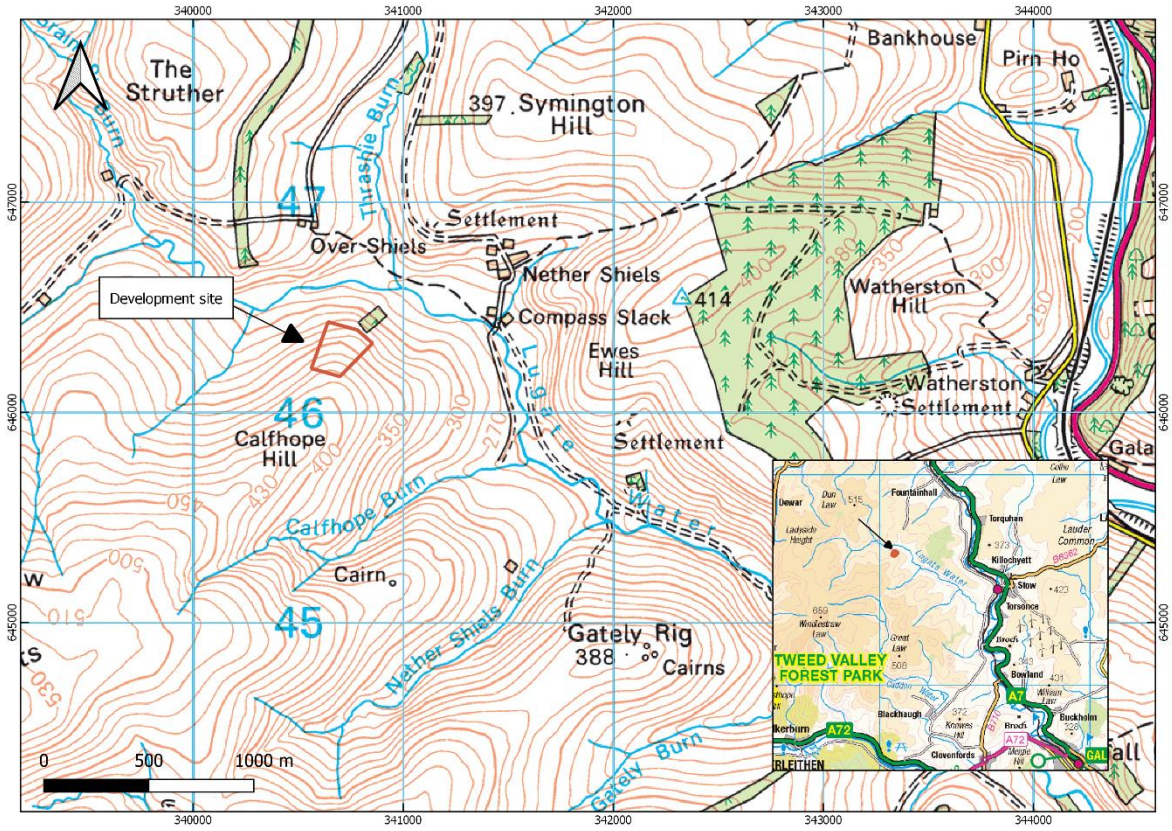

Figure 1 - Map showing the Location of the Proposed Development Site

The proposed development will consist of using some machinery (such as a rotavator) to till the soil in July or August, and sow the crops, by seed drilling. Crop rotation is planned. Manure and small applications of chemical fertilizers and pesticides will be used.

Surrounding bracken to the grassland has been controlled by usage of Asulox on an annual basis, and this is expected to continue. Moderate levels of sheep grazing will continue in adjacent grassland.

3. Scoping of Environmental Impact Assessment

The European Union (Environmental Impact Assessment) Regulations, (as amended) and directive 2014/52/EU prescribe a list of areas of the environment that must initially be addressed in any E.I.A.R. These areas comprise/may comprise of:

- Population and Human Health
- Biodiversity (Flora & Fauna, Special Policy Areas etc.).

- Land and Soil.
- Water.
- Air.
- Climate / Climate Change
- Landscape.
- Material Assets / Traffic.
- Architectural and Archaeological Heritage / Cultural Heritage.
- The inter-relationship between the factors listed above

It is necessary to encompass each of these sections of the environment with respect to the impacts that the proposed development will have on them. The purpose of this exercise is to shape and mould the E.I.A.R. so as not to overlook any impacts that may be significant, and to focus on the issues that have potential for environmental impact. In this case the above criteria were studied and prioritized, ensuring that particular attention was paid to the issues that are directly relevant to the impact of the proposed development. A Matrix has been developed so as to assess the magnitude and nature of any potential impacts at the Scoping stage. Resulting from this preliminary assessment, only those issues identified as potentially significantly impacted by this development have been assessed in detail in this E.I.A.R., in line with E.I.A.R. draft guidelines (**1**).

The potential impacts that the proposed development could impose on each aspect of the environment were sub-divided into the following categories, and analysed separately:

- Potential impacts if the proposed development does not proceed.
- Potential impacts during the preparation phase of proposed development (tilling of the area to convert grassland pasture into arable land).
- Potential impacts during the operational phase of proposed development (cultivation of crops, crop rotation, harvesting), to reflect impacts in the long-term.

	No development	Preparation phase	Operational phase
Population / Human Health	=	=	+
Biodiversity (Flora)	=	- -	-
Biodiversity (Fauna)	=	- -	-
Land and Soil	=	- -	-
Water / Hydrology	=	-	- -
Air	=	=	=
Climate / Greenhouse emissions	=	-	=
Ambient and Noise	=	- -	-
Cultural Heritage / Archaeological Heritage	=	=	=
Landscape	=	-	=
Material Assets			
Traffic	=	- -	-
Employment / Financial benefits	-	+	+ +

Key:

= no impact

- slight negative potential impact
- - moderate negative potential impact
+ slight positive potential impact
+ + moderate positive potential impact

3.1. The data required to identify and assess the main effects of the development on the environment

- Knowledge about the presence or absence, and potential suitable habitat for protected animal species (protected mammals, reptiles and amphibians)
- Knowledge about the flora diversity within and around the project site, and the presence or absence of rare and protected plant species
- Knowledge about the breeding bird assemblage, and the eventual presence of species of conservation interest
- Knowledge about the slope condition, and general hydrology of the project site, and surroundings.

4. Factors likely to be significantly affected

Baseline conditions

The site of development is dominated by acid grassland which is in favourable but declining condition due to bracken encroachment. Grazing pressure by sheep is low. The acid grassland shows good species diversity with both forbs and grasses present and is located on a moderate slope (20 degrees). A significant proportion of this site is dominated by semi-contiguous bracken, particularly in the northeast and east. The bracken area still contains a reasonable amount of forbs. There is also some semi-improved neutral grassland to the southeast of the site, and a small area of degraded dry shrub heath at the northwest edge (Figure 2).

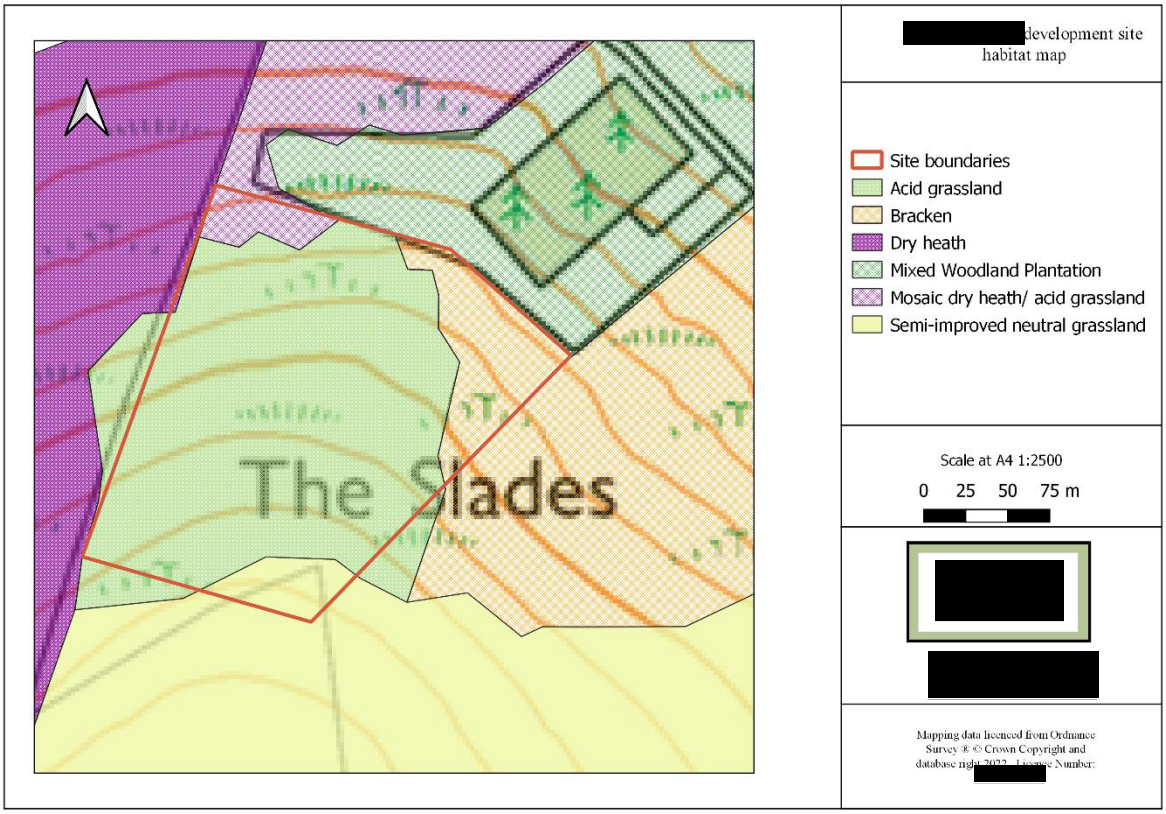

Figure 2. Dominant habitat type across the proposed development site and surrounding area.

No flora species of conservation concern were found during our survey (to be detailed below). The adjacent areas (outside of site for proposed development) contains dry heath and wet heath (to the northwest and west) and mixed woodland plantation (immediately to the northeast). There were no wet flushes within the development site.

This project is not expected to affect population, human health, air, climate, material assets, and cultural heritage, in any significant way. Greenhouse emissions are expected to be small due to standard farm machinery usage.

The Lugate water runs to the north of the site. There are no other significant water bodies in the project site or its proximity (there is only one very small stream running at the northern boundary of the project site). There is one farm in the vicinity, located about 600 meters to the north. There is a very low possibility of a minor impact in **hydrology**, mainly due to run-off of chemical fertilizers, manure, and other chemical agricultural inputs, due to the slope of the site. However, these can be negated by using best practice when applying any chemicals. There are also some concerns about impact on **soil**, namely due to erosion (due to tilling on slope) and compaction. Slope is about 20 degrees in some locations of the project site. Soil of the project site is loam, moderately rich in organic matter, and nearly always covered with vegetation; no signs of erosion have been found.

The impact on the **landscape** is expected to be minimal, considering the fact that the site of the project is already grazed by sheep and it is of small dimension. The impact on **biodiversity (flora and fauna)** should be relatively small, except for potential disturbance to curlew and lapwing nesting sites, if proposed works take place in proximity of bird breeding season, as well as potential minor impact in any local population of otters and badgers, if these are present in the vicinity.

4.1. IMPACT ON BIODIVERSITY

Considering that the most significant impact expected is to biodiversity, we carried out a more detailed analysis below, based on the results of a survey performed on the land on the 23rd of June 2022.

4.1.1. Mammals

The following mammal species are all protected species, under Schedule 5 of Wildlife and Countryside Act 1981.

Water vole (*Arvicola terrestris)*
This species has full protection under the Wildlife and Countryside Act 1981. There is suitable habitat for water voles at around 300 meters north of the proposed development, namely a small river (Lugate water). Water voles have home ranges up to 300 meters (**2**). Considering this, the project site will fall just outside of the normal range for water voles that might be present in the vicinity of the Lugate water river. Due to the relative distance to the proposed development, well upslope from that river, we do not anticipate that the proposed development will have any significant impact on the local population of water voles.

Hazel Dormice (*Muscardinus avellanarius)*
There was no need to survey for this species, as the project site is outside of the current range of the species in the UK.

Otters (*Lutra lutra*)
There is suitable habitat for otters at around 300 meters north of the proposed development, namely a small river (Lugate water). Whilst otters have very large home ranges along a river length (up to 32 km), due to the relative distance between the river and the proposed development (located well upslope from that river), we do not anticipate that the proposed development will have any significant negative impact on the local population of otters. There was

no need for surveying otters, as this is only recommended when a project is proposed within 200 meters of a water course (**3).**

Pine Marten (*Martes martes*)
The habitat surrounding the project site is not suitable for pine martens, which usually prefer native conifer woodlands and plantations, while there is only a small parcel of mixed woodland plantation near the project site. In addition, the local area is only known to contain isolated populations of this species, therefore it is very unlikely that this species is present in the vicinity of the proposed development. We do not anticipate that the project will have any significant impact on this species.

Red Squirrels (*Sciurus vulgaris)*
The woodland in the vicinity of the project site is suitable habitat for Red Squirrels, but it is unlikely that the proposed development would have any significant impact on the local population of this species, should there be one, except perhaps for a minor impact caused by noise when machinery is used on site.

Bats (*Vespertilionidae and Rhinolophidae*)
There was no need to survey bats, as there are no trees, buildings or walls on the project site, so there should not be any significant impact on the local bat population. Any roosting or hibernation sites would be located outside of the area of proposed development.

Badgers (*Meles meles*)
Badgers are a protected species under the Protection of Badgers Act 1992. Whilst there is no historical presence of badgers as reported by the client, there is suitable badger habitat in the vicinity of the site (woodland, with access to water and open country). No traces of badger activity (setts, paths or latrines) were recorded after a thorough walk across the project site and the area 200 meters around it. Should there be a population further away, the impact would be negligible.

In addition to what has been reported above, widespread signs of European Mole (*Talpa europaea*) activity were recorded on site, but this species is very abundant and not protected.

4.1.2. Reptiles and Amphibians

Great Crested Newt (*Triturus cristatus)*
There are no ponds within or in the proximity (within 500 meters) of the project site. Therefore, the proposed development should not have any impact on the local newt population.

Adder (*Vipera berus)*
No sightings were recorded during the survey and no historical presence as reported by the client. There should be no significant impact of the proposed development in the local population of this species.

Grass Snake (*Natrix natrix)*
The project site is located outside of the distribution range of this species in the UK. We estimate that there should be no significant impact of the proposed development in the local population of this species.

Common Lizard (*Zootoca vivipara)*
No sightings were recorded during the survey. Whilst this species is generally very abundant, we estimate that there should be no significant impact of the proposed development in the local population of this species.

Slowworm (*Anguis fragilis)*

No sightings were recorded during the survey. We estimate that there should be no significant impact of the proposed development in the local population of this species.

4.1.3. Flora

We carried a thorough survey aiming to detect the presence of any species protected under Schedule 8 of Wildlife and Countryside Act 1981. No protected species were recorded.

Several random locations were surveyed for plant species present, and an estimation of species cover in percentage was noted. The Grid Reference coordinates and habitat were recorded. Results are detailed below and each sampling plot is also linked to photographs (**Figure 3, 4, 5, 6 and 7**).

1. NT 41049/46173 Habitat: Semi-improved Neutral grassland

Species	Latin name	Abundance (% cover)
Grass spp.		50
Yorkshire Fog	*Holcus lanatus*	15
Meadow-grass	*Poa spp.*	10
Red Fescue	*Festuca rubra*	10
Wavy hair grass	*Deschampsia flexuosa*	5
Common bent	*Agrostis capillaris*	5
False oat-grass	*Arrhenatherum elatius*	5
Quaking grass	*Briza media*	<5
Other grasses		<5
Creeping Thistle	*Cirsium arvense*	15
White Clover	*Trifolium repens*	10
Buttercup	*Ranunculus* spp.	10
Lesser Stitchwort	*Stellaria graminea*	10
Heath Speedwell	*Veronica officinalis*	<5
Sorrel	*Rumex* spp.	<5
Yarrow	*Achillea millefolium*	<5
Nettle	*Urtica dioica*	<5
Creeping Cinquefoil	*Potentilla reptans*	<5

No rare or protected species recorded

2. NT 40750/46372 Habitat: Acid Grassland

Species	Latin name	Abundance (% cover)
Grass spp.		40
Common bent	*Agrostis capillaris*	20
Mat grass	*Nardus stricta*	10
Sheeps Fescue	*Festuca ovina*	5
Other grasses		5
Creeping Cinquefoil	*Potentilla reptans*	20
Heath Bedstraw	*Galium saxatile*	10
Bracken	*Pteridium*	10
Heath Speedwell	*Veronica officinalis*	5
Blaeberry	*Vaccinium myrtillus*	5
Deergrass	*Trichophorum cespitosum*	5
Glittering wood moss	*Hylocomium splendens*	5
Hard fern	*Blechnum* spp.	<5

No rare or protected species recorded

3. NT40662/46365 Habitat: Dry Heath and acid grassland mosaic

Species	Latin name	Abundance (% cover)
Blaeberry	*Vaccinium myrtillus*	40
Creeping Cinquefoil	*Potentilla reptans*	20
Mat grass	Nardus stricta	15
Glittering wood moss	*Hylocomium splendens*	10
Heath Bedstraw	*Galium saxatile*	5
Bracken	*Pteridium*	5
Deer grass	*Trichophorum cespitosum*	5

No rare or protected species recorded

4. NT 40576/46219 Habitat: Acid grassland

Species	Latin name	Abundance (% cover)
Grass spp.		35
Mat Grass	Nardus stricta	20
Other grasses		15
Creeping Cinquefoil	*Potentilla reptans*	25
Soft Rush	*Juncus effusus*	10
Heath Bedstraw	*Gallium saxatile*	10
Glittering Wood Moss	*Hylocomium splendens*	10
Deergrass	*Trichophorum cespitosum*	5
Blaeberry	*Vaccinium myrtillus*	5

No rare or protected species recorded

5. 40708/46191 Habitat: Semi-improved Neutral grassland

Species	Latin name	Abundance (% cover)
Grass spp.		50
Common Bent	*Agrostis capillaris*	10
False oat-grass	*Arrhenatherum elatius*	10
Red Fescue	*Festuca rubra*	10
Cockfoot grass	*Dactylis glomerata*	5
Other grasses		15
White Clover	*Trifolium repens*	15
Creeping Thistle	*Cirsium arvense*	15
Bracken	*Pteridium*	10
Buttercup	*Ranunculus* spp.	5
Nettle	*Urtica dioica*	5
Sorrel	*Rumex* spp.	<5

No rare or protected species recorded

Figure 3. Sampling plot 1, for flora diversity. Habitat: semi improved neutral grassland, dominated by *Holcus lanatus* surrounds the project site to the east

Figure 4. Sampling plot 2, for flora diversity. Habitat: acid grassland, dominated by *Nardus stricta* and also *Potentilla reptans*, comprises most of the project site.

Figure 5. Sampling plot 3, for flora diversity. Habitat: mosaic dry heath and acid grassland, dominated by *Vaccinium myrtillus*, towards the northwest

Figure 6. Sampling plot 4, for flora diversity. Habitat: acid grassland, dominated by *Nardus stricta* and also *Potentilla reptans*, comprises most of the project site.

Figure 7. Sampling plot 5, for flora diversity. Habitat: semi-improved neutral grassland, at the southern edge of the project site.

In conclusion, there should be only a minor impact of this project on local flora biodiversity, as no rare or protected species seem to be present on site, and most recorded species are common.

4.1.4. Nesting Birds

Barn Owls

There is no suitable nesting habitat for barn on the proposed development site and as such there is unlikely to be a significant impact should they be present in the wider area.

We used Brown and Shepherd methodology (**4**) to survey the site of proposed site and the surrounding area. This methodology involves an intensive search covering the entire area within 100 meters, and spending an average of 25 minutes per 500 x 500 meter square.

Other bird species

In total, 17 bird species were recorded during the survey, all of which are likely to be breeding.

The species recorded directly on site were: Curlew, Skylark, Meadow Pipit, Mistle Thrush, Blackbird, Goldfinch, and Pheasant. Of these, **Curlew** *(Numenius arquata*) is the only species of concern, as this protected species is observed to be potentially nesting on site, and the proposed development could have some impact in this species local population, depending on the timing of the use of machinery to till the area or harvest crops. Mistle Thrush (*Turdus viscivorus*) and Skylark (*Alauda arvensis*) are red-listed species, meaning their UK numbers have declined in recent decades, however both of these species were very abundant in the surrounding area, and the proposed works should not have a significant in their local populations.

The following species were recorded in the surrounding area: Lapwing, Oystercatcher, Blackcap, Willow Warbler, Woodpigeon, Chaffinch, Wren, Robin, Red Legged Partridge, Swallow, Mistlethrush, Skylark. Of these, **Lapwing** (*Vanellus vanellus*) is the species of most concern.

Golden Plover is a species of particular interest which is known to be breeding in the wider area, but which was not recorded on or near the proposed development. This is likely to due to the relatively low altitude of the site. Historically, there are some protected species that have been reported in the wider area, such as: Golden Eagle, Peregrine and Hen Harrier. These species are not likely to be breeding in the immediate vicinity of the project site.

The total list of bird species observed with the Brown and Shepherd survey is shown in Table 1 together with their conservation status as described in the Birds of Conservation Concern 4 (BOCC4) (Burns *et al*. 2020) and legal protection offered by the Wildlife and Countryside Act 1981 and EU Birds Directive.

Table 1: The total list of bird species observed with the Brown and Shepherd survey which are likely to have a territory completely inside the study site. Species are divided by colour category following the latest BOCC report, indicating degree of conservation concern with Red being the highest and Green the least. Species underlined are those also present in the Schedule 1 list from the Wildlife and Countryside Act 1981 and/or the Annex 1 of the European Birds Directive.

Common Name	Scientific Name	BOCC4 List
Curlew	*Numenius arquata*	Red
Lapwing	*Vanellus vanellus*	Red
Mistle Thrush	*Turdus viscivorus*	Red
Skylark	*Alauda arvensis*	Red
Meadow Pipit	*Anthus pratensis*	Amber
Oystercatcher	*Haematopus Ostralegus*	Amber
Willow Warbler	*Phylloscopus Trochilus*	Amber
Woodpigeon	*Columba palumbus*	Amber
Wren	*Troglodytes troglodytes*	Amber
Blackbird	*Turdus merula*	Green
Blackcap	*Sylvia atricapilla*	Green
Chaffinch	*Fringilla coelebs*	Green
Goldfinch	*Carduelis carduelis*	Green
Pheasant	*Phasianus colchicus*	Green
Red Legged Partridge	*Alectoris rufa*	Green
Robin	*Erithacus rubecula*	Green
Swallow	*Hirundo rustica*	Green

4.1.5. Butterflies / Other Invertebrates

Two transects spaced 200 meters were walked across, and butterfly species were noted. Only common heath (*Ematurga atomaria*) and small heath (*Coenonympha pamphilus)* were recorded. No other invertebrates were surveyed. We don't anticipate any significant negative impact on the local population of butterflies.

5. Mitigation Measures

The following mitigation would alleviate any minor concerns which were flagged up during the survey:

- Contour ploughing and avoidance of bare soil for long periods would reduce the likelihood of soil erosion.
- Minimal use of fertiliser and pesticides and application following best practice would reduce possibility of run-off from the proposed site.
- Use of agricultural machinery only outside of breeding bird season (March to July) would avoid disturbance of breeding birds such as curlew and lapwings and would leave long vegetation for nesting during this period.
- Predator control should be continued following best practice as this is likely to have a beneficial impact on the breeding success of wading species.
- Avoidance of operating machinery during dusk and dawn would mitigate against any noise disturbance to any otters and badgers in the wider surrounding area.

6. Description of Reasonable Alternatives

The proposed site was chosen as most other locations around the farm were allocated to other uses, for example crops or livestock grazing. Two alternatives were considered. Consideration was given to setting up a new parcel by the river. However this would have a stronger impact on local biodiversity and hydrology and could increase riverbank erosion; riparian habitats are also critical habitat for breeding birds such as oystercatchers in addition to curlews. The impact on flora would also be more significant, as the riverside banks are home to a mosaic of acid grassland and wetlands, with richer flora diversity. In addition to this, a third site was considered. This was located upslope of the proposed development. This would have resulted in disturbance to the surrounding moorland, with potentially greater impacts for wildlife. This is particularly pertinent as the area in within a SSSI and an SAC which target the protection of dry heath, blanket bog, golden plover breeding. There would also be an increase chance of disturbance to hunting behaviours of protected raptor species such as Golden Eagle, Peregrine and Hen Harrier. In some locations, conversion of the moorland into farmland, could also result in more significant impact in local hydrology.

Considering the two main alternatives studied, the current proposed site has the lowest predicted impact in local biodiversity and hydrology. The proposed site still can result in a minor impact to the curlew population, and the disadvantage of a greater slope, which can mean more soil erosion but with the proper mitigation measures implemented the impact of the proposed development is likely to be low and insignificant to the surrounding landscape, biodiversity and hydrology.

7. References

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